Fresas torbellino — Fresas de roscar — Calibres

Thread whirl cutters — Thread milling cutters — Thread gauges

ES-EN-ID TM.1

Catálogo

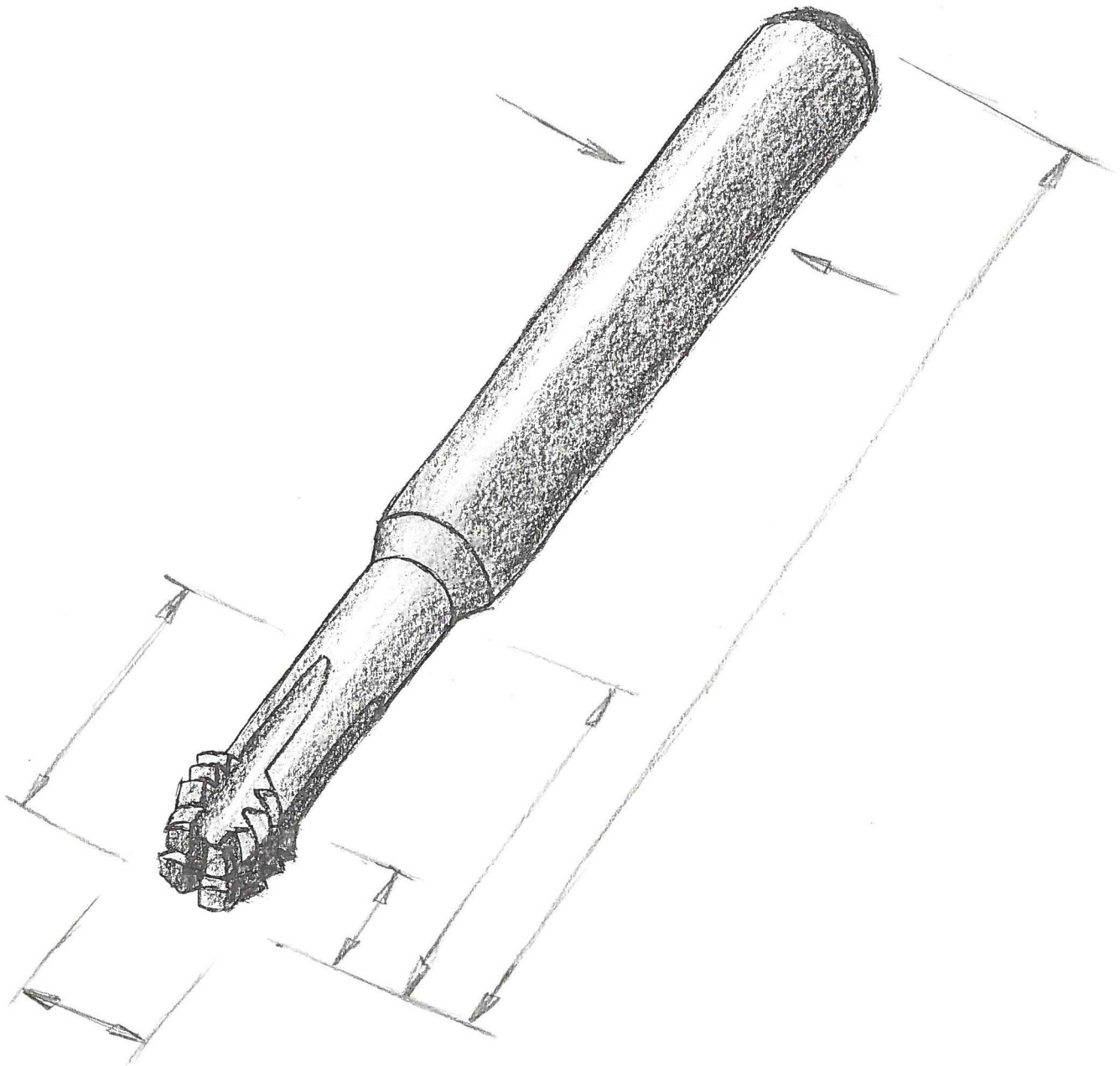
Fresas torbellino
Fresas de roscar
Calibres

Catalogue

Thread whirl cutters
Thread milling cutters
Thread gauges

ES-EN-ID TM.1


TAP
DC
DC
DC



DISPONIBILIDAD DE LOS ARTICULOS

- ID *Artículos disponibles de stock*
- ID *Disponible a corto plazo*
- * ID *Artículos disponibles de stock hasta agotamiento*

AVAILABILITY OF THE ARTICLES

- ID Stock item
- ID Available at short notice
- * ID Available from stock, while stock lasts

Nuestra innovadora empresa está situada en el cantón de Berna en Suiza, entre la cadena montañosa del Jura y al borde del rio que atraviesa nuestro valle, la Birse. Es ahí que desde 1940 nuestras herramientas de roscado de alto rendimiento se desarrollan, fabrican y se mandan a través del mundo.

Desde la fundación de nuestra empresa nos hemos centrado en optimizar todas las gamas de machos de corte y de deformación en HSSE / HSSE-PM de nuestro programa, a fin de satisfacer las necesidades de nuestros clientes, desarrollando nuevos tipos de geometrías adaptándolas a las últimas tecnologías y materiales.

En el año 2000, creamos la nueva división de producción "ONE STEP", equipada con las últimas tecnologías para el desarrollo y la producción de fresas de roscar en metal duro. En ese mismo tiempo nuestro programa "CAR" (metal duro) se desarrolló y amplio fuertemente poniendo el focus en las fresas torbellino.

Desde 2010, se ha prestado especial atención al desarrollo de nuestras micro herramientas. El resultado es un amplio programa "NANO", que incluye torbellinos, machos de corte, machos de deformación, calibres, contra-calibres en una gama de dimensión de 0.3 a 2.75 mm. Y con la acreditación ISO17025/2005, siendo DC Nano Tools SA un especialista en este mercado.

Hoy día nuestros productos de alto nivel son utilizados en el mundo entero y en todas las industrias donde ***calidad***, ***rendimiento*** *y* ***fiabilidad*** *son primordiales.*

Si no encuentra lo que necesita en nuestra amplia gama de productos estándar, podemos modificar las herramientas para satisfacer sus necesidades o fabricar artículos especiales específicos, basados en sus descripciones y dibujos.

Para las preguntas a las que no puedes encontrar respuestas en nuestro catálogo, estamos encantado de estar a su entera disposición.

"Al principio, estaba buscando las mejores herramientas, entonces decidí de producirlas yo mismo"

Daniel Charpilloz – 1940

Our innovative SME is at home in the Berner Jura in Switzerland, idyllically nestled between hills and on the banks of the still young river called Birs. This is where since 1940 the high-performance threading tools of our brand DC are developed, manufactured and supplied all over the world.

Since the foundation of our company, we have focused on expanding our range of HSSE / HSSE-PM taps and thread formers in order to optimally meet our customers' needs and on constantly developing new tool types for the latest technologies and materials.

In 2000, we created the new "ONE STEP" production division, equipped with the latest production technologies, for the development and manufacture of reliable and powerful solid carbide thread milling cutters. In the meantime, our CAR programme has been greatly developed and expanded, with a focus on thread whirling cutters.

Since 2010, special attention has been paid to the development of our micro tools. The result is our in the meantime really broad "nano" programme, which includes thread whirlers, taps, thread formers, thread gauges and check thread gauges in the diameter range from 0.3 - 2.75 mm. As an ISO 17025/2005 accredited company, DC Nano Tools SA is your specialist in this field.

Today, our high performance threading tools are used worldwide and in all industries where **quality**, **performance** and **reliability** of the products are paramount.

If you do not find what you need in our wide range of standard products, we can modify tools to suit your needs or manufacture specific special items, based on your specifications and drawings.

For questions, to which you cannot find an answer in our catalogue, we are of course gladly at your entire disposal.

"In the beginning, I was looking for the best tools, then I decided to produce them myself"

Daniel Charpilloz – 1940

DC SWISS EN EL MUNDO ENTERO *Y SIEMPRE A SU LADO*

PROXIMIDAD A LOS CLIENTES

Encontrareís siempre un interlocutor competente, ya sea en la oficina central en Suiza, en una de sus sucursales de Alemania, Italia o Inglaterra o a traves de sus numerosos partners tecnológicos o distribuidores alrededor del mundo.

CUSTOMER PROXIMITY

You will always find a competent contact person, whether at our main site in Switzerland, at one of our subsidiaries in Germany, Italy and England, or at one of our many representatives or resellers worldwide.

Sucursales - Subsidiaries
Partners tecnológicos - Technology Partners
Agencias - Distributors

Para los otros paises : dcswiss.com/es/red-de-ventas
For further countries: : dcswiss.com/en/sales-network

DC SWISS WORLDWIDE

AND ALWAYS CLOSE TO YOU

SWISS QUALITY

***100 % made by DC SWISS** - Garantía desde el desarollo de la herramienta a su fabricación y control final, gracia a nuestra peritación y a nuestra competencia en todos los dominios de producción de herramientas.*

100 % made by DC SWISS - guaranteed from the development of the tool to its production and straight through to the end control, thanks to our know-how and competencies in the whole field of threading tool manufacturing.

NUESTROS VALORES

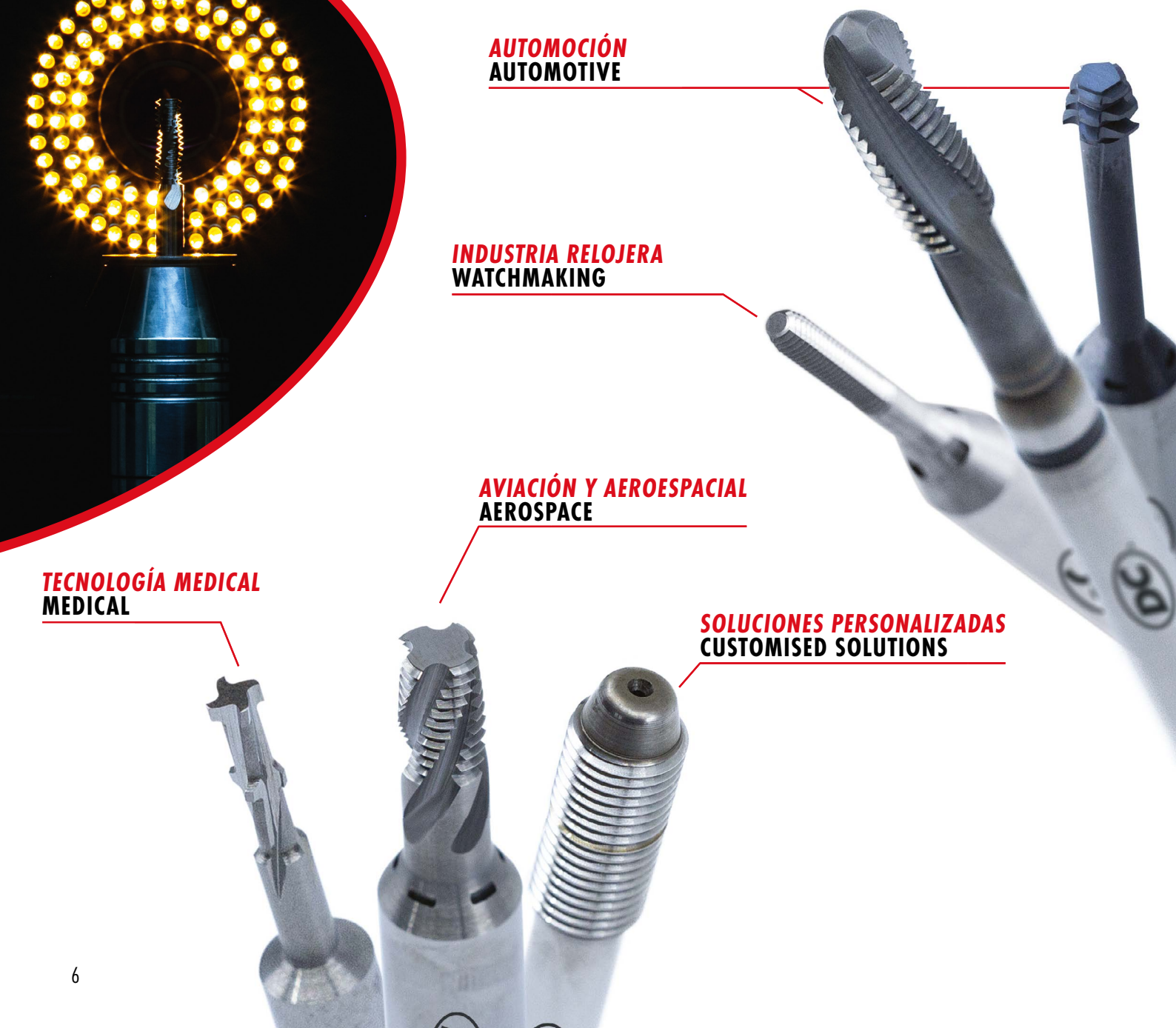
OUR VALUES

RESULTADO

El resultado esta al centro de nuestras preocupaciones para el desarollo de soluciones personalizadas y mejoras de nuestros productos estándar a las necesidades del cliente. Damos gran importancia en ofrecer la mejor relación calidad/precio como base de una relación de confianza con nuestros clientes.

PERFORMANCE

We make every effort to develop new high-performance threading tools and to adapt the performance of our standard tools to the current needs of our customers. We attach great importance to a constant price/performance ratio as the basis for a trusting relationship with our customers.



AUTOMOCIÓN
AUTOMOTIVE

INDUSTRIA RELOJERA
WATCHMAKING

AVIACIÓN Y AEROESPACIAL
AEROSPACE

TECNOLOGÍA MEDICAL
MEDICAL

SOLUCIONES PERSONALIZADAS
CUSTOMISED SOLUTIONS

CONOCIMIENTO

El valor de nuestro Saber Hacer se traduce por una manera unica de resolver problemas y de asociar el conjunto de conocimientos, experiencias y competencia acumuladas desde 1940.

FIABILIDAD

Relaciones a largo plazo se construyen unicamente sobre base de confianza, transparencia y compromisos quotidiano de cada uno de nuestros colaboradores a suministrar a nuestros clientes herramientas y servicios de maxima calidad.

KNOW-HOW

The value of our know-how represents in a unique way the solving of problems and articulates, implements and associates the whole knowledge, experiences and competences accumulated since 1940.

RELIABILITY

We know that lasting relationships can only be built on the basic of confidence, transparency and the daily efforts of each of our employees to provide our customers with tools and services of an excellent quality.

ROSCADO CLÁSICO
THREAD CUTTING

ROSCADO POR LAMINACIÓN
THREAD FORMING

ROSCADO POR INTERPOLACIÓN
THREAD MILLING

AVIACIÓN Y AEROESPACIAL
AEROSPACE

AUTOMOCIÓN
AUTOMOTIVE

TECNOLOGÍA MÉDICAL
MEDICAL

SOLUCIONES PERSONALIZADAS
CUSTOMISED SOLUTIONS

PRODUCCIÓN DE ENERGÍA
POWER GENERATION

INDUSTRIA RELOJERA
WATCHMAKING

MECÁNICA GENERAL
GENERAL ENGINEERING

TORBELLINO
THREAD WHIRLING

CALIBRES DE CONTROL
THREAD GAUGES

MANDRIL DE ROSCAR
TAPPING CHUCKS

COJINETES DE ROSCAR
DIES

NUESTRAS COMPETENCIAS
SERVICIO DE MEDICIÓN Y DE METROLOGÍA

DC SWISS dispone de un laboratorio metrológico acreditado por el Servicio Suizo de Acreditación como laboratorio de calibración de dimensiones.

DC SWISS está capacitada para ofrecer servicios de calibración y metrología para conexiones roscadas.

Un certificado es la confirmación por escrito de la calidad del equipo metrológico de una empresa. DC NANO TOOLS SA (acreditación SCS 0143), miembro del Grupo DC SWISS, puede inspeccionar y calibrar calibres tampón, así como los Masters para medición de anillos de rosca de acuerdo con la norma internacional ISO 17025.

Nuestras herramientas son el resultado de numerosos estudios. Los diseñamos usando todo el conocimiento que hemos adquirido durante muchos años, siempre poniéndolos a prueba hasta sus máximos límites. Compartimos todo este conocimiento con usted gracias a los diferentes servicios que les ofrecemos. Nuestro objetivo es proporcionar la solución más adecuada en cada caso, desde el estudio de viabilidad hasta la producción en serie.

Somos expertos en todos los aspectos del proceso de roscado y somos capaces de ofrecerle nuestra experiencia de montaje desde el diseño, mecanizado e inspección metrológica a través de las diversas etapas de la creación de conexiones roscadas.

Expertos en diseños
Cada diseño es único pero a menudo hay múltiples soluciones. Podemos asesorarle sobre qué tipo de fijación elegir, por ejemplo, ajustable, auto bloqueo, o roscados de alta calidad. Durante la fase de elaboración, podemos ayudar a sus ingenieros a identificar y decidir la mejor conexión roscada en términos de dimensiones, practicidad, costes de producción y montaje.

Experiencia en mecanizado
Cada herramienta requiere una programación especial con numerosos parámetros. Podemos ayudarle a sacar lo mejor de sus máquinas y herramientas para lograr el máximo rendimiento a través de una programación personalizada. Y si una herramienta lo precisa, podemos hacerlo para que cumpla con todos sus requisitos. A menudo, un enfoque particular del ajuste permite resolver un problema causado por geometría compleja o posicionamiento inusual.

Experiencia en metrología
Suministramos un gran número de medidores y también asesoramiento sobre cómo utilizarlos e inspeccionarlos para garantizar que la calidad requerida se alcanza de manera adecuada. Otras medidas más específicas están disponibles, como la concentricidad asin que todas las medidas de certificación. Podemos ayudarle a establecer procedimientos de control. Este servicio está disponible para diámetros de flanco de 0.1 à 3.0 mm, y diámetros externos de 0.1 à 3.5 mm. Confie en la experiencia de DC NANO TOOLS SA para calibrar sus herramientas de medición.

Formación
En nuestro centro de aplicación y laboratorio, distribuimos información completa y asesoramiento sobre las mejores prácticas a todos nuestros clientes en el diseño, la fabricación y el funcionamento de fijaciones roscadas. Podemos proporcionar formación bajo demanda en temas específicos como fijaciones seguras.

OUR EXPERTISE
CALIBRATION & METROLOGY SERVICE

DC SWISS has a metrology lab that is accredited by the Swiss Accreditation Service as a laboratory for calibrating lengths.

DC SWISS is able to offer a calibration and metrology service for screw connections.

A certificate is written confirmation of the quality of a company's metrological equipment. DC NANO TOOLS SA (SCS accreditation 0143), a member of the DC SWISS Group, can inspect and calibrate thread plug gauges as well as thread ring gauges in accordance with the ISO 17025 international standard.

Our tools are the result of numerous studies. We design them using all the knowledge we have acquired over many years, always testing them to their utmost limits. We share all this knowledge with you in the form of our services. Our aim is to provide the most appropriate solution in each case, from feasibility study right through to mass production.

We are experts in all aspects of the process of screw threading, and are able to offer you our assembly expertise from design, machining and metrological inspection through the various stages of creating screw connections.

Design expertise
Each design is unique, but there are often multiple solutions. We can advise you on which type of screw fixing to choose, for example adjustable, self-locking or high-quality screws. During the design phase, we can help your designers to identify and decide the best-performing screw fixing in terms of dimensions, practicality, production costs and assembly.

Machining expertise
Each tool calls for special programming involving numerous parameters. We can help you to get the best out of your machines and tools in order to achieve maximum performance via personalised programming. We can provide you with support in the inspection and measurement phase, so you can be sure of having produced the screw thread you were expecting. And if a tool needs to be customised, we can do this so that it meets all your requirements. Often, a particular approach to fitting makes it possible to resolve a problem caused by complex geometry or unusual positioning.

Metrological expertise
We supply a large number of measuring gauges and also advice on how to use and inspect them in order to ensure the required quality is consistently achieved. Other more specific measures are available, such as concentricity and certification measures. We can assist you in setting up control procedures. This service is available for pitch diameters of 0.1 to 3.0 mm, and external diameters of 0.1 to 3.5 mm. Don't take the risk – benefit from the expertise of DC NANO TOOLS SA to calibrate your measuring tools.

Training
In our application centre and our laboratory, we distribute full information and advice on best practice to all our customers in the design, manufacture and use of screw fixings. We can provide on-demand training in specific subjects such as secure fixings.

SWISS ACCREDITATION
sas.admin.ch SCS 0143

Certificate CH07/0649

The management system of

DC Swiss SA

CP 363,
Grand rue 19
CH - 2735 Malleray

has been assessed and certified as meeting the requirements of

ISO 9001:2015

For the following activities

Design, development, manufacturing, marketing, sales and distribution of cutting tools. Expertise in threading technology.

This certificate is valid from 19 June 2018 until 18 June 2021
and remains valid subject to satisfactory surveillance audits
Recertification audit due before 7 June 2021
Issue 6. Certified since September 2007

Authorised by

SGS Société Générale de Surveillance SA
Technoparkstrasse 1 8005 Zurich Switzerland
t +41 (0)44 445-16-80 f +41 (0)44 445-16-88 www.sgs.com

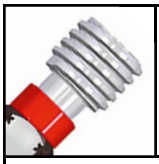
REGISTRO — REGISTER

Torbellino
Thread whirling

Brocas de centrajes, Brocas helicoïdales
Spotting drills, Twist drills

Roscado por interpolación
Thread milling

REGISTRO — REGISTER



Calibres tampón de roscas
Thread plug gauges

Calibres anillos de roscas
Thread ring gauges

Todos los calibres tampón de roscar nano disponen de certificados SCS de pago, disponible sobre pedido.
All nano thread plug gauges are SCS-certified and the paid certificate is available on request.

Todos los calibres anillos nano estan acompañados de un certificado de control, hecho con contracalibres tampons certificados SCS. El certificado de control de pago es disponible sobre pedido.
All nano ring gauges have a certificate of measurement, established with SCS certified plug check gauges. The paid certificate is available on request.

REGISTRO — REGISTER

Contra calibre
Thread plug check gauges

M nano

RN05-1	174	RN15-1	174
RN05-2	179	RN15-2	179

MF nano

RN05-1	175	RN15-1	175
RN05-2	180	RN15-2	180

UNC nano

RN05-1	176	RN15-1	176
RN05-2	181	RN15-2	181

UNF nano

RN05-1	176	RN15-1	176
RN05-2	181	RN15-2	181

S nano

RN05-1	177	RN15-1	177
RN05-2	182	RN15-2	182

SF nano

RN05-1	178	RN15-1	178
RN05-2	183	RN15-2	183

Certificado SCS incluido.
SCS certificate included.

Testimonio de desgaste
Master plug gauges WEAR

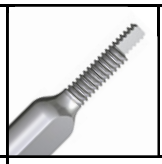
M nano

RN05-3	184	RN15-3	184

MF nano

RN05-3	185	RN15-3	185

Certificado SCS incluido.
SCS certificate included.



Patrón roscado
Calibration thread plug gauges

S nano

EN00	186

Certificado SCS incluido.
SCS certificate included.

Calibres nano - Equipamiento de control - certificado SCS
Formulario de pedido para calibres nano
Micro-Safelock

Tabla de dureza
Pulgadas - mm
Tabla de conversión
Diámetro del agujero
Diámetro de torneado
Cuestionario técnico
Condiciones de entrega

Encontrará más información en
www.dcswiss.com

nano-Thread gauges - Inspection devices - SCS Measurement certificate
Order form for nano thread gauges
Micro-Safelock

Hardness chart
Chart inches - mm
Conversion table
Core holes
Turned diameters
Technical questionnaire
Delivery and payment conditions

Further information are available on
www.dcswiss.com

PICTOGRAMAS — PICTOGRAPHS

Fresas torbellino, fresas de roscar , fresas de taladrar/roscar, brocas de centrar y de taladrar en metal duro integral
Solid carbide thread whirl cutters, thread milling cutters, thrillers, circular drill thread milling cutters, spotting drills and twist drills

VHM CAR — *Metal duro integral*
Solid carbide

VS — *Recubrimiento de protección contra el desgaste "VS" para uso general*
DC "VS" wear-protective coating for general use

VX — *Recubrimiento de protección "VX" para aceros inoxidables y aleaciones de Ni*
DC "VX" wear-protective coating for stainless steels and Nickel alloys

VH — *Recubrimiento resistente "VH" para aceros templados (≤ 63 HRC)*
DC "VH" wear-protective coating for tempered steels (≤ 63 HRC)

NIHS — *Norma de la industria relojera suiza*
Norm of Swiss Watch Industry

HRC ≤ 63 — *Para materiales ≤ 63 HRC (GWH - GFH)*
For materials ≤ 63 HRC (GWH - GFH)

h5/h6 — *Tolerancia del mango h5 / h6*
Shank tolerance h5 / h6

h5 — *Tolerancia del mango h5*
Shank tolerance h5

h6 — *Tolerancia del mango h6*
Shank tolerance h6

< 3µm — *Coaxialidad*
Shape accuracy

HSC — *Mecanizado HSC*
HSC-Machining

 — *GW1000 perfil*
GW1000 profile

 — *GW2000 perfil*
GW2000 profile

 — *GW3000 perfil*
GW3000 profile

 — *GWi3000 perfil*
GWi3000 profile

 — *GWi5000 perfil*
GWi5000 profile

 — *Numeros de diente para la programación (GWi5000)*
Number of teeth for programming (GWi5000)

 — *Para roscados sin rebabas (GWi5000)*
For burr-free threads (GWi5000)

 — *Perfil de la fresa de taladro circular*
Circular drill thread milling cutter profile

 — *Fresa de taladro circular con canal de lubrificación*
Circular drill thread milling cutter with cooling channel

> 20 bar — *Lubrificación interna minima 20 bars*
Internal coolant min. 20 bar

 — *Canal de lubrificación interna*
Internal cooling channel

 — *Canal de lubrificación interna (BGF, 2 ranuras)*
Internal cooling channel (BGF, 2 flutes)

 — *Canal de lubrificación interna (BGF, 3 ranuras)*
Internal cooling channel (BGF, 3 flutes)

 — *Ranuras helicoidales con hélice a 10° a derecha*
10° right-hand spiral flutes

 — *Ranuras helicoidales con hélice a 15° a derecha*
15° right-hand spiral flutes

 — *Ranuras helicoidales con hélice a 27° a derecha*
27° right-hand spiral flutes

 — *Ranuras helicoidales con hélice a 27° a derecha*
27° right-hand spiral flutes

 — *0° ángulo de hélice (GWi5000 - GWH)*
0° helix angle (GWi5000 - GWH)

 — *10° ángulo de hélice a derecha*
10° right-hand helix angle

 — *3° ángulo de hélice a izquierda (ZBGF)*
3° left-hand helix angle (ZBGF)

 — *Con corte de chaflán a 45°*
With 45° chamfer for countersinking

 — *Radio en el diámetro exterior*
Radius on external diameter

 — *Canal de lubrificación interna GWi Ø 0.8 - ≤ 6.35 mm*
Cooling channel GWi Ø 0.8 - ≤ 6.35 mm

 — *Canal de lubrificación interna GWi Ø > 6.35 - 20 mm*
Cooling channel GWi Ø > 6.35 - ≤ 20 mm

 — *Rosca cónica 1:16 (NPT - NPTF)*
Tapered thread 1:16 (NPT - NPTF)

 — *Longitud roscada 2 x D_1*
Thread length 2 x D_1

 — *Longitud roscada 2.5 x D_1*
Thread length 2.5 x D_1

 — *Longitud roscada 3 x D_1*
Thread length 3 x D_1

 — *Longitud roscada 4 x D_1*
Thread length 4 x D_1

PICTOGRAMAS — PICTOGRAPHS

Longitud roscada 1.5 x D_1
Thread length 1.5 x D_1

Longitud roscada 2 x D_1
Thread length 2 x D_1

Longitud roscada 2.5 x D_1
Thread length 2.5 x D_1

Rosca interior
Internal thread

Rosca exterior
External thread

Rosca interior (GW - GWi - GWH)
Internal thread (GW - GWi - GWH)

Para agujero ciego (BGF)
Blind holes (BGF)

Para agujero pasante (BGF)
Through holes (BGF)

BGF, 2 ranuras
BGF, 2 flutes

BGF, 3 ranuras
BGF, 3 flutes

Rosca EG
Thread EG (for wire screw thread inserts)

Diámetro del agujero
Core-hole diameter

Número de ranuras (Z)
Number of flutes (Z)

Sentido de rotación a izquierda
Sense of rotation of tool "left"

Sobre pedido
On request

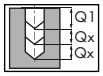
Quitar el diente incompleto (GF61 - GFH61), conversión a la nueva versión en curso
Removal of incomplete thread (GF61 - GFH61), change to new version in progress

Ángulo de chaflán 90°
Chamfer 90°

Profundidad de taladrado 5 x d_1
Drilling depth 5 x d_1

Profundidad de taladrado 6 x d_1
Drilling depth 6 x d_1

Profundidad de taladrado 8 x d_1
Drilling depth 8 x d_1



Perforación con desahogo
Drilling with pecking

Ángulo de punta a 130°
130° point angle

Ángulo de punta a 140°
140° point angle

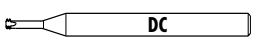
Ranuras helicoidales con hélice a 30° a derecha
30° right-hand spiral flutes

Refrigeración interna, con 2 salidas frontales
Internal coolant, with 2 frontal outflows

Refrigeración interna, con 2 canales en espiral
Internal coolant, with 2 twisted coolant channels

Para profundidad de taladrado 3 x d_1
For drilling depth 3 x d_1

Para profundidad de taladrado 5 x d_1
For drilling depth 5 x d_1



Dimensiones de construcción según norma de fábrica DC
General dimensions as per DC standards

Dimensiones del mango según DIN 6535 HA
Shank dimensions as per DIN 6535 HA

Nota GFM

Para evitar de recortar el perfil, el diámetro de la fresa no deberá superar $^2/_3$ del diámetro a realizar para los pasos estándar y $^3/_4$ para los pasos finos.

Notice GFM

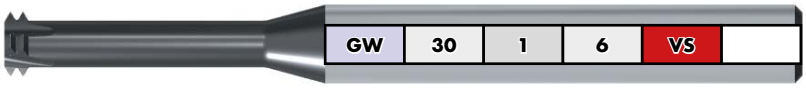
In order to avoid profile defects it is important that the tool diameter does not exceed $^2/_3$ of the diameter of the work-piece thread for coarse threads ($^3/_4$ for fine threads).

CODIFICACIÓN — CODIFICATION

Fresas torbellino en metal duro integral

Solid carbide thread whirl cutters

Ejemplo - Example



Ejecución estándar	Standard execution	**GW**					
Para aceros templados (55 - ≤ 63 HRC)	For hardened steels (55 - ≤ 63 HRC)	**GWH**					
Con canal de refrigeración	With cooling channel	**GWi**					
Un diente	Single tooth		**11**				
Multi-diente a un perfil	Single profile, multi toothed		**20**				
Multi-diente a doble perfil	Double pitch with multi flutes		**30**				
Multi-diente con perfil completo	Multi fluted with full profile		**50**				
Lubrificación exterior	External lubrication			**1**			
Lubrificación interior	Internal lubrication			**6**			
Longitud roscada 2 x D_1	Thread length 2 x D_1				**5**		
Longitud roscada 2.5 x D_1	Thread length 2.5 x D_1				**6**		
Longitud roscada 3 x D_1	Thread length 3 x D_1				**7**		
Longitud roscada 4 x D_1	Thread length 4 x D_1				**9**		
Protección contra el desgaste "VS" para uso general	VS wear-protective coating, general					**VS**	
Protección "VX" para aceros inoxidables y aleaciones de Ni	VX coating for stainless steels and Nickel alloys					**VX**	
Protección "VH" para aceros templados (≤ 63 HRC)	VH coating for hardened steels (≤ 63 HRC)					**VH**	
Ejecución especial	Special execution						**SP**

Fresa de taladrar/roscar circular en metal duro integral

Solid carbide circular drill thread milling cutters

Ejemplo - Example

Ejecución estándar	Standard execution	**ZBGF**					
Ranuras helicoidales con hélice a 3° a izquierda	Spiral flutes 3°		**60**				
Lubrificación interior	Internal lubrication			**6**			
Longitud roscada 2 x D_1	Thread length 2 x D_1				**5**		
Longitud roscada 3 x D_1	Thread length 3 x D_1				**7**		
Protección contra el desgaste "VS" para uso general	VS wear-protective coating, general					**VS**	
Ejecución especial	Special execution						**SP**

CODIFICACIÓN — CODIFICATION

Fresas de roscar en metal duro integral

Solid carbide thread milling cutters

Ejemplo - Example

Ejecución estándar	Standard execution	**GF**						
Para aceros templados (55 - ≤ 63 HRC)	For hardened steels (55 - ≤ 63 HRC)	**GFH**						
Con corte de chaflán a 45°	With 45° chamfer for countersinking	**GFS**						
Fresa de roscar polivalente	For multi sizes thread milling cutters	**GFM**						
Fresa de taladrar/roscar	Thrillers	**BGF**						
Helicoidal 27° (GF61), 10° (GFH)	Spiral flutes 27° (GF61), 10° (GFH)		**61**					
Helicoidal 15° (GF62, GFM62)	Spiral flutes 15° (GF62, GFM62)		**62**					
Helicoidal 27° (GFS)	Spiral flutes 27°(GFS)		**66**					
Fresa de taladrar/roscar 2 ranuras	Thrillers 2 flutes		**67**					
Fresa de taladrar/roscar 3 ranuras	Thrillers 3 flutes		**68**					
Lubrificación exterior	External lubrication			**1**				
Lubrificación interior	Internal lubrication			**6**				
Longitud roscada 1.5 x D_1	Thread lenght 1.5 x D_1				**0**			
Longitud roscada 2 x D_1	Thread length 2 x D_1				**5**			
Longitud roscada 2.5 x D_1	Thread length 2.5 x D_1				**6**			
Protección contra el desgaste "VS" para uso general	VS wear-protective coating, general					**VS**		
Protección "VX" para aceros inoxidables y aleaciones de Ni	VX coating for stainless steels and Nickel alloys					**VX**		
Protección "VH" para aceros templados (≤ 63 HRC)	VH coating for hardened steels (≤ 63 HRC)					**VH**		
Ejecución especial	Special execution						**SP**	
Perfil adaptado a la rosca exterior	Profile for external threads							**EX**

Nota GFM

Para evitar de recortar el perfil, el diámetro de la fresa no deberá superar $^2/_3$ del diámetro a realizar para los pasos estándar y $^3/_4$ para los pasos finos.

Notice GFM

In order to avoid profile defects it is important that the tool diameter does not exceed $^2/_3$ of the diameter of the work-piece thread for coarse threads ($^3/_4$ for fine threads).

CLASIFICACIÓN DE LOS MATERIALES

Ejemplos prácticos de clasificación de los materiales

11 Aceros de decoletaje

1.0711	9S20
1.0715	9SMn28
1.0718	9SMnPb28
1.0726	35S20
1.0737	9SMnPb36

12 Aceros de construcción o de cementación

1.0037	St37-2 (S235JR)
1.0050	St50-2 (E295)
1.0060	St60-2 (E335)
1.5919	15CrNi6
1.7131	16MnCr5

13 Aceros al carbón

1.0503	C45
1.0535	C55
1.0601	C60
1.1545	C105W1
1.2067	102Cr6 (100Cr6)

14 Aceros aleados < 850 N/mm2

1.2363	X100CrMoV5-1
1.3551	80MoCrV42-16
1.7218	25CrMo4
1.7220	34CrMo4
1.7225	42CrMo4

15 Aceros aleados/trat. > 850 - < 1150 N/mm2

1.3553	X82WMoCrV6-5-4
1.6580	30CrNiMo8
1.7220	34CrMo4
1.7225	42CrMo4
1.8507	34CrAlMo5

16 Aceros de alta resistencia ≤ 44 HRC

	EN-GJS-1200-2
1.6582	34CrNiMo6v
1.7225	42CrMo4v
1.7228	50CrMo4v
1.8515	31CrMo12v

17 Aceros templados y revenidos > 44 - ≤ 54 HRC

> 44 - ≤ 54 HRC

18 Aceros templados > 54 - ≤ 63 HRC

> 54 - ≤ 63 HRC

21 Aceros inoxidables al azufre

1.4005	X12CrS13
1.4104	X14CrMoS17
1.4305	X10CrNiS18-9

22 Austeníticos

1.4301	X5CrNi18-10
1.4406	X2CrNiMoN17-12-2
1.4435	X2CrNiMo18-14-3
1.4541	X6CrNiTi18-10
1.4571	X6CrNiMoTi17-12-2

23 Ferríticos y martensíticos ≤ 850 N/mm2

1.4112	X90CrMoV18
1.4540	X4CrNiCuNb16-4
1.4582	X4CrNiMoNb25-7
1.4762	X10CrAl24
1.4922	X20CrMo11-1

24 Ferríticos y martensíticos > 850 - ≤ 1150 N/mm2

1.4057	X17CrNi17-2
1.4125	X105CrMo17
1.4542	X5CrNiCuNb16-4
1.4548	X5CrNiCuNb17-4-4
1.4748	X85CrMoV18-2

31 Fundición gris

0.6015	GG15
0.6020	GG20
0.6025	GG25
0.6030	GG30

32 Fundición de grafito + esferoidal y maleable

0.7040	GGG40
0.7043	GGG40.3
0.7050	GGG50
0.7060	GGG60
0.7080	GGG80

41 Titanio puro

3.7024	Grad1
3.7034	Grad2
3.7055	Grad3
3.7065	Grad4

42 Aleación al titanio

3.7124	TiCu2.5
	Ti6Al7Nb
3.7164	TiAl6V4 (Grad5)
3.7174	TiAl6V6Sn2

51 Aleación al Niquel 1 ≤ 850 N/mm2

1.3912	Ni36 (Invar)
2.4360	NiCu30Fe (Monel 400)
2.4816	NiCr15Fe (Inconel 600)
1.4876	X10NiCrAlTi32-20

52 Aleación al Niquel 2 > 850 - ≤ 1150 N/mm2

2.4375	NiCu30Al (MonelK500)
2.4631	NiCr20TiAl (Nimonic 80)
2.4668	NiCr19NbMo (Inconel718)

53 Aleación al Niquel 3 > 1150 - ≤ 1600 N/mm2

2.4631	NiCr20TiAl (Nimonic80)
2.4668	NiCr19NbMo (Inconel718)

61 Cobre puro (electrolítico)

2.0060	E-Cu57 (E-Cu)

62 Latón, bronce (virutas cortas)

2.0401	CuZn39Pb3 (Ms58)
2.0402	CuZn40Pb2 (Ms58)
2.1030	CuSn8 (Bz)
2.1096	G-CuSn5ZnPb

63 Latón (virutas largas)

2.0240	CuZn15 (Ms85)
2.0265	CuZn30 (Ms70)
2.0321	CuZn37 (Ms63)

71 Al no aleado

3.0205	Al99
3.0255	Al99.5

72 Al aleado Si ≤ 1.5 %

3.1255	AlCuSiMn
3.1355	AlCuMg2
3.2315	AlMgSi1
3.3206	AlMgSi0.5
3.4345	AlZnMgCu0.5

73 Al aleado Si > 1.5 % - ≤ 10 %

3.2161	G-AlSi8Cu3
3.2162	GD-AlSi8Cu3
3.2341	G-AlSi5Mg
3.2371	G-AlSi7Mg

74 Al aleado Si > 10 %, Aleaciones Magnesio

3.2381	G-AlSi10Mg
3.2382	GD-AlSi10Mg
3.2581	G-AlSi12
3.2583	G-AlSi12 (Cu)

81 Materiales termoplásticos

Delrin (POM)
Teflon
Nylon

82 Materiales duroplásticos

Bakelit
Novopan

83 Materiales plásticos reforzados por fibras

Materiales plásticos reforzados por fibras

Referencia: DIN

91 Oro amarillo

2N18
Au585AgCu205
3N18
Au917AgCu44

92 Oro rojo

4N18
5N18
Au585CuAg325
Au750AgCu
Au917Cu83

93 Oro blanco

Au750PdCu125
Au750PdCu150
Au585PdCu150
Au925Pd75

94 Plata

Ag999
Ag800Cu
Ag925Cu

APPLICATION GROUPS

Examples for application groups

11 Free-cutting steels

1.0711	1212
1.0715	1213
1.0718	12L13
1.0726	1140
1.0737	12L14

12 Structural, cementation steels

1.0037	1015
1.0050	A570 Gr.50
1.0060	A572 Gr.65
1.5919	3115
1.7131	5115

13 Carbon steels

1.0503	1045
1.0535	1055
1.0601	1060
1.1545	W110
1.2067	L 3

14 Alloy steels < 850 N/mm2

1.2363	A2
1.3551	M50
1.7218	4130
1.7220	4135
1.7225	4140

15 Alloy steels hard./temp. > 850 - < 1150 N/mm2

1.3553	-
1.6580	4340
1.7220	4135
1.7225	4140
1.8507	A355CLD (K23510)

16 High tensile alloy steels ≤ 44 HRC

	EN-GJS-1200-2
1.6582	4340
1.7225	4140
1.7228	4150
1.8515	-

17 Alloy steels tempered > 44 - ≤ 54 HRC

> 44 - ≤ 54 HRC

18 Alloy steels hardened > 54 - ≤ 63 HRC

> 54 - ≤ 63 HRC

21 Free machining stainless steels

1.4005	416
1.4104	430F
1.4305	303

22 Austenitic stainless steels

1.4301	304
1.4406	316LN
1.4435	316L
1.4541	321
1.4571	316Ti

23 Ferritic and martensitic < 850 N/mm2

1.4112	440B
1.4540	XM12 (15-5PH)
1.4582	-
1.4762	446
1.4821	4922

24 Ferritic and martensitic > 850 - < 1150 N/mm2

1.4057	431
1.4125	440C
1.4542	630 (17-4PH)
1.4748	-

31 Cast iron

0.6015	A48-25B
0.6020	A48-30B
0.6025	A48-40B
0.6030	A48-45B

32 Spheroidal graphite + malleable cast iron

0.7040	60-40-18
0.7043	-
0.7050	65-45-12
0.7060	80-55-06
0.7080	120-90-02

41 Pure titanium

3.7024	Gr.1
3.7034	Gr.2
3.7055	Gr.3
3.7065	Gr.4

42 Titanium alloys

3.7124	Alloy 230
	F-1295
3.7164	Gr.5
3.7174	-

51 Nickel alloys 1 ≤ 850 N/mm2

1.3912	K93600
2.4360	N04400
1.4816	N08800

52 Nickel alloys 2 > 850 - ≤ 1150 N/mm2

2.4375	N05500 (B865)
2.4631	N07080 (B637)
2.4668	N07718 (B637)

53 Nickel alloys 3 > 1150 - ≤ 1600 N/mm2

2.4631	N07080 (B637)
2.4668	N07718 (B637)

61 Pure copper (electrolytic copper)

2.0060	C11000

62 Short chip brass, phosphor bronze, gun metal

2.0401	C38500
2.0402	C37800
2.1030	C52100
2.1096	-

63 Long chip brass

2.0240	C23000
2.0265	C26000
2.0321	C27200

71 Al unalloyed

3.0205	1200
3.0255	1050A

72 Al alloyed Si < 1.5 %

3.1255	2014
3.1355	2024
3.2315	6082
3.3206	6060
3.4345	7020

73 Al alloyed Si > 1.5 % - < 10 %

3.2161	380.1
3.2162	-
3.2341	-
3.2371	A 356.2

74 Al alloyed Si > 10 %, Mg-alloys

3.2381	A360
3.2382	-
3.2581	A413
3.2583	413.1

81 Thermoplastics

Delrin (POM)
Teflon
Nylon

82 Duroplastics

Bakelit
Novopan

83 Glass fibre reinforced plastics

Glass fibre reinforced,
Thermo and Duroplastics

Reference:
AISI/ASTM/UNS

91 Yellow gold

2N18
Au585AgCu205
3N18
Au917AgCu44

92 Red gold

4N18
5N18
Au585CuAg325
Au750AgCu
Au917Cu83

93 White gold

Au750PdCu125
Au750PdCu150
Au585PdCu150
Au925Pd75

94 Silver

Ag999
Ag800Cu
Ag925Cu

ESPECIFICACIONES — SPECIFICATIONS

RECUBRIMIENTO VS — VS-COATING

VS

- *Protección contra el desgaste "VS" para uso general*
- *Para evitar las soldaduras frias*

*** *** *** *** *** *** ***

- DC "VS" wear-protective coating for general use
- To prevent cold welding

NUEVO: RECUBRIMIENTO VX — NEW: VX-COATING

VX

- *Resistencia al desgaste mejorada en los aceros inoxidables y aleaciones de Ni gracia al recubrimiento "VX" , duración de vida claramente prolongada*
- *Para evitar las soldaduras frias*

*** *** *** *** *** *** *** *** *** ***

- Improved wear resistance and longer tool life in stainless steels and Nickel alloys thanks to the DC "VX"-coating
- To prevent cold welding

NUEVO: RECUBRIMIENTO VH — NEW: VH-COATING

VH

- *Recubrimiento anti-desgaste "VH" para el trabajo en seco de aceros templados de 55 - 63 HRC*
- *Contra el aumento de calor y la deformación plástica*

*** *** *** *** *** *** *** *** *** ***

- DC "VH" wear-protective coating for dry machining of tempered steels with a hardness of 55 - 63 HRC
- Against heat development and plastic deformation

Fresa torbellino GW *SERIES 1000* — Thread whirl cutter GW SERIES 1000

- *Aplicación general*
- *Seguridad de proceso elevado*
- *Apto para dimensiones pequeñas*
- *Mas espacio para evacuar virutas*
- *Para profundidad de utilización hasta 2.5 x D_1*

*** *** *** *** *** ***

- Universal application
- High process security
- Suitable for the smallest dimensions
- More space for chip evacuation
- For threading depths up to 2.5 x D_1

Fresa torbellino GW *SERIES 2000* — Thread whirl cutter GW SERIES 2000

- *Velocidad de avance multiplicada según el numero de dientes*
- *Menos desgaste, vida útil aumentada*
- *Numeros de dientes varía según la dimensión*
- *Para profundidad de utilización hasta 2.5 x D_1*

*** *** *** *** *** ***

- Feed rate multiplied by number of teeth
- Less wear, longer tool life
- The number of teeth varies, depending on the size
- For threading depths up to 2.5 x D_1

Fresa torbellino GW *SERIES 3000* — Thread whirl cutter GW SERIES 3000

- *Seguridad del proceso, menos correciones CN*
- *Para profundidad de utilización hasta 4 x D_1*

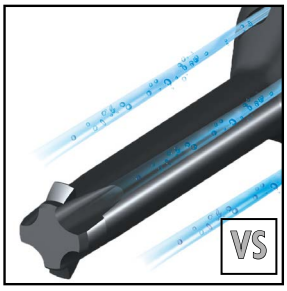
*** *** *** *** *** ***

- Secure process, reduction in NC-corrections
- For threading depths up to 4 x D_1

Fresa torbellino GWi *SERIES 3000* — Thread whirl cutter GWi SERIES 3000

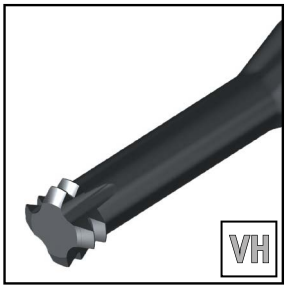
- *Gracias a la optíma alimentación del lubricante:*
  - *—la evacuación de virutas es optíma*
  - *—dobbla la duración de vida*
- *Para profundidad de utilización hasta 4 x D_1*
  *** *** *** *** *** ***
- Thanks to an optimal, specific coolant supply:
  - —improved chip evacuation
  - —twice the tool life
- For threading depths up to 4 x D_1

Fresa torbellino GWi *SERIES 5000* — Thread whirl cutter GWi SERIES 5000



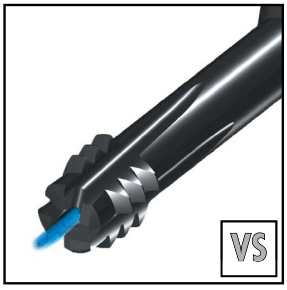
- *Su geometría específica permite el fresado final del diámetro interior asín que el desbarbado del perfil realizado*
- *Roscado geométricamente perfecto gracias a un dispositivo de corte especial*
- *Para roscados sin rebabas, en todas clases de materiales y asegurando la precisión dimensional (tolerancia)*
- *Alta calidad de superficie gracias al condicionamento de las aristes de corte*
- *Optima evacuación de virutas y larga duración de vida gracia a la óptima alimentación del lubricante*
- *Seguridad de proceso, menos correcciones CN*
- *LH-Rot - Corte a izquierda, trabajando en concordencia, con menos presión sobre las aristas de corte*
- *Para profundidad de utilización hasta 3 x D_1*
  *** *** *** *** *** *** *** *** *** ***
- Its specific geometry allows the final milling of the internal diameter and also the deburring of the realised profile
- Geometrically perfect thread thanks to special cutting division
- For absolutely burr-free threads, even in difficult-to-machine materials, while maintaining dimensional accuracy (tolerance)
- High surface quality thanks to specific cutting edge conditioning
- Improved chip evacuation and long tool life thanks to optimum coolant supply
- Secure process, reduction in NC-corrections
- LH rotation - left-hand cutting for less pressure on the cutting edges
- For threading depths up to 3 x D_1

Fresa torbellino GWH *SERIES 3000* — Thread whirl cutter GWH SERIES 3000



- *Geometría especialemente adaptada para una resistencia en el corte de aceros templados hasta 63HRC*
- *Alta calidad de superficie gracias al condicionamento de las aristes de corte*
- *LH-Rot - Corte a izquierda, trabajando en concordencia, con menos presión sobre las aristas de corte*
- *Para profundidad de utilización hasta 3 x D_1*
  *** *** *** *** *** *** *** *** ***
- Special cutting geometry for high process security when machining high-tensile materials up to 63 HRC
- High surface quality thanks to specific cutting edge conditioning
- LH rotation - left-hand cutting for less pressure on the cutting edges
- For threading depths up to 3 x D_1

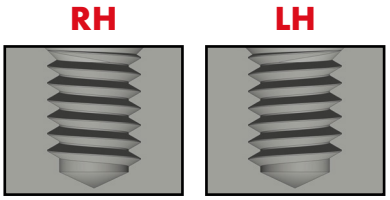
Taladro y roscado circular ZBGF *SERIES 6000* — Circular drill thread milling cutter ZBGF SERIES 6000



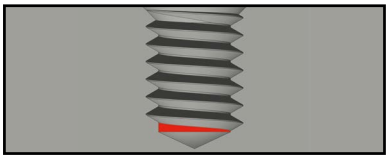
- *Herramienta combinada para fresar el diámetro previo asin que el roscado*
- *Lubrificación interna para una óptima evacuación de virutas (min. 20 bares)*
- *Alta calidad de superficie gracias al condicionamento de las aristes de corte*
- *LH-Rot - Corte a izquierda, trabajando en concordencia, con menos presión sobre las aristas de corte*
- *Para profundidad de utilización hasta 3 x D_1*
  *** *** *** *** *** *** *** *** *** ***
- Combinated tool for drilling the core hole and whirling the thread
- Advanced internal cooling for optimum chip removal (at least 20 bar)
- High surface quality thanks to specific cutting edge conditioning
- LH rotation - left-hand cutting for less pressure on the cutting edges
- For threading depths up to 3 x D_1

APLICACIONES CONCRETAS — SPECIFIC APPLICATION CASES

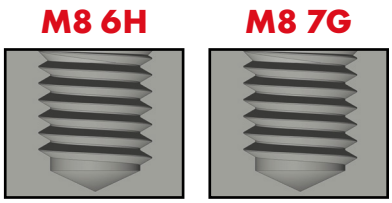
GW - GWH - GWi -GF - GFH - GFS - GFM



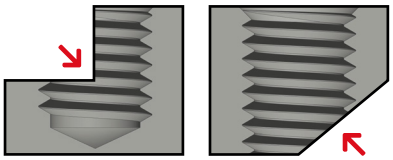
Una única fresa para roscas derechas y izquierdas
The same thread whirler / cutter can be used for right- and left-hand threads



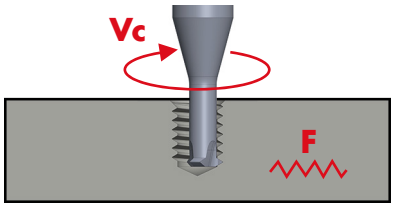
Fresado a fondo de hilo
For threads to be cut near to the bottom of blind holes



Tolerancia requerida ajustable
Required tolerance adjustable as per users choice

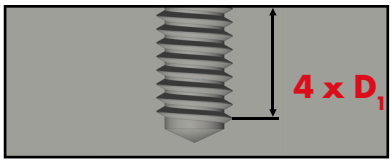


Posibilidad de roscar partes oblicuas o interrumpidas
For threads with interrupted cut or with oblique entrance or exit



Velocidad de corte y avance gestionada individualmente en función del material a roscar
The cutting speed and feed rate can be matched individually to each work-piece material

GW - GWi

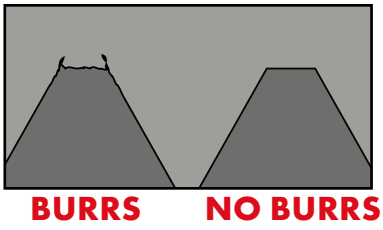


Óptimo para agujeros ciegos profundos
Ideal for deep blind holes

GWH - GFH

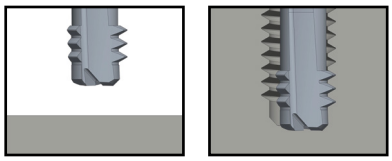
Para roscar aceros templados
To realise threads in hardened materials

GWi5000

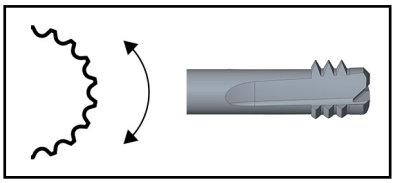


Para roscar sin dejar rebabas
For whirling burr-free threads

ZBGF

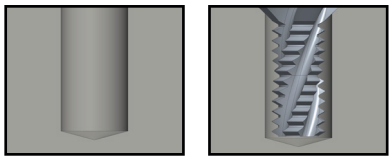


Herramienta combinada para el corte del previo y el fresado del roscado
Combinated tool for drilling and threading



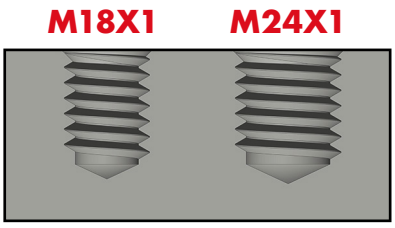
Ganar espacio en el almacén CN y economía del tiempo de intercambio herramienta
Space-saving in the tool carousel; time saving when tool changing

GFS



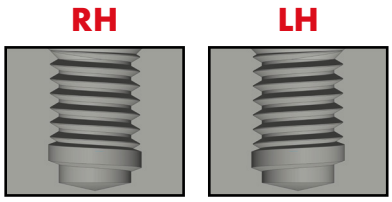
Achaflanar 45° y roscar con una sola herramienta
45° countersinking and thread milling with one only tool

GFM

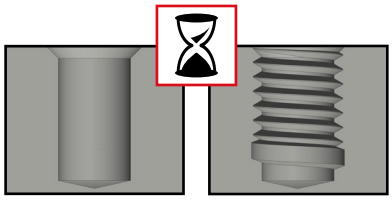


Posibilidad de trabajar una multitud de diámetros a paso idéntico
One only tool for threads of a wide range of diameters with the same pitch

BGF



Una única fresa de taladrar/roscar para rosca derecha y izquierda
The same thriller can be used for right- and left-hand threads



Ganancia de tiempo y de sitio en el almacén de la máquina
Space-saving in the tool carousel and saving of machining time

TABLA DE UTILIZACIÓN GW— APPLICATION CHART GW

Ciclo de programación para fresas torbellino GW1000 y GW2000
Programming cycle for thread whirling GW1000 and GW2000

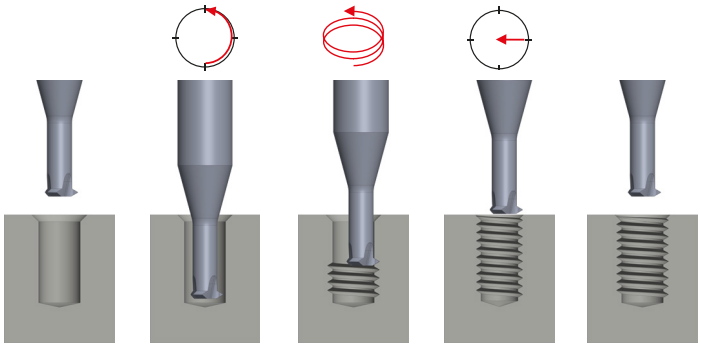


Tabla de utilización para fresas torbellino — Application chart for thread whirling

	Grupos de materiales Material groups		*Clasificación de los materiales*	Material designation	*Dureza* Hardness (HB)	*Resistencia* Tensile strength Rm (N/mm²)	*Lubricante* Lubricant: *Estándar* Standard	*Lubricante* Lubricant: *Recub.* Coated
10	*Aceros* Steels	11	*Aceros de decoletaje*	Free-cutting steels	< 200	< 700		O E
		12	*Aceros de construcción o de cementación*	Structural, cementation steels	< 200	< 700		O E
		13	*Aceros al carbón*	Carbon steels	< 300	< 1000		O E
		14	*Aceros aleados < 850 N/mm²*	Alloy steels < 850 N/mm²	< 250	< 850		O E
		15	*Aceros aleados/trat. > 850 - < 1150 N/mm²*	Alloy steels hard. / temp. > 850 - < 1150 N/mm²	> 250	> 850		O E
		16	*Aceros de alta resistencia ≤ 44 HRC*	High tensile alloy steels ≤ 44 HRC	> 250	> 850		O E
		17	*Aceros templados y revenidos > 44 - ≤ 54 HRC*	Alloy steels tempered > 44 - ≤ 54 HRC	> 410	> 1400		O E
		18	*Aceros templados > 54 - ≤ 63 HRC*	Alloy steels hardened > 54 - ≤ 63 HRC	> 560	> 1980		
20	*Aceros inoxidables* Stainless steels	21	*Aceros inoxidables al azufre*	Free machining stainless steels	< 250	< 850		O E
		22	*Austeníticos*	Austenitic stainless steels	< 250	< 850		O E
		23	*Ferríticos y martensíticos < 850 N/mm²*	Ferritic and martensitic < 850 N/mm²	< 250	< 850		O E
		24	*Ferríticos y martensíticos > 850 - < 1150 N/mm²*	Ferritic and martensitic > 850 - < 1150 N/mm²	> 250	> 850		O E
30	*Fundición* Cast iron	31	*Fundición gris*	Cast iron	< 250	< 850		O E A
		32	*Fundición de grafito + esferoidal y maleable*	Spheroidal graphite + malleable cast iron	< 250	< 850		O E
40	*Titanio* Titanium	41	*Titanio puro*	Pure titanium	< 250	< 850	O E	O E
		42	*Aleación al titanio*	Titanium alloys	> 250	> 850	O E	O E
50	*Níquel* Nickel	51	*Aleación al Níquel 1 ≤ 850 N/mm²*	Nickel alloys 1 ≤ 850 N/mm²	< 250	< 850		O E
		52	*Aleación al Níquel 2 > 850 - ≤ 1150 N/mm²*	Nickel alloys 2 > 850 - ≤ 1150 N/mm²	> 250	> 850		O E
		53	*Aleación al Níquel 3 > 1150 - ≤ 1600 N/mm²*	Nickel alloys 3 > 1150 - ≤ 1600 N/mm²	> 340	> 1150		O E
60	*Cobre* Copper	61	*Cobre puro (electrolítico)*	Pure copper (electrolytic copper)	< 120	< 400	O E	O E
		62	*Latón, bronce (virutas cortas)*	Short chip brass, phosphor bronze, gun metal	< 200	< 700	O E A	O E A
		63	*Latón (virutas largas)*	Long chip brass	< 200	< 700	O E	O E
70	*Aluminio Magnesio* Aluminium Magnesium	71	*Al no aleado*	Al unalloyed	< 100	< 350	O E	O E
		72	*Al aleado Si < 1.5 %*	Al alloyed Si < 1.5 %	< 150	< 500	O E	O E
		73	*Al aleado Si > 1.5 % - < 10 %*	Al alloyed Si > 1.5 % - < 10 %	< 120	< 400		O E
		74	*Al aleado Si > 10 %, Aleaciones Magnesio*	Al alloyed Si > 10 %, Mg-alloys	< 120	< 400		O E
80	*Materiales plásticos* Plastic compounds	81	*Materiales termoplásticos*	Thermoplastics	-	-	E	E
		82	*Materiales duroplásticos*	Duroplastics	-	-	E	E
		83	*Materiales plásticos reforzados por fibras*	Glass fibre reinforced plastics	-	-		E A
90	*Metales preciosos* Precious metals	91	*Oro amarillo*	Yellow gold	-	-	O E	O E
		92	*Oro rojo*	Red gold	-	-	O E	O E
		93	*Oro blanco*	White gold	-	-		O E
		94	*Plata*	Silver	-	-		O E

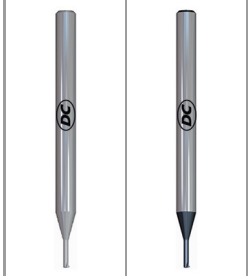
O *Óptimo con aceite de corte* Optimal with cutting oil

O *Aceptable con aceite de corte* Suitable with cutting oil

E *Óptimo con emulsión* Optimal with emulsion

E *Aceptable con emulsión* Suitable with emulsion

GW1116



VS

Vc (m/min)		Avance fz (mm/diente)	Milling fz (mm/tooth)
Estándar Standard	Recub. Coated	Ø 0.30 - 1.40	
	80-100		0.004-0.02
	80-100		0.004-0.02
	70-90		0.004-0.02
	70-90		0.004-0.02
	30-50		0.004-0.02
	15-40		0.004-0.02
	15-30		0.004-0.02
	40-60		0.004-0.02
	30-50		0.004-0.02
	30-50		0.004-0.02
	30-50		0.004-0.02
	90-120		0.004-0.02
	70-90		0.004-0.02
10-20	20-40	0.004-0.02	0.004-0.02
10-20	15-35	0.004-0.02	0.004-0.02
	20-40		0.004-0.02
	20-40		0.004-0.02
	20-30		0.004-0.02
150-200	200-250	0.004-0.02	0.004-0.02
100-150	150-200	0.004-0.02	0.004-0.02
100-150	150-200	0.004-0.02	0.004-0.02
150-200	200-250	0.004-0.02	0.004-0.02
150-200	200-250	0.004-0.02	0.004-0.02
	200-250		0.004-0.02
	200-250		0.004-0.02
150-200	200-250	0.004-0.02	0.004-0.02
80-120	100-200	0.004-0.02	0.004-0.02
	80-100		0.004-0.02
100-150	150-200	0.004-0.02	0.004-0.02
70-90	90-120	0.004-0.02	0.004-0.02
	30-50		0.004-0.02
	90-120		0.004-0.02

GW2016

VS VS VS VS

Vc (m/min)		Avance fz (mm/diente)				Milling fz (mm/tooth)				
Estándar Standard	Recub. Coated	Ø 0.50 - 1.00		Ø 1.01 - 2.74		Ø 2.75 - 6.00		Ø 6.01 - 20.00		
	80-100		0.004-0.01		0.01-0.05		0.04-0.10		0.08-0.15	11
	80-100		0.004-0.01		0.01-0.05		0.04-0.10		0.08-0.15	12
	70-90		0.004-0.01		0.01-0.05		0.02-0.10		0.05-0.15	13
	70-90		0.004-0.01		0.01-0.05		0.02-0.10		0.05-0.15	14
	30-50		0.004-0.01		0.01-0.05		0.02-0.08		0.04-0.15	15
	15-40		0.003-0.01		0.006-0.03		0.008-0.05		0.01-0.08	16
	15-30		0.003-0.01		0.006-0.025		0.008-0.04		0.01-0.06	17
										18
	40-60		0.004-0.01		0.01-0.05		0.02-0.10		0.05-0.15	21
	30-50		0.004-0.01		0.01-0.03		0.02-0.05		0.03-0.08	22
	30-50		0.004-0.01		0.01-0.03		0.02-0.05		0.03-0.08	23
	30-50		0.004-0.01		0.01-0.03		0.02-0.05		0.03-0.08	24
	90-120		0.004-0.01		0.01-0.05		0.04-0.10		0.08-0.15	31
	70-90		0.004-0.01		0.01-0.05		0.02-0.10		0.05-0.15	32
10-20	20-40	0.004-0.01	0.004-0.01	0.01-0.03	0.01-0.03	0.02-0.05	0.02-0.05	0.03-0.08	0.03-0.08	41
10-20	15-35	0.004-0.01	0.004-0.01	0.01-0.03	0.01-0.03	0.02-0.05	0.02-0.05	0.03-0.08	0.03-0.08	42
	20-40		0.004-0.01		0.01-0.03		0.02-0.06		0.03-0.08	51
	20-40		0.004-0.01		0.01-0.03		0.02-0.06		0.03-0.08	52
	20-30		0.003-0.01		0.006-0.03		0.008-0.05		0.03-0.08	53
150-200	200-250	0.004-0.01	0.004-0.01	0.01-0.05	0.01-0.05	0.02-0.10	0.02-0.10	0.05-0.15	0.05-0.15	61
100-150	150-200	0.004-0.01	0.004-0.01	0.01-0.05	0.01-0.05	0.04-0.10	0.04-0.10	0.08-0.15	0.08-0.15	62
100-150	150-200	0.004-0.01	0.004-0.01	0.01-0.05	0.01-0.05	0.02-0.10	0.02-0.10	0.05-0.15	0.05-0.15	63
150-200	200-300	0.004-0.01	0.004-0.01	0.01-0.05	0.01-0.05	0.05-0.10	0.05-0.10	0.10-0.20	0.10-0.20	71
150-200	200-300	0.004-0.01	0.004-0.01	0.01-0.05	0.01-0.05	0.05-0.10	0.05-0.10	0.10-0.20	0.10-0.20	72
	200-300		0.004-0.01		0.01-0.05		0.05-0.10		0.10-0.20	73
	200-300		0.004-0.01		0.01-0.05		0.04-0.10		0.08-0.15	74
150-200	200-300	0.004-0.01	0.004-0.01	0.01-0.05	0.01-0.05	0.05-0.10	0.05-0.10	0.10-0.20	0.10-0.20	81
80-120	100-200	0.004-0.01	0.004-0.01	0.01-0.05	0.01-0.05	0.04-0.10	0.04-0.10	0.08-0.15	0.08-0.15	82
	80-100		0.004-0.01		0.01-0.05		0.04-0.10		0.08-0.15	83
100-150	150-200	0.004-0.01	0.004-0.01	0.01-0.05	0.01-0.05	0.04-0.10	0.04-0.10	0.08-0.15	0.08-0.15	91
70-90	90-120	0.004-0.01	0.004-0.01	0.01-0.05	0.01-0.05	0.02-0.10	0.02-0.10	0.04-0.15	0.04-0.15	92
	30-50		0.004-0.01		0.01-0.05		0.02-0.05		0.03-0.08	93
	90-120		0.004-0.01		0.01-0.05		0.02-0.10		0.04-0.15	94

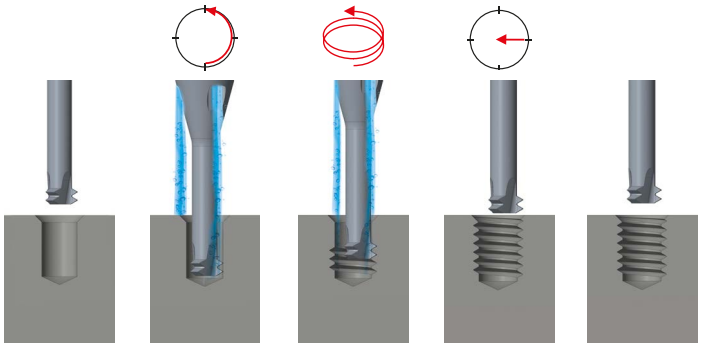
A ***Óptimo con aire***
Optimal with air

A ***Aceptable con aire***
Suitable with air

Los valores son indicativos.
The indicated values are a guideline.

TABLA DE UTILIZACIÓN GW - GWi — APPLICATION CHART GW - GWi

Ciclo de programación para fresas torbellino GW3000 - GWi3000
Programming cycle for thread whirling GW3000 - GWi3000



DC *Tabla de utilización para fresas torbellino* DC Application chart for thread whirling

	Grupos de materiales Material groups		*Clasificación de los materiales*	Material designation	*Dureza* Hardness (HB)	*Resistencia* Tensile strength Rm (N/mm²)	*Lubricante* Lubricant: *Estándar* Standard	*Lubricante* Lubricant: *Recub.* Coated
10	*Aceros* Steels	11	*Aceros de decoletaje*	Free-cutting steels	< 200	< 700		O E
		12	*Aceros de construcción o de cementación*	Structural, cementation steels	< 200	< 700		O E
		13	*Aceros al carbón*	Carbon steels	< 300	< 1000		O E
		14	*Aceros aleados < 850 N/mm²*	Alloy steels < 850 N/mm²	< 250	< 850		O E
		15	*Aceros aleados/trat. > 850 - < 1150 N/mm²*	Alloy steels hard. / temp. > 850 - < 1150 N/mm²	> 250	> 850		O E
		16	*Aceros de alta resistencia ≤ 44 HRC*	High tensile alloy steels ≤ 44 HRC	> 250	> 850		O E
		17	*Aceros templados y revenidos > 44 - ≤ 54 HRC*	Alloy steels tempered > 44 - ≤ 54 HRC	> 410	> 1400		O E
		18	*Aceros templados > 54 - ≤ 63 HRC*	Alloy steels hardened > 54 - ≤ 63 HRC	> 560	> 1980		
20	*Aceros inoxidables* Stainless steels	21	*Aceros inoxidables al azufre*	Free machining stainless steels	< 250	< 850		O E
		22	*Austeníticos*	Austenitic stainless steels	< 250	< 850		O E
		23	*Ferríticos y martensíticos < 850 N/mm²*	Ferritic and martensitic < 850 N/mm²	< 250	< 850		O E
		24	*Ferríticos y martensíticos > 850 - < 1150 N/mm²*	Ferritic and martensitic > 850 - < 1150 N/mm²	> 250	> 850		O E
30	*Fundición* Cast iron	31	*Fundición gris*	Cast iron	< 250	< 850		O E A
		32	*Fundición de grafito + esferoidal y maleable*	Spheroidal graphite + malleable cast iron	< 250	< 850		O E
40	*Titanio* Titanium	41	*Titanio puro*	Pure titanium	< 250	< 850	O E	O E
		42	*Aleación al titanio*	Titanium alloys	> 250	> 850	O E	O E
50	*Níquel* Nickel	51	*Aleación al Níquel 1 ≤ 850 N/mm²*	Nickel alloys 1 ≤ 850 N/mm²	< 250	< 850		O E
		52	*Aleación al Níquel 2 > 850 - ≤ 1150 N/mm²*	Nickel alloys 2 > 850 - ≤ 1150 N/mm²	> 250	> 850		O E
		53	*Aleación al Níquel 3 > 1150 - ≤ 1600 N/mm²*	Nickel alloys 3 > 1150 - ≤ 1600 N/mm²	> 340	> 1150		O E
60	*Cobre* Copper	61	*Cobre puro (electrolítico)*	Pure copper (electrolytic copper)	< 120	< 400	O E	O E
		62	*Latón, bronce (virutas cortas)*	Short chip brass, phosphor bronze, gun metal	< 200	< 700	O E A	O E A
		63	*Latón (virutas largas)*	Long chip brass	< 200	< 700	O E	O E
70	*Aluminio Magnesio* Aluminium Magnesium	71	*Al no aleado*	Al unalloyed	< 100	< 350	O E	O E
		72	*Al aleado Si < 1.5 %*	Al alloyed Si < 1.5 %	< 150	< 500	O E	O E
		73	*Al aleado Si > 1.5 % - < 10 %*	Al alloyed Si > 1.5 % - < 10 %	< 120	< 400		O E
		74	*Al aleado Si > 10 %, Aleaciones Magnesio*	Al alloyed Si > 10 %, Mg-alloys	< 120	< 400		O E
80	*Materiales plásticos* Plastic compounds	81	*Materiales termoplásticos*	Thermoplastics	-	-	E	E
		82	*Materiales duroplásticos*	Duroplastics	-	-	E	E
		83	*Materiales plásticos reforzados por fibras*	Glass fibre reinforced plastics	-	-		E A
90	*Metales preciosos* Precious metals	91	*Oro amarillo*	Yellow gold	-	-	O E	O E
		92	*Oro rojo*	Red gold	-	-	O E	O E
		93	*Oro blanco*	White gold	-	-		O E
		94	*Plata*	Silver	-	-		O E

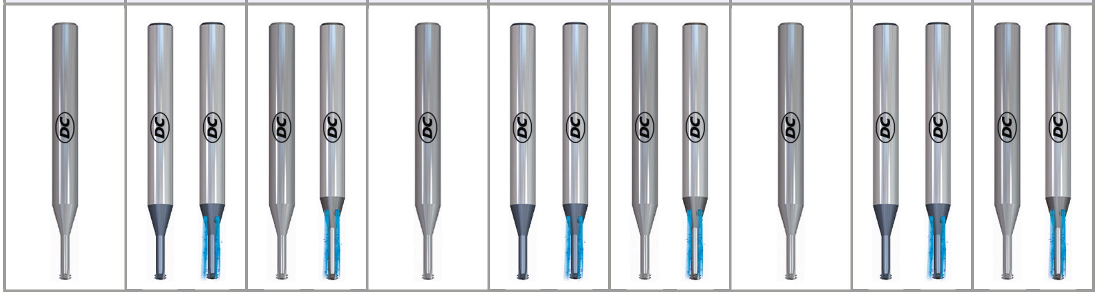
O *Óptimo con aceite de corte* Optimal with cutting oil

O *Aceptable con aceite de corte* Suitable with cutting oil

E *Óptimo con emulsión* Optimal with emulsion

E *Aceptable con emulsión* Suitable with emulsion

GW3000 - GWi3000



Vc (m/min) Estándar Standard	Vc (m/min) Recub. Coated	GW3016 GW3017 GW3019	GW3016VS GW3017VS GW3019VS GWi3066VS GWi3067VS GWi3069VS	GW3016VX GW3017VX GWi3066VX GWi3067VX	GW3016 GW3017 GW3019	GW3016VS GW3017VS GW3019VS GWi3066VS GWi3067VS GWi3069VS	GW3016VX GW3017VX GWi3066VX GWi3067VX	GW3016 GW3017 GW3019	GW3016VS GW3017VS GW3019VS GWi3066VS GWi3067VS GWi3069VS	GW3016VX GW3017VX GWi3066VX GWi3067VX	
			VS	VX		VS	VX		VS	VX	
		Avance fz *(mm/diente)* / Milling fz (mm/tooth)									
		Ø 0.80 - 2.74			Ø 2.75 - 6.00			Ø 6.01 - 20.00			
	80-100		0.01-0.05	0.01-0.05		0.04-0.10	0.04-0.10		0.08-0.15	0.08-0.15	11
	80-100		0.01-0.05	0.01-0.05		0.04-0.10	0.04-0.10		0.08-0.15	0.08-0.15	12
	70-90		0.01-0.05	0.01-0.05		0.02-0.10	0.02-0.10		0.05-0.15	0.05-0.15	13
	70-90		0.01-0.05	0.01-0.05		0.02-0.10	0.02-0.10		0.05-0.15	0.05-0.15	14
	30-50		0.01-0.05	0.01-0.05		0.02-0.08	0.02-0.08		0.04-0.15	0.04-0.15	15
	15-40		0.006-0.03	0.006-0.03		0.008-0.05	0.008-0.05		0.01-0.08	0.01-0.08	16
	15-30		0.006-0.025	0.006-0.025		0.008-0.04	0.008-0.04		0.01-0.06	0.01-0.06	17
											18
	40-60		0.01-0.05	0.01-0.05		0.02-0.10	0.02-0.10		0.05-0.15	0.05-0.15	21
	30-50		0.01-0.03	0.01-0.03		0.02-0.05	0.02-0.05		0.03-0.08	0.03-0.08	22
	30-50		0.01-0.03	0.01-0.03		0.02-0.05	0.02-0.05		0.03-0.08	0.03-0.08	23
	30-50		0.01-0.03	0.01-0.03		0.02-0.05	0.02-0.05		0.03-0.08	0.03-0.08	24
	90-120		0.01-0.05	0.01-0.05		0.04-0.10	0.04-0.10		0.08-0.15	0.08-0.15	31
	70-90		0.01-0.05	0.01-0.05		0.02-0.10	0.02-0.10		0.05-0.15	0.05-0.15	32
10-20	20-40	0.01-0.03	0.01-0.03	0.01-0.03	0.02-0.05	0.02-0.05	0.02-0.05	0.03-0.08	0.03-0.08	0.03-0.08	41
10-20	15-35	0.01-0.03	0.01-0.03	0.01-0.03	0.02-0.05	0.02-0.05	0.02-0.05	0.03-0.08	0.03-0.08	0.03-0.08	42
	20-40		0.01-0.03	0.01-0.03		0.02-0.06	0.02-0.06		0.03-0.08	0.03-0.08	51
	20-40		0.01-0.03	0.01-0.03		0.02-0.06	0.02-0.06		0.03-0.08	0.03-0.08	52
	20-30		0.006-0.03	0.006-0.03		0.008-0.05	0.008-0.05		0.03-0.08	0.03-0.08	53
150-200	200-250	0.01-0.05	0.01-0.05	0.01-0.05	0.02-0.10	0.02-0.10	0.02-0.10	0.05-0.15	0.05-0.15	0.05-0.15	61
100-150	150-200	0.01-0.05	0.01-0.05	0.01-0.05	0.04-0.10	0.04-0.10	0.04-0.10	0.08-0.15	0.08-0.15	0.08-0.15	62
100-150	150-200	0.01-0.05	0.01-0.05	0.01-0.05	0.02-0.10	0.02-0.10	0.02-0.10	0.05-0.15	0.05-0.15	0.05-0.15	63
150-200	200-300	0.01-0.05	0.01-0.05	0.01-0.05	0.05-0.10	0.05-0.10	0.05-0.10	0.10-0.20	0.10-0.20	0.10-0.20	71
150-200	200-300	0.01-0.05	0.01-0.05	0.01-0.05	0.05-0.10	0.05-0.10	0.05-0.10	0.10-0.20	0.10-0.20	0.10-0.20	72
	200-300		0.01-0.05	0.01-0.05		0.05-0.10	0.05-0.10		0.10-0.20	0.10-0.20	73
	200-300		0.01-0.05	0.01-0.05		0.04-0.10	0.04-0.10		0.08-0.15	0.08-0.15	74
150-200	200-300	0.01-0.05	0.01-0.05	0.01-0.05	0.05-0.10	0.05-0.10	0.05-0.10	0.10-0.20	0.10-0.20	0.10-0.20	81
80-120	100-200	0.01-0.05	0.01-0.05	0.01-0.05	0.04-0.10	0.04-0.10	0.04-0.10	0.08-0.15	0.08-0.15	0.08-0.15	82
	80-100		0.01-0.05	0.01-0.05		0.04-0.10	0.04-0.10		0.08-0.15	0.08-0.15	83
100-150	150-200	0.01-0.05	0.01-0.05	0.01-0.05	0.04-0.10	0.04-0.10	0.04-0.10	0.08-0.15	0.08-0.15	0.08-0.15	91
70-90	90-120	0.01-0.05	0.01-0.05	0.01-0.05	0.02-0.10	0.02-0.10	0.02-0.10	0.04-0.15	0.04-0.15	0.04-0.15	92
	30-50		0.01-0.05	0.01-0.05		0.02-0.05	0.02-0.05		0.03-0.08	0.03-0.08	93
	90-120		0.01-0.05	0.01-0.05		0.02-0.10	0.02-0.10		0.04-0.15	0.04-0.15	94

A ***Óptimo con aire*** **Optimal with air**

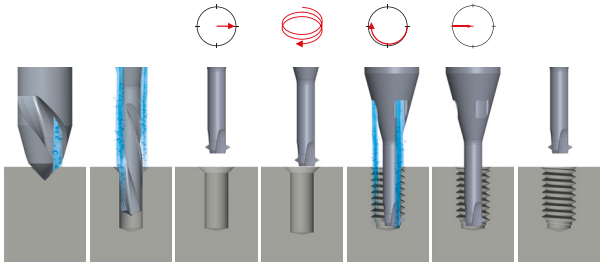
A ***Aceptable con aire*** **Suitable with air**

Los valores son indicativos.
The indicated values are a guideline.

TABLA DE UTILIZACIÓN GWi - GWH — APPLICATION CHART GWi - GWH

Ciclo de programación para fresas torbellino GWi5000 - GWH3000
Programming cycle for thread whirling GWi5000 - GWH3000

GWi5000



GWH3000

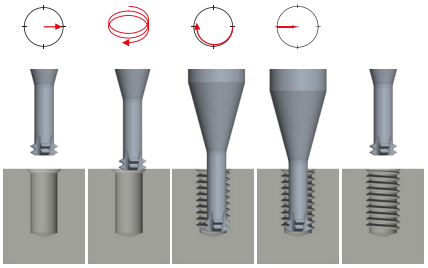


Tabla de utilización para fresas torbellino — Application chart for thread whirling

	Grupos de materiales / Material groups		Clasificación de los materiales	Material designation	Dureza Hardness (HB)	Resistencia Tensile strength Rm (N/mm²)	Lubricante Lubricant: Estándar Standard	Lubricante Lubricant: Recub. Coated
10	Aceros / Steels	11	Aceros de decoletaje	Free-cutting steels	< 200	< 700		O E
		12	Aceros de construcción o de cementación	Structural, cementation steels	< 200	< 700		O E
		13	Aceros al carbón	Carbon steels	< 300	< 1000		O E
		14	Aceros aleados < 850 N/mm²	Alloy steels < 850 N/mm²	< 250	< 850		O E
		15	Aceros aleados/trat. > 850 - < 1150 N/mm²	Alloy steels hard. / temp. > 850 - < 1150 N/mm²	> 250	> 850		O E
		16	Aceros de alta resistencia ≤ 44 HRC	High tensile alloy steels ≤ 44 HRC	> 250	> 850		O E
		17	Aceros templados y revenidos > 44 - ≤ 54 HRC	Alloy steels tempered > 44 - ≤ 54 HRC	> 410	> 1400		O E
		18	Aceros templados > 54 - ≤ 63 HRC	Alloy steels hardened > 54 - ≤ 63 HRC	> 560	> 1980		
20	Aceros inoxidables / Stainless steels	21	Aceros inoxidables al azufre	Free machining stainless steels	< 250	< 850		O E
		22	Austeníticos	Austenitic stainless steels	< 250	< 850		O E
		23	Ferríticos y martensíticos < 850 N/mm²	Ferritic and martensitic < 850 N/mm²	< 250	< 850		O E
		24	Ferríticos y martensíticos > 850 - < 1150 N/mm²	Ferritic and martensitic > 850 - < 1150 N/mm²	> 250	> 850		O E
30	Fundición / Cast iron	31	Fundición gris	Cast iron	< 250	< 850		O E
		32	Fundición de grafito + esferoidal y maleable	Spheroidal graphite + malleable cast iron	< 250	< 850		O E
40	Titanio / Titanium	41	Titanio puro	Pure titanium	< 250	< 850		O E
		42	Aleación al titanio	Titanium alloys	> 250	> 850		O E
50	Níquel / Nickel	51	Aleación al Níquel 1 ≤ 850 N/mm²	Nickel alloys 1 ≤ 850 N/mm²	< 250	< 850		O E
		52	Aleación al Níquel 2 > 850 - ≤ 1150 N/mm²	Nickel alloys 2 > 850 - ≤ 1150 N/mm²	> 250	> 850		O E
		53	Aleación al Níquel 3 > 1150 - ≤ 1600 N/mm²	Nickel alloys 3 > 1150 - ≤ 1600 N/mm²	> 340	> 1150		O E
60	Cobre / Copper	61	Cobre puro (electrolítico)	Pure copper (electrolytic copper)	< 120	< 400		O E
		62	Latón, bronce (virutas cortas)	Short chip brass, phosphor bronze, gun metal	< 200	< 700		O E
		63	Latón (virutas largas)	Long chip brass	< 200	< 700		O E
70	Aluminio Magnesio / Aluminium Magnesium	71	Al no aleado	Al unalloyed	< 100	< 350		O E
		72	Al aleado Si < 1.5 %	Al alloyed Si < 1.5 %	< 150	< 500		O E
		73	Al aleado Si > 1.5 % - < 10 %	Al alloyed Si > 1.5 % - < 10 %	< 120	< 400		O E
		74	Al aleado Si > 10 %, Aleaciones Magnesio	Al alloyed Si > 10 %, Mg-alloys	< 120	< 400		O E
80	Materiales plásticos / Plastic compounds	81	Materiales termoplásticos	Thermoplastics	-	-		E
		82	Materiales duroplásticos	Duroplastics	-	-		E
		83	Materiales plásticos reforzados por fibras	Glass fibre reinforced plastics	-	-		E
90	Metales preciosos / Precious metals	91	Oro amarillo	Yellow gold	-	-		O E
		92	Oro rojo	Red gold	-	-		O E
		93	Oro blanco	White gold	-	-		O E
		94	Plata	Silver	-	-		O E

O — Óptimo con aceite de corte / Optimal with cutting oil

O — Aceptable con aceite de corte / Suitable with cutting oil

E — Óptimo con emulsión / Optimal with emulsion

E — Aceptable con emulsión / Suitable with emulsion

		GWi5000						GWH3000		
										
		VS	VS					VH	VH	
Vc (m/min)		Avance fz (mm/diente)	Milling fz (mm/tooth)	Lubricante Lubricant		Vc (m/min)		Avance fz (mm/diente)	Milling fz (mm/tooth)	
Estándar Standard	Recub. Coated	Ø 0.80 - 2.74	Ø 2.75 - 6.00	Estándar Standard	Recub. Coated	Estándar Standard	Recub. Coated	Ø 2.75 - 6.00	Ø 6.01 - 12.70	
	80-100	0.007-0.05	0.04-0.10							11
	80-100	0.007-0.05	0.04-0.10							12
	70-90	0.007-0.05	0.02-0.10							13
	70-90	0.007-0.05	0.02-0.10							14
	30-50	0.007-0.05	0.02-0.08							15
	15-40	0.004-0.03	0.008-0.05		E		15-40	0.008-0.05	0.01-0.08	16
	15-30	0.004-0.025	0.008-0.04		E		15-30	0.008-0.04	0.01-0.06	17
					A		25-50	0.01-0.025	0.015-0.035	18
	40-60	0.007-0.05	0.02-0.10							21
	30-50	0.007-0.03	0.02-0.05							22
	30-50	0.007-0.03	0.02-0.05							23
	30-50	0.007-0.03	0.02-0.05							24
	90-120	0.007-0.05	0.04-0.10		E A		90-120	0.04-0.10	0.08-0.15	31
	70-90	0.007-0.05	0.02-0.10							32
	20-40	0.007-0.03	0.02-0.05							41
	15-35	0.007-0.03	0.02-0.05							42
	20-40	0.007-0.03	0.02-0.06							51
	20-40	0.007-0.03	0.02-0.06							52
	20-30	0.004-0.03	0.008-0.05							53
	200-250	0.007-0.05	0.02-0.10							61
	150-200	0.007-0.05	0.04-0.10		E A		150-200	0.04-0.10	0.08-0.15	62
	150-200	0.007-0.05	0.02-0.10							63
	200-300	0.007-0.05	0.05-0.10							71
	200-300	0.007-0.05	0.05-0.10							72
	200-300	0.007-0.05	0.05-0.10							73
	200-300	0.007-0.05	0.04-0.10		E A		200-300	0.04-0.10	0.08-0.15	74
	200-300	0.007-0.05	0.05-0.10							81
	100-200	0.007-0.05	0.04-0.10							82
	80-100	0.007-0.05	0.04-0.10		E A		80-100	0.04-0.10	0.08-0.15	83
	150-200	0.007-0.05	0.04-0.10							91
	90-120	0.007-0.05	0.02-0.10							92
	30-50	0.007-0.05	0.02-0.05							93
	90-120	0.007-0.05	0.02-0.10							94

A ***Óptimo con aire***
Optimal with air

A ***Aceptable con aire***
Suitable with air

Los valores son indicativos.
The indicated values are a guideline.

TABLA DE UTILIZACIÓN ZBGF — APPLICATION CHART ZBGF

Ciclo de programación para fresas de taladro y roscado circular ZBGF6065 - ZBGF6067
Programming cycle for circular drill thread milling cutters *ZBGF6065 - ZBGF6067*

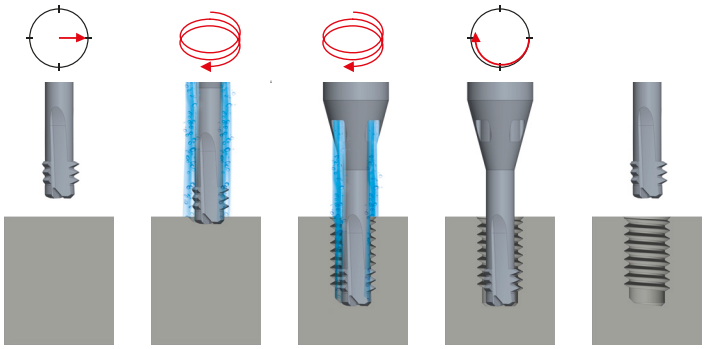


Tabla de utilización para fresas de taladro y roscado circular

Application chart for ZBGF

	Grupos de materiales Material groups		*Clasificación de los materiales*	Material designation	*Dureza* Hardness (HB)	*Resistencia* Tensile strength Rm (N/mm²)	*Lubricante* Lubricant	
							Estándar Standard	*Recub.* Coated
10	***Aceros*** **Steels**	11	*Aceros de decoletaje*	Free-cutting steels	< 200	< 700		O E
		12	*Aceros de construcción o de cementación*	Structural, cementation steels	< 200	< 700		O E
		13	*Aceros al carbón*	Carbon steels	< 300	< 1000		O E
		14	*Aceros aleados < 850 N/mm²*	Alloy steels < 850 N/mm²	< 250	< 850		O E
		15	*Aceros aleados/trat. > 850 - < 1150 N/mm²*	Alloy steels hard. / temp. > 850 - < 1150 N/mm²	> 250	> 850		O E
		16	*Aceros de alta resistencia ≤ 44 HRC*	High tensile alloy steels ≤ 44 HRC	> 250	> 850		O E
		17	*Aceros templados y revenidos > 44 - ≤ 54 HRC*	Alloy steels tempered > 44 - ≤ 54 HRC	> 410	> 1400		O E
		18	*Aceros templados > 54 - ≤ 63 HRC*	Alloy steels hardened > 54 - ≤ 63 HRC	> 560	> 1980		
20	***Aceros inoxidables*** **Stainless steels**	21	*Aceros inoxidables al azufre*	Free machining stainless steels	< 250	< 850		O E
		22	*Austeníticos*	Austenitic stainless steels	< 250	< 850		O E
		23	*Ferríticos y martensíticos < 850 N/mm²*	Ferritic and martensitic < 850 N/mm²	< 250	< 850		O E
		24	*Ferríticos y martensíticos > 850 - < 1150 N/mm²*	Ferritic and martensitic > 850 - < 1150 N/mm²	> 250	> 850		O E
30	***Fundición*** **Cast iron**	31	*Fundición gris*	Cast iron	< 250	< 850		O E
		32	*Fundición de grafito + esferoidal y maleable*	Spheroidal graphite + malleable cast iron	< 250	< 850		O E
40	***Titanio*** **Titanium**	41	*Titanio puro*	Pure titanium	< 250	< 850		O E
		42	*Aleación al titanio*	Titanium alloys	> 250	> 850		O E
50	***Níquel*** **Nickel**	51	*Aleación al Níquel 1 ≤ 850 N/mm²*	Nickel alloys 1 ≤ 850 N/mm²	< 250	< 850		O E
		52	*Aleación al Níquel 2 > 850 - ≤ 1150 N/mm²*	Nickel alloys 2 > 850 - ≤ 1150 N/mm²	> 250	> 850		O E
		53	*Aleación al Níquel 3 > 1150 - ≤ 1600 N/mm²*	Nickel alloys 3 > 1150 - ≤ 1600 N/mm²	> 340	> 1150		O E
60	***Cobre*** **Copper**	61	*Cobre puro (electrolítico)*	Pure copper (electrolytic copper)	< 120	< 400		
		62	*Latón, bronce (virutas cortas)*	Short chip brass, phosphor bronze, gun metal	< 200	< 700		O E
		63	*Latón (virutas largas)*	Long chip brass	< 200	< 700		O E
70	***Aluminio Magnesio*** **Aluminium Magnesium**	71	*Al no aleado*	Al unalloyed	< 100	< 350		O E
		72	*Al aleado Si < 1.5 %*	Al alloyed Si < 1.5 %	< 150	< 500		O E
		73	*Al aleado Si > 1.5 % - < 10 %*	Al alloyed Si > 1.5 % - < 10 %	< 120	< 400		O E
		74	*Al aleado Si > 10 %, Aleaciones Magnesio*	Al alloyed Si > 10 %, Mg-alloys	< 120	< 400		O E
80	***Materiales plásticos*** **Plastic compounds**	81	*Materiales termoplásticos*	Thermoplastics	-	-		E
		82	*Materiales duroplásticos*	Duroplastics	-	-		E
		83	*Materiales plásticos reforzados por fibras*	Glass fibre reinforced plastics	-	-		E
90	***Metales preciosos*** **Precious metals**	91	*Oro amarillo*	Yellow gold	-	-		O E
		92	*Oro rojo*	Red gold	-	-		O E
		93	*Oro blanco*	White gold	-	-		O E
		94	*Plata*	Silver	-	-		O E

O ***Óptimo con aceite de corte*** **Optimal with cutting oil**

O ***Aceptable con aceite de corte*** **Suitable with cutting oil**

E ***Óptimo con emulsión*** **Optimal with emulsion**

E ***Aceptable con emulsión*** **Suitable with emulsion**

Vc (m/min)		ZBGF		
		ZBGF6065VS	ZBGF6067VS	
				
		VS	VS	
Estándar Standard	Recub. Coated	Avance fz (mm/diente)	Milling fz (mm/tooth	
	50-100	0.02-0.06		11
	50-100	0.01-0.05		12
	50-100	0.01-0.05		13
	50-100	0.01-0.05		14
	40-80	0.01-0.05		15
	30-60	0.008-0.04		16
	30-60	0.006-0.025		17
				18
	40-80	0.01-0.04		21
	30-50	0.01-0.04		22
	30-60	0.01-0.04		23
	30-50	0.01-0.03		24
	70-140	0.01-0.05		31
	50-100	0.01-0.05		32
	30-50	0.01-0.04		41
	30-50	0.01-0.04		42
	40-60	0.01-0.03		51
	30-50	0.01-0.03		52
	30-50	0.005-0.03		53
				61
	100-200	0.01-0.05		62
	100-200	0.01-0.05		63
	100-200	0.01-0.05		71
	100-200	0.01-0.05		72
	100-200	0.01-0.05		73
	70-140	0.01-0.05		74
	80-180	0.05-0.10		81
	80-180	0.02-0.08		82
	50-150	0.02-0.10		83
	80-120	0.02-0.08		91
	50-100	0.01-0.05		92
	40-80	0.01-0.04		93
	50-100	0.01-0.05		94

A ***Óptimo con aire***
Optimal with air

A ***Aceptable con aire***
Suitable with air

Los valores son indicativos.
The indicated values are a guideline.

TABLA DE UTILIZACIÓN C315VS — APPLICATION CHART C315VS

Ciclo de programación para punta de centrar C315VS
Programming cycle for spotting drills C315VS

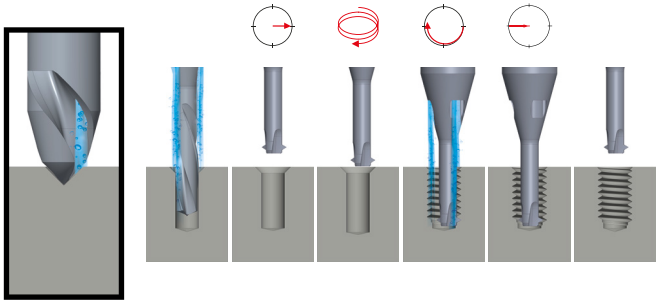


Tabla de utilización para punta de centrar Application chart for spotting drills

	Grupos de materiales Material groups		*Clasificación de los materiales*	Material designation	*Dureza* Hardness (HB)	*Resistencia* Tensile strength Rm (N/mm²)	*Lubricante* Lubricant	
							Estándar Standard	*Recub.* Coated
10	*Aceros* Steels	11	*Aceros de decoletaje*	Free-cutting steels	< 200	< 700		O E
		12	*Aceros de construcción o de cementación*	Structural, cementation steels	< 200	< 700		O E
		13	*Aceros al carbón*	Carbon steels	< 300	< 1000		O E
		14	*Aceros aleados < 850 N/mm²*	Alloy steels < 850 N/mm²	< 250	< 850		O E
		15	*Aceros aleados/trat. > 850 - < 1150 N/mm²*	Alloy steels hard. / temp. > 850 - < 1150 N/mm²	> 250	> 850		O E
		16	*Aceros de alta resistencia ≤ 44 HRC*	High tensile alloy steels ≤ 44 HRC	> 250	> 850		O E
		17	*Aceros templados y revenidos > 44 - ≤ 54 HRC*	Alloy steels tempered > 44 - ≤ 54 HRC	> 410	> 1400		O E
		18	*Aceros templados > 54 - ≤ 63 HRC*	Alloy steels hardened > 54 - ≤ 63 HRC	> 560	> 1980		
20	*Aceros inoxidables* Stainless steels	21	*Aceros inoxidables al azufre*	Free machining stainless steels	< 250	< 850		O E
		22	*Austeníticos*	Austenitic stainless steels	< 250	< 850		O E
		23	*Ferríticos y martensíticos < 850 N/mm²*	Ferritic and martensitic < 850 N/mm²	< 250	< 850		O E
		24	*Ferríticos y martensíticos > 850 - < 1150 N/mm²*	Ferritic and martensitic > 850 - < 1150 N/mm²	> 250	> 850		O E
30	*Fundición* Cast iron	31	*Fundición gris*	Cast iron	< 250	< 850		O E
		32	*Fundición de grafito + esferoidal y maleable*	Spheroidal graphite + malleable cast iron	< 250	< 850		O E
40	*Titanio* Titanium	41	*Titanio puro*	Pure titanium	< 250	< 850		O E
		42	*Aleación al titanio*	Titanium alloys	> 250	> 850		O E
50	*Níquel* Nickel	51	*Aleación al Níquel 1 ≤ 850 N/mm²*	Nickel alloys 1 ≤ 850 N/mm²	< 250	< 850		O E
		52	*Aleación al Níquel 2 > 850 - ≤ 1150 N/mm²*	Nickel alloys 2 > 850 - ≤ 1150 N/mm²	> 250	> 850		O E
		53	*Aleación al Níquel 3 > 1150 - ≤ 1600 N/mm²*	Nickel alloys 3 > 1150 - ≤ 1600 N/mm²	> 340	> 1150		O E
60	*Cobre* Copper	61	*Cobre puro (electrolítico)*	Pure copper (electrolytic copper)	< 120	< 400		O E
		62	*Latón, bronce (virutas cortas)*	Short chip brass, phosphor bronze, gun metal	< 200	< 700		O E
		63	*Latón (virutas largas)*	Long chip brass	< 200	< 700		O E
70	*Aluminio Magnesio* Aluminium Magnesium	71	*Al no aleado*	Al unalloyed	< 100	< 350		O E
		72	*Al aleado Si < 1.5 %*	Al alloyed Si < 1.5 %	< 150	< 500		O E
		73	*Al aleado Si > 1.5 % - < 10 %*	Al alloyed Si > 1.5 % - < 10 %	< 120	< 400		O E
		74	*Al aleado Si > 10 %, Aleaciones Magnesio*	Al alloyed Si > 10 %, Mg-alloys	< 120	< 400		O E
80	*Materiales plásticos* Plastic compounds	81	*Materiales termoplásticos*	Thermoplastics	-	-		E
		82	*Materiales duroplásticos*	Duroplastics	-	-		E
		83	*Materiales plásticos reforzados por fibras*	Glass fibre reinforced plastics	-	-		E
90	*Metales preciosos* Precious metals	91	*Oro amarillo*	Yellow gold	-	-		O E
		92	*Oro rojo*	Red gold	-	-		O E
		93	*Oro blanco*	White gold	-	-		O E
		94	*Plata*	Silver	-	-		O E

O *Óptimo con aceite de corte* Optimal with cutting oil

O *Aceptable con aceite de corte* Suitable with cutting oil

E *Óptimo con emulsión* Optimal with emulsion

E *Aceptable con emulsión* Suitable with emulsion

C315VS

VS	VS	VS	VS	VS	VS

Vc (m/min)		Avance f (mm/rev.)			Feed rate f (mm/rev.)			
Estándar Standard	Recub. Coated	Ø 1.40	Ø 2.00	Ø 3.00	Ø 4.00	Ø 6.00	Ø 8.00	
	120	0.05	0.08	0.10	0.12	0.15	0.20	11
	120	0.05	0.08	0.10	0.12	0.15	0.20	12
	120	0.05	0.08	0.10	0.12	0.15	0.20	13
	80	0.05	0.08	0.10	0.12	0.15	0.20	14
	60	0.03	0.04	0.06	0.08	0.12	0.18	15
	40	0.02	0.03	0.04	0.05	0.06	0.07	16
	40	0.02	0.03	0.04	0.05	0.06	0.07	17
								18
	60	0.03	0.04	0.06	0.08	0.12	0.18	21
	50	0.03	0.04	0.06	0.07	0.09	0.11	22
	50	0.03	0.04	0.06	0.07	0.09	0.11	23
	50	0.03	0.04	0.06	0.07	0.09	0.11	24
	100	0.04	0.05	0.07	0.09	0.11	0.15	31
	100	0.04	0.05	0.07	0.09	0.11	0.15	32
	25	0.03	0.04	0.06	0.07	0.09	0.11	41
	25	0.04	0.07	0.09	0.11	0.14	0.18	42
	25	0.025	0.03	0.04	0.05	0.07	0.09	51
	20	0.025	0.03	0.04	0.05	0.07	0.09	52
	10	0.025	0.03	0.04	0.05	0.07	0.09	53
	100	0.06	0.09	0.11	0.13	0.18	0.23	61
	100	0.06	0.09	0.11	0.13	0.16	0.18	62
	80	0.06	0.09	0.11	0.13	0.16	0.18	63
	150	0.06	0.09	0.11	0.13	0.18	0.23	71
	150	0.06	0.09	0.11	0.13	0.18	0.23	72
	100	0.06	0.09	0.11	0.13	0.18	0.23	73
	100	0.06	0.09	0.11	0.13	0.18	0.23	74
	200	0.08	0.11	0.13	0.15	0.20	0.25	81
	200	0.08	0.11	0.13	0.15	0.20	0.25	82
	100	0.08	0.11	0.13	0.15	0.20	0.25	83
	200	0.08	0.11	0.13	0.15	0.20	0.25	91
	150	0.08	0.11	0.13	0.15	0.20	0.25	92
	100	0.08	0.11	0.13	0.15	0.20	0.25	93
	100	0.08	0.11	0.13	0.15	0.20	0.25	94

A ***Óptimo con aire***
Optimal with air

A ***Aceptable con aire***
Suitable with air

Los valores son indicativos.
The indicated values are a guideline.

TABLA DE UTILIZACIÓN FZ315VS — APPLICATION CHART FZ315VS

Ciclo de programación para brocas de taladrar FZ315VS
Programming cycle for twist drills FZ315VS

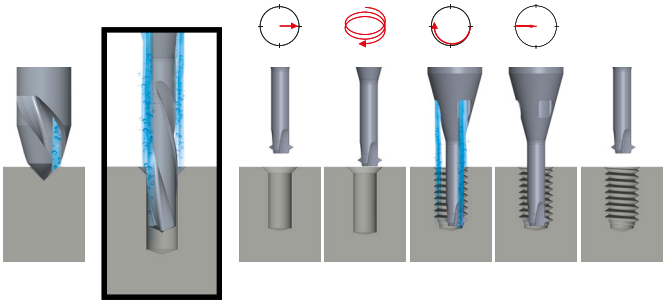


Tabla de utilización para brocas de taladrar — Application chart for twist drills

	Grupos de materiales Material groups		*Clasificación de los materiales*	Material designation	*Dureza* Hardness (HB)	*Resistencia* Tensile strength Rm (N/mm²)	*Lubricante* Lubricant	
							Estándar Standard	*Recub.* Coated
10	*Aceros* Steels	11	*Aceros de decoletaje*	Free-cutting steels	< 200	< 700		O E
		12	*Aceros de construcción o de cementación*	Structural, cementation steels	< 200	< 700		O E
		13	*Aceros al carbón*	Carbon steels	< 300	< 1000		O E
		14	*Aceros aleados < 850 N/mm²*	Alloy steels < 850 N/mm²	< 250	< 850		O E
		15	*Aceros aleados/trat. > 850 - < 1150 N/mm²*	Alloy steels hard. / temp. > 850 - < 1150 N/mm²	> 250	> 850		O E
		16	*Aceros de alta resistencia ≤ 44 HRC*	High tensile alloy steels ≤ 44 HRC	> 250	> 850		O E
		17	*Aceros templados y revenidos > 44 - ≤ 54 HRC*	Alloy steels tempered > 44 - ≤ 54 HRC	> 410	> 1400		O E
		18	*Aceros templados > 54 - ≤ 63 HRC*	Alloy steels hardened > 54 - ≤ 63 HRC	> 560	> 1980		
20	*Aceros inoxidables* Stainless steels	21	*Aceros inoxidables al azufre*	Free machining stainless steels	< 250	< 850		O E
		22	*Austeníticos*	Austenitic stainless steels	< 250	< 850		O E
		23	*Ferríticos y martensíticos < 850 N/mm²*	Ferritic and martensitic < 850 N/mm²	< 250	< 850		O E
		24	*Ferríticos y martensíticos > 850 - < 1150 N/mm²*	Ferritic and martensitic > 850 - < 1150 N/mm²	> 250	> 850		O E
30	*Fundición* Cast iron	31	*Fundición gris*	Cast iron	< 250	< 850		O E
		32	*Fundición de grafito + esferoidal y maleable*	Spheroidal graphite + malleable cast iron	< 250	< 850		O E
40	*Titanio* Titanium	41	*Titanio puro*	Pure titanium	< 250	< 850		O E
		42	*Aleación al titanio*	Titanium alloys	> 250	> 850		O E
50	*Níquel* Nickel	51	*Aleación al Níquel 1 ≤ 850 N/mm²*	Nickel alloys 1 ≤ 850 N/mm²	< 250	< 850		O E
		52	*Aleación al Níquel 2 > 850 - ≤ 1150 N/mm²*	Nickel alloys 2 > 850 - ≤ 1150 N/mm²	> 250	> 850		O E
		53	*Aleación al Níquel 3 > 1150 - ≤ 1600 N/mm²*	Nickel alloys 3 > 1150 - ≤ 1600 N/mm²	> 340	> 1150		O E
60	*Cobre* Copper	61	*Cobre puro (electrolítico)*	Pure copper (electrolytic copper)	< 120	< 400		O E
		62	*Latón, bronce (virutas cortas)*	Short chip brass, phosphor bronze, gun metal	< 200	< 700		O E
		63	*Latón (virutas largas)*	Long chip brass	< 200	< 700		O E
70	*Aluminio Magnesio* Aluminium Magnesium	71	*Al no aleado*	Al unalloyed	< 100	< 350		O E
		72	*Al aleado Si < 1.5 %*	Al alloyed Si < 1.5 %	< 150	< 500		O E
		73	*Al aleado Si > 1.5 % - < 10 %*	Al alloyed Si > 1.5 % - < 10 %	< 120	< 400		O E
		74	*Al aleado Si > 10 %, Aleaciones Magnesio*	Al alloyed Si > 10 %, Mg-alloys	< 120	< 400		O E
80	*Materiales plásticos* Plastic compounds	81	*Materiales termoplásticos*	Thermoplastics	-	-		E
		82	*Materiales duroplásticos*	Duroplastics	-	-		E
		83	*Materiales plásticos reforzados por fibras*	Glass fibre reinforced plastics	-	-		E
90	*Metales preciosos* Precious metals	91	*Oro amarillo*	Yellow gold	-	-		O E
		92	*Oro rojo*	Red gold	-	-		O E
		93	*Oro blanco*	White gold	-	-		O E
		94	*Plata*	Silver	-	-		O E

O *Óptimo con aceite de corte* Optimal with cutting oil

O *Aceptable con aceite de corte* Suitable with cutting oil

E *Óptimo con emulsión* Optimal with emulsion

E *Aceptable con emulsión* Suitable with emulsion

FZ315VS									FZ315VS					
Vc (m/min) Ø 0.58 - 2.0		Avance f (mm/rev.)			Feed rate f (mm/rev.)			Vc (m/min) Ø 2.01 - 5.4		Avance f (mm/rev.)		Feed rate f (mm/rev.)		
Estándar Standard	*Recub.* Coated	Ø0.58-0.82	Ø0.83-1.07	Ø1.08-1.46	Ø1.47-2.0	Q1	Qx	*Estándar* Standard	*Recub.* Coated	Ø2.01-3.05	Ø3.06-4.5	Ø4.51-5.4	Qx	
	40-60	0.02-0.035	0.03-0.045	0.04-0.055	0.05-0.065	$1xd_1$-$4xd_1$	$1xd_1$-$2xd_1$		80-110	0.07-0.12	0.12-0.18	0.18-0.23		11
	40-60	0.02-0.035	0.03-0.045	0.04-0.055	0.05-0.065	$1xd_1$-$4xd_1$	$1xd_1$-$2xd_1$		80-110	0.07-0.12	0.12-0.17	0.17-0.22		12
	35-55	0.015-0.025	0.025-0.035	0.035-0.045	0.045-0.055	$1xd_1$-$4xd_1$	$1xd_1$-$2xd_1$		70-100	0.07-0.12	0.12-0.17	0.17-0.22		13
	35-55	0.015-0.025	0.025-0.035	0.035-0.045	0.045-0.055	$1xd_1$-$4xd_1$	$1xd_1$-$2xd_1$		70-100	0.07-0.12	0.12-0.17	0.17-0.22		14
	35-55	0.015-0.025	0.025-0.035	0.035-0.045	0.045-0.055	$1xd_1$-$4xd_1$	$1xd_1$-$2xd_1$		70-100	0.07-0.12	0.12-0.17	0.17-0.22		15
	35-55	0.015-0.025	0.025-0.035	0.035-0.045	0.045-0.055	$1xd_1$-$4xd_1$	$1xd_1$-$2xd_1$		70-100	0.07-0.10	0.10-0.14	0.14-0.17		16
	30-45	0.015-0.025	0.025-0.035	0.035-0.045	0.045-0.055	$1xd_1$-$4xd_1$	$1xd_1$-$2xd_1$		60-80	0.07-0.10	0.10-0.15	0.14-0.18		17
														18
	30-45	0.015-0.025	0.025-0.035	0.035-0.045	0.045-0.055	$1xd_1$-$4xd_1$	$1xd_1$-$2xd_1$		60-80	0.045-0.055	0.055-0.07	0.07-0.10		21
	30-45	0.015-0.025	0.025-0.035	0.035-0.045	0.045-0.055	$1xd_1$-4xd1	$1xd_1$-$2xd_1$		60-80	0.045-0.055	0.055-0.07	0.07-0.10		22
	35-50	0.02-0.025	0.025-0.035	0.04-0.05	0.05-0.065	$1xd_1$-$4xd_1$	$1xd_1$-$2xd_1$		60-80	0.05-0.065	0.05-0.065	0.06-0.09		23
	35-50	0.02-0.025	0.025-0.035	0.04-0.05	0.05-0.065	$1xd_1$-$4xd_1$	$1xd_1$-$2xd_1$		60-80	0.05-0.065	0.05-0.065	0.06-0.09		24
	50-80	0.025-0.045	0.045-0.065	0.065-0.085	0.085-0.10	$4xd_1$-$8xd_1$	$4xd_1$		90-130	0.10-0.15	0.15-0.20	0.20-0.25		31
	40-70	0.025-0.045	0.045-0.065	0.065-0.085	0.085-0.10	$4xd_1$-$8xd_1$	$4xd_1$		80-120	0.10-0.14	0.14-0.18	0.18-0.23		32
	15-25	0.005-0.02	0.015-0.045	0.04-0.06	0.055-0.07	$1/2xd_1$-$1xd_1$	$1/4xd_1$-$1/2xd_1$		30-40	0.055-0.07	0.055-0.07	0.055-0.07	$1/3xd_1$-$1/2xd_1$	41
	15-25	0.005-0.02	0.015-0.045	0.04-0.06	0.055-0.07	$1/2xd_1$-$1xd_1$	$1/4xd_1$-$1/2xd_1$		30-40	0.055-0.07	0.055-0.07	0.055-0.07	$1/3xd_1$-$1/2xd_1$	42
	15-25	0.005-0.02	0.02-0.025	0.025-0.035	0.035-0.05	$1/2xd_1$-$1xd_1$	$1/2xd_1$		30-40	0.035-0.05	0.035-0.05	0.05-0.08		51
	15-25	0.015-0.02	0.02-0.025	0.025-0.035	0.035-0.05	$1/2xd_1$-$1xd_1$	$1/2xd_1$		30-40	0.035-0.05	0.035-0.05	0.05-0.08		52
	15-25	0.005-0.01	0.01-0.02	0.02-0.03	0.03-0.04	$1/2xd_1$-$1xd_1$	$1/2xd_1$		30-40	0.03-0.04	0.03-0.04	0.04-0.06		53
	50-80	0.05-0.08	0.06-0.10	0.08-0.12	0.12-0.15	$4xd_1$-$8xd_1$	$4xd_1$		130-180	0.12-0.15	0.15-0.20	0.20-0.25		61
	50-80	0.05-0.08	0.06-0.10	0.08-0.12	0.12-0.15	$4xd_1$-$8xd_1$	$4xd_1$		130-180	0.12-0.15	0.15-0.20	0.20-0.25		62
	50-80	0.05-0.08	0.06-0.10	0.08-0.12	0.12-0.15	$4xd_1$-$8xd_1$	$4xd_1$		80-110	0.12-0.15	0.14-0.18	0.18-0.23		63
	50-80	0.05-0.08	0.06-0.10	0.08-0.12	0.12-0.15	$2xd_1$-$3xd_1$	$3xd_1$		130-180	0.12-0.15	0.15-0.20	0.20-0.25		71
	50-80	0.05-0.08	0.06-0.10	0.08-0.12	0.12-0.15	$2xd_1$-$3xd_1$	$3xd_1$		130-180	0.12-0.15	0.15-0.20	0.20-0.25		72
	50-80	0.05-0.08	0.06-0.10	0.08-0.12	0.12-0.15	$2xd_1$-$3xd_1$	$3xd_1$		100-130	0.12-0.15	0.14-0.18	0.18-0.23		73
	50-80	0.05-0.08	0.06-0.10	0.08-0.12	0.12-0.15	$2xd_1$-$3xd_1$	$3xd_1$		100-130	0.12-0.15	0.14-0.18	0.18-0.23		74
	50-80	0.05-0.08	0.06-0.10	0.08-0.12	0.12-0.15	$4xd_1$-$8xd_1$	$4xd_1$		130-180	0.12-0.15	0.15-0.20	0.20-0.25		81
	50-80	0.05-0.08	0.06-0.10	0.08-0.12	0.12-0.15	$4xd_1$-$8xd_1$	$4xd_1$		130-180	0.12-0.15	0.15-0.20	0.20-0.25		82
	40-60	0.02-0.035	0.03-0.045	0.04-0.055	0.05-0.065	$2xd_1$-$3xd_1$	$3xd_1$		80-120	0.07-0.12	0.12-0.18	0.18-0.23		83
	50-80	0.02-0.035	0.03-0.045	0.04-0.055	0.05-0.065	$2xd_1$-$3xd_1$	$3xd_1$		130-180	0.07-0.12	0.12-0.17	0.17-0.22		91
	50-80	0.02-0.035	0.03-0.045	0.04-0.055	0.05-0.065	$2xd_1$-$3xd_1$	$3xd_1$		130-180	0.07-0.12	0.12-0.17	0.17-0.22		92
	40-60	0.02-0.035	0.03-0.045	0.04-0.055	0.05-0.065	$2xd_1$-$3xd_1$	$3xd_1$		80-110	0.07-0.12	0.12-0.17	0.17-0.22		93
	40-60	0.02-0.035	0.03-0.045	0.04-0.055	0.05-0.065	$2xd_1$-$3xd_1$	$3xd_1$		80-110	0.07-0.12	0.12-0.17	0.17-0.22		94

A *Óptimo con aire* **Optimal with air**

A *Aceptable con aire* **Suitable with air**

Los valores son indicativos.
The indicated values are a guideline.

TABLA DE UTILIZACIÓN F286VS — APPLICATION CHART F286VS

Tabla de utilización para brocas de taladrar — Application chart for twist drills

	Grupos de materiales Material groups		*Clasificación de los materiales*	Material designation	*Dureza* Hardness (HB)	*Resistencia* Tensile strength Rm (N/mm²)	*Lubricante* Lubricant	
							Estándar Standard	*Recub.* Coated
10	***Aceros*** **Steels**	11	*Aceros de decoletaje*	Free-cutting steels	< 200	< 700		O E
		12	*Aceros de construcción o de cementación*	Structural, cementation steels	< 200	< 700		O E
		13	*Aceros al carbón*	Carbon steels	< 300	< 1000		O E
		14	*Aceros aleados < 850 N/mm²*	Alloy steels < 850 N/mm²	< 250	< 850		O E
		15	*Aceros aleados/trat. > 850 - < 1150 N/mm²*	Alloy steels hard. / temp. > 850 - < 1150 N/mm²	> 250	> 850		O E
		16	*Aceros de alta resistencia ≤ 44 HRC*	High tensile alloy steels ≤ 44 HRC	> 250	> 850		
		17	*Aceros templados y revenidos > 44 - ≤ 54 HRC*	Alloy steels tempered > 44 - ≤ 54 HRC	> 410	> 1400		
		18	*Aceros templados > 54 - ≤ 63 HRC*	Alloy steels hardened > 54 - ≤ 63 HRC	> 560	> 1980		
20	***Aceros inoxidables*** **Stainless steels**	21	*Aceros inoxidables al azufre*	Free machining stainless steels	< 250	< 850		O E
		22	*Austeníticos*	Austenitic stainless steels	< 250	< 850		O E
		23	*Ferríticos y martensíticos < 850 N/mm²*	Ferritic and martensitic < 850 N/mm²	< 250	< 850		O E
		24	*Ferríticos y martensíticos > 850 - < 1150 N/mm²*	Ferritic and martensitic > 850 - < 1150 N/mm²	> 250	> 850		O E
30	***Fundición*** **Cast iron**	31	*Fundición gris*	Cast iron	< 250	< 850		
		32	*Fundición de grafito + esferoidal y maleable*	Spheroidal graphite + malleable cast iron	< 250	< 850		
40	***Titanio*** **Titanium**	41	*Titanio puro*	Pure titanium	< 250	< 850		O E
		42	*Aleación al titanio*	Titanium alloys	> 250	> 850		
50	***Níquel*** **Nickel**	51	*Aleación al Níquel 1 ≤ 850 N/mm²*	Nickel alloys 1 ≤ 850 N/mm²	< 250	< 850		O E
		52	*Aleación al Níquel 2 > 850 - ≤ 1150 N/mm²*	Nickel alloys 2 > 850 - ≤ 1150 N/mm²	> 250	> 850		
		53	*Aleación al Níquel 3 > 1150 - ≤ 1600 N/mm²*	Nickel alloys 3 > 1150 - ≤ 1600 N/mm²	> 340	> 1150		
60	***Cobre*** **Copper**	61	*Cobre puro (electrolítico)*	Pure copper (electrolytic copper)	< 120	< 400		O E
		62	*Latón, bronce (virutas cortas)*	Short chip brass, phosphor bronze, gun metal	< 200	< 700		
		63	*Latón (virutas largas)*	Long chip brass	< 200	< 700		O E
70	***Aluminio Magnesio*** **Aluminium Magnesium**	71	*Al no aleado*	Al unalloyed	< 100	< 350		O E
		72	*Al aleado Si < 1.5 %*	Al alloyed Si < 1.5 %	< 150	< 500		O E
		73	*Al aleado Si > 1.5 % - < 10 %*	Al alloyed Si > 1.5 % - < 10 %	< 120	< 400		O E
		74	*Al aleado Si > 10 %, Aleaciones Magnesio*	Al alloyed Si > 10 %, Mg-alloys	< 120	< 400		
80	***Materiales plásticos*** **Plastic compounds**	81	*Materiales termoplásticos*	Thermoplastics	-	-		
		82	*Materiales duroplásticos*	Duroplastics	-	-		
		83	*Materiales plásticos reforzados por fibras*	Glass fibre reinforced plastics	-	-		
90	***Metales preciosos*** **Precious metals**	91	*Oro amarillo*	Yellow gold	-	-		
		92	*Oro rojo*	Red gold	-	-		
		93	*Oro blanco*	White gold	-	-		O E
		94	*Plata*	Silver	-	-		O E

O ***Óptimo con aceite de corte*** **Optimal with cutting oil**

O ***Aceptable con aceite de corte*** **Suitable with cutting oil**

E ***Óptimo con emulsión*** **Optimal with emulsion**

E ***Aceptable con emulsión*** **Suitable with emulsion**

F286VS

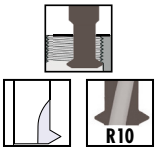
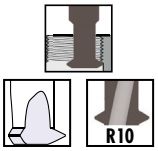
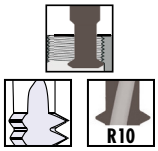
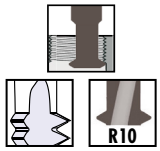
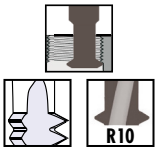
Vc (m/min)		Avance f (mm/rev.)			Feed rate f (mm/rev.)			
Estándar Standard	Recub. Coated	Ø 0.8 - 1.2	Ø 1.21 - 3.0	Ø 3.01 - 6.0	Ø 6.01 - 8.5	Ø 8.51 - 11.0	Ø 11.02 - 14.0	
	70-90	0.015-0.025	0.015-0.025	0.035-0.045	0.11-0.13	0.15-0.17	0.18-0.22	11
	70-90	0.10-0.20	0.015-0.025	0.035-0.045	0.11-0.13	0.15-0.17	0.18-0.22	12
	70-90	0.10-0.20	0.015-0.025	0.035-0.045	0.11-0.13	0.15-0.17	0.18-0.22	13
	70-90	0.10-0.20	0.015-0.025	0.035-0.045	0.11-0.13	0.15-0.17	0.18-0.22	14
	60-80	0.10-0.20	0.015-0.025	0.035-0.045	0.07-0.09	0.11-0.13	0.15-0.17	15
								16
								17
								18
	40-60	0.008-0.012	0.015-0.02	0.035-0.04	0.075-0.085	0.095-0.105	0.15-0.16	21
	40-60	0.008-0.012	0.015-0.02	0.035-0.04	0.075-0.085	0.095-0.105	0.15-0.16	22
	40-60	0.008-0.012	0.015-0.02	0.035-0.04	0.075-0.085	0.095-0.105	0.15-0.16	23
	40-60	0.008-0.012	0.015-0.02	0.035-0.04	0.075-0.085	0.095-0.105	0.15-0.16	24
								31
								32
	40-80	0.003-0.006	0.008-0.012	0.01-0.018	0.025-0.03	0.055-0.06	0.075-0.085	41
								42
	30-50	0.008-0.012	0.015-0.02	0.035-0.04	0.075-0.085	0.095-0.105	0.11-0.13	51
								52
								53
	70-150	0.15-0.25	0.035-0.045	0.055-0.065	0.11-0.13	0.15-0.17	0.18-0.22	61
								62
	70-150	0.15-0.25	0.035-0.045	0.055-0.065	0.11-0.13	0.15-0.17	0.18-0.22	63
	100-160	0.025-0.035	0.045-0.055	0.075-0.085	0.15-0.17	0.22-0.26	0.30-0.34	71
	100-160	0.025-0.035	0.045-0.055	0.075-0.085	0.15-0.17	0.22-0.26	0.30-0.34	72
	60-130	0.02-0.03	0.035-0.045	0.055-0.065	0.11-0.13	0.16-0.20	0.22-0.26	73
								74
								81
								82
								83
								91
								92
	40-60	0.008-0.012	0.015-0.02	0.035-0.04	0.075-0.085	0.095-0.105	0.15-0.16	93
	40-60	0.008-0.012	0.015-0.02	0.035-0.04	0.075-0.085	0.095-0.105	0.15-0.16	94

A ***Óptimo con aire***
Optimal with air

A ***Aceptable con aire***
Suitable with air

Los valores son indicativos.
The indicated values are a guideline.

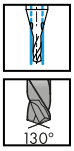
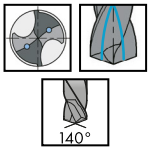
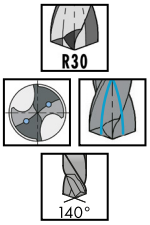
Directorio - Fresas torbellino en metal duro integral tipo GW
Directory - Solid carbide thread whirl cutters type GW

		GW										
Tipo **Type**		GW1116	GW1116VS	GW2016	GW2016VS	GW3016	GW3016VS	GW3016VX	GW3017	GW3017VS	GW3017VX	GW3019	GW3019VS
Recubrimiento **Coating**			VS		VS		VS	VX		VS	VX		VS
													
Longitud roscada **Thread length**		 2.5 x D_1		 2.5 x D_1		 2.5 x D_1			 3 x D_1			 4 x D_1	
Características **Characteristics**		 R10		 R10		 R10			 R10			 R10	
M	ISO DIN 14 ISO DIN 13	44	44	47	47	50	50	50	51	51	51	52	52
MF	ISO DIN 13					53	53	53	54	54	54	55	55
UNC	ASME B1.1					56	56	56	57	57	57	58	58
UNF	ASME B1.1					59	59	59	60	60	60	61	61
S	NIHS 06-10	45	45	48	48	62	62	62	63	63	63	64	64
SL	SL 15-01	46	46	49	49	62	62						

Directorio - Fresas torbellino en metal duro integral tipo GWi - GWH, fresas de taladro y roscado circular tipo ZBGF
Directory - Solid carbide thread whirl cutters type GWi - GWH, circular drill thread milling cutters type ZBGF

		GWi							GWH		ZBGF	
Tipo Type		GWi3066VS	GWi3066VX	GWi3067VS	GWi3067VX	GWi3069VS	GWi5066VS	GWi5067VS	GWH3015VH	GWH3017VH	ZBGF6065VS	ZBGF6067VS
Recubrimiento Coating		VS	VX	VS	VX	VS	VS	VS	VH	VH	VS	VS
												
Longitud roscada Thread length		2.5 x D_1		3 x D_1		4 x D_1	2.5 x D_1	3 x D_1	2 x D_1	3 x D_1	2 x D_1	3 x D_1
Características Characteristics		R10		R10		R10	R0	R0	R0	R0	L3	L3
M	ISO DIN 14 ISO DIN 13	65	65	66	66	68	82	82	89	89	90	90
MJ	ISO 5855			67	67							
MF	ISO DIN 13	69	69	70	70	72						
MJF	ISO 5855			71	71							
UNC	ASME B1.1	73	73	74	74	76	83	83			91	91
UNJC	ISO 3161			75	75							
UNF	ASME B1.1	77	77	78	78	80	84	84			92	92
UNJF	ISO 3161			79	79							
S	NIHS 06-10	81	81	81	81		85					

Directorio - Punta de centrar tipo C, Brocas de taladrar tipo FZ-F, en metalo duro integral
Directory - Solid carbide spotting drills type C, solid carbide twist drills type FZ - F

	C	FZ		F
Tipo **Type**	**C315VS**	**FZ315VS**	**FZ315VS**	**F286VS**
Recubrimiento **Coating**	VS	VS	VS	VS
				
Profundidad de taladrado **Drilling depth**				
Características **Characteristics**				
C315VS	86			
FZ315VS		87	87	
F286VS				88

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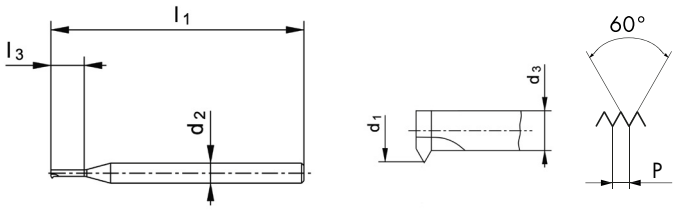
M ISO DIN 14 ISO DIN 13

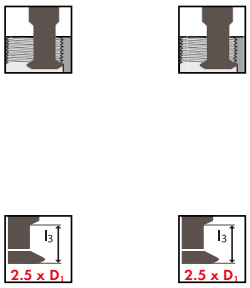
VHM CAR | < 3µm | DC | h5

GW

GW1116 | R10

GW1116VS | R10 | VS





Ø D_1 M	P mm	d_1 mm	l_1 mm	l_3 mm	d_2 h5 mm	d_3 mm			GW1116 ID	GW1116VS ID
0.3	0.08	0.21	39	0.9	3	0.1	1	0.23	● 194227	● 194245
0.35	0.09	0.25	39	1	3	0.13	1	0.28	● 194228	● 194246
0.4	0.1	0.29	39	1.2	3	0.15	1	0.32 [1]	● 194229	● 194247
0.5	0.125	0.36	39	1.5	3	0.19	1	0.41 [1]	● 194230	● 194248
0.6	0.15	0.43	39	1.7	3	0.23	1	0.5 [1]	● 194231	● 194249
0.7	0.175	0.5	39	2	3	0.27	1	0.58 [1]	● 194232	● 194250
0.8	0.2	0.57	39	2.3	3	0.31	1	0.66 [1]	● 194233	● 194251
0.9	0.225	0.64	39	2.6	3	0.34	1	0.74 [1]	● 194234	● 194252
1	0.25	0.71	39	2.9	3	0.38	1	0.75	● 194235	● 194253
1.2	0.25	0.91	39	3.4	3	0.58	1	0.95	● 194236	● 194254
1.4	0.3	1.06	39	3.9	3	0.66	1	1.1	● 194237	● 194255

[1] **4H5H → 4H6H =** +0.02mm

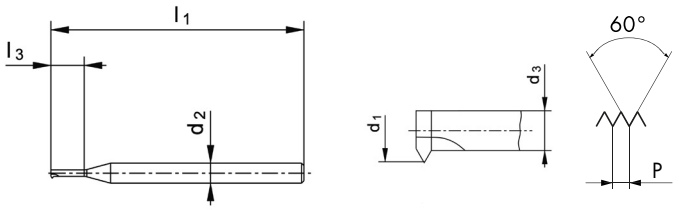
S NIHS 06-10

VHM CAR | < 3µm | DC | h5

GW

GW1116

GW1116VS



	GW1116	GW1116VS		
				
				
				

Ø D_1 S	P mm	d_1 mm	l_1 mm	l_3 mm	d_2 h5 mm	d_3 mm			ID	ID
0.3	**0.08**	0.21	39	0.9	3	0.1	1	0.23	● **166930**	● **166940**
0.35	**0.09**	0.25	39	1	3	0.13	1	0.28	● **194226**	● **194244**
0.4	**0.1**	0.29	39	1.2	3	0.15	1	0.32 [1]	● **166931**	● **166941**
0.5	**0.125**	0.36	39	1.5	3	0.19	1	0.41 [1]	● **166932**	● **166942**
0.6	**0.15**	0.43	39	1.7	3	0.23	1	0.5 [1]	● **166933**	● **166943**
0.7	**0.175**	0.5	39	2	3	0.27	1	0.58 [1]	● **166934**	● **166944**
0.8	**0.2**	0.57	39	2.3	3	0.31	1	0.66 [1]	● **166935**	● **166945**
0.9	**0.225**	0.64	39	2.6	3	0.34	1	0.74 [1]	● **166936**	● **166946**
1	**0.25**	0.71	39	2.9	3	0.38	1	0.82 [1]	● **166937**	● **166947**
1.2	**0.25**	0.91	39	3.4	3	0.58	1	1.02 [1]	● **166938**	● **166948**
1.4	**0.3**	1.06	39	3.9	3	0.66	1	1.18 [1]	● **166939**	● **166949**

[1] **4H5H → 4H6H =** +0.02mm

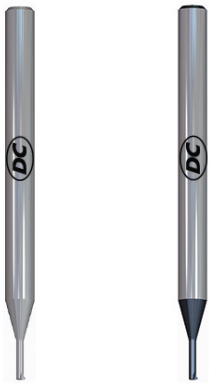
SL

SL 15-01

VHM CAR | < 3µm | DC | h5

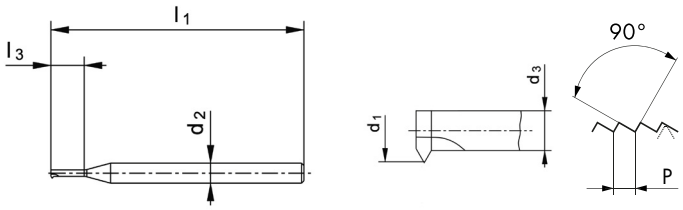
GW

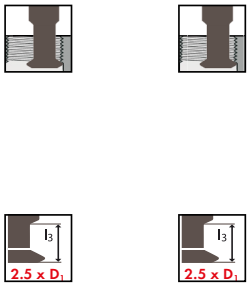
GW1116	GW1116VS		



GW1116

GW1116VS





Ø D_1 SL	P mm	d_1 mm	l_1 mm	l_3 mm	d_2 h5 mm	d_3 mm			ID	ID
0.3	0.06	0.23	39	0.9	3	0.15	1	0.27	600017	600023
0.35	0.06	0.28	39	1	3	0.2	1	0.32	600237	600243
0.4	0.08	0.31	39	1.2	3	0.2	1	0.36	600018	600024
0.5	0.1	0.39	39	1.4	3	0.25	1	0.46	600019	600025
0.6	0.125	0.46	39	1.7	3	0.29	1	0.55	600020	600026
0.7	0.15	0.53	39	2	3	0.32	1	0.64	600021	600027
0.8	0.15	0.63	39	2.2	3	0.42	1	0.74	600238	600244
0.9	0.175	0.7	39	2.5	3	0.46	1	0.83	600239	600245
1	0.2	0.77	39	2.8	3	0.49	1	0.92	600240	600246
1.2	0.2	0.97	39	3.3	3	0.69	1	1.12	600241	600247
1.4	0.25	1.11	39	3.9	3	0.76	1	1.3	600242	600248

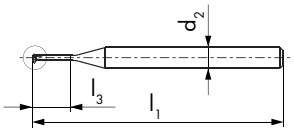
M ISO DIN 14
ISO DIN 13

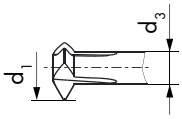
VHM CAR | < 3µm | DC | h5

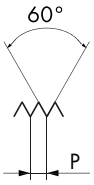
GW

GW2016 R10

GW2016VS R10 VS







Ø D_1 M	P mm	d_1 mm	l_1 mm	l_3 mm	d_2 h5 mm	d_3 mm			GW2016 ID	GW2016VS ID
0.5	0.125	0.36	39	1.5	3	0.19	3	0.41 [1]	194262	194275
0.6	0.15	0.43	39	1.7	3	0.22	3	0.5 [1]	194263	194276
0.7	0.175	0.5	39	2	3	0.26	3	0.58 [1]	194264	194277
0.8	0.2	0.57	39	2.3	3	0.29	3	0.66 [1]	166974	166993
0.9	0.225	0.64	39	2.6	3	0.33	3	0.74 [1]	166975	166994
1	0.25	0.71	39	2.9	3	0.36	3	0.75	166976	166995
1.2	0.25	0.91	39	3.4	3	0.56	3	0.95	166977	166996
1.4	0.3	1.06	39	3.9	3	0.64	3	1.1	166978	166997
1.6	0.35	1.2	39	4.5	3	0.71	3	1.25	166979	166998
1.8	0.35	1.4	39	5	3	0.91	3	1.45	166980	166999
2	0.4	1.54	39	5.6	3	0.98	3	1.6	166981	167000
2.3	0.4	1.84	39	6.3	3	1.28	3	1.9	194265	167399
2.5	0.45	1.98	39	6.9	3	1.35	3	2.05	166982	167001
2.6	0.45	2.08	39	7.1	3	1.45	3	2.15	194266	194278
3	0.5	2.43	51	8.4	5	1.73	4	2.5	166983	167002
3.5	0.6	2.81	51	9.9	5	1.97	4	2.9	166984	167003
4	0.7	3.2	51	11.3	5	2.22	4	3.3	166985	167004
5	0.8	4.08	51	14	5	2.96	4	4.2	166986	167005
6	1	4.85	51	16.8	5	3.45	4	5	166987	167006

[1] **4H5H → 4H6H =** +0.02mm

S NIHS 06-10

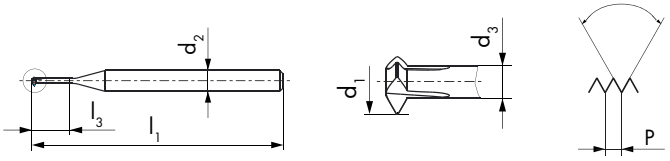
VHM CAR | < 3µm | DC | h5

GW

GW2016	GW2016VS		

GW2016 R10

GW2016VS R10 VS



Ø D_1 S	P mm	d_1 mm	l_1 mm	l_3 mm	d_2 h5 mm	d_3 mm			ID	ID
0.5	0.125	0.36	39	1.5	3	0.19	3	0.41 [1]	● 181410	● 181413
0.6	0.15	0.43	39	1.7	3	0.22	3	0.5 [1]	● 181374	● 180947
0.7	0.175	0.5	39	2	3	0.26	3	0.58 [1]	● 181375	● 181378
0.8	0.2	0.57	39	2.3	3	0.29	3	0.66 [1]	● 166969	● 166988
0.9	0.225	0.64	39	2.6	3	0.33	3	0.74 [1]	● 166970	● 166989
1	0.25	0.71	39	2.9	3	0.36	3	0.82 [1]	● 166971	● 166990
1.2	0.25	0.91	39	3.4	3	0.56	3	1.02 [1]	● 166972	● 166991
1.4	0.3	1.06	39	3.9	3	0.64	3	1.18 [1]	● 166973	● 166992

[1] **4H5H → 4H6H =** +0.02mm

SL SL 15-01

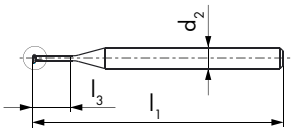
VHM CAR | < 3µm | DC | h5

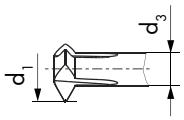
GW

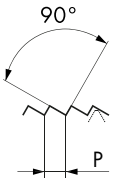
GW2016

GW2016VS









Ø D_1 SL	P mm	d_1 mm	l_1 mm	l_3 mm	d_2 h5 mm	d_3 mm			GW2016 ID	GW2016VS ID
0.5	0.1	0.39	39	1.4	3	0.25	3	0.46	600249	600257
0.6	0.125	0.46	39	1.7	3	0.29	3	0.55	600250	600258
0.7	0.15	0.53	39	2	3	0.32	3	0.64	600251	600259
0.8	0.15	0.63	39	2.2	3	0.42	3	0.74	600252	600260
0.9	0.175	0.7	39	2.5	3	0.46	3	0.83	600253	600261
1	0.2	0.77	39	2.8	3	0.49	3	0.92	600254	600262
1.2	0.2	0.97	39	3.3	3	0.69	3	1.12	600255	600263
1.4	0.25	1.11	39	3.9	3	0.76	3	1.3	600256	600264

M ISO DIN 14 ISO DIN 13

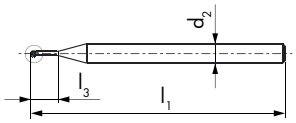
VHM CAR | < 3µm | DC | h5/h6

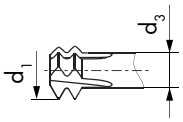
GW

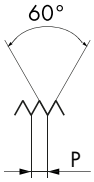
GW3016

GW3016VS

GW3016VX







GW3016	GW3016VS	GW3016VX
		
		
		

Ø D_1 M	P mm	d_1 mm	l_1 mm	l_3 mm	d_2 h5 mm	d_3 mm			ID	ID	ID
0.8	0.2	0.57	39	2.3	3	0.29	3	0.66 [1]	● 167021	● 167035	● 187261
0.9	0.225	0.64	39	2.6	3	0.33	3	0.74 [1]	● 167022	● 167036	● 187262
1	0.25	0.71	39	2.9	3	0.36	3	0.75	● 167023	● 167037	● 187263
1.2	0.25	0.91	39	3.4	3	0.56	3	0.95	● 167024	● 167038	● 187264
1.4	0.3	1.06	39	3.9	3	0.64	3	1.1	● 167025	● 167039	● 187265
1.6	0.35	1.2	39	4.5	3	0.71	3	1.25	● 167026	● 167040	● 187266
1.8	0.35	1.4	39	5	3	0.91	3	1.45	● 167027	● 167041	● 187267
2	0.4	1.54	39	5.6	3	0.98	3	1.6	● 167028	● 167042	● 187268
2.3	0.4	1.84	39	6.3	3	1.28	3	1.9	● 196140	● 167296	● 194310
2.5	0.45	1.98	39	6.9	3	1.35	3	2.05	● 167029	● 167043	● 187269
2.6	0.45	2.08	39	7.1	3	1.45	3	2.15	● 196141	● 194290	● 194311
3	0.5	2.43	51	8.4	5	1.73	4	2.5	● 167030	● 167044	● 187270
3.5	0.6	2.81	51	9.9	5	1.97	4	2.9	● 167031	● 167045	● 187271
4	0.7	3.2	51	11.3	5	2.22	4	3.3	● 167032	● 167046	● 187272
5	0.8	4.08	51	14	5	2.96	4	4.2	● 167033	● 167047	● 187273
6	1	4.85	51	16.8	5	3.45	4	5	● 167034	● 167048	● 187274
8	1.25	5.95	63	23	6 [2]	4.2	5	6.8	● 175229	● 175243	● 187275
10	1.5	7.95	67	28	8 [2]	5.85	5	8.5	● 175230	● 175244	● 187276
12	1.75	9.95	76	34	10 [2]	7.5	5	10.2	● 175231	● 175245	● 187277
14	2	10.95	95	44	12 [2]	8.15	5	12	● 196142	● 184748	● 187278
16	2	10.95	95	44	12 [2]	8.15	5	14	● 196143	● 186813	● 187279
18	2.5	13.95	105	55	14 [2]	10.45	6	15.5	● 196144	● 184503	● 187280
20	2.5	13.95	105	55	14 [2]	10.45	6	17.5	● 196145	● 186814	● 187281

[1] 4H5H → 4H6H = +0.02mm

[2] Tol. h6

M ISO DIN 14 ISO DIN 13

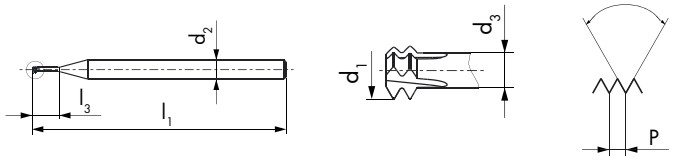
VHM CAR | < 3µm | DC | h5/h6

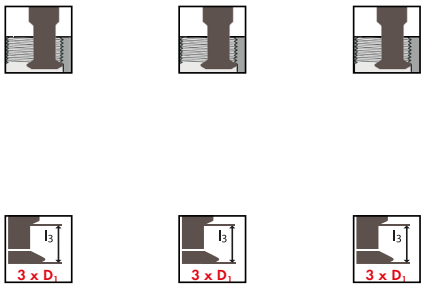
GW

GW3017 — R10

GW3017VS — R10 — VS

GW3017VX — R10 — VX





Ø D_1 M	P mm	d_1 mm	l_1 mm	l_3 mm	d_2 h5 mm	d_3 mm			GW3017 ID	GW3017VS ID	GW3017VX ID
0.8	0.2	0.57	39	2.7	3	0.29	3	0.66 [1]	196172	186266	187389
0.9	0.225	0.64	39	3	3	0.33	3	0.74 [1]	196173	186267	187390
1	0.25	0.71	39	3.4	3	0.36	3	0.75	196189	186268	187391
1.2	0.25	0.91	39	4	3	0.56	3	0.95	196174	186269	187392
1.4	0.3	1.06	39	4.6	3	0.64	3	1.1	196175	186270	187393
1.6	0.35	1.2	39	5.3	3	0.71	3	1.25	196176	186271	187394
1.8	0.35	1.4	39	5.9	3	0.91	3	1.45	196177	186272	187395
2	0.4	1.54	39	6.6	3	0.98	3	1.6	183766	186273	187396
2.3	0.4	1.84	39	7.5	3	1.28	3	1.9	196190	194296	194317
2.5	0.45	1.98	39	8.1	3	1.35	3	2.05	196193	186274	187397
2.6	0.45	2.08	39	8.4	3	1.45	3	2.15	196194	194297	194318
3	0.5	2.43	51	9.9	5	1.73	4	2.5	196201	186275	187398
3.5	0.6	2.81	51	11.6	5	1.97	4	2.9	196199	186276	187399
4	0.7	3.2	51	13.3	5	2.22	4	3.3	196203	186277	187400
5	0.8	4.08	51	16.5	5	2.96	4	4.2	196205	186278	187401
6	1	4.85	51	19.8	5	3.45	4	5	196207	186279	187402
8	1.25	5.95	75	27	6 [2]	4.2	5	6.8	196209	186280	187403
10	1.5	7.95	83	33	8 [2]	5.85	5	8.5	196180	186281	187404
12	1.75	9.95	95	40	10 [2]	7.5	5	10.2	196182	186282	187405
14	2	10.95	120	52	12 [2]	8.15	5	12	196184	186283	187406
16	2	10.95	120	52	12 [2]	8.15	5	14	196186	186821	187407
18	2.5	13.95	135	65	14 [2]	10.45	6	15.5	196188	186284	187408
20	2.5	13.95	135	65	14 [2]	10.45	6	17.5	196196	186822	187409

[1] 4H5H → 4H6H = +0.02mm

[2] Tol. h6

M ISO DIN 14 ISO DIN 13

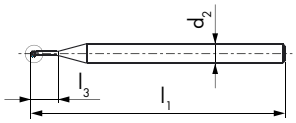
VHM CAR | < 3µm | DC | h5/h6

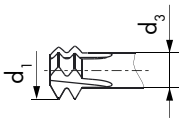
GW

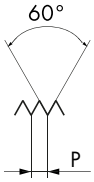
GW3019 | GW3019VS

GW3019 — R10

GW3019VS — R10 — VS







Ø D_1 M	P mm	d_1 mm	l_1 mm	l_3 mm	d_2 h5 mm	d_3 mm			ID	ID
0.8	0.2	0.57	39	3.5	3	0.29	3	0.66 [1]	● 167063	● 167077
0.9	0.225	0.64	39	3.9	3	0.33	3	0.74 [1]	● 167064	● 167078
1	0.25	0.71	39	4.4	3	0.36	3	0.75	● 167065	● 167079
1.2	0.25	0.91	39	5.2	3	0.56	3	0.95	● 167066	● 167080
1.4	0.3	1.06	39	6	3	0.64	3	1.1	● 167067	● 167081
1.6	0.35	1.2	39	6.9	3	0.71	3	1.25	● 167068	● 167082
1.8	0.35	1.4	39	7.7	3	0.91	3	1.45	● 167069	● 167083
2	0.4	1.54	39	8.6	3	0.98	3	1.6	● 167070	● 167084
2.3	0.4	1.84	39	9.8	3	1.28	3	1.9	● 196268	● 194303
2.5	0.45	1.98	39	10.6	3	1.35	3	2.05	● 167071	● 167085
2.6	0.45	2.08	39	11	3	1.45	3	2.15	● 196269	● 194304
3	0.5	2.43	51	12.9	5	1.73	4	2.5	● 167072	● 167086
3.5	0.6	2.81	51	15.1	5	1.97	4	2.9	● 167073	● 167087
4	0.7	3.2	51	17.3	5	2.22	4	3.3	● 167074	● 167088
5	0.8	4.08	51	21.5	5	2.96	4	4.2	● 167075	● 167089
6	1	4.85	51	25.8	5	3.45	4	5	● 167076	● 167090
8	1.25	5.95	75	35	6 [2]	4.2	5	6.8	● 175258	● 175274
10	1.5	7.95	83	43	8 [2]	5.85	5	8.5	● 175259	● 175275
12	1.75	9.95	95	52	10 [2]	7.5	5	10.2	● 175260	● 175276
14	2	10.95	120	68	12 [2]	8.15	5	12	● 196243	● 184751
16	2	10.95	120	68	12 [2]	8.15	5	14	● 196244	● 186829
18	2.5	13.95	135	85	14 [2]	10.45	6	15.5	● 196245	● 184754
20	2.5	13.95	135	85	14 [2]	10.45	6	17.5	● 196246	● 186830

[1] **4H5H → 4H6H =** +0.02mm

[2] **Tol. h6**

MF ISO DIN 13

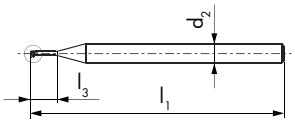
VHM CAR | < 3µm | DC | h5/h6

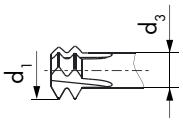
GW

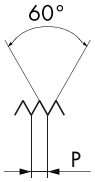
GW3016

GW3016VS

GW3016VX







GW3016	GW3016VS	GW3016VX
		
		
		

Ø D_1 MF	P mm	d_1 mm	l_1 mm	l_3 mm	d_2 h5 mm	d_3 mm			ID	ID	ID
2	0.2	1.77	39	5.3	3	1.49	3	1.8	175225	171442	187282
2	0.25	1.71	39	5.4	3	1.36	3	1.75	196146	186209	187283
2.5	0.2	2.27	39	6.6	3	1.99	3	2.3	175226	175241	187284
2.5	0.25	2.21	39	6.6	3	1.86	3	2.25	175227	167299	187285
3	0.35	2.6	51	8.2	5	2.11	4	2.65	175228	175242	187286
4	0.5	3.43	51	10.9	5	2.73	4	3.5	196147	184572	187287
5	0.5	4.43	51	13.4	5	3.73	4	4.5	196148	186210	187288
6	0.75	4.95	51	16.4	5	3.9	4	5.25	196149	186211	187289
8	1	5.95	63	22	6 [1]	4.55	5	7	196150	186212	187290
10	1	7.95	67	27	8 [1]	6.55	5	9	196151	186213	187291
10	1.25	7.95	67	28	8 [1]	6.2	5	8.8	196152	186214	187292
12	1.5	9.95	76	33	10 [1]	7.85	5	10.5	196153	186215	187293
14	1.5	10.95	95	43	12 [1]	8.85	5	12.5	196154	186216	187294
16	1.5	10.95	95	43	12 [1]	8.85	5	14.5	196155	186815	187295
18	1.5	13.95	105	53	14 [1]	11.85	6	16.5	196156	186217	187296
20	1.5	13.95	105	53	14 [1]	11.85	6	18.5	196157	186816	187297

[1] Tol. h6

MF ISO DIN 13

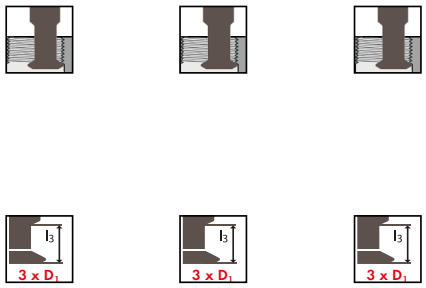
VHM CAR | < 3µm | DC | h5/h6

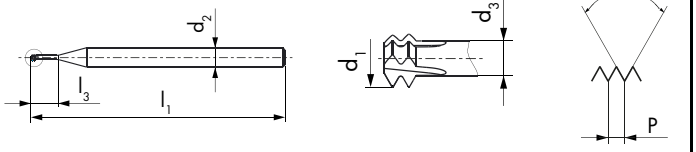
GW

GW3017

GW3017VS

GW3017VX





Ø D_1 MF	P mm	d_1 mm	l_1 mm	l_3 mm	d_2 h5 mm	d_3 mm			GW3017 ID	GW3017VS ID	GW3017VX ID
2	0.2	1.77	39	6.3	3	1.49	3	1.8	196197	186325	187410
2	0.25	1.71	39	6.4	3	1.36	3	1.75	196198	186326	187411
2.5	0.2	2.27	39	7.8	3	1.99	3	2.3	196191	186327	187412
2.5	0.25	2.21	39	7.9	3	1.86	3	2.25	196192	186328	187413
3	0.35	2.6	51	9.7	5	2.11	4	2.65	196200	186329	187414
4	0.5	3.43	51	12.9	5	2.73	4	3.5	196202	186330	187415
5	0.5	4.43	51	15.9	5	3.73	4	4.5	196204	175199	187416
6	0.75	4.95	51	19.4	5	3.9	4	5.25	196206	186331	187417
8	1	5.95	75	26	6 [1]	4.55	5	7	196208	181233	187418
10	1	7.95	83	32	8 [1]	6.55	5	9	196178	186332	187419
10	1.25	7.95	83	33	8 [1]	6.2	5	8.8	196179	186333	187420
12	1.5	9.95	95	39	10 [1]	7.85	5	10.5	196181	186334	187421
14	1.5	10.95	120	51	12 [1]	8.85	5	12.5	196183	186335	187422
16	1.5	10.95	120	51	12 [1]	8.85	5	14.5	196185	186823	187423
18	1.5	13.95	135	63	14 [1]	11.85	6	16.5	196187	186336	187424
20	1.5	13.95	135	63	14 [1]	11.85	6	18.5	196195	186824	187425

[1] Tol. h6

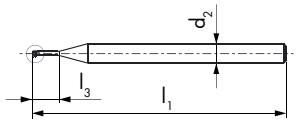
MF ISO DIN 13

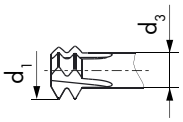
VHM CAR | < 3µm | DC | h5/h6

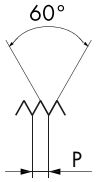
GW

GW3019 — R10

GW3019VS — R10 — VS







Ø D_1 MF	P mm	d_1 mm	l_1 mm	l_3 mm	d_2 h5 mm	d_3 mm			GW3019 ID	GW3019VS ID
2	0.2	1.77	39	8.3	3	1.49	3	1.8	175254	175270
2	0.25	1.71	39	8.4	3	1.36	3	1.75	196242	186592
2.5	0.2	2.27	39	10.3	3	1.99	3	2.3	175255	175271
2.5	0.25	2.21	39	10.4	3	1.86	3	2.25	175256	175272
3	0.35	2.6	51	12.7	5	2.11	4	2.65	175257	175273
4	0.5	3.43	51	16.9	5	2.73	4	3.5	196247	186593
5	0.5	4.43	51	20.9	5	3.73	4	4.5	196248	171033
6	0.75	4.95	51	25.4	5	3.9	4	5.25	196249	186594
8	1	5.95	75	34	6 [1]	4.55	5	7	196250	186595
10	1	7.95	83	42	8 [1]	6.55	5	9	196251	186596
10	1.25	7.95	83	43	8 [1]	6.2	5	8.8	196252	186597
12	1.5	9.95	95	51	10 [1]	7.85	5	10.5	196253	186598
14	1.5	10.95	120	67	12 [1]	8.85	5	12.5	196254	186599
16	1.5	10.95	120	67	12 [1]	8.85	5	14.5	196255	186831
18	1.5	13.95	135	83	14 [1]	11.85	6	16.5	196256	186600
20	1.5	13.95	135	83	14	11.85	6	18.5	196257	186832

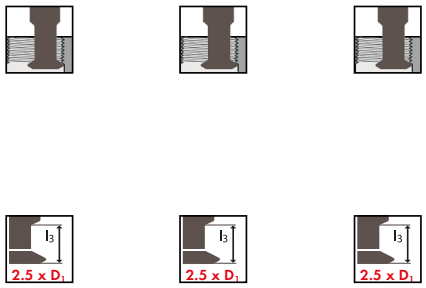
[1] Tol. h6

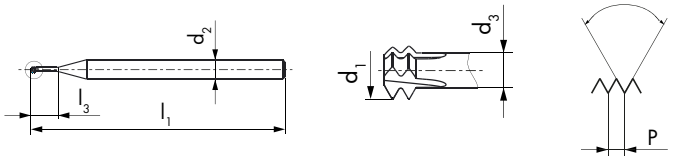
UNC ASME B1.1

VHM CAR | < 3µm | DC | h5/h6

GW

	GW3016	GW3016VS	GW3016VX
	R10	R10 VS	R10 VX





Ø" D_1 UNC	P TPI	d_1 mm	l_1 mm	l_3 mm	d_2 h5 mm	d_3 mm			GW3016 ID	GW3016VS ID	GW3016VX ID
2	56	1.66	39	6.1	3	1.02	3	1.75	167472	167500	187298
3	48	1.91	39	7	3	1.17	3	2	196158	186236	187299
4	40	2.11	39	8	3	1.22	3	2.25	167473	167501	187300
5	40	2.44	51	9.1	5	1.55	4	2.55	196159	186237	187301
6	32	2.59	51	10.2	5	1.48	4	2.75	167474	167502	187302
8	32	3.25	51	11.9	5	2.14	4	3.4	167475	167503	187303
10	24	3.6	51	14	5	2.12	4	3.8	173983	173986	187304
12	24	4.27	51	15.7	5	2.79	4	4.4	196160	186238	187305
1/4	20	4.89	51	18.2	5	3.11	4	5.1	167476	167504	187306
5/16	18	5.95	63	23	6 [1]	3.97	5	6.5	175232	175246	187307
3/8	16	7.1	67	27	8 [1]	4.87	5	8	175233	173546	187308
7/16	14	7.95	67	32	8 [1]	5.41	5	9.3	196161	186239	187309
1/2	13	9.95	76	36	10 [1]	7.21	5	10.8	175234	175247	187310

[1] Tol. h6

UNC ASME B1.1

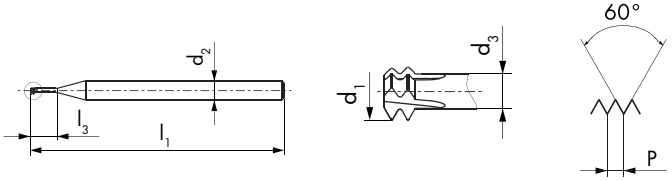
VHM CAR | < 3µm | DC | h5/h6

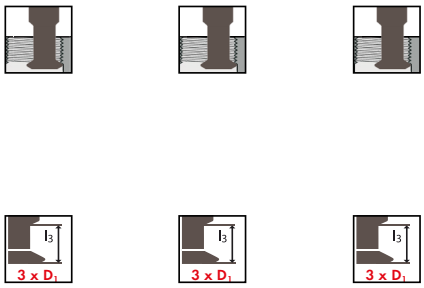
GW

GW3017 — R10

GW3017VS — R10 — VS

GW3017VX — R10 — VX





Ø" D_1 UNC	P TPI	d_1 mm	l_1 mm	l_3 mm	d_2 h5 mm	d_3 mm			GW3017 ID	GW3017VS ID	GW3017VX ID
2	56	1.66	39	7.2	3	1.02	3	1.75	196219	186365	187426
3	48	1.91	39	8.3	3	1.17	3	2	196221	186366	187427
4	40	2.11	39	9.4	3	1.22	3	2.25	196222	186367	187428
5	40	2.44	51	10.7	5	1.55	4	2.55	196224	186368	187429
6	32	2.59	51	12	5	1.48	4	2.75	196225	186369	187430
8	32	3.25	51	14	5	2.14	4	3.4	196227	186370	187431
10	24	3.6	51	16.4	5	2.12	4	3.8	196217	186371	187432
12	24	4.27	51	18.4	5	2.79	4	4.4	196218	186372	187433
1/4	20	4.89	51	21.4	5	3.11	4	5.1	196216	186373	187434
5/16	18	5.95	75	27	6 [1]	3.97	5	6.5	196223	186374	187435
3/8	16	7.1	83	32	8 [1]	4.87	5	8	196220	186375	187436
7/16	14	7.95	83	37	8 [1]	5.41	5	9.3	196226	186376	187437
1/2	13	9.95	95	42	10 [1]	7.21	5	10.8	196215	186377	187438

[1] Tol. h6

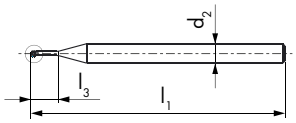
UNC ASME B1.1

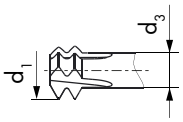
VHM CAR | < 3µm | DC | h5/h6

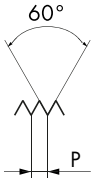
GW

GW3019


GW3019VS





GW3019	GW3019VS		
			
			
			

Ø" D_1 UNC	P TPI	d_1 mm	l_1 mm	l_3 mm	d_2 h5 mm	d_3 mm			ID	ID
2	56	1.66	39	9.4	3	1.02	3	1.75	● 167479	● 167507
3	48	1.91	39	10.8	3	1.17	3	2	● 196258	● 186601
4	40	2.11	39	12.2	3	1.22	3	2.25	● 167480	● 167508
5	40	2.44	51	13.9	5	1.55	4	2.55	● 196259	● 186602
6	32	2.59	51	15.5	5	1.48	4	2.75	● 167481	● 167509
8	32	3.25	51	18.1	5	2.14	4	3.4	● 167482	● 167510
10	24	3.6	51	21.3	5	2.12	4	3.8	● 173982	● 173979
12	24	4.27	51	23.9	5	2.79	4	4.4	● 196260	● 186603
1/4	20	4.89	51	27.7	5	3.11	4	5.1	● 167483	● 167511
5/16	18	5.95	75	35	6 [1]	3.97	5	6.5	● 175261	● 175277
3/8	16	7.1	83	41	8 [1]	4.87	5	8	● 175262	● 175278
7/16	14	7.95	83	48	8 [1]	5.41	5	9.3	● 196261	● 186604
1/2	13	9.95	95	55	10 [1]	7.21	5	10.8	● 175263	● 175279

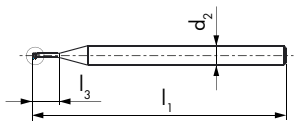
[1] Tol. h6

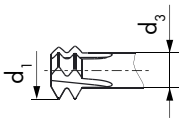
UNF ASME B1.1

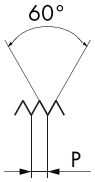
VHM CAR | < 3µm | DC | h5/h6

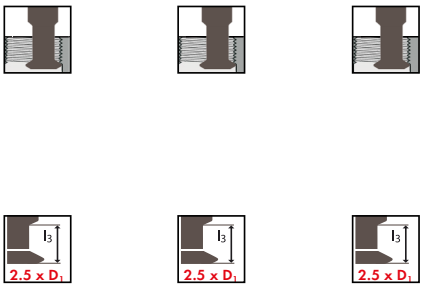
GW

GW3016	R10		
GW3016VS	R10	VS	
GW3016VX	R10	VX	









Ø" D_1 UNF	P TPI	d_1 mm	l_1 mm	l_3 mm	d_2 h5 mm	d_3 mm			ID	ID	ID
0	80	1.15	39	4.3	3	0.71	3	1.2	● 175235	● 175248	● 187311
1	72	1.44	39	5.1	3	0.95	3	1.5	● 175236	● 175249	● 187312
2	64	1.73	39	6	3	1.17	3	1.8	● 196162	● 186248	● 187313
4	48	2.23	39	7.9	3	1.49	3	2.35	● 175237	● 175250	● 187314
5	44	2.51	51	9	5	1.7	4	2.6	● 196163	● 186249	● 187315
6	40	2.77	51	10	5	1.88	4	2.9	● 196164	● 186250	● 187316
8	36	3.35	51	11.7	5	2.36	4	3.5	● 175238	● 175251	● 187317
10	32	3.91	51	13.5	5	2.8	4	4.05	● 167477	● 167505	● 187318
12	28	4.44	51	15.4	5	3.17	4	4.6	● 196165	● 186251	● 187319
1/4	28	4.95	51	17.6	5	3.68	4	5.5	● 167478	● 167506	● 187320
5/16	24	5.95	63	22	6 [1]	4.47	5	6.9	● 175239	● 175252	● 187321
3/8	24	7.1	67	26	8 [1]	5.62	5	8.5	● 175240	● 175253	● 187322
7/16	20	7.95	67	31	8 [1]	6.17	5	9.8	● 196166	● 186252	● 187323
1/2	20	9.95	76	35	10 [1]	8.17	5	11.4	● 196167	● 186253	● 187324

[1] Tol. h6

UNF ASME B1.1

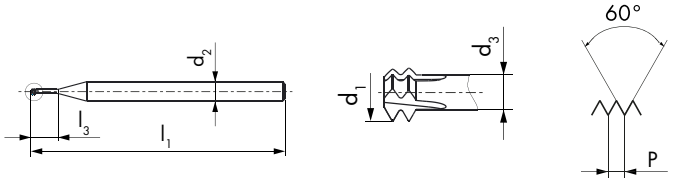
VHM CAR | < 3µm | DC | h5/h6

GW

GW3017 — R10

GW3017VS — R10 — VS

GW3017VX — R10 — VX



Ø" D_1 UNF	P TPI	d_1 mm	l_1 mm	l_3 mm	d_2 h5 mm	d_3 mm			GW3017 ID	GW3017VS ID	GW3017VX ID
0	80	1.15	39	5	3	0.71	3	1.2	• 196228	• 186404	• 187439
1	72	1.44	39	6.1	3	0.95	3	1.5	• 196233	• 186405	• 187440
2	64	1.73	39	7.1	3	1.17	3	1.8	• 196234	• 186406	• 187441
4	48	2.23	39	9.3	3	1.49	3	2.35	• 196236	• 186407	• 187442
5	44	2.51	51	10.6	5	1.7	4	2.6	• 196238	• 186408	• 187443
6	40	2.77	51	11.7	5	1.88	4	2.9	• 196239	• 186409	• 187444
8	36	3.35	51	13.8	5	2.36	4	3.5	• 196241	• 186410	• 187445
10	32	3.91	51	15.9	5	2.8	4	4.05	• 196231	• 184633	• 187446
12	28	4.44	51	18.1	5	3.17	4	4.6	• 196232	• 186411	• 187447
1/4	28	4.95	51	20.7	5	3.68	4	5.5	• 196230	• 186412	• 187448
5/16	24	5.95	75	26	6 [1]	4.47	5	6.9	• 196237	• 186413	• 187449
3/8	24	7.1	83	31	8 [1]	5.62	5	8.5	• 196235	• 186414	• 187450
7/16	20	7.95	83	36	8 [1]	6.17	5	9.8	• 196240	• 186415	• 187451
1/2	20	9.95	95	41	10 [1]	8.17	5	11.4	• 196229	• 186416	• 187452

[1] Tol. h6

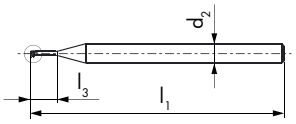
UNF ASME B1.1

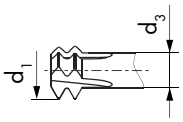
VHM CAR | < 3µm | DC | h5/h6

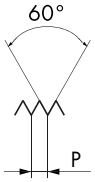
GW

GW3019


GW3019VS





GW3019	GW3019VS		


Ø" D_1 UNF	P TPI	d_1 mm	l_1 mm	l_3 mm	d_2 h5 mm	d_3 mm			ID	ID
0	80	1.15	39	6.6	3	0.71	3	1.2	● 175264	● 175280
1	72	1.44	39	7.9	3	0.95	3	1.5	● 175265	● 175281
2	64	1.73	39	9.3	3	1.17	3	1.8	● 196262	● 186605
4	48	2.23	39	12.1	3	1.49	3	2.35	● 175266	● 172376
5	44	2.51	51	13.8	5	1.7	4	2.6	● 196263	● 169815
6	40	2.77	51	15.2	5	1.88	4	2.9	● 196264	● 186606
8	36	3.35	51	18	5	2.36	4	3.5	● 175267	● 175282
10	32	3.91	51	20.8	5	2.8	4	4.05	● 167484	● 167512
12	28	4.44	51	23.6	5	3.17	4	4.6	● 196265	● 186607
1/4	28	4.95	51	27.1	5	3.68	4	5.5	● 167485	● 167513
5/16	24	5.95	75	34	6 [1]	4.47	5	6.9	● 175268	● 175283
3/8	24	7.1	83	40	8 [1]	5.62	5	8.5	● 175269	● 175284
7/16	20	7.95	83	47	8 [1]	6.17	5	9.8	● 196266	● 186608
1/2	20	9.95	95	54	10 [1]	8.17	5	11.4	● 196267	● 186609

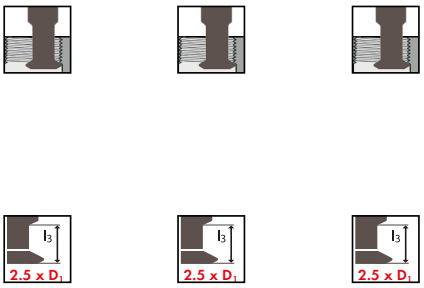
[1] Tol. h6

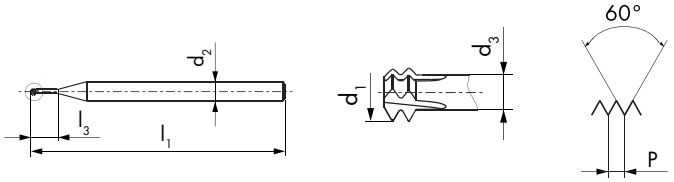
S NIHS 06-10 SL SL 15-01

VHM CAR | < 3µm | DC | h5

GW

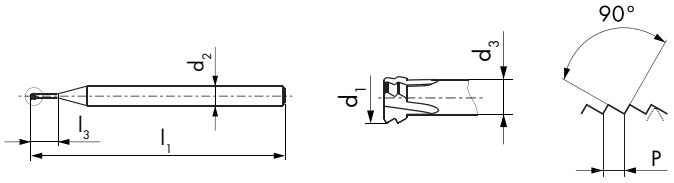
	GW3016	GW3016VS	GW3016VX
	R10	R10 VS	R10 VX





Ø D_1 S	P mm	d_1 mm	l_1 mm	l_3 mm	d_2 h5 mm	d_3 mm			ID	ID	ID
0.8	0.2	0.57	39	2.3	3	0.29	3	0.66 [1]	● 196168	● 194287	● 194305
0.9	0.225	0.64	39	2.6	3	0.33	3	0.74 [1]	● 196169	● 182875	● 194306
1	0.25	0.71	39	2.9	3	0.36	3	0.82 [1]	● 180683	● 168667	● 194307
1.2	0.25	0.91	39	3.4	3	0.56	3	1.02 [1]	● 196170	● 194288	● 194308
1.4	0.3	1.06	39	3.9	3	0.64	3	1.18 [1]	● 196171	● 194289	● 194309

[1] 4H5H → 4H6H = +0.02mm



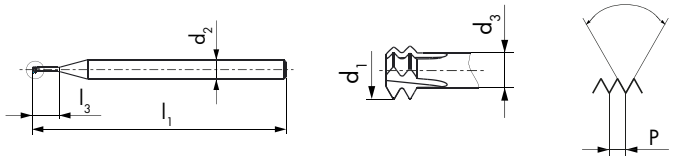
Ø D_1 SL	P mm	d_1 mm	l_1 mm	l_3 mm	d_2 h5 mm	d_3 mm			ID	ID
0.8	0.15	0.63	39	2.3	3	0.42	3	0.74	● 600028	● 600034
0.9	0.175	0.7	39	2.6	3	0.46	3	0.83	● 600029	● 600035
1	0.2	0.77	39	2.9	3	0.49	3	0.92	● 600030	● 600036
1.2	0.2	0.97	39	3.4	3	0.69	3	1.11	● 600031	● 600037
1.4	0.25	1.11	39	3.9	3	0.76	3	1.3	● 600032	● 600038

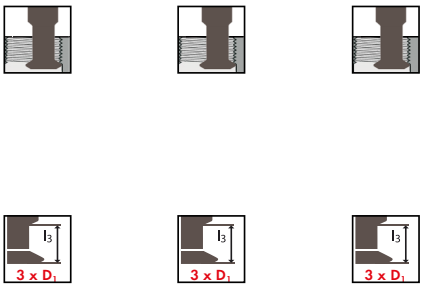
S NIHS 06-10

VHM CAR | < 3µm | DC | h5

GW

GW3017	R10		
GW3017VS	R10	VS	
GW3017VX	R10	VX	





Ø D_1 S	P mm	d_1 mm	l_1 mm	l_3 mm	d_2 h5 mm	d_3 mm			GW3017 ID	GW3017VS ID	GW3017VX ID
0.8	**0.2**	0.57	39	2.7	3	0.29	3	0.66 [1]	● **196210**	● **194291**	● **194312**
0.9	**0.225**	0.64	39	3	3	0.33	3	0.74 [1]	● **196211**	● **194292**	● **194313**
1	**0.25**	0.71	39	3.4	3	0.36	3	0.82 [1]	● **196214**	● **194293**	● **194314**
1.2	**0.25**	0.91	39	4	3	0.56	3	1.02 [1]	● **196212**	● **194294**	● **194315**
1.4	**0.3**	1.06	39	4.6	3	0.64	3	1.18 [1]	● **196213**	● **194295**	● **194316**

[1] **4H5H → 4H6H =** +0.02mm

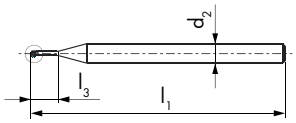
S NIHS 06-10

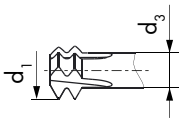
VHM CAR | < 3µm | DC | h5

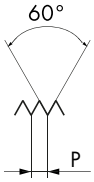
GW

GW3019

GW3019VS







GW3019	GW3019VS		
			
			
			

Ø D_1 S	P mm	d_1 mm	l_1 mm	l_3 mm	d_2 h5 mm	d_3 mm			ID	ID
0.8	**0.2**	0.57	39	3.5	3	0.29	3	0.66 [1]	● **196270**	● **194298**
0.9	**0.225**	0.64	39	3.9	3	0.33	3	0.74 [1]	● **196271**	● **194299**
1	**0.25**	0.71	39	4.4	3	0.36	3	0.82 [1]	● **196274**	● **194300**
1.2	**0.25**	0.91	39	5.2	3	0.56	3	1.02 [1]	● **196272**	● **194301**
1.4	**0.3**	1.06	39	6	3	0.64	3	1.18 [1]	● **196273**	● **194302**

[1] **4H5H → 4H6H =** +0.02mm

M ISO DIN 14
ISO DIN 13

VHM CAR | < 3µm | DC | h6

GWi

GWi3066VS

GWi3066VX

GWi3066VS	GWi3066VX		
			



Ø D_1 M	P mm	d_1 mm	l_1 mm	l_3 mm	d_2 h6 mm	d_3 mm			ID	ID
0.8	0.2	0.57	40	2.3	3	0.29	3	0.66	● 186029	● 187325
0.9	0.225	0.64	40	2.6	3	0.33	3	0.74	● 186030	● 187326
1	0.25	0.71	40	2.9	3	0.36	3	0.75	● 186031	● 187327
1.2	0.25	0.91	40	3.4	3	0.56	3	0.95	● 186032	● 187328
1.4	0.3	1.06	40	3.9	4	0.64	3	1.1	● 186033	● 187329
1.6	0.35	1.2	40	4.5	4	0.71	3	1.25	● 186034	● 187330
1.8	0.35	1.4	40	5	4	0.91	3	1.45	● 186035	● 187331
2	0.4	1.54	40	5.6	4	0.98	3	1.6	● 186036	● 187332
2.3	0.4	1.84	40	6.3	4	1.28	3	1.9	● 194324	● 194334
2.5	0.45	1.98	40	6.9	4	1.35	3	2.05	● 186037	● 187333
2.6	0.45	2.08	40	7.1	4	1.45	3	2.15	● 194325	● 194335
3	0.5	2.43	51	8.4	5	1.73	4	2.5	● 186038	● 187334
3.5	0.6	2.81	51	9.9	6	1.97	4	2.9	● 186039	● 187335
4	0.7	3.2	51	11.3	6	2.22	4	3.3	● 186040	● 187336
5	0.8	4.08	51	14	8	2.96	4	4.2	● 186041	● 187337
6	1	4.85	51	16.8	8	3.45	4	5	● 186042	● 187338
8	1.25	5.95	75	23	6	4.2	5	6.8	● 186043	● 187339
10	1.5	7.95	83	28	8	5.85	5	8.5	● 186044	● 187340
12	1.75	9.95	95	34	10	7.5	5	10.2	● 186045	● 187341
14	2	10.95	120	44	12	8.15	5	12	● 186046	● 187342
16	2	10.95	120	44	12	8.15	5	14	● 186817	● 187343
18	2.5	13.95	135	55	14	10.45	6	15.5	● 186047	● 187344
20	2.5	13.95	135	55	14	10.45	6	17.5	● 186818	● 187345

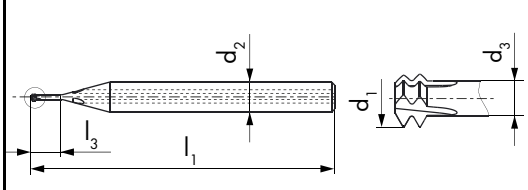
M ISO DIN 13

VHM CAR | < 3µm | DC | h6

GWi

GWi3067VS — R10 — VS

GWi3067VX — R10 — VX



GWi3067VS	GWi3067VX		
			
			
 3 x D1	 3 x D1		

Ø D1 M	P mm	d1 mm	l1 mm	l3 mm	d2 h6 mm	d3 mm			ID	ID
1.4	0.3	1.06	40	4.6	4	0.64	3	1.1	186443	187453
1.6	0.35	1.2	40	5.3	4	0.71	3	1.25	186444	187454
1.8	0.35	1.4	40	5.9	4	0.91	3	1.45	186445	187455
2	0.4	1.54	40	6.6	4	0.98	3	1.6	186446	187456
2.3	0.4	1.84	40	7.5	4	1.28	3	1.9	194327	194337
2.5	0.45	1.98	40	8.1	4	1.35	3	2.05	186447	187457
2.6	0.45	2.08	40	8.4	4	1.45	3	2.15	194328	194338
3	0.5	2.43	51	9.9	5	1.73	4	2.5	186448	187458
3.5	0.6	2.81	51	11.6	6	1.97	4	2.9	186449	187459
4	0.7	3.2	51	13.3	6	2.22	4	3.3	186450	187460
5	0.8	4.08	51	16.5	8	2.96	4	4.2	186451	187461
6	1	4.85	51	19.8	8	3.45	4	5	186452	187462
8	1.25	5.95	75	27	6	4.2	5	6.8	186453	187463
10	1.5	7.95	83	33	8	5.85	5	8.5	186454	187464
12	1.75	9.95	95	40	10	7.5	5	10.2	186455	187465
14	2	10.95	120	52	12	8.15	5	12	186456	187466
16	2	10.95	120	52	12	8.15	5	14	186825	187467
18	2.5	13.95	135	65	14	10.45	6	15.5	186457	187468
20	2.5	13.95	135	65	14	10.45	6	17.5	186826	187469

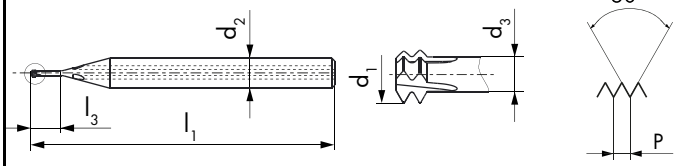
MJ ISO 5855

VHM CAR | < 3µm | DC | h6

GWi

GWi3067VS

GWi3067VX



GWi3067VS	GWi3067VX		
			

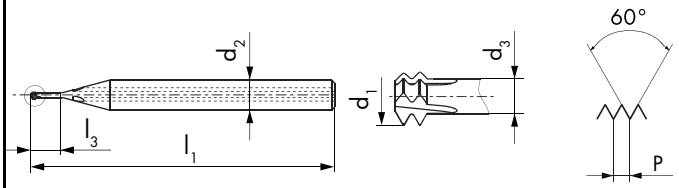


Ø D_1 MJ	P mm	d_1 mm	l_1 mm	l_3 mm	d_2 h6 mm	d_3 mm			ID	ID
3	0.5	2.17	51	9.9	5	1.47	4	2.55	188820	188843
4	0.7	2.84	51	13.3	6	1.86	4	3.4	188821	188844
5	0.8	3.67	51	16.5	8	2.55	4	4.3	188822	188845
6	1	4.34	51	19.8	8	2.94	4	5.1	188823	188846
8	1.25	5.95	75	27	6	4.2	5	6.9	188824	188847
10	1.5	7.95	83	33	8	5.85	5	8.6	188825	188848
12	1.75	9.95	95	40	10	7.5	5	10.4	188826	188849

VHM CAR | < 3µm | DC | h6

GWi

GWi3069VS | R10 | VS



Ø D1 M	P mm	d1 mm	l1 mm	l3 mm	d2 h6 mm	d3 mm			ID
3	0.5	2.43	51	12.9	5	1.73	4	2.5	186610
3.5	0.6	2.81	51	15.1	6	1.97	4	2.9	186611
4	0.7	3.2	51	17.3	6	2.22	4	3.3	186612
5	0.8	4.08	51	21.5	8	2.96	4	4.2	186613
6	1	4.85	51	25.8	8	3.45	4	5	186614
8	1.25	5.95	75	35	6	4.2	5	6.8	186615
10	1.5	7.95	83	43	8	5.85	5	8.5	186616
12	1.75	9.95	95	52	10	7.5	5	10.2	186617
14	2	10.95	120	68	12	8.15	5	12	186618
16	2	10.95	120	68	12	8.15	5	14	186833
18	2.5	13.95	135	85	14	10.45	6	15.5	186619
20	2.5	13.95	135	85	14	10.45	6	17.5	186834

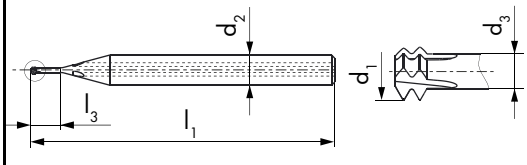
MF ISO DIN 13

VHM CAR | < 3µm | DC | h6

GWi

GWi3066VS

GWi3066VX



GWi3066VS	GWi3066VX		
			

Ø D1 MF	P mm	d1 mm	l1 mm	l3 mm	d2 h6 mm	d3 mm			ID	ID
2	0.2	1.77	40	5.3	4	1.49	3	1.8	186086	187346
2	0.25	1.71	40	5.4	4	1.36	3	1.75	186087	187347
2.5	0.2	2.27	40	6.6	4	1.99	3	2.3	186088	187348
2.5	0.25	2.21	40	6.6	4	1.86	3	2.25	186089	187349
3	0.35	2.6	51	8.2	5	2.11	4	2.65	186090	187350
4	0.5	3.43	51	10.9	6	2.73	4	3.5	186091	187351
5	0.5	4.43	51	13.4	8	3.73	4	4.5	186092	187352
6	0.75	4.95	51	16.4	8	3.9	4	5.25	186093	187353
8	1	5.95	75	22	6	4.55	5	7	186094	187354
10	1	7.95	83	27	8	6.55	5	9	186095	187355
10	1.25	7.95	83	28	8	6.2	5	8.8	186096	187356
12	1.5	9.95	95	33	10	7.85	5	10.5	186097	187357
14	1.5	10.95	120	43	12	8.85	5	12.5	186098	187358
16	1.5	10.95	120	43	12	8.85	5	14.5	186819	187359
18	1.5	13.95	135	53	14	11.85	6	16.5	186099	187360
20	1.5	13.95	135	53	14	11.85	6	18.5	186820	187361

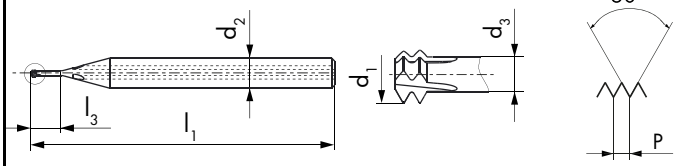
MF ISO DIN 13

VHM CAR | < 3µm | DC | h6

GWi

GWi3067VS


GWi3067VX

GWi3067VS	GWi3067VX		
			



Ø D_1 MF	P mm	d_1 mm	l_1 mm	l_3 mm	d_2 h6 mm	d_3 mm			ID	ID
2	0.2	1.77	40	6.3	4	1.49	3	1.8	186488	187470
2	0.25	1.71	40	6.4	4	1.36	3	1.75	186489	187471
2.5	0.2	2.27	40	7.8	4	1.99	3	2.3	186490	187472
2.5	0.25	2.21	40	7.9	4	1.86	3	2.25	186491	187473
3	0.35	2.6	51	9.7	5	2.11	4	2.65	186492	187474
4	0.5	3.43	51	12.9	6	2.73	4	3.5	186493	187475
5	0.5	4.43	51	15.9	8	3.73	4	4.5	186494	187476
6	0.75	4.95	51	19.4	8	3.9	4	5.25	186495	187477
8	1	5.95	75	26	6	4.55	5	7	186496	187478
10	1	7.95	83	32	8	6.55	5	9	186497	187479
10	1.25	7.95	83	33	8	6.2	5	8.8	186498	187480
12	1.5	9.95	95	39	10	7.85	5	10.5	186499	187481
14	1.5	10.95	120	51	12	8.85	5	12.5	186500	187482
16	1.5	10.95	120	51	12	8.85	5	14.5	186827	187483
18	1.5	13.95	135	63	14	11.85	6	16.5	186501	187484
20	1.5	13.95	135	63	14	11.85	6	18.5	186828	187485

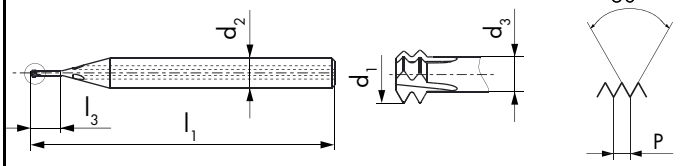
MJF ISO 5855

VHM CAR | < 3µm | DC | h6

GWi

GWi3067VS

GWi3067VX



GWi3067VS	GWi3067VX		
			

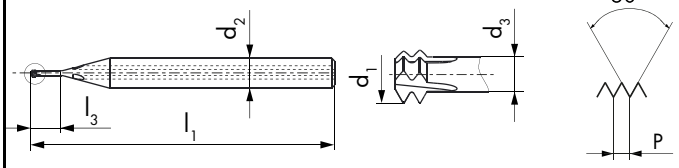
Ø D_1 MJF	P mm	d_1 mm	l_1 mm	l_3 mm	d_2 h6 mm	d_3 mm			ID	ID
6	0.75	4.76	51	19.4	8	3.71	4	5.35	188827	188850
8	1	5.95	75	26	6	4.55	5	7.1	188828	188851
10	1.25	7.95	83	33	8	6.2	5	8.9	188829	188852
12	1.5	9.95	95	39	10	7.85	5	10.6	188830	188853

MF ISO DIN 13

VHM CAR | < 3µm | DC | h6

GWi

GWi3069VS

GWi3069VS

Ø D_1 MF	P mm	d_1 mm	l_1 mm	l_3 mm	d_2 h6 mm	d_3 mm			ID
3	0.35	2.6	51	12.7	5	2.11	4	2.65	186620
4	0.5	3.43	51	16.9	6	2.73	4	3.5	186621
5	0.5	4.43	51	20.9	8	3.73	4	4.5	186622
6	0.75	4.95	51	25.4	8	3.9	4	5.25	186623
8	1	5.95	75	34	6	4.55	5	7	186624
10	1	7.95	83	42	8	6.55	5	9	186625
10	1.25	7.95	83	43	8	6.2	5	8.8	186626
12	1.5	9.95	95	51	10	7.85	5	10.5	186627
14	1.5	10.95	120	67	12	8.85	5	12.5	186628
16	1.5	10.95	120	67	12	8.85	5	14.5	186835
18	1.5	13.95	135	83	14	11.85	6	16.5	186629
20	1.5	13.95	135	83	14	11.85	6	18.5	186836

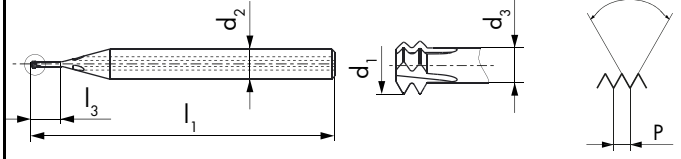
UNC ASME B1.1

VHM CAR | < 3µm | DC | h6

GWi

GWi3066VS

GWi3066VX



	GWi3066VS	GWi3066VX		
				
				
				

Ø" D_1 UNC	P TPI	d_1 mm	l_1 mm	l_3 mm	d_2 h6 mm	d_3 mm			ID	ID
2	56	1.66	40	6.1	4	1.02	3	1.75	● 186128	● 187362
3	48	1.91	40	7	4	1.17	3	2	● 186129	● 187363
4	40	2.11	51	8	5	1.22	3	2.25	● 186130	● 187364
5	40	2.44	51	9.1	5	1.55	4	2.55	● 186131	● 187365
6	32	2.59	51	10.2	6	1.48	4	2.75	● 186132	● 187366
8	32	3.25	51	11.9	6	2.14	4	3.4	● 186133	● 187367
10	24	3.6	51	14	8	2.12	4	3.8	● 186134	● 187368
12	24	4.27	51	15.7	8	2.79	4	4.4	● 186135	● 187369
1/4	20	4.89	51	18.2	8	3.11	4	5.1	● 186136	● 187370
5/16	18	5.95	75	23	6	3.97	5	6.5	● 186137	● 187371
3/8	16	7.1	83	27	8	4.87	5	8	● 186138	● 187372
7/16	14	7.95	83	32	8	5.41	5	9.3	● 186139	● 187373
1/2	13	9.95	95	36	10	7.21	5	10.8	● 186140	● 187374

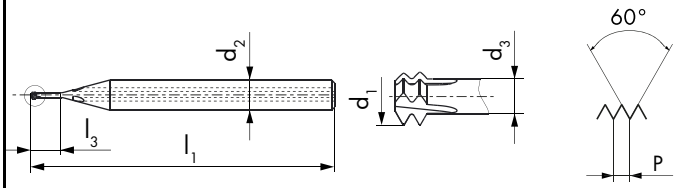
UNC ASME B1.1

VHM CAR | < 3µm | DC | h6

GWi

GWi3067VS

GWi3067VX



Ø" D_1 UNC	P TPI	d_1 mm	l_1 mm	l_3 mm	d_2 h6 mm	d_3 mm			GWi3067VS ID	GWi3067VX ID
4	40	2.11	51	9.4	5	1.22	3	2.25	186526	187486
5	40	2.44	51	10.7	5	1.55	4	2.55	186527	187487
6	32	2.59	51	12	6	1.48	4	2.75	186528	187488
8	32	3.25	51	14	6	2.14	4	3.4	186529	187489
10	24	3.6	51	16.4	8	2.12	4	3.8	186530	187490
12	24	4.27	51	18.4	8	2.79	4	4.4	186531	187491
1/4	20	4.89	51	21.4	8	3.11	4	5.1	186532	187492
5/16	18	5.95	75	27	6	3.97	5	6.5	186533	187493
3/8	16	7.1	83	32	8	4.87	5	8	186534	187494
7/16	14	7.95	83	37	8	5.41	5	9.3	186535	187495
1/2	13	9.95	95	42	10	7.21	5	10.8	186536	187496

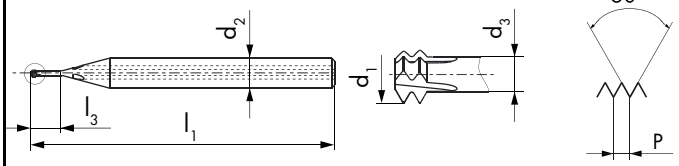
UNJC ISO 3161

VHM CAR | < 3µm | DC | h6

GWi

GWi3067VS

GWi3067VX



GWi3067VS	GWi3067VX		
			

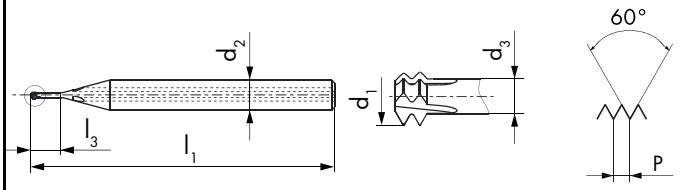
Ø" D1 UNJC	P TPI	d1 mm	l1 mm	l3 mm	d2 h6 mm	d3 mm			ID	ID
6	32	2.59	51	12	6	1.48	4	2.8	● 188831	● 188854
10	24	3.6	51	16.4	8	2.12	4	3.9	● 188832	● 188855
1/4	20	4.89	51	21.4	8	3.11	4	5.2	● 188833	● 188856
5/16	18	5.95	75	27	6	3.97	5	6.7	● 188834	● 188857
3/8	16	7.1	83	32	8	4.87	5	8.1	● 188835	● 188858
1/2	13	9.95	95	42	10	7.21	5	10.9	● 188836	● 188859

UNC ASME B1.1

VHM CAR | < 3µm | DC | h6

GWi

GWi3069VS

Ø" D_1 UNC	P TPI	d_1 mm	l_1 mm	l_3 mm	d_2 h6 mm	d_3 mm			ID
6	32	2.59	51	15.5	6	1.48	4	2.75	186630
8	32	3.25	51	18.1	6	2.14	4	3.4	186631
10	24	3.6	51	21.3	8	2.12	4	3.8	186632
12	24	4.27	51	23.9	8	2.79	4	4.4	186633
1/4	20	4.89	51	27.7	8	3.11	4	5.1	186634
5/16	18	5.95	75	35	6	3.97	5	6.5	186635
3/8	16	7.1	83	41	8	4.87	5	8	186636
7/16	14	7.95	83	48	8	5.41	5	9.3	186637
1/2	13	9.95	95	55	10	7.21	5	10.8	186638

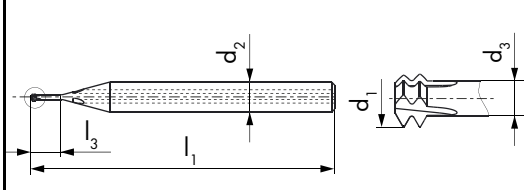
UNF ASME B1.1

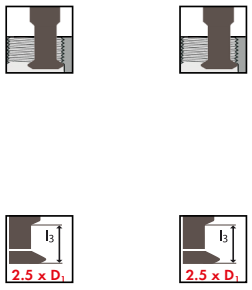
VHM CAR | < 3µm | DC | h6

GWi

GWi3066VS — R10 — VS

GWi3066VX — R10 — VX





Ø" D_1 UNF	P TPI	d_1 mm	l_1 mm	l_3 mm	d_2 h6 mm	d_3 mm			GWi3066VS ID	GWi3066VX ID
0	80	1.15	40	4.3	4	0.71	3	1.2	● 186167	● 187375
1	72	1.44	40	5.1	4	0.95	3	1.5	● 186168	● 187376
2	64	1.73	40	6	4	1.17	3	1.8	● 186169	● 187377
4	48	2.23	51	7.9	5	1.49	3	2.35	● 186170	● 187378
5	44	2.51	51	9	5	1.7	4	2.6	● 186171	● 187379
6	40	2.77	51	10	6	1.88	4	2.9	● 186172	● 187380
8	36	3.35	51	11.7	6	2.36	4	3.5	● 186173	● 187381
10	32	3.91	51	13.5	8	2.8	4	4.05	● 186174	● 187382
12	28	4.44	51	15.4	8	3.17	4	4.6	● 186175	● 187383
1/4	28	4.95	51	17.6	8	3.68	4	5.5	● 186176	● 187384
5/16	24	5.95	75	22	6	4.47	5	6.9	● 186177	● 187385
3/8	24	7.1	83	26	8	5.62	5	8.5	● 186178	● 187386
7/16	20	7.95	83	31	8	6.17	5	9.8	● 186179	● 187387
1/2	20	9.95	95	35	10	8.17	5	11.4	● 186180	● 187388

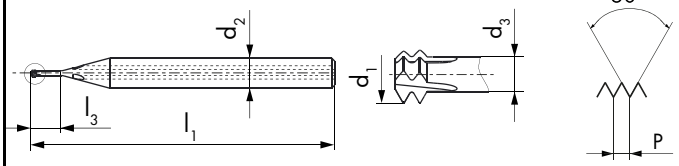
UNF ASME B1.1

VHM CAR | < 3µm | DC | h6

GWi

GWi3067VS


GWi3067VX

GWi3067VS	GWi3067VX		
			



Ø" D1 UNF	P TPI	d1 mm	l1 mm	l3 mm	d2 h6 mm	d3 mm			ID	ID
4	48	2.23	51	9.3	5	1.49	3	2.35	● 186559	● 187497
5	44	2.51	51	10.6	5	1.7	4	2.6	● 186560	● 187498
6	40	2.77	51	11.7	6	1.88	4	2.9	● 186561	● 187499
8	36	3.35	51	13.8	6	2.36	4	3.5	● 186562	● 187500
10	32	3.91	51	16	8	2.8	4	4.05	● 186563	● 187501
12	28	4.44	51	18.1	8	3.17	4	4.6	● 186564	● 187502
1/4	28	4.95	51	20.7	8	3.68	4	5.5	● 186565	● 187503
5/16	24	5.95	75	26	6	4.47	5	6.9	● 186566	● 187504
3/8	24	7.1	83	31	8	5.62	5	8.5	● 186567	● 187505
7/16	20	7.95	83	36	8	6.17	5	9.8	● 186568	● 187506
1/2	20	9.95	95	41	10	8.17	5	11.4	● 186569	● 187507

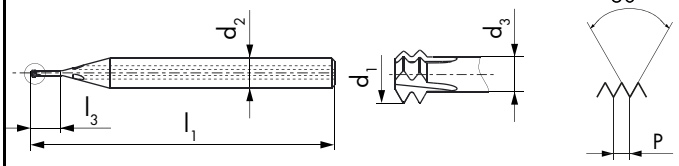
UNJF ISO 3161

VHM CAR | < 3µm | DC | h6

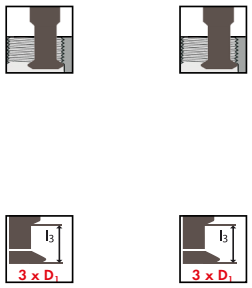
GWi

GWi3067VS

GWi3067VX



GWi3067VS	GWi3067VX		
			



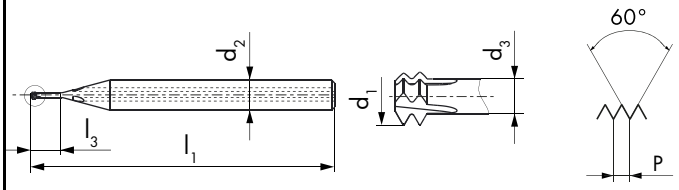
Ø" D1 UNJF	P TPI	d1 mm	l1 mm	l3 mm	d2 h6 mm	d3 mm			ID	ID
8	36	2.99	51	13.8	6	2	4	3.55	● 188837	● 188860
10	32	3.51	51	16	8	2.4	4	4.1	● 188838	● 188861
1/4	28	4.84	51	20.7	8	3.57	4	5.55	● 188839	● 188862
5/16	24	5.95	75	26	6	4.47	5	7	● 188840	● 188863
3/8	24	7.1	83	31	8	5.62	5	8.6	● 188841	● 188864
1/2	20	9.95	95	41	10	8.17	5	11.55	● 188842	● 188865

UNF ASME B1.1

VHM CAR | < 3µm | DC | h6

GWi

GWi3069VS | R10 | VS



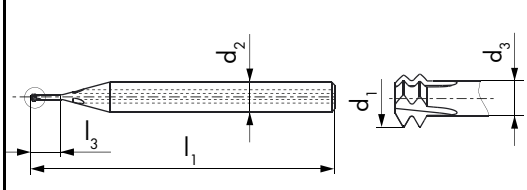
Ø" D_1 UNF	P TPI	d_1 mm	l_1 mm	l_3 mm	d_2 h6 mm	d_3 mm			ID
6	40	2.77	51	15.2	6	1.88	4	2.9	186639
8	36	3.35	51	18	6	2.36	4	3.5	186640
10	32	3.91	51	20.8	8	2.8	4	4.05	186641
12	28	4.44	51	23.6	8	3.17	4	4.6	186642
1/4	28	4.95	51	27.1	8	3.68	4	5.5	186643
5/16	24	5.95	75	34	6	4.47	5	6.9	186644
3/8	24	7.1	83	40	8	5.62	5	8.5	186645
7/16	20	7.95	83	47	8	6.17	5	9.8	186646
1/2	20	9.95	95	54	10	8.17	5	11.4	186647

S NIHS 06-10

VHM CAR | < 3µm | DC | h6

GWi

GWi3066VS	R10	VS	
GWi3066VX	R10	VX	
GWi3067VS	R10	VS	
GWi3067VX	R10	VX	



GWi3066VS	GWi3066VX	GWi3067VS	GWi3067VX
			
			
 2.5 x D1	 2.5 x D1	 3 x D1	 3 x D1

Ø D1 S	P mm	d1 mm	l1 mm	l3 mm	d2 h6 mm	d3 mm			ID	ID
0.8	0.2	0.57	40	2.3	3	0.29	3	0.66[1]	● 194319	● 194329
0.9	0.225	0.64	40	2.6	3	0.33	3	0.74[1]	● 194320	● 194330
1	0.25	0.71	40	2.9	3	0.36	3	0.82[1]	● 194321	● 194331
1.2	0.25	0.91	40	3.4	3	0.56	3	1.02[1]	● 194322	● 194332
1.4	0.3	1.06	40	3.9	4	0.64	3	1.18[1]	● 194323	● 194333

[1] 4H5H → 4H6H = +0.02mm

Ø D1 S	P mm	d1 mm	l1 mm	l3 mm	d2 h6 mm	d3 mm			ID	ID
1.4	0.3	1.06	40	4.6	4	0.64	3	1.18[1]	● 194326	● 194336

[1] 4H5H → 4H6H = +0.02mm

M ISO DIN 14 ISO DIN 13

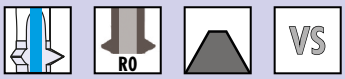
VHM CAR | < 3µm | DC | h6

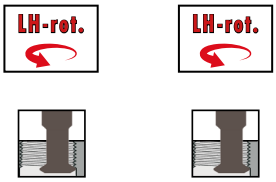
GWi

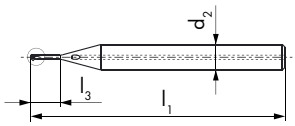
GWi5066VS	GWi5067VS		

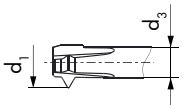
GWi5066VS

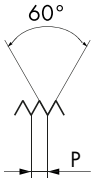
GWi5067VS











Ø D_1 M	P mm	d_1 mm	l_1 mm	l_3 mm	d_2 h6 mm	d_3 mm			ID
0.8	0.2	0.55	40	2.3	3	0.27	1	0.58 [1]	189165
0.9	0.225	0.62	40	2.6	3	0.31	1	0.65 [1]	189166
1	0.25	0.66	40	2.9	3	0.31	1	0.7 [1]	189167
1.2	0.25	0.86	40	3.4	3	0.51	1	0.9 [1]	189168
1.4	0.3	1.03	40	4	4	0.61	1	1.05 [1]	189169
1.6	0.35	1.16	40	4.6	4	0.67	1	1.19 [1]	189170
1.8	0.35	1.36	40	5.1	4	0.87	1	1.39 [1]	189171
2	0.4	1.5	40	5.6	4	0.94	1	1.54 [1]	189172
2.5	0.45	1.94	40	7	4	1.31	1	1.98 [1]	189173
3	0.5	2.38	51	8.3	5	1.68	2	2.45 [2]	193422
3.5	0.6	2.75	51	9.7	6	1.91	2	2.85 [2]	193423
4	0.7	3.13	51	11.1	6	2.15	2	3.25 [2]	193424
5	0.8	4	51	13.7	8	2.88	2	4.1 [2]	193425
6	1	4.75	51	16.5	8	3.35	2	4.9 [2]	193426

Ø D_1 M	P mm	d_1 mm	l_1 mm	l_3 mm	d_2 h6 mm	d_3 mm			ID
1.4	0.3	1.03	40	4.7	4	0.61	1	1.05 [1]	189174
1.6	0.35	1.16	40	5.4	4	0.67	1	1.19 [1]	189175
1.8	0.35	1.36	40	6	4	0.87	1	1.39 [1]	189176
2	0.4	1.5	40	6.6	4	0.94	1	1.54 [1]	189177
2.5	0.45	1.94	40	8.2	4	1.31	1	1.98 [1]	189178
3	0.5	2.38	51	9.8	5	1.68	2	2.45 [2]	193432
3.5	0.6	2.75	51	11.4	6	1.91	2	2.85 [2]	193433
4	0.7	3.13	51	13.1	6	2.15	2	3.25 [2]	193434
5	0.8	4	51	16.2	8	2.88	2	4.1 [2]	193435
6	1	4.75	51	19.5	8	3.35	2	4.9 [2]	193436

[1] Tol. = +0/0.02mm / [2] Tol. = +0/0.03mm

UNC ASME B1.1

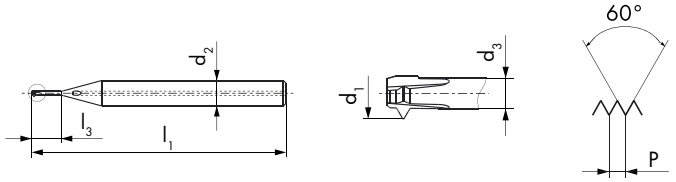
VHM CAR | < 3µm | DC | h6

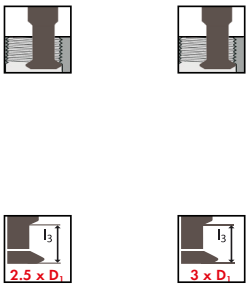
GWi

GWi5066VS

GWi5067VS

LH-rot.





Ø" D1 UNC	P TPI	d1 mm	l1 mm	l3 mm	d2 h6 mm	d3 mm			GWi5066VS ID	GWi5067VS ID
4	40	2.05	51	8.1	5	1.16	2	2.15 [1]	● 193427	
6	32	2.51	51	10	6	1.4	2	2.65 [1]	● 193428	
1/4	20	4.76	51	17.8	8	2.98	2	5 [1]	● 193429	

[1] Tol. = +0/0.03mm

Ø" D1 UNC	P TPI	d1 mm	l1 mm	l3 mm	d2 h6 mm	d3 mm			GWi5066VS ID	GWi5067VS ID
4	40	2.05	51	9.5	5	1.16	2	2.15 [1]		● 193437
6	32	2.51	51	11.8	6	1.4	2	2.65 [1]		● 193438
1/4	20	4.76	51	21	8	2.98	2	5 [1]		● 193439

[1] Tol. = +0/0.03mm

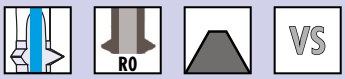
UNF ASME B1.1

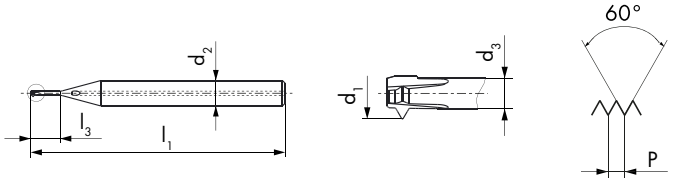
VHM CAR | < 3µm | DC | h6

GWi

	GWi5066VS	GWi5067VS		
				

GWi5066VS 

GWi5067VS 



Ø" D1 UNF	P TPI	d1 mm	l1 mm	l3 mm	d2 h6 mm	d3 mm			ID
10	32	3.83	51	13.3	8	2.72	2	3.95 [1]	● 193430
1/4	28	5.22	51	17.3	8	3.95	2	5.4 [1]	● 193431

[1] Tol. = +0/0.03mm

Ø" D1 UNF	P TPI	d1 mm	l1 mm	l3 mm	d2 h6 mm	d3 mm			ID
10	32	3.83	51	15.7	8	2.72	2	3.95 [1]	● 193440
1/4	28	5.22	51	20.5	8	3.95	2	5.4 [1]	● 193441

[1] Tol. = +0/0.03mm

S NIHS 06-10

VHM CAR | < 3µm | DC | h6

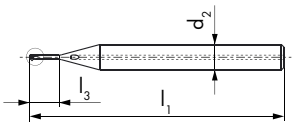
GWi

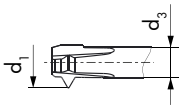
GWi5066VS

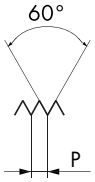


GWi5066VS

LH-rot.





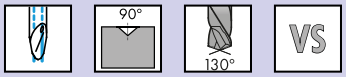


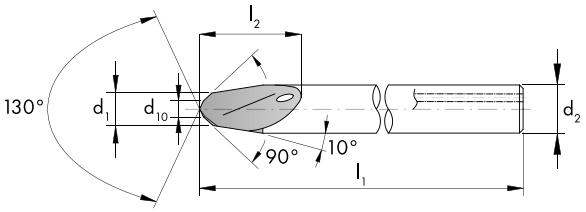
Ø D_1 S	P mm	d_1 mm	l_1 mm	l_3 mm	d_2 h6 mm	d_3 mm			ID
0.8	**0.2**	0.55	40	2.3	3	0.27	1	0.59 [1]	● **189204**
0.9	**0.225**	0.62	40	2.6	3	0.31	1	0.67 [1]	● **189205**
1	**0.25**	0.66	40	2.9	3	0.31	1	0.74 [1]	● **189206**
1.2	**0.25**	0.86	40	3.4	3	0.51	1	0.94 [1]	● **189207**
1.4	**0.3**	1.03	40	4	4	0.61	1	1.09 [1]	● **189208**

[1] **Tol. =** +0/0.01mm

C

C315VS





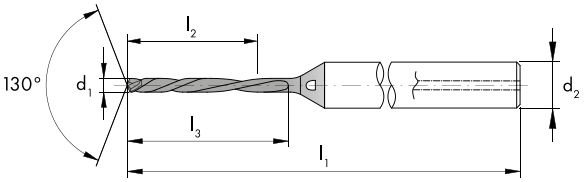
Ø d_1	l_1 mm	l_2 mm	d_2 h6 mm	d_{10} mm		ID
1.4	40	6	3	0.5	2	● 182872
2	40	6.2	3	1	2	● 182873
3	40	6.3	3	1.5	2	● 182874
4	50	8	4	2	2	● 190331
6	60	12	6	3	2	● 190332
8	70	16	8	4	2	● 190333

FZ

FZ315VS


FZ315VS





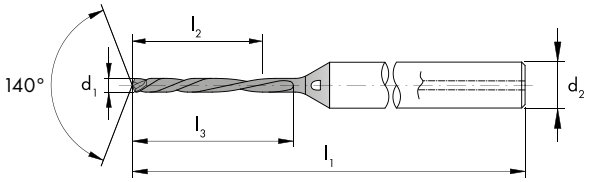
FZ315VS	FZ315VS		

Ø d_1	D_1 mm	l_1 mm	l_2 mm	l_3 mm	d_2 h6 mm		ID
0.58	M0.8	42	4.6	5.7	3	2	● 182863
0.59	S0.8	42	4.7	5.8	3	2	● 188023
0.65	M0.9	45	5.2	6.4	3	2	● 182864
0.67	S0.9	45	5.4	6.6	3	2	● 188024
0.7	M1	45	5.6	6.9	3	2	● 182865
0.74	S1	45	5.9	7.3	3	2	● 188025
0.9	M1.2	45	7.2	8.8	3	2	● 182866
0.94	S1.2	48	7.5	9.2	3	2	● 188026
1.05	M1.4	48	8.4	10.3	3	2	● 182867
1.09	S1.4	48	8.7	10.7	3	2	● 188027
1.19	M1.6	48	9.5	11.7	3	2	● 182868
1.39	M1.8	52	11.1	13.6	4	2	● 182869
1.54	M2	55	12.3	15.1	4	2	● 182870
1.98	M2.5	55	15.8	19.4	4	2	● 182871

Ø d_1	D_1 mm	l_1 mm	l_2 mm	l_3 mm	d_2 h6 mm		ID
2.15	UNC4	63	12.9	19.4	4	2	● 190326
2.45	M3	65	14.7	22.1	4	2	● 190321
2.65	UNC6	68	15.9	23.9	4	2	● 190327
2.85	M3.5	68	17.1	25.7	4	2	● 190322
3.25	M4	74	19.5	29.3	6	2	● 190323
3.95	UNF10	78	23.7	35.6	6	2	● 190329
4.1	M5	80	24.6	36.9	6	2	● 190324
4.9	M6	84	29.4	44.1	6	2	● 190325
5	UNC1/4	84	30	45	6	2	● 190328
5.4	UNF1/4	88	32.4	48.6	6	2	● 190330

F

F286VS



Ø d_1 (m7)	D_1 mm	l_1 mm	l_2 mm	l_3 mm	d_2 h6 mm		ID
3.3	M4	66	23	28	6	2	* 160989
4.2	M5	74	29	36	6	2	* 160990
5	M6	82	35	44	6	2	* 160991
6.8	M8	91	43	53	8	2	* 160992
8.5	M10	103	49	61	10	2	* 160993
10.2	M12	118	56	71	12	2	* 160994

M ISO DIN 13

VHM CAR | < 3µm | DC | h5/h6

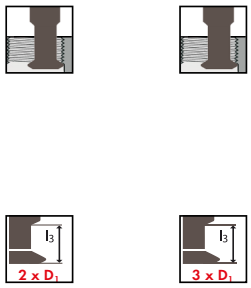
GWH

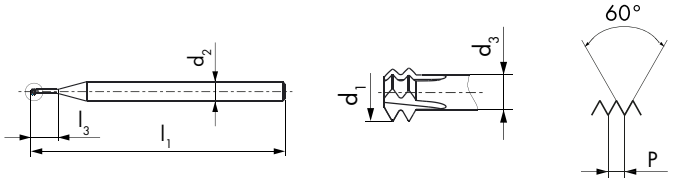
GWH3015VH | GWH3017VH

GWH3015VH — RO — VH

GWH3017VH — RO — VH

LH-rot. | LH-rot.





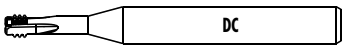
Ø D1 M	P mm	d1 mm	l1 mm	l3 mm	d2 h5 mm	d3 mm			ID
3	0.5	2.4	51	6.8	5	1.7	4	2.5	196558
3.5	0.6	2.8	51	7.9	5	1.96	4	2.9	196559
4	0.7	3.2	51	9.1	5	2.22	4	3.3	196560
5	0.8	4	51	11.2	5	2.88	4	4.2	196561
6	1	4.8	51	13.5	5	3.4	4	5	196562
8	1.25	6.4	67	18	8[1]	4.65	5	6.8	196563
10	1.5	7.95	67	23	8[1]	5.85	5	8.5	196564
12	1.75	9.6	76	27	10[1]	7.15	5	10.25	196565

[1] Tol. h6

Ø D1 M	P mm	d1 mm	l1 mm	l3 mm	d2 h5 mm	d3 mm			ID
3	0.5	2.4	51	9.8	5	1.7	4	2.5	196582
3.5	0.6	2.8	51	11.4	5	1.96	4	2.9	196583
4	0.7	3.2	51	13.1	5	2.22	4	3.3	196584
5	0.8	4	51	16.2	5	2.88	4	4.2	196585
6	1	4.8	51	19.5	5	3.4	4	5	196586
8	1.25	6.4	83	26	8[1]	4.65	5	6.8	196587
10	1.5	7.95	83	33	8[1]	5.85	5	8.5	196588
12	1.75	9.6	95	39	10[1]	7.15	5	10.25	196589

[1] Tol. h6

VHM CAR



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ZBGF6065VS	ZBGF6067VS		

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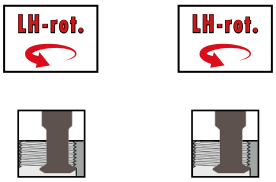
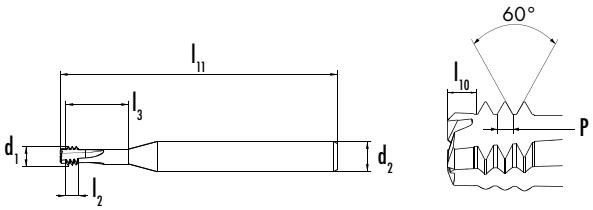


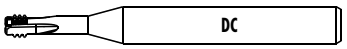


Ø D1 M	P mm	d1 mm	l11 mm	l2 mm	l3 mm	d2 h6 mm	l10 mm		ID
3	0.5	2.43	55	1.5	7.5	4	0.75	3	● 181605
4	0.7	3.05	55	2.1	10.1	6	1.05	3	● 181606
5	0.8	4.08	55	2.4	12.4	6	1.2	3	● 181607
6	1	4.5	64	3	15	6	1.5	4	● 181608
8	1.25	5.95	64	3.75	19.8	6	1.88	4	● 181609
10	1.5	7.95	74	4.5	24.5	8	2.25	4	● 181610
12	1.75	9.95	80	5.25	29.3	10	2.63	4	● 181611
16	2	11.95	92	6	38	12	3	4	● 181612

Ø D1 M	P mm	d1 mm	l11 mm	l2 mm	l3 mm	d2 h6 mm	l10 mm		ID
3	0.5	2.43	55	1.5	10.5	4	0.75	3	● 181613
4	0.7	3.05	55	2.1	14.1	6	1.05	3	● 181614
5	0.8	4.08	55	2.4	17.4	6	1.2	3	● 181615
6	1	4.5	72	3	21	6	1.5	4	● 181616
8	1.25	5.95	72	3.75	27.8	6	1.88	4	● 181617
10	1.5	7.95	90	4.5	34.5	8	2.25	4	● 181618
12	1.75	9.95	102	5.25	41.3	10	2.63	4	● 181619
16	2	11.95	115	6	54	12	3	4	● 181620

UNC ASME B1.1

VHM CAR



h6

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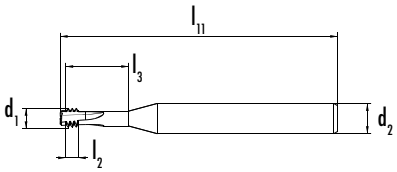
ZBGF6065VS

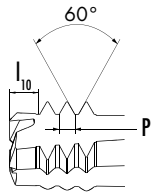


ZBGF6067VS



ZBGF6065VS	ZBGF6067VS		

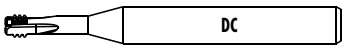


Ø" D_1 UNC	P TPI	d_1 mm	l_{11} mm	l_2 mm	l_3 mm	d_2 h6 mm	l_{10} mm		ID
4	40	2.11	55	1.9	7.6	4	0.95	3	● 183509
6	32	2.59	55	2.4	9.4	4	1.19	3	● 183510
8	32	3.1	55	2.4	10.8	6	1.19	3	● 183511
10	24	3.6	55	3.2	12.9	6	1.59	3	● 183512
1/4	20	4.8	64	3.8	16.6	6	1.91	4	● 183513
5/16	18	5.95	64	4.2	20.2	6	2.12	4	● 183514
3/8	16	7.1	74	4.8	23.9	8	2.38	4	● 183515
1/2	13	9.95	80	5.9	31.3	10	2.93	4	● 183516
5/8	11	11.95	92	6.9	38.7	12	3.46	4	● 183517

Ø" D_1 UNC	P TPI	d_1 mm	l_{11} mm	l_2 mm	l_3 mm	d_2 h6 mm	l_{10} mm		ID
8	32	3.1	55	2.4	14.9	6	1.19	3	● 183520
1/4	20	4.8	72	3.8	22.9	6	1.91	4	● 183522
5/16	18	5.95	72	4.2	28.1	6	2.12	4	● 183523
3/8	16	7.1	90	4.8	33.4	8	2.38	4	● 183524
1/2	13	9.95	102	5.9	44	10	2.93	4	● 183525
5/8	11	11.95	115	6.9	54.6	12	3.46	4	● 183526

UNF ASME B1.1

VHM CAR



h6

ZBGF

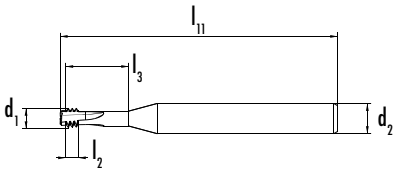
ZBGF6065VS

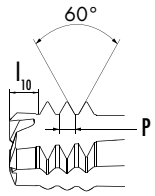


ZBGF6067VS



ZBGF6065VS	ZBGF6067VS		



Ø" D_1 UNF	P TPI	d_1 mm	l_{11} mm	l_2 mm	l_3 mm	d_2 h6 mm	l_{10} mm		ID
4	48	2.23	55	1.6	7.3	4	0.79	3	● 183527
8	36	3.1	55	2.1	10.5	6	1.06	3	● 183528
10	32	3.91	55	2.4	12.1	6	1.19	3	● 183529
1/4	28	4.8	64	2.7	15.5	6	1.36	4	● 183530
5/16	24	5.95	64	3.2	19.1	6	1.59	4	● 183531
3/8	24	7.1	74	3.2	22.3	8	1.59	4	● 183532
7/16	20	7.95	74	3.8	26.1	8	1.91	4	● 183533
1/2	20	9.95	80	3.8	29.3	10	1.91	4	● 183534
5/8	18	11.95	92	4.2	36	12	2.12	4	● 183535

Ø" D_1 UNF	P TPI	d_1 mm	l_{11} mm	l_2 mm	l_3 mm	d_2 h6 mm	l_{10} mm		ID
4	48	2.23	55	1.6	10.2	4	0.79	3	● 183536
8	36	3.1	55	2.1	14.7	6	1.06	3	● 183537
10	32	3.91	55	2.4	16.9	6	1.19	3	● 183538
1/4	28	4.8	72	2.7	21.8	6	1.36	4	● 183539
5/16	24	5.95	72	3.2	27	6	1.59	4	● 183540
3/8	24	7.1	90	3.2	31.8	8	1.59	4	● 183541
7/16	20	7.95	90	3.8	37.2	8	1.91	4	● 183542
1/2	20	9.95	102	3.8	42	10	1.91	4	● 183543
5/8	18	11.95	115	4.2	51.9	12	2.12	4	● 183544

QTAP

EL TODO TERRENO MAS COMPLETO

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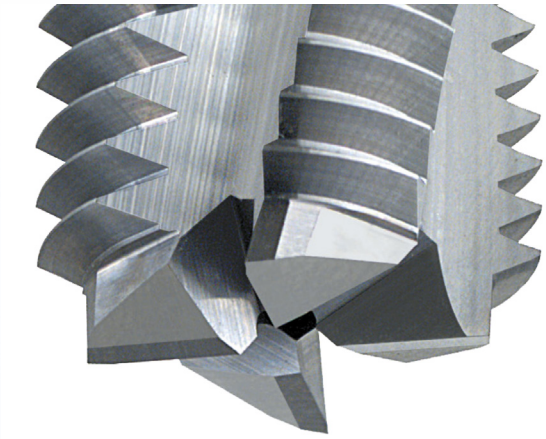
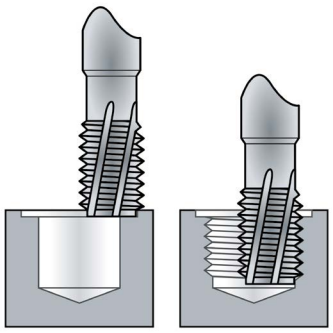
We offer you a wide range of standard products, based on today's technical standards and the general needs of our customers. If you should not find in our standard programme the right tool for your workpiece to be machined, we will gladly make you an offer for the custom-made threading tool in special execution, adapted to your application.

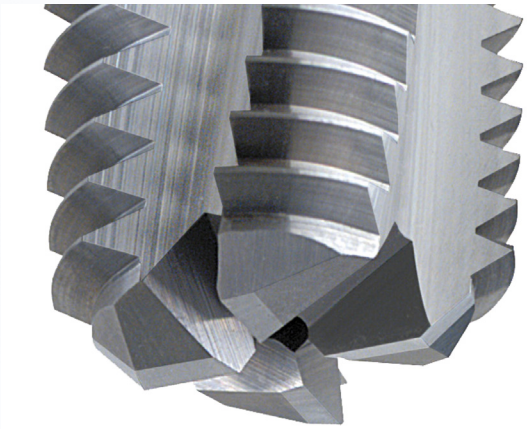
GFMS

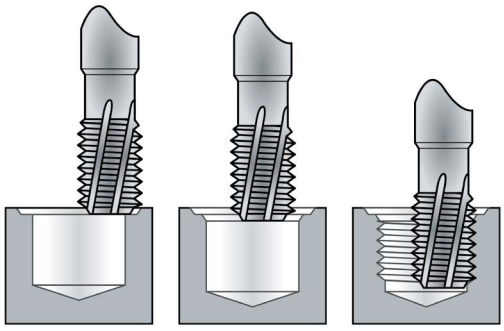




Corte frontal
Spot facing cutter

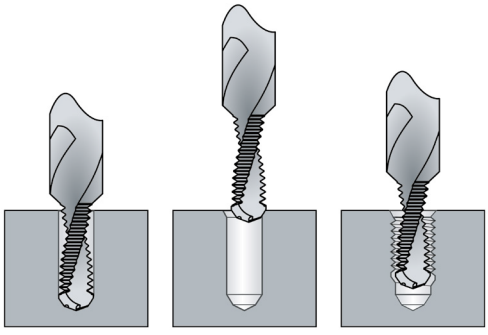
GFMS





Corte frontal + corte circular con chaflán a 45°
Spot facing cutter + circular cutter with 45° bevel

BGFS

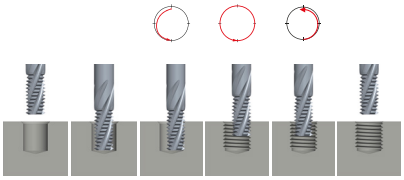


Con corte circular a 45° para achaflanar
With 45° circular chamfer for countersinking

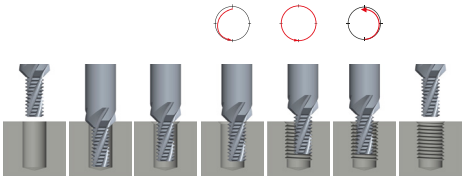
TABLA DE UTILIZACIÓN GF - GFH - GFS - GFM
APPLICATION CHART GF - GFH - GFS - GFM

Ciclo de programación para fresas de roscar GF - GFH - GFS - GFM
Programming cycle for thread milling cutters GF - GFH - GFS - GFM

GF - GFH



GFS



GFM

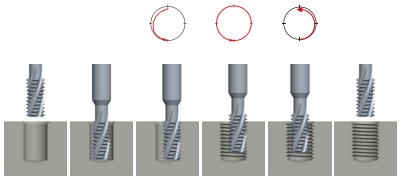


Tabla de utilización para fresas de roscar

Application chart for thread milling cutters

	Grupos de materiales Material groups		*Clasificación de los materiales*	Material designation	*Dureza* Hardness (HB)	*Resistencia* Tensile strength Rm (N/mm²)	*Lubricante* Lubricant: *Estándar* Standard	*Lubricante* Lubricant: *Recub.* Coated
10	*Aceros* Steels	11	*Aceros de decoletaje*	Free-cutting steels	< 200	< 700		O E
		12	*Aceros de construcción o de cementación*	Structural, cementation steels	< 200	< 700		O E
		13	*Aceros al carbón*	Carbon steels	< 300	< 1000		O E
		14	*Aceros aleados < 850 N/mm²*	Alloy steels < 850 N/mm²	< 250	< 850		O E
		15	*Aceros aleados/trat. > 850 - < 1150 N/mm²*	Alloy steels hard. / temp. > 850 - < 1150 N/mm²	> 250	> 850		O E
		16	*Aceros de alta resistencia ≤ 44 HRC*	High tensile alloy steels ≤ 44 HRC	> 250	> 850		O E
		17	*Aceros templados y revenidos > 44 - ≤ 54 HRC*	Alloy steels tempered > 44 - ≤ 54 HRC	> 410	> 1400		O E
		18	*Aceros templados > 54 - ≤ 63 HRC*	Alloy steels hardened > 54 - ≤ 63 HRC	> 560	> 1980		A
20	*Aceros inoxidables* Stainless steels	21	*Aceros inoxidables al azufre*	Free machining stainless steels	< 250	< 850		O E
		22	*Austeníticos*	Austenitic stainless steels	< 250	< 850		O E
		23	*Ferríticos y martensíticos < 850 N/mm²*	Ferritic and martensitic < 850 N/mm²	< 250	< 850		O E
		24	*Ferríticos y martensíticos > 850 - < 1150 N/mm²*	Ferritic and martensitic > 850 - < 1150 N/mm²	> 250	> 850		O E
30	*Fundición* Cast iron	31	*Fundición gris*	Cast iron	< 250	< 850		O E A
		32	*Fundición de grafito + esferoidal y maleable*	Spheroidal graphite + malleable cast iron	< 250	< 850		O E
40	*Titanio* Titanium	41	*Titanio puro*	Pure titanium	< 250	< 850	O E	O E
		42	*Aleación al titanio*	Titanium alloys	> 250	> 850	O E	O E
50	*Níquel* Nickel	51	*Aleación al Níquel 1 ≤ 850 N/mm²*	Nickel alloys 1 ≤ 850 N/mm²	< 250	< 850		O E
		52	*Aleación al Níquel 2 > 850 - ≤ 1150 N/mm²*	Nickel alloys 2 > 850 - ≤ 1150 N/mm²	> 250	> 850		O E
		53	*Aleación al Níquel 3 > 1150 - ≤ 1600 N/mm²*	Nickel alloys 3 > 1150 - ≤ 1600 N/mm²	> 340	> 1150		O E
60	*Cobre* Copper	61	*Cobre puro (electrolítico)*	Pure copper (electrolytic copper)	< 120	< 400		O E
		62	*Latón, bronce (virutas cortas)*	Short chip brass, phosphor bronze, gun metal	< 200	< 700	O E A	O E A
		63	*Latón (virutas largas)*	Long chip brass	< 200	< 700	O E	O E
70	*Aluminio Magnesio* Aluminium Magnesium	71	*Al no aleado*	Al unalloyed	< 100	< 350	O E	O E
		72	*Al aleado Si < 1.5 %*	Al alloyed Si < 1.5 %	< 150	< 500	O E	O E
		73	*Al aleado Si > 1.5 % - < 10 %*	Al alloyed Si > 1.5 % - < 10 %	< 120	< 400		O E
		74	*Al aleado Si > 10 %, Aleaciones Magnesio*	Al alloyed Si > 10 %, Mg-alloys	< 120	< 400		O E
80	*Materiales plásticos* Plastic compounds	81	*Materiales termoplásticos*	Thermoplastics	-	-	E	E
		82	*Materiales duroplásticos*	Duroplastics	-	-	E	E
		83	*Materiales plásticos reforzados por fibras*	Glass fibre reinforced plastics	-	-		E A
90	*Metales preciosos* Precious metals	91	*Oro amarillo*	Yellow gold	-	-	O E	O E
		92	*Oro rojo*	Red gold	-	-	O E	O E
		93	*Oro blanco*	White gold	-	-		O E
		94	*Plata*	Silver	-	-		O E

O *Óptimo con aceite de corte* Optimal with cutting oil

O *Aceptable con aceite de corte* Suitable with cutting oil

E *Óptimo con emulsión* Optimal with emulsion

E *Aceptable con emulsión* Suitable with emulsion

GF - GFH - GFS - GFM

Vc (m/min)		GF611x		GF616x		GF621x GF626x	GFH611x	GFS661x		GFS666x		GFM626x		
			VS		VS	VS	VH		VS		VS		VS	
Estándar Standard	Recub. Coated	Avance fz (mm/diente) / Milling fz (mm/tooth)												
	80-150		0.04-0.15		0.04-0.15	0.04-0.15			0.04-0.15		0.04-0.15		0.04-0.15	11
	60-120		0.04-0.15		0.04-0.15	0.04-0.15			0.04-0.15		0.04-0.15		0.04-0.15	12
	60-120		0.02-0.10		0.02-0.10	0.02-0.10			0.02-0.10		0.02-0.10		0.02-0.10	13
	60-120		0.02-0.10		0.02-0.10	0.02-0.10			0.02-0.10		0.02-0.10		0.02-0.10	14
	50-90		0.02-0.08		0.02-0.08	0.02-0.08			0.02-0.08		0.02-0.08		0.02-0.08	15
	30-60		0.01-0.05		0.01-0.05	0.01-0.05	0.01-0.05		0.01-0.05		0.01-0.05		0.01-0.05	16
	30-50		0.008-0.035		0.008-0.035	0.008-0.035	0.008-0.035		0.008-0.035		0.008-0.035		0.008-0.035	17
	20-40						0.005-0.02							18
	50-90		0.02-0.10		0.02-0.10	0.02-0.10			0.02-0.10		0.02-0.10		0.02-0.10	21
	30-60		0.01-0.05		0.01-0.05	0.01-0.05			0.01-0.05		0.01-0.05		0.01-0.05	22
	50-90		0.02-0.08		0.02-0.08	0.02-0.08			0.02-0.08		0.02-0.08		0.02-0.08	23
	30-60		0.01-0.05		0.01-0.05	0.01-0.05			0.01-0.05		0.01-0.05		0.01-0.05	24
	80-150		0.05-0.15		0.05-0.15	0.05-0.15	0.05-0.15		0.05-0.15		0.05-0.15		0.05-0.15	31
	80-120		0.02-0.10		0.02-0.10	0.02-0.10			0.02-0.10		0.02-0.10		0.02-0.10	32
40-70	60-100	0.02-0.08	0.02-0.08	0.02-0.08	0.02-0.08	0.02-0.08		0.02-0.08	0.02-0.08	0.02-0.08	0.02-0.08	0.02-0.08	0.02-0.08	41
20-40	30-60	0.01-0.05	0.01-0.05	0.01-0.05	0.01-0.05	0.01-0.05		0.01-0.05	0.01-0.05	0.01-0.05	0.01-0.05	0.01-0.05	0.01-0.05	42
	30-60		0.02-0.08		0.02-0.08	0.02-0.08			0.02-0.08		0.02-0.08		0.02-0.08	51
	30-60		0.02-0.08		0.02-0.08	0.02-0.08			0.02-0.08		0.02-0.08		0.02-0.08	52
	20-30		0.005-0.02		0.005-0.02	0.005-0.02			0.005-0.02		0.005-0.02		0.005-0.02	53
	200-250		0.05-0.15		0.05-0.15	0.05-0.15			0.05-0.15		0.05-0.15		0.05-0.15	61
150-200	200-250	0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15	62
150-200	200-250	0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15		0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15	63
100-250	100-250	0.05-0.20	0.05-0.20	0.05-0.20	0.05-0.20	0.05-0.20		0.05-0.20	0.05-0.20	0.05-0.20	0.05-0.20	0.05-0.20	0.05-0.20	71
100-250	100-250	0.05-0.20	0.05-0.20	0.05-0.20	0.05-0.20	0.05-0.20		0.05-0.20	0.05-0.20	0.05-0.20	0.05-0.20	0.05-0.20	0.05-0.20	72
	100-250		0.05-0.20		0.05-0.20	0.05-0.20			0.05-0.20		0.05-0.20		0.05-0.20	73
	100-250		0.05-0.15		0.05-0.15	0.05-0.15			0.05-0.15		0.05-0.15		0.05-0.15	74
100-200	100-200	0.05-0.20	0.05-0.20	0.05-0.20	0.05-0.20	0.05-0.20		0.05-0.20	0.05-0.20	0.05-0.20	0.05-0.20	0.05-0.20	0.05-0.20	81
50-100	50-100	0.04-0.15	0.04-0.15	0.04-0.15	0.04-0.15	0.04-0.15		0.04-0.15	0.04-0.15	0.04-0.15	0.04-0.15	0.04-0.15	0.04-0.15	82
	60-80		0.04-0.15		0.04-0.15	0.04-0.15	0.04-0.15		0.04-0.15		0.04-0.15		0.04-0.15	83
50-100	100-150	0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15		0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15	91
50-90	90-120	0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15		0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15	92
	30-50		0.05-0.15		0.05-0.15	0.05-0.15			0.05-0.15		0.05-0.15		0.05-0.15	93
	90-120		0.05-0.15		0.05-0.15	0.05-0.15			0.05-0.15		0.05-0.15		0.05-0.15	94

A **Óptimo con aire**
Optimal with air

A **Aceptable con aire**
Suitable with air

Los valores son indicativos.
The indicated values are a guideline.

TABLA DE UTILIZACIÓN BGF— APPLICATION CHART BGF

Ciclo de programación para fresas de taladrar/roscar BGF
Programming cycle for thrillers BGF

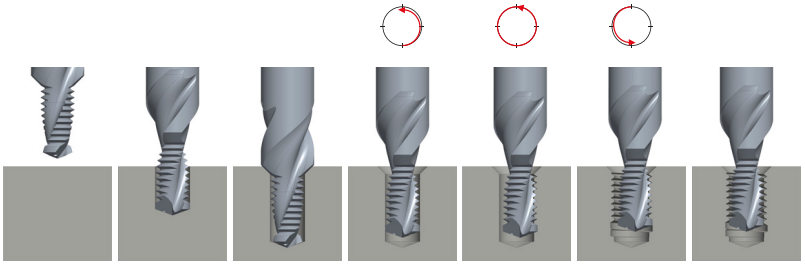


Tabla de utilización para fresas de taladrar/roscar — Application chart for thrillers

	Grupos de materiales Material groups		*Clasificación de los materiales*	Material designation	*Dureza* Hardness (HB)	*Resistencia* Tensile strength Rm (N/mm²)	*Lubricante* Lubricant	
							Estándar Standard	*Recub.* Coated
10	***Aceros*** **Steels**	11	*Aceros de decoletaje*	Free-cutting steels	< 200	< 700		
		12	*Aceros de construcción o de cementación*	Structural, cementation steels	< 200	< 700		
		13	*Aceros al carbón*	Carbon steels	< 300	< 1000		
		14	*Aceros aleados < 850 N/mm²*	Alloy steels < 850 N/mm²	< 250	< 850		
		15	*Aceros aleados/trat. > 850 - < 1150 N/mm²*	Alloy steels hard. / temp. > 850 - < 1150 N/mm²	> 250	> 850		
		16	*Aceros de alta resistencia ≤ 44 HRC*	High tensile alloy steels ≤ 44 HRC	> 250	> 850		
		17	*Aceros templados y revenidos > 44 - ≤ 54 HRC*	Alloy steels tempered > 44 - ≤ 54 HRC	> 410	> 1400		
		18	*Aceros templados > 54 - ≤ 63 HRC*	Alloy steels hardened > 54 - ≤ 63 HRC	> 560	> 1980		
20	***Aceros inoxidables*** **Stainless steels**	21	*Aceros inoxidables al azufre*	Free machining stainless steels	< 250	< 850		
		22	*Austeníticos*	Austenitic stainless steels	< 250	< 850		
		23	*Ferríticos y martensíticos < 850 N/mm²*	Ferritic and martensitic < 850 N/mm²	< 250	< 850		
		24	*Ferríticos y martensíticos > 850 - < 1150 N/mm²*	Ferritic and martensitic > 850 - < 1150 N/mm²	> 250	> 850		
30	***Fundición*** **Cast iron**	31	*Fundición gris*	Cast iron	< 250	< 850		O E
		32	*Fundición de grafito + esferoidal y maleable*	Spheroidal graphite + malleable cast iron	< 250	< 850		O E
40	***Titanio*** **Titanium**	41	*Titanio puro*	Pure titanium	< 250	< 850		
		42	*Aleación al titanio*	Titanium alloys	> 250	> 850		
50	***Níquel*** **Nickel**	51	*Aleación al Níquel 1 ≤ 850 N/mm²*	Nickel alloys 1 ≤ 850 N/mm²	< 250	< 850		
		52	*Aleación al Níquel 2 > 850 - ≤ 1150 N/mm²*	Nickel alloys 2 > 850 - ≤ 1150 N/mm²	> 250	> 850		
		53	*Aleación al Níquel 3 > 1150 - ≤ 1600 N/mm²*	Nickel alloys 3 > 1150 - ≤ 1600 N/mm²	> 340	> 1150		
60	***Cobre*** **Copper**	61	*Cobre puro (electrolítico)*	Pure copper (electrolytic copper)	< 120	< 400		
		62	*Latón, bronce (virutas cortas)*	Short chip brass, phosphor bronze, gun metal	< 200	< 700	O E	O E
		63	*Latón (virutas largas)*	Long chip brass	< 200	< 700	O E	O E
70	***Aluminio Magnesio*** **Aluminium Magnesium**	71	*Al no aleado*	Al unalloyed	< 100	< 350	O E	O E
		72	*Al aleado Si < 1.5 %*	Al alloyed Si < 1.5 %	< 150	< 500	O E	O E
		73	*Al aleado Si > 1.5 % - < 10 %*	Al alloyed Si > 1.5 % - < 10 %	< 120	< 400	O E	O E
		74	*Al aleado Si > 10 %, Aleaciones Magnesio*	Al alloyed Si > 10 %, Mg-alloys	< 120	< 400	O E	O E
80	***Materiales plásticos*** **Plastic compounds**	81	*Materiales termoplásticos*	Thermoplastics	-	-		
		82	*Materiales duroplásticos*	Duroplastics	-	-		
		83	*Materiales plásticos reforzados por fibras*	Glass fibre reinforced plastics	-	-		E
90	***Metales preciosos*** **Precious metals**	91	*Oro amarillo*	Yellow gold	-	-	O E	O E
		92	*Oro rojo*	Red gold	-	-		
		93	*Oro blanco*	White gold	-	-		
		94	*Plata*	Silver	-	-		

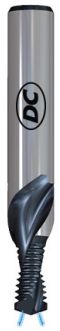
O ***Óptimo con aceite de corte*** Optimal with cutting oil

O ***Aceptable con aceite de corte*** Suitable with cutting oil

E ***Óptimo con emulsión*** Optimal with emulsion

E ***Aceptable con emulsión*** Suitable with emulsion

BGF



Vc (m/min)			VS		VS	
Estándar Standard	Recub. Coated	Avance taladro f (mm/rev.)	Drilling f (mm/rev.)	Avance fresado fz (mm/diente)	Milling fz (mm/tooth)	
						11
						12
						13
						14
						15
						16
						17
						18
						21
						22
						23
						24
	80-150		0.10-0.30		0.05-0.15	31
	80-120		0.10-0.20		0.02-0.10	32
						41
						42
						51
						52
						53
						61
100-200	150-300	0.10-0.40	0.10-0.40	0.05-0.20	0.05-0.20	62
100-200	150-300	0.10-0.40	0.10-0.40	0.05-0.20	0.05-0.20	63
100-200	150-300	0.10-0.40	0.10-0.40	0.05-0.20	0.05-0.20	71
100-200	150-300	0.10-0.40	0.10-0.40	0.05-0.20	0.05-0.20	72
100-200	150-300	0.10-0.40	0.10-0.40	0.05-0.20	0.05-0.20	73
100-200	150-250	0.10-0.30	0.10-0.30	0.05-0.15	0.05-0.15	74
						81
						82
	80-120		0.10-0.20		0.02-0.10	83
100-200	150-300	0.10-0.40	0.10-0.40	0.05-0.20	0.05-0.20	91
						92
						93
						94

A *Óptimo con aire* Optimal with air

A *Aceptable con aire* Suitable with air

Los valores son indicativos.
The indicated values are a guideline.

Notas técnicas

Δ *La ejecución del taladrado en materiales de viruta larga debe realizarse en varias pasadas.*

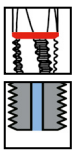
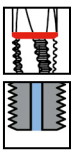
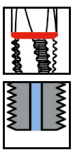
Δ *Para la utilización de la fresa de taladrar/roscar tipo BGF en otro tipo de materiales, deben dirigirse a DC SWISS SA.*

Technical notes

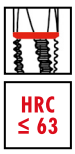
Δ When machining long chipping materials, they may require deburring operations.

Δ Please ask DC SWISS SA before using BGF type thrillers in materials where no cutting data is given.

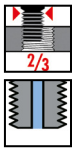
Directorio - Fresas de roscar en metal duro integral tipo GF
Directory - Solid carbide thread milling cutters type GF

	GF											
Tipo **Type**	GF6110	GF6110VS	GF6160	GF6160VS	GF6115	GF6115VS	GF6165	GF6165VS	GF6116	GF6116VS	GF6166	GF6166VS
Recubrimiento **Coating**		VS		VS		VS		VS		VS		VS
												
Longitud roscada **Thread length**												
Características **Characteristics**												
M ISO DIN 13	104				105		105		106		106	
MF ISO DIN 13	107						108				108	
UNC ASME B1.1	109						110				110	
UNF ASME B1.1	111						112				112	
UN ASME B1.1												
UNEF ASME B1.1												
UNS ASME B1.1												
G (BSP) DIN EN ISO 228							113				113	
NPT ASME B1.20.1			114									
NPTF ANSI B1.20.3			114									

Directorio - Fresas de roscar en metal duro integral tipo GF, GFH y GFS
Directory - Solid carbide thread milling cutters type GF, GFH and GFS

		GF		GFH	GFS							
Tipo **Type**		GF6215VS	GF6265VS	GFH6110VH	GFS6610	GFS6610VS	GFS6660	GFS6660VS	GFS6615	GFS6615VS	GFS6665	GFS6665VS
Recubrimiento **Coating**		VS	VS	VH		VS		VS		VS		VS
												
Longitud roscada **Thread length**												
Características **Characteristics**												
M	ISO DIN 13	115	115	104	117		117		118		118	
MF	ISO DIN 13	115	115		120		120		121		121	
UNC	ASME B1.1	116	116		122		122		123		123	
UNF	ASME B1.1	116	116		124		124		125		125	
UN	ASME B1.1											
UNEF	ASME B1.1											
UNS	ASME B1.1											
G (BSP)	DIN EN ISO 228						126				126	
NPT	ASME B1.20.1						127					
NPTF	ANSI B1.20.3						127					

Directorio - Fresas de roscar en metal duro integral tipo GFS y GFM
Directory - Solid carbide thread milling cutters type GFS and GFM

		GFS				GFM	
Tipo **Type**		GFS6616	GFS6616VS	GFS6666	GFS6666VS	GFM6260	GFM6260VS
Recubrimiento **Coating**			VS		VS		VS
							
Longitud roscada **Thread length**							
Características **Characteristics**							
M	ISO DIN 13	119		119		128	
MF	ISO DIN 13					128	
UNC	ASME B1.1					129	
UNF	ASME B1.1					129	
UN	ASME B1.1					129	
UNEF	ASME B1.1					129	
UNS	ASME B1.1					129	
G (BSP)	DIN EN ISO 228					130	
NPT	ASME B1.20.1					131	
NPTF	ANSI B1.20.3					131	

Directorio - Fresas de taladrar/roscar en metal duro integral tipo BGF
Directory - Solid carbide thrillers type BGF

	BGF									
Tipo **Type**	**BGF6760**	**BGF6760VS**	**BGF6765**	**BGF6765VS**	**BGF6766**	**BGF6766VS**	**BGF6865**	**BGF6865VS**	**BGF6866**	**BGF6866VS**
Recubrimiento **Coating**		VS		VS		VS		VS		VS
										
Longitud roscada **Thread length**	l_2 1.5 x D_1		l_2 2 x D_1		l_2 2.5 x D_1		l_2 2 x D_1		l_2 2.5 x D_1	
Características **Characteristics**										
M ISO DIN 13	132		133		133		134		134	
MF ISO DIN 13	135		135							

Fórmula de cálculo para el avance de la fresa

Avance en contorno V_{fK} = $fz \times Z \times n$

Avance centro del útil V_{fM} = $\dfrac{V_{fK} \times (\text{Ø nominal del roscado} - \text{Ø de la fresa de roscar})}{\text{Ø nominal del roscado}}$

Para las máquinas CN que no calculan automáticamente el avance del centro del útil, el valor "avance centro del útil V_{fM}" debe tomarse en consideración.

Thread milling feed rates

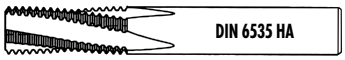
Feed rate V_{fK} = $fz \times Z \times n$

Feed rate of the tool middle V_{fM} = $\dfrac{V_{fK} \times (\text{nominal thread Ø} - \text{Ø of the thread milling cutter})}{\text{nominal thread Ø}}$

On CNC machines, which do not calculate for themselves the feed rate at the tool-centre, the value "centre of the tool V_{fM}" must be considered.

M ISO DIN 13

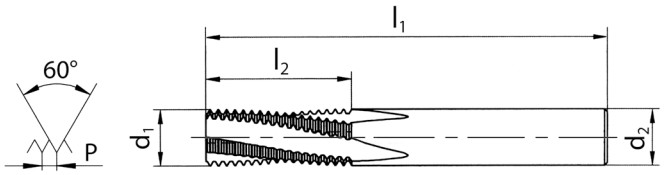
VHM CAR



HB HE sur demande auf Anfrage on request su richiesta sobre pedido

GF - GFH

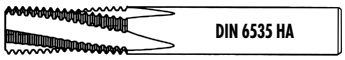
	GF6110	GF6110VS		GFH6110VH
				
				HRC ≤ 63
				
				



Ø D_1 M	P mm	d_1 mm	l_1 mm	l_2 mm	d_2 mm	GF	GFH		ID	ID	ID
2	0.4	1.5	48	3.4	6	2		1.6	● 125233	● 115993	
2.5	0.45	1.9	48	4.3	6	3		2.05	● 150565	● 152124	
3	0.5	2.3	48	5.3	6	3	3	2.5	● 125660	● 116395	● 150072
3.5	0.6	2.7	48	6.3	6	3		2.9	● 116350	● 135217	
4	0.7	3	48	7.4	6	3	3	3.3	● 125944	● 116396	● 150073
5	0.8	3.8	48	9.2	6	3	4	4.2	● 126158	● 116397	● 150074
6	1	4.5	54	10.5	6		4	5			● 150075
8	1.25	5.95	54	13.1	6		5	6.8			● 150076
10	1.5	7.95	64	17.3	8		5	8.5			● 150077
12	1.75	9.95	74	20.1	10		5	10.2			● 151326

M ISO DIN 13

VHM CAR



HB HE sur demande auf Anfrage on request su richiesta sobre pedido

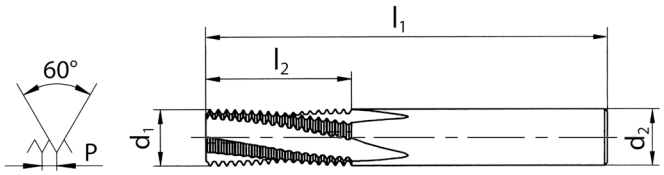
GF

GF6115 — R27

GF6115VS — R27, VS

GF6165 — R27

GF6165VS — R27, VS

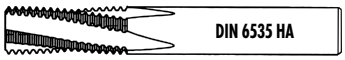


GF6115	GF6115VS	GF6165	GF6165VS
			
			
			

Ø D_1 M	P mm	d_1 mm	l_1 mm	l_2 mm	d_2 mm			ID	ID	ID	ID
4	0.7	3	48	8.8	6	3	3.3	● 146298	● 146969		
5	0.8	3.8	48	10.8	6	3	4.2	● 146299	● 146970		
6	1	4.5	54	13.5	6	3	5	● 146300	● 146971	● 126350	● 116398
8	1.25	5.95	54	18.1	6	3	6.8	● 146321	● 146972	● 126586	● 116399
10	1.5	7.95	64	21.8	8	4	8.5	● 146322	● 146973	● 124836	● 116400
12	1.75	9.95	72	25.4	10	4	10.2			● 116342	● 116401
14	2	9.95	74	31	10	4	12			● 125066	● 116402
16	2	11.95	80	35	12	4	14			● 125114	● 115990
18	2.5	13.95	90	41.3	14	4	15.5			● 125229	● 116403
20							17.5				

M ISO DIN 13

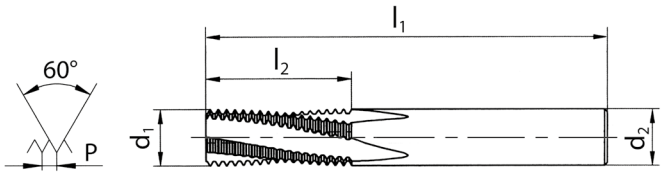
VHM CAR

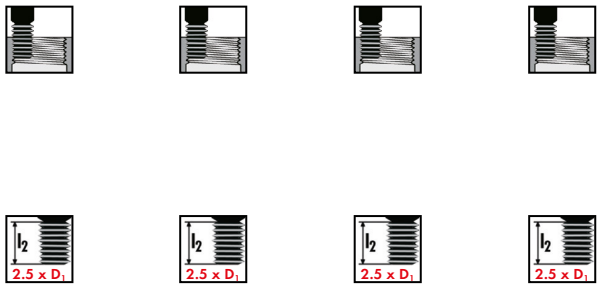


HB HE sur demande auf Anfrage on request su richiesta sobre pedido

GF

GF6116	R27			
GF6116VS	R27		VS	
GF6166	R27			
GF6166VS	R27			VS

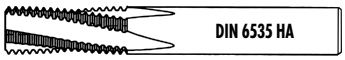




Ø D_1 M	P mm	d_1 mm	l_1 mm	l_2 mm	d_2 mm			GF6116 ID	GF6116VS ID	GF6166 ID	GF6166VS ID
4	0.7	3	48	10.9	6	3	3.3	● 155365	● 155370		
5	0.8	3.8	48	13.2	6	3	4.2	● 155366	● 155371		
6	1	4.5	54	16.5	6	3	5	● 155367	● 155372	● 155375	● 155382
8	1.25	5.95	54	21.9	6	3	6.8	● 155368	● 155373	● 155376	● 155383
10	1.5	7.95	64	26.3	8	4	8.5	● 155369	● 155374	● 155377	● 155384
12	1.75	9.95	74	32.4	10	4	10.2			● 155378	● 155385
14	2	9.95	74	37	10	4	12			● 155379	● 155386
16	2	11.95	90	43	12	4	14			● 155380	● 155387
18	2.5	13.95	105	53.8	14	4	15.5			● 155381	● 155388
20							17.5				

MF ISO DIN 13

VHM CAR

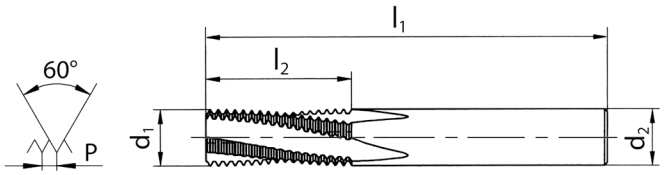


HB HE sur demande auf Anfrage on request su richiesta sobre pedido

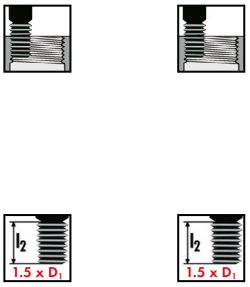
GF

GF6110

GF6110VS

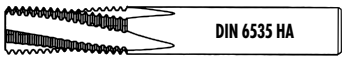


Ø D_1 MF	P mm	d_1 mm	l_1 mm	l_2 mm	d_2 mm			GF6110 ID	GF6110VS ID
4	0.5	3	48	7.3	6	3	3.5	● 135218	● 135219
5	0.5	3.8	48	8.8	6	3	4.5	● 135069	● 135220



MF ISO DIN 13

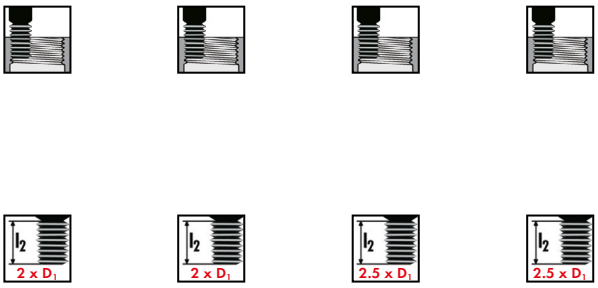
VHM CAR

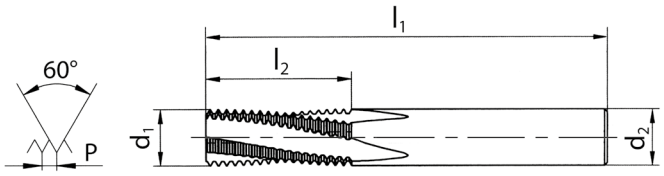


HB HE sur demande auf Anfrage on request su richiesta sobre pedido

GF

	GF6165	GF6165VS	GF6166	GF6166VS
	R27	R27 VS	R27	R27 VS



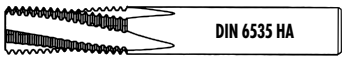


Ø D_1 MF	P mm	d_1 mm	l_1 mm	l_2 mm	d_2 mm			ID	ID
6	0.5	4.5	54	12.8	6	3	5.5	● 135221	● 135222
6	0.75	4.5	54	13.1	6	3	5.25	● 123664	● 123665
8	0.5	5.95	54	17.8	6	3	7.5	● 135002	● 135223
8	0.75	5.95	54	16.9	6	3	7.25	● 143110	● 135224
8	1	5.95	54	17.5	6	3	7	● 124239	● 116404
10	1	7.95	64	21.5	8	4	9	● 119986	● 116405
10	1.25	7.95	64	21.9	8	4	8.8	● 120102	● 116406
12	1	9.95	72	25.5	10	4	11	● 120303	● 116407
12	1.5	9.95	72	26.3	10	4	10.5	● 120392	● 120393

Ø D_1 MF	P mm	d_1 mm	l_1 mm	l_2 mm	d_2 mm			ID	ID
6	0.5	4.5	54	15.8	6	3	5.5	● 155389	● 155398
6	0.75	4.5	54	16.1	6	3	5.25	● 155390	● 155399
8	0.5	5.95	54	20.8	6	3	7.5	✱ 155391	✱ 155400
8	0.75	5.95	54	20.6	6	3	7.25	● 155392	● 155401
8	1	5.95	54	21.5	6	3	7	✱ 155393	✱ 155402
10	1	7.95	64	26.5	8	4	9	● 155394	● 155403
10	1.25	7.95	64	26.9	8	4	8.8	✱ 155395	✱ 155404
12	1	9.95	74	31.5	10	4	11	● 155396	● 155405
12	1.5	9.95	74	32.3	10	4	10.5	● 155397	● 155406

UNC ASME B1.1

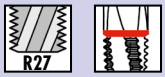
VHM CAR



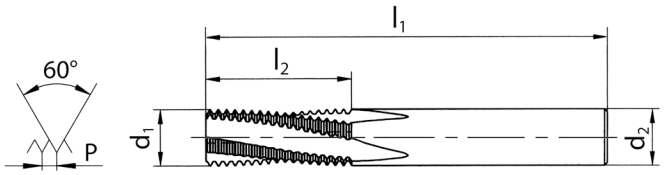
HB HE sur demande auf Anfrage on request su richiesta sobre pedido

GF

GF6110



GF6110VS

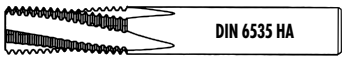


GF6110	GF6110VS		
			
			
			

Ø" D_1 UNC	P TPI	d_1 mm	l_1 mm	l_2 mm	d_2 mm			ID	ID
10	**24**	3.6	48	10.1	6	3	3.8	● **135225**	● **135226**
12	**24**	4.1	48	10.1	6	3	4.4	● **135227**	● **135228**
1/4	**20**	4.8	54	12.1	6	3	5.1	● **135229**	● **135230**

UNC ASME B1.1

VHM CAR

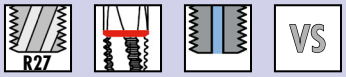


HB HE sur demande auf Anfrage on request su richiesta sobre pedido

GF

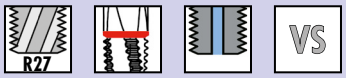
GF6165

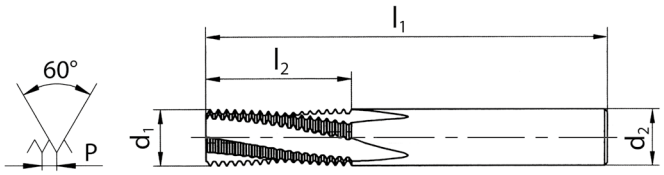
GF6165VS



GF6166

GF6166VS





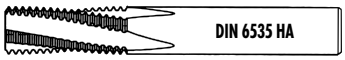
GF6165	GF6165VS	GF6166	GF6166VS
			
			
			

Ø" D_1 UNC	P TPI	d_1 mm	l_1 mm	l_2 mm	d_2 mm			ID	ID
1/4	20	4.8	54	14.6	6	3	5.1	✶ 155407	✶ 155408
5/16	18	5.95	54	17.6	6	3	6.5	● 116047	● 135231
3/8	16	7.1	64	21.5	8	4	8	● 135232	● 135233
7/16	14	7.95	64	24.5	8	4	9.3	✶ 116049	✶ 135234
1/2	13	9.95	72	28.4	10	4	10.8	✶ 135235	✶ 135236

Ø" D_1 UNC	P TPI	d_1 mm	l_1 mm	l_2 mm	d_2 mm			ID	ID
1/4	20	4.8	54	17.1	6	3	5.1	● 155409	● 155414
5/16	18	5.95	54	21.9	6	3	6.5	● 155410	● 155415
3/8	16	7.1	64	26.2	8	4	8	● 155411	● 155416
7/16	14	7.95	64	29.9	8	4	9.3	● 155412	● 155417
1/2	13	9.95	74	34.2	10	4	10.8	● 155413	● 155418

UNF ASME B1.1

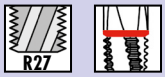
VHM CAR



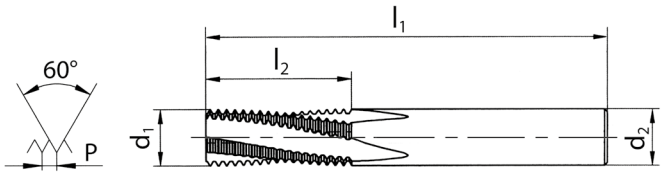
HB HE sur demande auf Anfrage on request su richiesta sobre pedido

GF

GF6110



GF6110VS

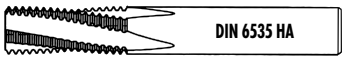


GF6110	GF6110VS		
			
			
			

Ø" D_1 UNF	P TPI	d_1 mm	l_1 mm	l_2 mm	d_2 mm			ID	ID
10	32	3.6	48	8.3	6	3	4.05	● 128659	● 135237
12	28	4.1	48	9.5	6	3	4.6	● 135238	● 135239
1/4	28	4.8	54	11.3	6	3	5.5	● 135240	● 135176

UNF ASME B1.1

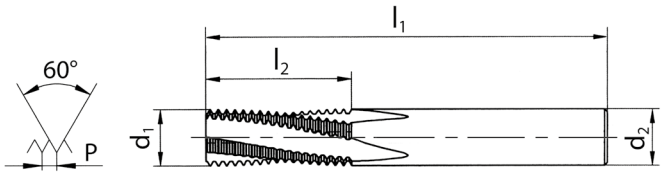
VHM CAR



HB HE sur demande auf Anfrage on request su richiesta sobre pedido

GF

GF6165	R27			
GF6165VS	R27			VS
GF6166	R27			
GF6166VS	R27			VS



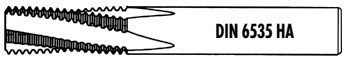
GF6165	GF6165VS	GF6166	GF6166VS
			
			
			

Ø" D_1 UNF	P TPI	d_1 mm	l_1 mm	l_2 mm	d_2 mm			ID	ID
1/4	28	4.8	54	14.1	6	3	5.5	155419	155420
5/16	24	5.95	54	17.5	6	3	6.9	135242	135243
3/8	24	7.1	64	20.6	8	4	8.5	135182	135245
7/16	20	7.95	64	24.8	8	4	9.8	135246	135247
1/2	20	9.95	72	27.3	10	4	11.4	135183	135249

Ø" D_1 UNF	P TPI	d_1 mm	l_1 mm	l_2 mm	d_2 mm			ID	ID
1/4	28	4.8	54	16.8	6	3	5.5	155421	155426
5/16	24	5.95	54	20.6	6	3	6.9	155422	155427
3/8	24	7.1	64	24.9	8	4	8.5	155423	155428
7/16	20	7.95	64	28.6	8	4	9.8	155424	155429
1/2	20	9.95	74	33.7	10	4	11.4	155425	155430

G DIN EN ISO 228 (BSP)

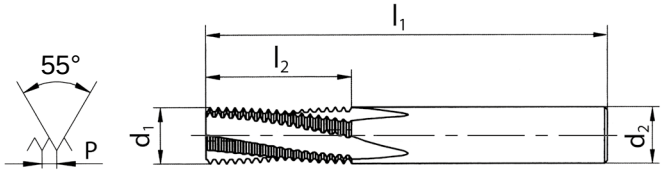
VHM CAR



HB HE sur demande auf Anfrage on request su richiesta sobre pedido

GF

GF6165	R27			
GF6165VS	R27			VS
GF6166	R27			
GF6166VS	R27			VS



GF6165	GF6165VS	GF6166	GF6166VS
			
			
			
			

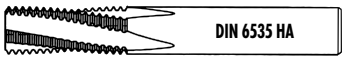
Ø" D_1 G	P TPI	d_1 mm	l_1 mm	l_2 mm	d_2 mm			ID	ID
1/8	28	7.95	64	21.3	8	4	8.75	● 119347	● 116409
1/4	19	9.95	72	28.7	10	4	11.6	● 119292	● 116410
3/8	19	13.6	80	35.4	14	4	15.2	● 119678	● 116411

Ø" D_1 G	P TPI	d_1 mm	l_1 mm	l_2 mm	d_2 mm			ID	ID
1/8	28	7.95	64	24.9	8	4	8.75	● 155431	● 155434
1/4	19	9.95	74	34.1	10	4	11.6	● 155432	● 155435
3/8	19	13.6	90	43.4	14	4	15.2	● 155433	● 155436

NPT, NPTF

ASME B1.20.1
ANSI B1.20.3

VHM CAR



HB HE

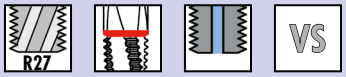
sur demande
auf Anfrage
on request
su richiesta
sobre pedido

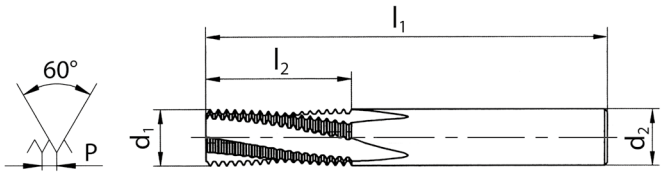
GF

	GF6160	GF6160VS		
				
				
				

GF6160

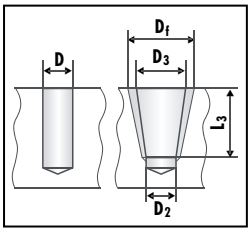
GF6160VS





Ø" D1 NPT	P TPI	d1 mm	l1 mm	l2 mm	d2 mm		GF6160 ID	GF6160VS ID
1/8	27	7.3	64	9.9	8	4	● 116371	● 116435
1/4	18	9.95	72	14.8	12	4	● 135250	● 135251
3/8	18	12.5	80	14.8	14	4	● 135252	● 135253
1/2	14	14.7	90	19.1	16	4	● 155437	● 155438

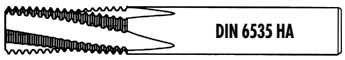
Ø" D1 NPTF	P TPI	d1 mm	l1 mm	l2 mm	d2 mm		GF6160 ID	GF6160VS ID
1/8	27	7.3	64	9.9	8	4	* 135254	
3/8	18	12.5	80	14.8	12	4	* 135258	* 135259
1/2	14	14.7	90	19.1	14	4	* 155439	* 155440



	Agujero Core hole				Fresado Milling	
			NPT NPTF			
Ø" D1	D	D2	D3 (+0.05)		Df	L3
1/8	8.5	8.3	8.74	8.76	9.81	6.92
1/4	11.0	10.8	11.36	11.40	12.99	10.02
3/8	14.5	14.2	14.80	14.84	16.41	10.33
1/2	17.9	17.5	18.32	18.33	20.37	13.57

M, MF ISO DIN 13

VHM CAR



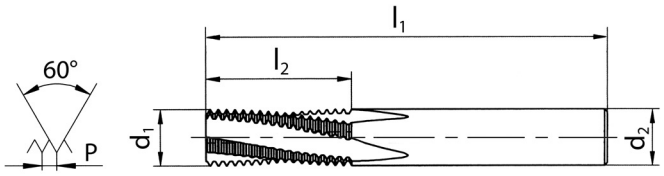
HB HE sur demande auf Anfrage on request su richiesta sobre pedido

GF

	GF6215VS	GF6265VS		
				
				
				

GF6215VS — R15 — VS

GF6265VS — R15 — VS

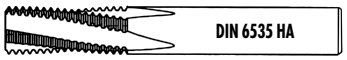


Ø D_1 M	P mm	d_1 mm	l_1 mm	l_2 mm	d_2 mm			ID	ID
4	0.7	3	48	8.8	6	3	3.3	● 196068	
5	0.8	3.8	48	10.8	6	3	4.2	● 196069	
6	1	4.5	54	13.5	6	3	5	● 196070	● 196080
8	1.25	5.95	54	18.1	6	3	6.8	● 196071	● 196081
10	1.5	7.95	64	21.8	8	4	8.5	● 196072	● 196082
12	1.75	9.95	72	25.4	10	4	10.2	● 196073	● 196083
14	2	9.95	74	31	10	4	12		● 196084
16	2	11.95	80	35	12	4	14		● 196085
18	2.5	13.95	90	43.8	14	4	15.5		● 196086
20	2.5	13.95	90	43.8	14	4	17.5		● 196087

Ø D_1 MF	P mm	d_1 mm	l_1 mm	l_2 mm	d_2 mm			ID	ID
6	0.75	4.5	54	13.1	6	3	5.25	● 196090	● 196099
8	1	5.95	54	17.5	6	3	7	● 196091	● 196100
10	1	7.95	64	21.5	8	4	9	● 196092	● 196101
10	1.25	7.95	64	21.9	8	4	8.8	● 196093	● 196102
12	1	9.95	72	25.5	10	4	11		● 197113
12	1.5	9.95	72	26.3	10	4	10.5	● 196094	● 196103
14	1.5	9.95	74	30.8	10	4	12.5		● 196104
16	1.5	11.95	80	33.8	12	4	14.5		● 196105
18	1.5	13.95	90	42.8	14	4	16.5		● 196106
20	1.5	13.95	90	42.8	14	4	18.5		● 196107

UNC, UNF ASME B1.1

VHM CAR



HB HE sur demande auf Anfrage on request su richiesta sobre pedido

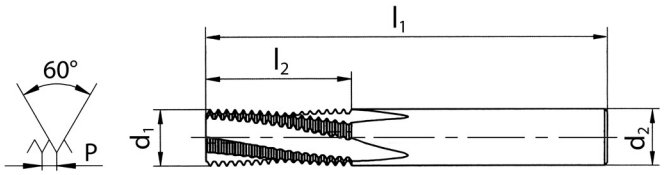
GF

	GF6215VS	GF6265VS		
				

GF6215VS  

GF6265VS   

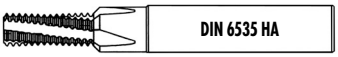


Ø" D1 UNC	P TPI	d1 mm	l1 mm	l2 mm	d2 mm			ID	ID
8	32	3.1	48	9.1	6	3	3.4	● 196109	
10	24	3.6	48	10.1	6	3	3.8	● 196110	
1/4	20	4.8	54	14.6	6	3	5.1	● 196111	● 196118
5/16	18	5.95	54	17.6	6	3	6.5	● 196112	● 196119
3/8	16	7.1	64	21.5	8	4	8	● 196113	● 196120
7/16	14	7.95	64	24.5	8	4	9.3	● 196114	● 196121
1/2	13	9.95	72	28.4	10	4	10.8	● 196115	● 196122
5/8	11	11.95	80	35.8	12	4	13.6		● 196123
3/4	10	13.95	90	41.9	14	4	16.6		● 196124

Ø" D1 UNF	P TPI	d1 mm	l1 mm	l2 mm	d2 mm			ID	ID
10	32	3.6	48	8.3	6	3	4.05	● 196125	
1/4	28	4.8	54	14.1	6	3	5.5	● 196126	● 196133
5/16	24	5.95	54	17.5	6	3	6.9	● 196127	● 196134
3/8	24	7.1	64	20.6	8	4	8.5	● 196128	● 196135
7/16	20	7.95	64	24.8	8	4	9.8	● 196129	● 196136
1/2	20	9.95	72	27.3	10	4	11.4	● 196130	● 196137
5/8	18	11.95	80	34.6	12	4	14.5		● 196138
3/4	16	13.95	90	40.5	14	4	17.5		● 196139

M ISO DIN 13

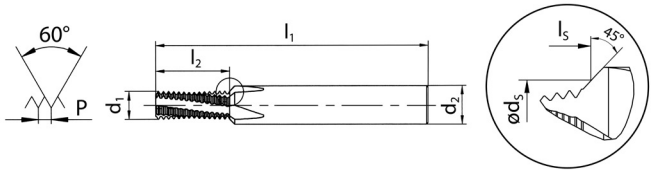
VHM CAR

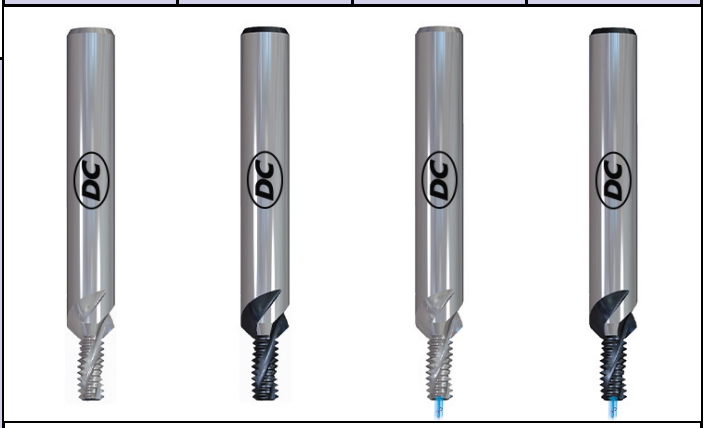


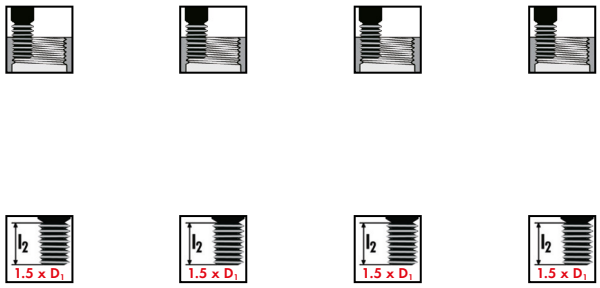
HB HE sur demande auf Anfrage on request su richiesta sobre pedido

GFS

GFS6610	R27	45°		
GFS6610VS	R27	45°	VS	
GFS6660	R27	45°		
GFS6660VS	R27	45°		VS





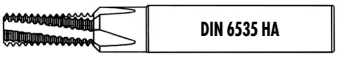


Ø D_1 M	P mm	d_1 mm	l_1 mm	l_2 mm	l_s mm	d_s mm	d_2 mm		
2	0.4	1.5	48	3.4	3.7	2.1	6	2	1.6
2.5	0.45	1.9	48	4.3	4.6	2.6	6	3	2.05
3	0.5	2.3	48	5.3	5.7	3.1	6	3	2.5
3.5	0.6	2.7	48	5.7	6.2	3.6	6	3	2.9
4	0.7	3	48	7.4	7.9	4.1	6	3	3.3
5	0.8	3.8	54	9.2	9.9	5.1	6	3	4.2
6	1	4.5	62	10.5	11.4	6.2	8	3	5
8	1.25	5.95	74	13.1	14.3	8.2	10	3	6.8
10	1.5	7.95	80	17.3	18.4	10.3	12	4	8.5
12	1.75	9.95	90	20.1	21.3	12.3	14	4	10.2
14	2	10.8	102	25	26.8	14.4	16	4	12
16	2	12.8	102	27	28.8	16.4	18	4	14
18	2.5	13.95	125	33.8	36	18.5	25	4	15.5
20					37	20.5			17.5

GFS6610	GFS6610VS	GFS6660	GFS6660VS
ID	ID	ID	ID
★ 135331	★ 135332		
★ 155441	★ 155443		
● 135333	● 135334		
★ 155442	★ 155444		
● 135335	● 135336		
● 135337	● 135338		
● 135339	● 116175		
		● 135340	● 116172
		● 135341	● 116173
		★ 135342	★ 116174
		★ 135343	★ 135344
		★ 135345	★ 135346
		★ 135347	★ 135348

M ISO DIN 13

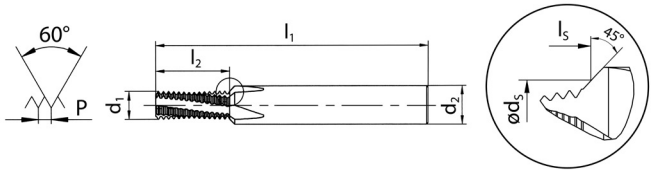
VHM CAR

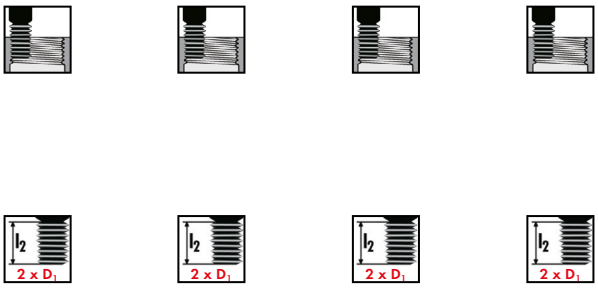


HB HE sur demande auf Anfrage on request su richiesta sobre pedido

GFS

GFS6615	R27	45°		
GFS6615VS	R27	45°	VS	
GFS6665	R27	45°		
GFS6665VS	R27	45°		VS



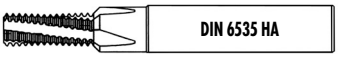


Ø D_1 M	P mm	d_1 mm	l_1 mm	l_2 mm	l_s mm	d_s mm	d_2 mm		
2	0.4	1.5	48	4.6	4.9	2.1	6	2	1.6
2.5	0.45	1.9	48	5.6	6	2.6	6	3	2.05
3	0.5	2.3	48	6.8	7.2	3.1	6	3	2.5
3.5	0.6	2.7	48	7.5	8	3.6	6	3	2.9
4	0.7	3	48	8.8	9.3	4.1	6	3	3.3
5	0.8	3.8	54	10.8	11.5	5.1	6	3	4.2
6	1	4.5	62	13.5	14.4	6.2	8	3	5
8	1.25	5.95	74	18.1	19.3	8.2	10	3	6.8
10	1.5	7.95	80	21.8	22.9	10.3	12	4	8.5
12	1.75	9.95	90	25.4	26.6	12.3	14	4	10.2
14	2	10.8	102	31	32.8	14.4	16	4	12
16	2	12.8	102	35	36.8	16.4	18	4	14
18	2.5	13.95	125	41.3	43.5	18.5	25	4	15.5
20					44.5	20.5			17.5

GFS6615	GFS6615VS	GFS6665	GFS6665VS
ID	ID	ID	ID
✶ 135349	✶ 135350		
✶ 155445	✶ 155447		
● 125661	● 135351		
✶ 155446	✶ 147108		
● 125946	● 135352		
● 126160	● 116178		
● 126352	● 135353	● 155524	● 155525
		● 126587	● 116343
		✶ 124837	✶ 135354
		✶ 124973	✶ 135355
		✶ 125067	✶ 135356
		✶ 125116	✶ 135357
			✶ 135358

M ISO DIN 13

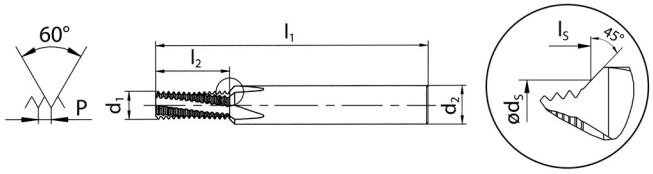
VHM CAR

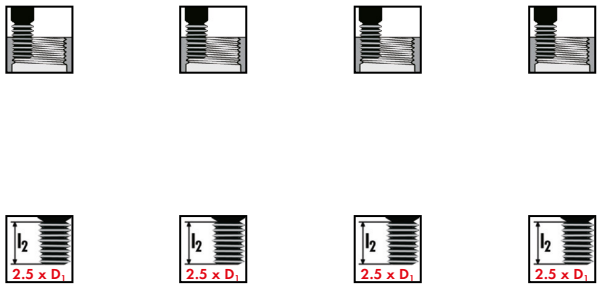


HB HE sur demande auf Anfrage on request su richiesta sobre pedido

GFS

GFS6616	R27	45°		
GFS6616VS	R27	45°	VS	
GFS6666	R27	45°		
GFS6666VS	R27	45°		VS

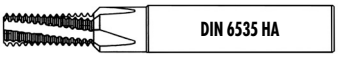




Ø D_1 M	P mm	d_1 mm	l_1 mm	l_2 mm	l_s mm	d_s mm	d_2 mm			GFS6616 ID	GFS6616VS ID	GFS6666 ID	GFS6666VS ID
3	0.5	2.3	48	8.3	8.7	3.1	6	3	2.5	● 155448	● 155452		
4	0.7	3	48	10.9	11.4	4.1	6	3	3.3	● 155449	● 155453		
5	0.8	3.8	54	13.2	13.9	5.1	6	3	4.2	● 155450	● 155454		
6	1	4.5	62	16.5	17.4	6.2	8	3	5	✶ 155451	✶ 155455	● 155456	● 155463
8	1.25	5.95	74	21.9	23	8.2	10	3	6.8			● 155457	● 155464
10	1.5	7.95	80	26.3	27.4	10.3	12	4	8.5			● 155458	● 155465
12	1.75	9.95	90	32.4	33.6	12.3	14	4	10.2			✶ 155459	✶ 155466
16	2	12.8	102	43	44.8	16.4	18	4	14			✶ 155461	✶ 155468

MF ISO DIN 13

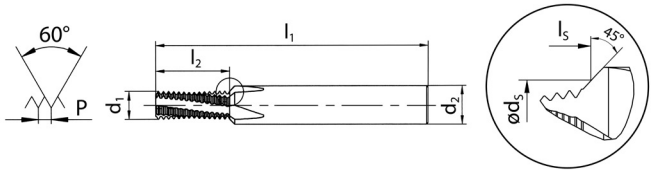
VHM CAR

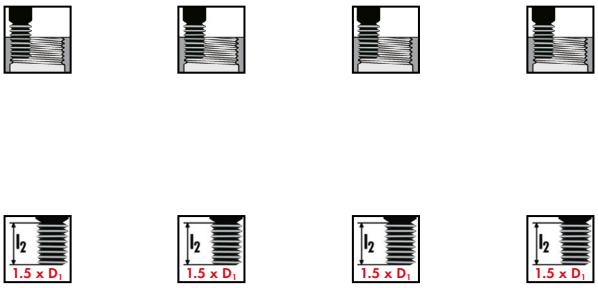


HB HE sur demande auf Anfrage on request su richiesta sobre pedido

GFS

GFS6610	R27	45°		
GFS6610VS	R27	45°	VS	
GFS6660	R27	45°		
GFS6660VS	R27	45°		VS

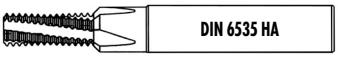




Ø D_1 MF	P mm	d_1 mm	l_1 mm	l_2 mm	l_s mm	d_s mm	d_2 mm			GFS6610 ID	GFS6610VS ID	GFS6660 ID	GFS6660VS ID
4	0.5	3	48	7.3	7.8	4.1	6	3	3.5	* 135359	* 135360		
5	0.5	3.8	54	8.8	9.4	5.1	6	3	4.5	* 135361	* 135362		
6	0.5	4.5	62	9.8	10.6	6.2	8	3	5.5	* 135363	* 135364		
6	0.75	4.5	62	10.1	11	6.2	8	3	5.25	* 135365	* 135366		
8	0.5	5.95	74	12.8	13.9	8.2	10	3	7.5			* 135367	* 135368
8	0.75	5.95	74	13.1	14.3	8.2	10	3	7.25			* 135369	* 135370
8	1	5.95	74	13.5	14.6	8.2	10	3	7			* 135371	* 135372
10	1	7.95	80	16.5	17.7	10.3	12	4	9			* 135373	* 135374
10	1.25	7.95	80	16.9	18.1	10.3	12	4	8.8			* 135375	* 135376
12	1	9.95	90	19.5	20.7	12.3	14	4	11			* 135377	* 135378
12	1.5	9.95	90	20.3	21.4	12.3	14	4	10.5			* 135379	* 135380
14	1.5	10.8	102	23.3	25.1	14.4	16	4	12.5			* 135381	* 135382
16	1.5	12.8	102	26.3	28.1	16.4	18	4	14.5			* 135383	* 135384

MF ISO DIN 13

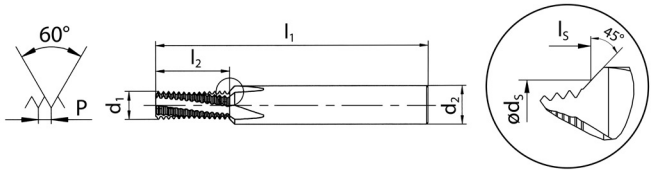
VHM CAR



HB HE sur demande auf Anfrage on request su richiesta sobre pedido

GFS

GFS6615	R27	45°		
GFS6615VS	R27	45°	VS	
GFS6665	R27	45°		
GFS6665VS	R27	45°		VS

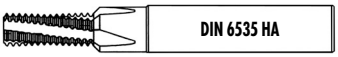


	GFS6615	GFS6615VS	GFS6665	GFS6665VS
				
				
				

Ø D_1 MF	P mm	d_1 mm	l_1 mm	l_2 mm	l_s mm	d_s mm	d_2 mm			ID	ID	ID	ID
4	0.5	3	48	8.8	9.3	4.1	6	3	3.5	● 135385	● 135386		
5	0.5	3.8	54	10.8	11.4	5.1	6	3	4.5	● 135387	● 135388		
6	0.5	4.5	62	12.8	13.6	6.2	8	3	5.5	✶ 135389	✶ 135390		
6	0.75	4.5	62	13.1	14	6.2	8	3	5.25	✶ 135391	✶ 135392		
8	0.5	5.95	74	17.8	18.9	8.2	10	3	7.5			✶ 135393	✶ 135394
8	0.75	5.95	74	16.9	18	8.2	10	3	7.25			● 135395	● 135396
8	1	5.95	74	17.5	18.6	8.2	10	3	7			✶ 135397	✶ 135398
10	1	7.95	80	21.5	22.7	10.3	12	4	9			✶ 135399	✶ 135400
10	1.25	7.95	80	21.9	23.1	10.3	12	4	8.8			✶ 135401	✶ 135402
12	1	9.95	90	25.5	26.7	12.3	14	4	11			✶ 135403	✶ 135404
12	1.5	9.95	90	26.3	27.4	12.3	14	4	10.5			✶ 135405	✶ 135406
14	1.5	10.8	102	30.8	32.6	14.4	16	4	12.5			✶ 135407	✶ 135408
16	1.5	12.8	102	33.8	35.6	16.4	18	4	14.5			● 135409	● 135410

UNC ASME B1.1

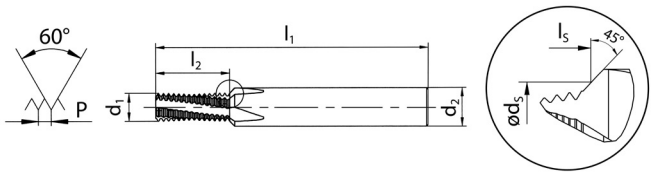
VHM CAR

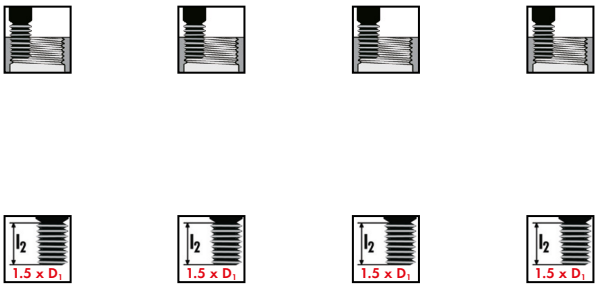


HB HE sur demande auf Anfrage on request su richiesta sobre pedido

GFS

GFS6610	R27	45°		
GFS6610VS	R27	45°	VS	
GFS6660	R27	45°		
GFS6660VS	R27	45°		VS

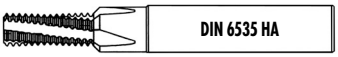




Ø" D_1 UNC	P TPI	d_1 mm	l_1 mm	l_2 mm	l_s mm	d_s mm	d_2 mm			GFS6610 ID	GFS6610VS ID	GFS6660 ID	GFS6660VS ID
12	24	4.1	54	10.1	10.8	5.6	6	3	4.4	* 135422	* 135423		
1/4	20	4.8	62	12.1	12.9	6.5	8	3	5.1	* 135424	* 135425	* 155470	* 155473
5/16	18	5.95	74	14.8	15.9	8.1	10	3	6.5	* 135426	* 135427	* 155471	* 155474
3/8	16	7.1	80	16.7	18	9.8	12	4	8	* 135428	* 135429	* 155472	* 155475
7/16	14	7.95	80	19.1	20.8	11.4	12	4	9.3			* 135430	* 135431
1/2	13	9.95	90	22.5	24	13	14	4	10.8			* 135432	* 135433
9/16	12	10.8	102	24.4	26.2	14.6	16	4	12.2			* 135434	* 135435
5/8	11	11.9	102	26.5	28.8	16.3	18	4	13.6			* 135436	* 135437

UNC ASME B1.1

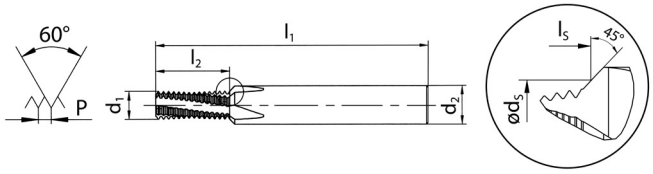
VHM CAR



HB HE sur demande auf Anfrage on request su richiesta sobre pedido

GFS

GFS6615	R27	45°		
GFS6615VS	R27	45°	VS	
GFS6665	R27	45°		
GFS6665VS	R27	45°		VS

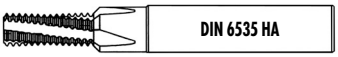


	GFS6615	GFS6615VS	GFS6665	GFS6665VS
				
				
				

Ø" D_1 UNC	P TPI	d_1 mm	l_1 mm	l_2 mm	l_5 mm	d_5 mm	d_2 mm			ID	ID	ID	ID
10	24	3.6	54	12.2	12.8	4.9	6	3	3.8	* 135438	* 135439		
12	24	4.1	54	13.2	14	5.6	6	3	4.4	* 135440	* 135441		
1/4	20	4.8	62	14.6	15.5	6.5	8	3	5.1	* 135442	* 135443	* 155476	* 155479
5/16	18	5.95	74	17.6	18.7	8.1	10	3	6.5	* 135444	* 135445	* 155477	* 155480
3/8	16	7.1	80	21.5	22.8	9.8	12	4	8	* 135446	* 135447	* 155478	* 155481
7/16	14	7.95	80	24.5	26.2	11.4	12	4	9.3			* 135448	* 135449
1/2	13	9.95	90	28.4	29.9	13	14	4	10.8			* 135450	* 135451
9/16	12	10.8	102	32.8	34.7	14.6	16	4	12.2			* 135452	* 135453
5/8	11	11.9	102	35.8	38	16.3	18	4	13.6			* 135454	* 135455

UNF ASME B1.1

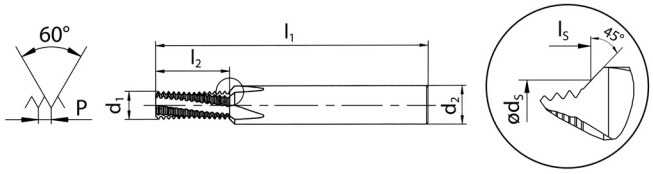
VHM CAR

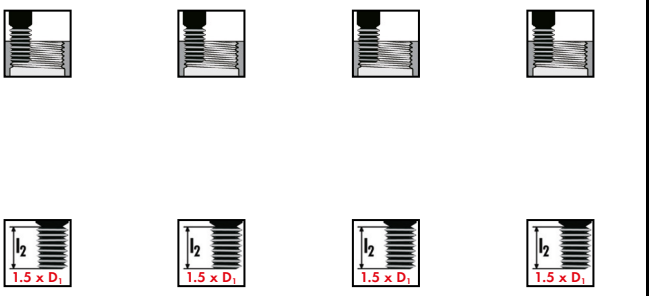


HB HE sur demande auf Anfrage on request su richiesta sobre pedido

GFS

GFS6610	R27	45°		
GFS6610VS	R27	45°	VS	
GFS6660	R27	45°		
GFS6660VS	R27	45°		VS

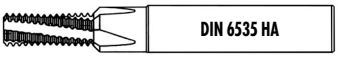




Ø" D_1 UNF	P TPI	d_1 mm	l_1 mm	l_2 mm	l_s mm	d_s mm	d_2 mm			GFS6610 ID	GFS6610VS ID	GFS6660 ID	GFS6660VS ID
12	28	4.1	54	9.5	10.3	5.6	6	3	4.6	* 135458	* 135459		
1/4	28	4.8	62	11.3	12.2	6.5	8	3	5.5	* 135460	* 135461	* 155482	* 155485
5/16	24	5.95	74	13.2	14.3	8.1	10	3	6.9	* 135462	* 135463	* 155483	* 155486
3/8	24	7.1	80	16.4	17.7	9.8	12	4	8.5	* 135464	* 135465	* 155484	* 155487
1/2	20	9.95	90	21	22.5	13	14	4	11.4			* 135468	* 135469
5/8	18	11.9	102	26.1	28.3	16.3	18	4	14.5			* 135472	* 135473

UNF ASME B1.1

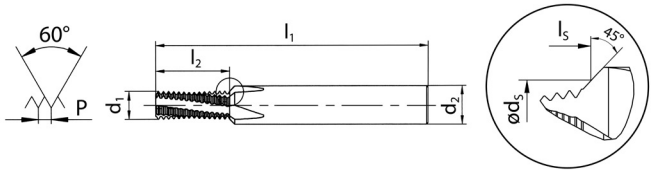
VHM CAR

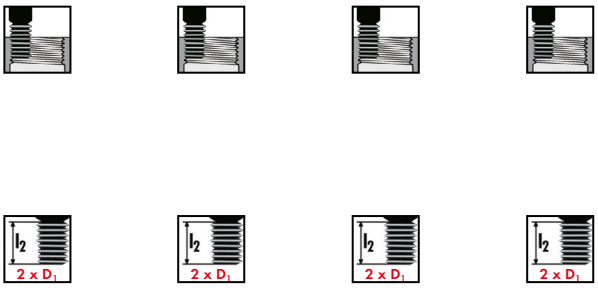


HB HE sur demande auf Anfrage on request su richiesta sobre pedido

GFS

GFS6615	R27	45°		
GFS6615VS	R27	45°	VS	
GFS6665	R27	45°		
GFS6665VS	R27	45°		VS

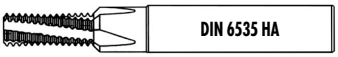




Ø" D_1 UNF	P TPI	d_1 mm	l_1 mm	l_2 mm	l_5 mm	d_5 mm	d_2 mm			GFS6615 ID	GFS6615VS ID	GFS6665 ID	GFS6665VS ID
10	32	3.6	54	11.5	12.2	4.9	6	3	4.05	● 128660	● 135474		
12	28	4.1	54	12.3	13	5.6	6	3	4.6	✱ 135475	✱ 135476		
1/4	28	4.8	62	14.1	14.9	6.5	8	3	5.5	● 128578	● 135477	✱ 155488	✱ 155491
5/16	24	5.95	74	17.5	18.5	8.1	10	3	6.9	✱ 135478	✱ 135479	✱ 155489	✱ 155492
3/8	24	7.1	80	20.6	22	9.8	12	4	8.5	✱ 135480	✱ 135481	✱ 155490	✱ 155493
7/16	20	7.95	80	24.8	26.5	11.4	12	4	9.8			✱ 135482	✱ 135483
1/2	20	9.95	90	27.3	28.8	13	14	4	11.4			✱ 135484	✱ 135485
5/8	18	11.9	102	34.6	36.8	16.3	18	4	14.5			✱ 135488	✱ 135489

G DIN EN ISO 228 (BSP)

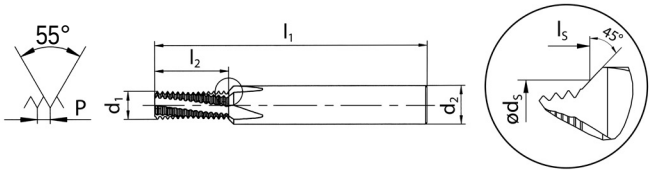
VHM CAR

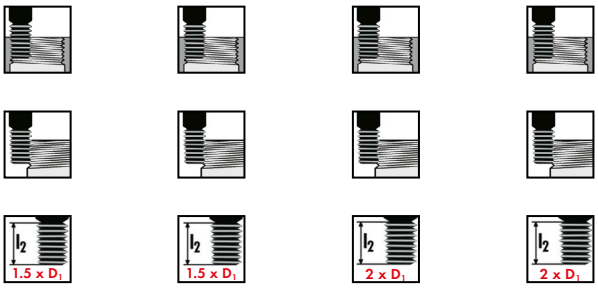


HB HE sur demande auf Anfrage on request su richiesta sobre pedido

GFS

GFS6660	R27	45°		
GFS6660VS	R27	45°		VS
GFS6665	R27	45°		
GFS6665VS	R27	45°		VS



	GFS6660	GFS6660VS	GFS6665	GFS6665VS
				
				

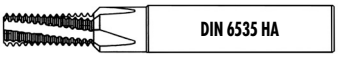
Ø" D_1 G	P TPI	d_1 mm	l_1 mm	l_2 mm	l_s mm	d_s mm	d_2 mm			ID	ID
1/4	19	9.95	90	22.1	23.8	13.5	14	4	11.6		* 135414
3/8	19	12.8	102	27.4	29.6	17.1	18	4	15.2	* 135415	* 135416

Ø" D_1 G	P TPI	d_1 mm	l_1 mm	l_2 mm	l_s mm	d_s mm	d_2 mm			ID	ID
1/8	28	7.95	80	21.3	22.3	10	12	4	8.75	* 119349	* 135417
1/4	19	9.95	90	28.7	30.5	13.5	14	4	11.6	* 119298	* 135418
3/8	19	12.8	102	35.4	37.6	17.1	18	4	15.2	* 119680	* 135419

NPT, NPTF

ASME B1.20.1
ANSI B1.20.3

VHM
CAR



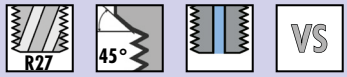
HB
HE

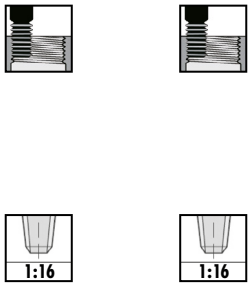
sur demande
auf Anfrage
on request
su richiesta
sobre pedido

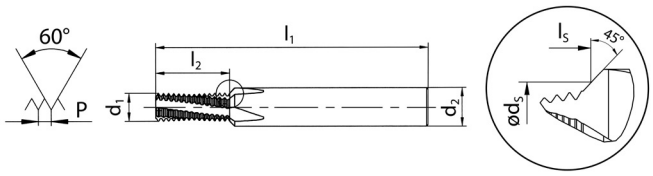
GFS

GFS6660

GFS6660VS

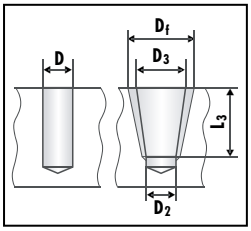






Ø" D_1 NPT	P TPI	d_1 mm	l_1 mm	l_2 mm	l_s mm	d_s mm	d_2 mm		GFS6660 ID	GFS6660VS ID
1/4	18	9.95	80	14.8	16.4	14	16	4	* 126899	* 135491
3/8	18	12.5	80	14.8	16.9	17.6	18	4	* 126928	

Ø" D_1 NPTF	P TPI	d_1 mm	l_1 mm	l_2 mm	l_s mm	d_s mm	d_2 mm		GFS6660 ID	GFS6660VS ID
1/8	27	7.3	70	9.9	11.2	10.6	12	4	* 135493	* 135494
1/4	18	9.95	80	14.8	16.4	14	16	4	* 135495	* 135496
3/8	18	12.5	80	14.8	16.9	17.6	18	4	* 135497	* 135498

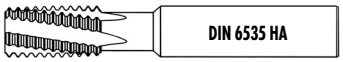


	Agujero Core hole			
			NPT NPTF	
Ø" D_1	D	D_2	D_3 (+0.05)	
1/8	8.5	8.3	8.74	8.76
1/4	11.0	10.8	11.36	11.40
3/8	14.5	14.2	14.80	14.84

Fresado Milling	
D_f	L_3
9.81	6.92
12.99	10.02
16.41	10.33

M, MF ISO DIN 13

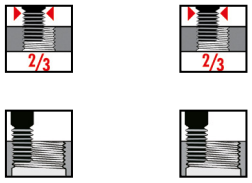
VHM CAR

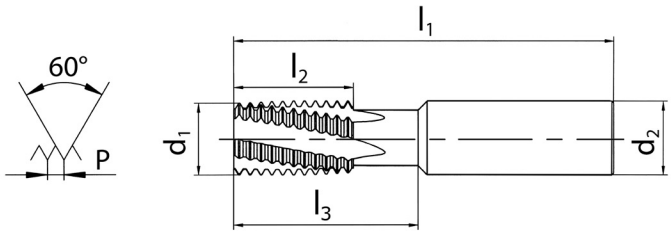


HB HE sur demande auf Anfrage on request su richiesta sobre pedido

GFM

	GFM6260	GFM6260VS
	R15	R15, VS



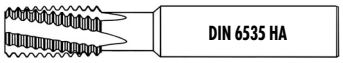


d_1 mm	P mm	Ø D_1 ≥ M, MF	l_1 mm	l_2 mm	l_3 mm	d_2 mm		ID	ID
8	0.5	10	64	16	16	8	4	● 116450	● 135260
8	0.75	10	64	15.8	16	8	4	● 116340	● 135261
10	0.75	14	70	15.8	26	10	4	✶ 116128	✶ 135262
10	1	14	70	16	26	10	4	● 118657	● 135263
10	1.25	14	70	16.3	26	10	4	✶ 118659	✶ 135264
10	1.5	14	70	16.5	26	10	4	● 118661	● 135265
12	0.5	18	80	20	32	12	4	✶ 116129	✶ 135214
12	0.75	18	80	20.3	32	12	4	● 155526	● 155527
12	1	18	80	20	32	12	4	● 118664	● 135007
12	1.5	18	80	21	32	12	4	● 118669	● 135181
12	2	18	80	20	32	12	4	● 118673	● 135269
16	1	24	90	25	42	16	4	● 118680	● 135270
16	1.5	24	90	25.5	42	16	4	● 118682	● 116017
16	2	24	90	26	42	16	4	● 118684	● 135271
16	2.5	24	90	25	42	16	4	● 118689	● 135272
16	3	24	90	27	42	16	4	● 158760	● 150564
20	1	30	105	33	52	20	5	✶ 135273	✶ 135274
20	1.5	30	105	33	52	20	5	● 118694	● 135275
20	2	30	105	34	52	20	5	● 116338	● 135276
20	3	30	105	33	52	20	5	✶ 118699	✶ 135279
20	3.5	30	105	35	52	20	5	● 144195	● 144065

UN

UNC, UNF
UNEF, UNS ASME B1.1

VHM CAR

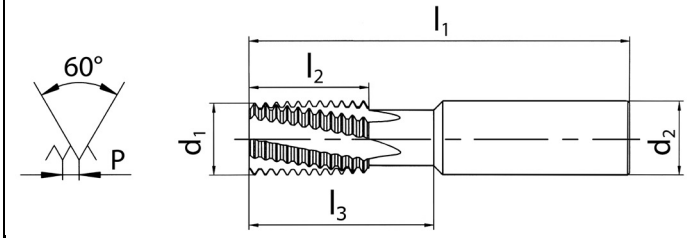


HB HE sur demande auf Anfrage on request su richiesta sobre pedido

GFM

GFM6260 R15

GFM6260VS R15 VS

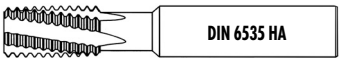


GFM6260	GFM6260VS		
			
			
			

d_1 mm	P TPI	Ø" D_1 ≥ UN	l_1 mm	l_2 mm	l_3 mm	d_2 mm		ID	ID
10	24	1/2	70	15.9	26	10	4	★ 135288	★ 135289
12	24	3/4	80	20.1	32	12	4	★ 135290	★ 135291
12	20	3/4	80	20.3	32	12	4	★ 135292	★ 135293
12	18	3/4	80	19.8	32	12	4	★ 135294	★ 135295
12	16	3/4	80	20.6	32	12	4	● 135296	● 135297
12	10	3/4	80	20.3	32	12	4	★ 150963	★ 155494
16	24	1	90	25.4	42	16	4	★ 135298	★ 135299
16	20	1	90	25.4	42	16	4	★ 135300	★ 135301
16	18	1	90	25.4	42	16	4	★ 135302	★ 135303
16	16	1	90	25.4	42	16	4	★ 135304	★ 135305
16	14	1	90	25.4	42	16	4	● 135306	● 135307
16	12	1	90	25.4	42	16	4	● 135308	● 135309
16	9	1	90	25.4	42	16	4	★ 150964	★ 155495
16	8	1	90	25.4	42	16	4	★ 150965	★ 155496
20	24	1 1/4	105	32.8	52	20	5	★ 135310	★ 135311
20	20	1 1/4	105	33	52	20	5	★ 135312	★ 135313
20	18	1 1/4	105	32.5	52	20	5	★ 135314	★ 135315
20	16	1 1/4	105	33.4	52	20	5	★ 118697	★ 135316
20	14	1 1/4	105	32.7	52	20	5	★ 135317	★ 135318
20	12	1 1/4	105	31.8	52	20	5	★ 135319	★ 135320
20	8	1 1/4	105	31.8	52	20	5	★ 135321	★ 135322
20	7	1 1/4	105	32.7	52	20	5	★ 150962	★ 155497

G DIN EN ISO 228 (BSP)

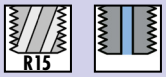
VHM CAR



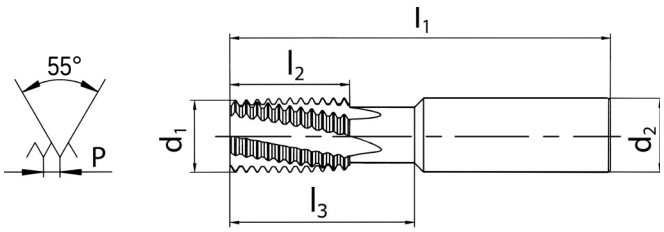
HB HE sur demande auf Anfrage on request su richiesta sobre pedido

GFM

	GFM6260	GFM6260VS		
				
				

GFM6260 

GFM6260VS 

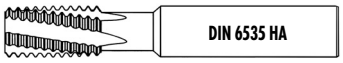


d_1 mm	P TPI	Ø" D_1 G	l_1 mm	l_2 mm	l_3 mm	d_2 mm		GFM6260 ID	GFM6260VS ID
10	**19**	1/4-3/8	70	16	26	10	4	● **118655**	● **135280**
16	**14**	1/2-7/8	90	25.4	42	16	4	● **118678**	● **135281**
20	**11**	≥ 1	105	32.3	52	20	5	● **118691**	● **135282**

NPT, NPTF

ASME B1.20.1
ANSI B1.20.3

VHM CAR



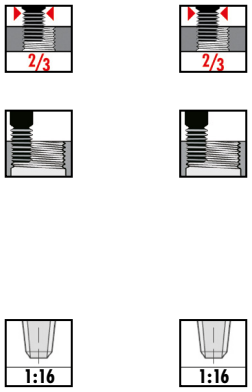
HB HE

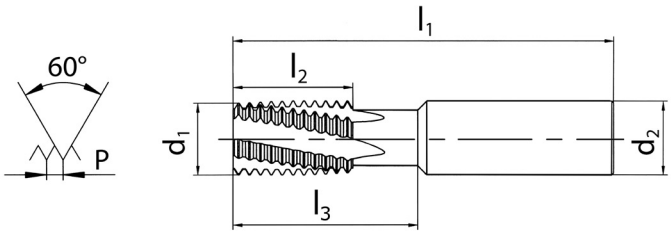
sur demande
auf Anfrage
on request
su richiesta
sobre pedido

GFM

GFM6260 R15

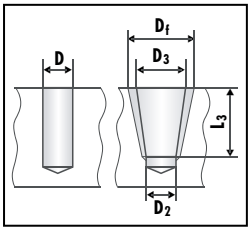
GFM6260VS R15 VS





d_1 mm	P TPI	Ø" D_1 ≥ NPT	l_1 mm	l_2 mm	d_2 mm		GFM6260 ID	GFM6260VS ID
14.5	14	1/2	90	19.1	16	4	● 135323	● 135324
18.5	11.5	1	90	23.2	20	5	● 135325	● 135326

d_1 mm	P TPI	Ø" D_1 ≥ NPTF	l_1 mm	l_2 mm	d_2 mm		GFM6260 ID	GFM6260VS ID
14.5	14	1/2	90	19.1	16	4	✱ 135327	✱ 135328
18.5	11.5	1	90	23.2	20	5	✱ 135329	✱ 135330



	Agujero / Core hole				Fresado / Milling	
			NPT NPTF			
Ø" D_1	D	D_2	D_3 (+0.05)		D_f	L_3
1/2	17.9	17.5	18.32	18.33	20.37	13.57
3/4	23.2	22.8	23.67	23.68	25.69	14.05
1	29.0	28.6	29.69	29.72	32.18	16.79
1 1/4	37.7	37.3	38.45	38.48	40.90	17.30
1 1/2	44.0	43.5	44.52	44.55	49.67	17.30
2	56.0	55.5	56.56	56.59	58.99	17.70

M ISO DIN 13

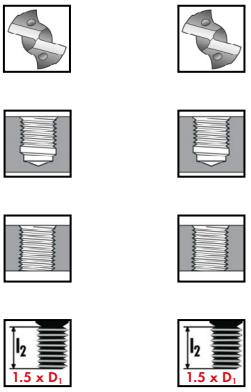
VHM CAR

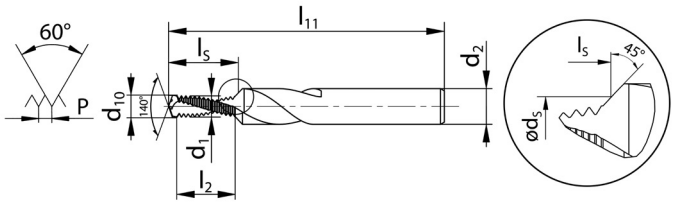
HB HE sur demande auf Anfrage on request su richiesta sobre pedido

BGF

BGF6760 R27 45°

BGF6760VS R27 45° VS





Ø D1 M	P mm	d1 mm	d10 mm	l11 mm	l2 mm	ls mm	ds mm	d2 mm		BGF6760 ID	BGF6760VS ID
4	0.7	3.1	3.3	48	5.6	7.4	4.1	6	2	* 153400	* 153415
5	0.8	4	4.2	54	7.2	9.4	5.1	6	2	* 153401	* 153416
6	1	4.75	5	62	9	11.7	6.2	8	2	* 153402	* 153417
8	1.25	6.5	6.75	74	11.2	14.6	8.2	10	2	* 151911	* 153418
10	1.5	8.25	8.5	80	15	19.1	10.3	12	2	* 153403	* 151442
12	1.75	9.95	10.25	90	17.4	22.1	12.3	14	2	* 153404	* 153419
14	2	11.6	12	102	19.9	25.1	14.4	16	2	* 153405	* 153420
16	2	13.6	14	102	23.9	29.5	16.4	18	2	* 153406	* 153421

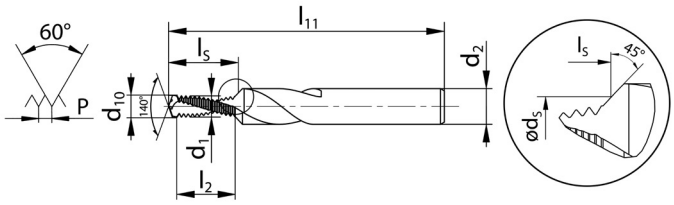
M ISO DIN 13

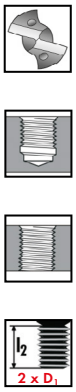
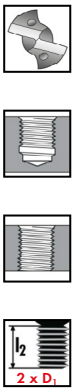
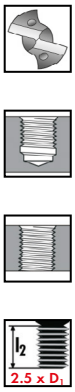
VHM CAR

HB HE sur demande auf Anfrage on request su richiesta sobre pedido

BGF

BGF6765	R27	45°		
BGF6765VS	R27	45°		VS
BGF6766	R27	45°		
BGF6766VS	R27	45°		VS



BGF6765	BGF6765VS	BGF6766	BGF6766VS
			
			

Ø D_1 M	P mm	d_1 mm	d_{10} mm	l_{11} mm	l_2 mm	l_s mm	d_s mm	d_2 mm		ID	ID
4	0.7	3.1	3.3	48	7.7	9.5	4.1	6	2	★ 153430	★ 153442
5	0.8	4	4.2	54	9.6	11.8	5.1	6	2	★ 151305	★ 151306
6	1	4.75	5	62	12	14.7	6.2	8	2	★ 150933	★ 151776
8	1.25	6.5	6.75	74	15	18.4	8.2	10	2	★ 153431	★ 150588
10	1.5	8.25	8.5	80	19.4	23.6	10.3	12	2	★ 153432	★ 150589
12	1.75	9.95	10.25	90	22.7	27.3	12.3	14	2	★ 153433	★ 150927
14	2	11.6	12	102	27.9	33.1	14.4	16	2	★ 153434	★ 153443
16	2	13.6	14	102	31.9	37.5	16.4	18	2	★ 153435	★ 151324

Ø D_1 M	P mm	d_1 mm	d_{10} mm	l_{11} mm	l_2 mm	l_s mm	d_s mm	d_2 mm		ID	ID
6	1	4.75	5	62	15	17.7	6.2	8	2	● 153451	● 153467
8	1.25	6.5	6.75	74	20	23.4	8.2	10	2	● 153452	● 153468
10	1.5	8.25	8.5	80	23.9	28.1	10.3	12	2	★ 153453	★ 153469
12	1.75	9.95	10.25	90	29.7	34.3	12.3	14	2	★ 153454	★ 153470
14	2	11.6	12	102	35.9	41.1	14.4	16	2	★ 153455	★ 153471
16	2	13.6	14	102	39.9	45.5	16.4	18	2	★ 153456	★ 153472

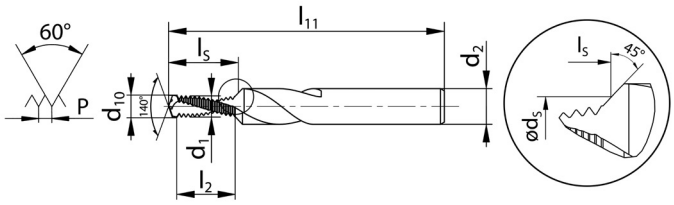
M ISO DIN 13

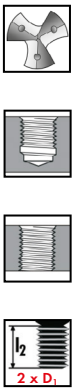
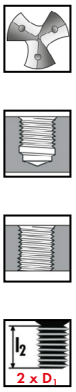
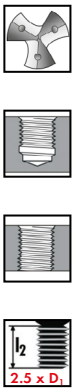
VHM CAR

HB HE sur demande auf Anfrage on request su richiesta sobre pedido

BGF

BGF6865	R27	45°		
BGF6865VS	R27	45°		VS
BGF6866	R27	45°		
BGF6866VS	R27	45°		VS



BGF6865	BGF6865VS	BGF6866	BGF6866VS
			
			

Ø D_1 M	P mm	d_1 mm	d_{10} mm	l_{11} mm	l_2 mm	l_s mm	d_s mm	d_2 mm		ID	ID
6	1	4.75	5	62	12	14.7	6.2	8	3	* 153577	* 153589
8	1.25	6.5	6.75	74	15	18.4	8.2	10	3	* 153578	* 153590
10	1.5	8.25	8.5	80	19.4	23.6	10.3	12	3	* 153579	* 153591
12	1.75	9.95	10.25	90	22.7	27.3	12.3	14	3	* 153580	* 153592
14	2	11.6	12	102	27.9	33.1	14.4	16	3	* 153581	* 153593
16	2	13.6	14	102	31.9	37.5	16.4	18	3	* 153582	* 153594

Ø D_1 M	P mm	d_1 mm	d_{10} mm	l_{11} mm	l_2 mm	l_s mm	d_s mm	d_2 mm		ID	ID
6	1	4.75	5	62	15	17.7	6.2	8	3	* 153601	* 153613
8	1.25	6.5	6.75	74	20	23.4	8.2	10	3	* 153602	* 153614
10	1.5	8.25	8.5	80	23.9	28.1	10.3	12	3	* 153603	* 153615
12	1.75	9.95	10.25	90	29.7	34.3	12.3	14	3	* 153604	* 153616
14	2	11.6	12	102	35.9	41.1	14.4	16	3	* 153605	* 153617
16	2	13.6	14	102	39.9	45.5	16.4	18	3	* 153606	* 153618

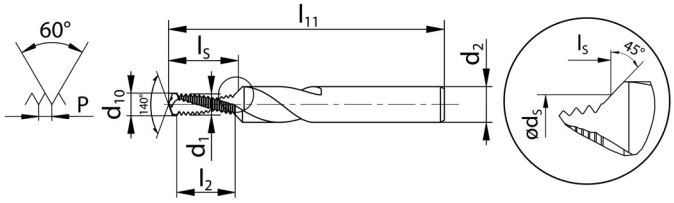
MF ISO DIN 13

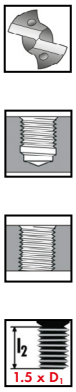
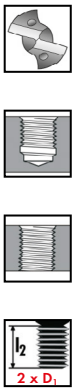
VHM CAR

HB HE sur demande auf Anfrage on request su richiesta sobre pedido

BGF

BGF6760	R27	45°		
BGF6760VS	R27	45°		VS
BGF6765	R27	45°		
BGF6765VS	R27	45°		VS



BGF6760	BGF6760VS	BGF6765	BGF6765VS
			
			

Ø D_1 MF	P mm	d_1 mm	d_{10} mm	l_{11} mm	l_2 mm	l_s mm	d_s mm	d_2 mm		ID	ID
6	0.75	5	5.25	62	9	11.4	6.2	8	2	* 153759	* 153780
8	1	6.75	7	74	12	15	8.2	10	2	* 153761	* 153782
10	1	8.75	9	80	15	18.5	10.3	12	2	* 153762	* 153783
12	1	10.7	11	90	18	21.9	12.3	14	2	* 153764	* 153785
12	1.5	10.2	10.5	90	17.9	22.5	12.3	14	2	* 153765	* 153786
14	1.5	12.1	12.5	102	20.9	26	14.4	16	2	* 153766	* 153787
16	1.5	14.1	14.5	102	23.9	29.4	16.4	18	2	* 153767	* 153788

Ø D_1 MF	P mm	d_1 mm	d_{10} mm	l_{11} mm	l_2 mm	l_s mm	d_s mm	d_2 mm		ID	ID
6	0.75	5	5.25	62	12	14.4	6.2	8	2	* 153802	* 153824
8	1	6.75	7	74	16	19	8.2	10	2	* 153804	* 153826
10	1	8.75	9	80	20	23.5	10.3	12	2	* 153805	* 153827
12	1	10.7	11	90	24	27.9	12.3	14	2	* 153807	* 153829
12	1.5	10.2	10.5	90	23.9	28.5	12.3	14	2	* 153808	* 153830
14	1.5	12.1	12.5	102	26.9	32	14.4	16	2	* 153809	* 153831

Directorio - Tampones de roscas y calibres anillos de roscas
Directory - Screw thread plug and ring gauges

Tipo Type		D5701-1	D5701-2	D5703		D5720	D5722	D5725
Características Characteristics								
								
M 6H / 6g	ISO DIN 13	138	138	138				
M 6G / 6e	ISO DIN 13			138				
M 6H / 6g LH	ISO DIN 13			138				
MF 6H / 6g	ISO DIN 13	140-141	141	140-141				
MF 6G / 6e	ISO DIN 13			140				
MF 6H / 6g LH	ISO DIN 13			140				
UNC	ASME B1.1	144		144				
UNF	ASME B1.1	145		145				
UNEF	ASME B1.1			145				
NPT	ASME B1.20.1					147		
NPTF	ANSI B1.20.3					147		
G (BSP)	DIN EN ISO 228	146	146	146				
PG	DIN 40430							146
EG M	ISO DIN 8140			148				
EG UNC	NASM 33537			148				
EG UNF	NASM 33537			148				

D5704	D5714	D5721	D5723
			
139	139		
139	139		
139			
142-143	142-143		
142			
144	144		
145	145		
145	145		
		147	
		147	
146	146		
146			

Pictogramas - Pictographs

"Pasa"
"Go"

"No pasa"
"No-Go"

"Pasa" / "No pasa"
"Go" / "No-Go"

6H — *Tolerancia 6H, "Pasa"*
Tolerance 6H, "Go"

6G — *Tolerancia 6G, "Pasa" / "No pasa"*
Tolerance 6G, "Go" / "No-Go"

6g — *Tolerancia 6g, "No pasa"*
Tolerance 6g, "No-Go"

LH — *Rosca izquierda*
Left-hand thread

Calibres de entrega inmediata sin certificado de control.

Sobre pedido, los calibres pueden ser entregados con certificado en breve, servicio de pago.

Para nuevos calibres de roscar / Incertidumbre de medida U95.

Al certificar, los calibres son marcados con el n° de identificación de los certificados correspondientes.

Thread gauges available from stock without test certificate.

However, all gauges can be delivered in short time with test certificate on request, price for the certificate on request.

For new ordered thread gauges / Measuring uncertainty U95.

All "certified" thread gauges will be marked with the identity number of the corresponding test certificate.

M ISO DIN 13
DIN ISO 1502

D5701-1 M1 - M1.4 = 5H

D5703 M1 - M1.4 = 5H

Ø d_1 M	P mm	D5701-1 6H ID	D5701-2 6H ID	D5703 6H ID	D5703 LH 6H ID	D5703 6G ID
1	0.25			● 100242		
1.1	0.25			● 100243		
1.2	0.25			● 100244		
1.4	0.3			● 100245		
1.6	0.35			● 100246		
1.7	0.35			● 100247		
1.8	0.35			● 100248		
2	0.4			● 100278	● 105159	● 104982
2.2	0.45			● 100280		
2.3	0.4			● 100281		
2.5	0.45			● 100283	● 105160	● 104979
2.6	0.45			● 100285		
3	0.5			● 100310	● 104964	● 104976
3.5	0.6			● 100312		● 104977
4	0.7			● 100333	● 104966	● 104978
4.5	0.75	* 100114				
5	0.8			● 100348	● 104967	● 104980
6	1			● 100363	● 104968	● 104981
7	1			● 100369	* 110186	
8	1.25			● 100373	● 104969	● 104983
9	1.25			● 100375		
10	1.5			● 100253	● 104970	● 104984
11	1.5			* 100256		
12	1.75			● 100261	● 104971	● 104985
14	2	* 100045		● 100266		● 104986
16	2			● 100271	● 104973	● 104987
18	2.5	* 100055		● 100276		* 104988
20	2.5	* 100068		● 100289	● 104975	● 104989
22	2.5	* 100072		● 100293	* 110178	
24	3	* 100076		● 100297	● 110179	
27	3			● 100305		
30	3.5			● 100316		
33	3.5	* 100101		● 100322		
36	4	* 100107		● 100328		
39	4	* 100109		● 100330		
42	4.5	● 100119	● 142843			
45	4.5	● 100122	● 142844			
48	5	● 100125	● 142845			
52	5	● 100132	● 142846			
56	5.5	● 100137	● 142847			

M ISO DIN 13
DIN ISO 1502

D5704 M1 - M1.4 = 6h

D5714 M1 - M1.4 = 6h

		D5704	D5704 LH	D5704	D5714	D5714
						
		6g	6g LH	6e	6g	6e
Ø d_1 M	P mm	ID	ID	ID	ID	ID
1	0.25	● 100480			● 110419	
1.2	0.25	● 100481			● 110420	
1.4	0.3	● 100482			● 110421	
1.6	0.35	● 100483			● 110422	
1.7	0.35	● 100484			● 111439	
1.8	0.35	● 100485			● 110423	
2	0.4	● 100515	● 105006		● 100734	
2.2	0.45	● 100517			● 100735	
2.3	0.4	● 100518			● 100736	
2.5	0.45	● 100520			● 100737	
2.6	0.45	● 100522			● 100738	
3	0.5	● 100547	● 105001		● 100763	
3.5	0.6	● 100549	● 110302	✶ 110301	● 100765	✶ 142836
4	0.7	● 100570	● 105003		● 100774	
5	0.8	● 100585	● 105004	✶ 104993	● 100778	✶ 143406
6	1	● 100600	● 105005	✶ 104994	● 100781	✶ 135556
7	1	● 100605		✶ 104995	● 100783	
8	1.25	● 100611	● 105007		● 100786	
9	1.25	● 100610			● 100788	
10	1.5	● 100490	● 105008		● 100711	✶ 142842
11	1.50				✶ 100713	
12	1.75	● 100498	● 105009		● 100718	
14	2	● 100503	● 105010		● 100723	
16	2	● 100508	● 105011	✶ 105000	● 100728	
18	2.5	● 100513	● 105012		● 100733	
20	2.5	● 100526	● 105013		● 100742	
22	2.5	● 100530	● 110298		● 100746	
24	3	● 100534			● 100750	
27	3	● 100542			● 100758	
30	3.5	● 100553			● 100769	
33	3.5	✶ 100559			✶ 100770	
39	4				✶ 110440	
45	4.5				✶ 110448	
56	5.5	✶ 100595			✶ 110461	

MF ISO DIN 13
DIN ISO 1502

		D5701-1	D5703	D5703 LH	D5703		
							
		6H	6H	6H LH	6G		
Ø d_1 MF	P mm	ID	ID	ID	ID		
2.5	0.35		● 100282				
3	0.35		● 100309				
4	0.35		● 100331				
4	0.5		● 100332				
5	0.5		● 100347	● 105016	● 105045		
6	0.5	* 100140	● 100361	● 110184			
6	0.75		● 100362		● 105046		
7	0.5		● 100367				
7	0.75	* 100147	● 100368				
8	0.5	* 100149	● 100370				
8	0.75		● 100371	● 105018	● 105047		
8	1	* 100151	● 100372	● 105019	● 105048		
9	1		● 100374				
10	0.5		● 100249				
10	0.75		● 100250				
10	1		● 100251	● 105020	● 105049		
10	1.25	* 100031	● 100252				
11	1	* 100034	● 100255				
12	0.75	* 100036	● 100257				
12	1		● 100258	● 105021	● 105050		
12	1.25		● 100259				
12	1.5		● 100260	● 105022			
14	1		● 100263	● 110171			
14	1.25		● 100264				
14	1.5		● 100265	● 105023	● 105052		
15	1		● 100267				
15	1.5		● 100268				
16	1		● 100269	● 110172			
16	1.5		● 100270	● 105024	● 105053		
17	1		● 100272				
18	1		● 100273				
18	1.5		● 100274	● 105025	● 105054		
18	2	* 100054	● 100275				
20	1	* 100065	● 100286				
20	1.5		● 100287	● 105026			
20	2	* 100067	● 100288		* 110176		
22	1		● 100290				
22	1.5		● 100291	● 110177			
22	2		● 100292				
24	1		● 100294				
24	1.5		● 100295				
24	2		● 100296				

MF ISO DIN 13 DIN ISO 1502

		D5701-1	D5701-2	D5703			
							
		6H	6H	6H			
Ø d_1 MF	P mm	ID	ID	ID			
25	1			● 100298			
25	1.5			● 100299			
25	2			● 100300			
26	1			● 100301			
26	1.5	* 100081		● 100302			
27	1.5	* 100082		● 100303			
27	2	* 100083		● 100304			
28	1			● 100306			
28	1.5	* 100086		● 100307			
28	2	* 100087		● 100308			
30	1	* 100092		● 100313			
30	1.5			● 100314			
30	2			● 100315			
32	1			● 100317			
32	1.5			● 100318			
32	2			● 100319			
33	1.5			● 100320			
33	2			● 100321			
35	1.5			● 100323			
36	1.5			● 100325			
36	2			● 100326			
36	3			● 100327			
38	1.5	* 100108		● 100329			
40	1.5			● 100336			
40	2			● 100337			
42	1.5	● 100117	● 142848				
42	2	● 100118	● 142849				
45	1.5	● 100120	● 110127				
45	2	● 100121	● 142851				
48	1.5	● 100123	● 123180				
48	2	● 100124	● 142853				
50	1.5	● 100128	● 142854				
50	2	● 100129	● 142855				
52	1.5	● 100130	● 123428				
52	2	● 100131	● 142857				
55	1.5		● 123468				
55	2	● 100134	● 142859				
56	1.5	● 100135	● 142860				
56	2	● 100136	● 142861				
58	1.5	● 100138	● 142862				
58	2	● 100139	● 142863				
60	1.5	● 100143	● 142864				
60	2	● 100144	● 142865				

MF ISO DIN 13 DIN ISO 1502

	D5704	D5704 LH	D5714			
						
	6g	6g LH	6g			
Ø d_1 MF	P mm	ID	ID	ID		
2.5	0.35	● 100519		● 110427		
3	0.35	● 100546		● 100762		
3.5	0.35	● 100548		● 100764		
4	0.35	● 100568		● 100772		
4	0.5	● 100569		● 100773		
4.5	0.5	● 100571		● 100775		
5	0.5	● 100584	● 105057	● 100777		
6	0.5	● 100598	● 110307	● 100779		
6	0.75	● 100599	● 105058	● 100780		
7	0.5	● 100603		● 110467		
7	0.75	● 100604		● 100782		
8	0.5	● 100606				
8	0.75	● 100607	* 105059	● 100784		
8	1	● 100608	● 105060	● 100785		
9	1	● 100609		● 100787		
10	0.5	● 100486		● 100707		
10	0.75	● 100487		● 100708		
10	1	● 100488	● 105061	● 100709		
10	1.25	● 100489		● 100710		
11	1	● 100492		● 100712		
12	0.75	● 100494		● 100714		
12	1	● 100495	● 105062	● 100715		
12	1.25	● 100496		● 100716		
12	1.5	● 100497	● 105063	● 100717		
13	1	● 100499		● 100719		
14	1	● 100500	● 110290	● 100720		
14	1.25	● 100501		● 100721		
14	1.5	● 100502	● 105064	● 100722		
15	1	● 100504		● 100724		
15	1.5	● 100505		● 100725		
16	1	● 100506	● 110292	● 100726		
16	1.5	● 100507	● 105065	● 100727		
17	1	● 100509		● 100729		
18	1	● 100510		● 100730		
18	1.5	● 100511	● 105066	● 100731		
20	1	● 100523	● 110295	● 100739		
20	1.5	● 100524	● 105067	● 100740		
20	2	● 100525		● 100741		
22	1	● 100527		● 100743		
22	1.5	● 100528		● 100744		
22	2	● 100529		● 100745		
24	1	● 100531		● 100747		
24	1.5	● 100532		● 100748		
24	2	● 100533				

MF ISO DIN 13
DIN ISO 1502

		D5704	D5714				
							
		6g	6g				
Ø d_1 MF	P mm	ID	ID				
25	1	● 100535					
25	1.5	● 100536					
26	1	● 100538					
26	1.5	● 100539					
27	1.5	● 100540					
27	2	● 100541	* 100757				
28	1	● 100543					
28	1.5	● 100544	* 100760				
30	1	● 100550					
30	1.5	● 100551					
30	2	● 100552					
32	1	● 100554					
32	1.5	● 100555					
32	2	● 100556					
33	1.5	● 100557					
33	2	● 100558	* 110433				
35	1.5	● 100560					
36	1.5	● 100562					
36	2	● 100563					
36	3	● 100564					
38	1.5	● 100566					
40	1.5	● 100573					
42	1.5	● 100575					
42	2	● 100576					
45	1.5	● 100578					
45	2	● 100579					
48	1.5	● 100581	* 110449				
48	2	● 100582					
50	1.5	● 100586					
50	2	● 100587	* 110453				
52	1.5		* 110454				
52	2	● 100589					
55	1.5	● 100591					
55	2	● 100592	* 110458				
56	1.5	● 100593	* 110459				
56	2		* 110460				
58	1.5	● 100596					
58	2	● 100597	* 110463				
60	1.5	● 100601					
60	2	● 105014					

UNC ASME B1.1
ANSI / ASME B1.2

		D5701-1	D5703	D5704	D5714		
							
		2B	2B	2A	2A		
Ø" d_1 UNC	P TPI	ID	ID	ID	ID		
1	64		● 100408	● 110347	● 110473		
2	56		● 100414	● 110353	● 110479		
3	48		● 100416				
4	40	★ 110080	● 110224	●110357	● 110483		
5	40		● 100420				
6	32	★ 110084	● 100423	●110361	● 110487		
8	32		● 100426	●110364	● 110490		
10	24	★ 110074	● 100412	●110351	● 110477		
12	24		● 100413				
1/4	20		● 100410	● 110349	● 110475		
5/16	18	★ 110082	● 100421	● 110359	● 110485		
3/8	16	★ 110079	● 100418	● 110356	● 110482		
7/16	14	★ 110085	● 100424	● 110362	● 110488		
1/2	13	★ 110071	● 100409	● 110348	● 110474		
9/16	12		● 100427	● 110365	★ 110491		
5/8	11		● 100422	● 110360			
3/4	10	★ 110078	● 100417	● 110355	★ 110481		
7/8	9		● 100425	● 110363	★ 110489		
1	8	★ 110073	● 100411	● 110350	★ 110476		
1 1/8	7	★ 110068	● 100405	★ 110345	★ 110471		
1 1/4	7	★ 110067	● 100404	★ 110344	★ 110470		
1 3/8	6	★ 110069	● 100407	★ 110346	★ 110472		
1 1/2	6	★ 110066	● 100403	★ 110343	★ 110469		

UNF, UNEF

ASME B1.1
ANSI / ASME B1.2

		D5701-1	D5703	D5704	D5714		
							
		2B	2B	2A	2A		
Ø" d_1 UNF	P TPI	ID	ID	ID	ID		
0	80		● 110246				
1	72		● 110251	● 110383	● 110508		
2	64		● 110256	● 110389	● 110514		
3	56		● 110257	● 110390	● 110515		
4	48		● 110260	● 110393	● 110518		
5	44	★ 110116					
6	40		● 110264				
8	36	★ 110122	● 110267				
10	32		● 110254	● 110387	● 110512		
12	28		● 110255	● 110388	● 110513		
1/4	28	★ 110107	● 110006	● 110385	● 110510		
5/16	24	★ 110117	● 110262	● 110395	● 110520		
3/8	24	★ 110114	● 110259	● 110392	● 110517		
7/16	20	★ 110120	● 110265	● 110398	● 111440		
1/2	20	★ 110106	● 110252	● 110384	● 110509		
9/16	18		● 110268	● 110401			
5/8	18		● 110263	● 110396			
3/4	16		● 110258	● 110391			
7/8	14		● 110266	● 110399			
1	12		● 128646	● 110386			
1 1/8	12	★ 110103	● 110249	● 110381			
1 1/4	12		● 110248	● 110380	★ 110505		
1 3/8	12	★ 110104	● 110250		★ 110507		
1 1/2	12		● 110247	● 110379			
Ø" d_1 UNEF	P TPI		ID	ID	ID		
12	32		● 110238				
1/4	32		● 110236	● 110368	● 110493		
5/16	32		● 110241	● 110373	● 110498		
3/8	32		● 110240	● 110372	● 110497		
7/16	28		● 110243	● 110375	● 110500		
1/2	28		● 110235	● 110367	● 110492		
9/16	24		● 110245	● 110377	● 110502		
5/8	24		● 110242	● 110374	● 110499		
3/4	20		● 110239	● 110371	● 110496		
7/8	20		● 110244		★ 110501		
1	20		● 110253	● 110369	● 110494		

G DIN EN ISO 228 (BSP) DIN EN ISO 228-2

PG DIN 40430 DIN 40431

Ø" d_1 G	P TPI	D5701-1	D5701-2	D5703	D5704	D5714	D5725
							
							
		ID	ID	ID	ID	ID	
1/8	28	✶ 110044		● 110009	● 110277	● 110408	
1/4	19			● 110003	● 110276	● 110407	
3/8	19	✶ 110052		● 110162	● 110284	● 110415	
1/2	14			● 110001	● 110275	● 110406	
5/8	14			● 110164	● 110286	● 110417	
3/4	14			● 110161	● 110283	● 110414	
7/8	14	✶ 110054		● 110165			
1	11			● 110156	● 110278	● 110409	
1 1/8	11			● 110154		✶ 110404	
1 1/4	11	● 110041	● 119459		● 110272		
1 1/2	11	● 110040	● 119429		● 110271		
1 3/4	11	● 110043	● 142868		● 110274	✶ 110405	
2	11	● 110050	● 110126		● 110282		
2 1/4	11					✶ 110411	
2 1/2	11		✶ 110125				
2 3/4	11					✶ 110412	

Ø d_1 PG	P TPI	ID	ID
7	20		● 110216
9	18		● 110217
11	18		● 110205
13.5	18		● 110209
16	18	✶ 110330	● 110210
21	16	✶ 110331	● 110211
29	16		● 110212

NPT ASME B1.20.1
ASME B1.20.1

NPTF ANSI B1.20.3
ASA B2.2

		D5720	D5721				
							
							
Ø" d_1 NPT	P TPI	ID	ID				
1/16	27	● 110190	● 110313				
1/8	27	● 110193	● 110316				
1/4	18	● 110192	● 110315				
3/8	18	● 110197	● 110320				
1/2	14	● 110191	● 110314				
3/4	14	● 110196	● 110319				
1	11.5	● 110194	● 110317				
1 1/4	11.5	● 110189	● 110312				
1 1/2	11.5	● 110188	● 110311				
2	11.5	● 110195	● 110318				
Ø" d_1 NPTF	P TPI	ID	ID				
1/8	27	● 110201					
1/4	18	● 110200	* 110323				
3/8	18	● 110204					
1/2	14	● 110199	* 110322				
3/4	14	● 110203	* 110326				
1	11.5	● 110202	* 110325				

EG M ISO DIN 8140-2 DIN ISO 1502 EG UNC, EG UNF NASM 33537 ~ ISO 1502

		D5703	D5703	D5703			
							
		6H$_{mod}$	3B	3B			
Ø d_1 EG M	P mm	ID					
2.5	0.45	● 110132					
3	0.5	● 110133					
4	0.7	● 110134					
5	0.8	● 110135					
6	1	● 110136					
8	1.25	● 110137					
10	1.5	● 110128					
12	1.75	● 110129					
16	2	● 110131					
Ø" d_1 EG UNC	P TPI		ID				
4	40		● 170252				
6	32		● 170253				
8	32		● 170254				
10	24		● 170255				
1/4	20		● 170256				
5/16	18		● 170257				
3/8	16		● 170258				
Ø" d_1 EG UNF	P TPI			ID			
6	40			● 170259			
8	36			● 170260			
10	32			● 161020			
1/4	28			● 151790			
5/16	24			● 170261			
3/8	24			● 160134			

MUCHO MAS A DESCUBRIR

EN EL NUEVO CATÁLOGO PARA HERRAMIENTAS DE ROSCADO, DISPONIBLE A FINAL 2020

MUCH MORE TO DISCOVER

IN OUR NEW THREADING TOOL CATALOGUE AVAILABLE AT THE END OF 2020

CALIBRES PARA ROSCAS NANO — NANO THREAD GAUGES

CALIBRES TAMPÓN — THREAD PLUG GAUGES

METROLOGÍA — METROLOGY

< 2.74 mm

GO

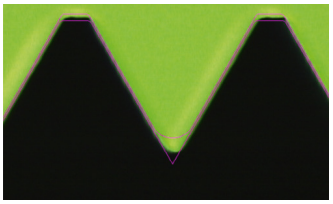
NO-GO

PRODUCCIÓN — PRODUCTION

GO

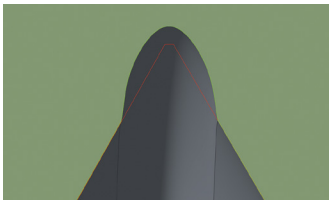
UTILIZACIÓN

El hecho de que el giro inicial de la rosca y la punta del calibrador hayan sido aplanados asegura que la herramienta se enganche óptimamente en la rosca, lo cual es esencial para garantizar una medición correcta. Eso permite al calibre de comprobar la rosca a su máxima profundidad.



CONTROL DE PERFIL

Nuestra experiencia en el campo de la rectificación nos asegura un control perfecto de las tolerancias, de la forma del perfil y la calidad superficial.



ANILLOS DE CONTROL NO PASA

El corte en el diámetro exterior de nuestros medidores de anillo NO-GO asegura que los lados del tornillo se pueden comprobar óptimamente, eliminando el riesgo de cualquier inspección incorrecta causada por un bloqueo en el diámetro exterior del medidor.

SISTEMA MODULAR

Un tornillo de acoplamiento permite conectar el calibre GO a la sección NO-GO según sea necesario. La caja rígida protege los medidores durante el transporte. Su interior moldeado mantiene el producto limpio y lo protege de los impactos.

CONTRA CALIBRES — PLUG CHECK GAUGES

El contra calibre NO-GO es el salvaguardia para el uso del calibre anillo.

The NO-GO plug check gauge is the foolproofing device for the new ring gauge.

El contra calibre GO sirve a qualificar el calibre anillo.

The GO plug check gauge is used to check the quality of your ring gauge.

En "M" el testimonio de desgaste extenderá la vida útil del calibre anillo hasta el límite de tolerancia dado por la norma.

The master plug gauge WEAR will extend the service life of your ring gauge up to a certain tolerance limit.

UTILISATION

The fact that the initial turn of the screw thread and also the tip of the gauge have been ground flat ensures that the tool engages optimally in the thread, which is essential for ensuring a correct measurement.
This enables the gauge to check the thread at its maximum depth.

PROFILE CONTROL

Our expertise in the field of rectification ensures we have perfect control of tolerances for the shape of the profile and for surface textures.

NO-GO RING GAUGE

The cut-away on the exterior diameter of our NO-GO ring gauges ensures the sides of the screw can be optimally checked, eliminating the risk of any incorrect inspection caused by a blockage on the exterior diameter of the gauge.

MODULAR SYSTEM

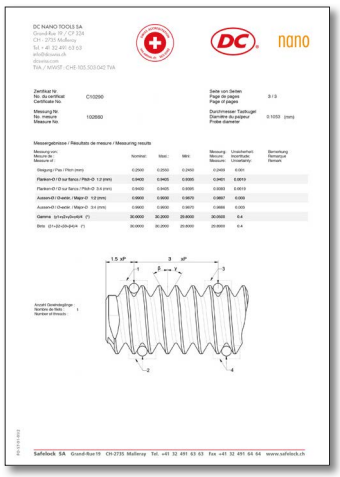
A coupling screw enables the GO gauge to be connected to the NO-GO section as required. The rigid box protects the gauges during transportation. Its moulded interior keeps the product clean and protects it from impacts.

SCS CERTIFICADO DE MEDICIÓN

Un certificado es la confirmación por escrito de la calidad del equipo metrológico de una empresa. DC NANO TOOLS SA (acreditación SCS 0143), miembro del Grupo DC SWISS, puede inspeccionar y calibrar medidores de rosca para usted de acuerdo con la norma internacional ISO 17025. Ese servicio de pago está disponible para diámetros de flanco de 0.1 à 3.0 mm, y diámetros externos de 0.1 à 3.5 mm.

La totalidad de los calibres tienen certificado SCS.

ISO 17025/2005 accredited © DC Nano Tools SA



SCS MEASUREMENT CERTIFICATE

A certificate is written confirmation of the quality of a company's metrological equipment. DC NANO TOOLS SA (SCS accreditation 0143), a member of the DC SWISS Group, can inspect and calibrate thread gauges for you in accordance with the ISO 17025 international standard.
This chargeable service is available for pitch diameters of 0.1 to 3.0 mm and external diameters of 0.1 to 3.5 mm.

All plug thread gauges are SCS certified.

ISO 17025/2005 accredited © DC NANO TOOLS SA

DESCARGUE SU CONFIRMACIÓN DE CUMPLIMIENTO

Ahora puede acceder a su confirmación de conformidad en cualquier momento, en cualquier lugar desde su teléfono. Simplemente escanee el código QR en la tarjeta acompañando la caja y descargue el archivo pdf asociado.

La confirmación de conformidad que acompaña a cada caja confirma que la calidad ha seguido escrupulosamente el proceso de seguimiento posterior a la producción.

DC SWISS SA quality control

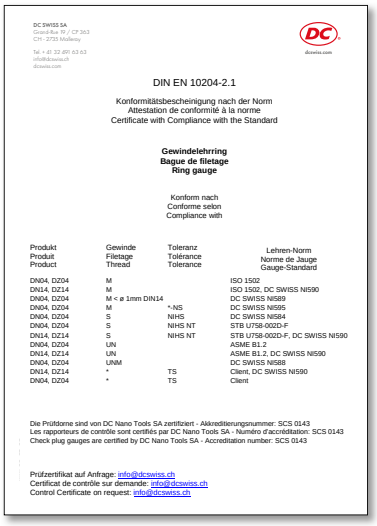
DOWNLOAD YOUR DC ATTESTATION

DOWNLOAD YOUR CONFIRMATION OF COMPLIANCE

You can now access your confirmation of compliance any time, at any place on your phone. Simply scan the QR code on the card inside the box and download the associated pdf file.

The confirmation of compliance accompanying each box confirms that the factory has scrupulously followed the post-production monitoring process.

DC SWISS SA quality control



DIN EN 10204-2.1

Konformitätsbescheinigung nach der Norm
Attestation de conformité à la norme
Certificate with Compliance with the Standard

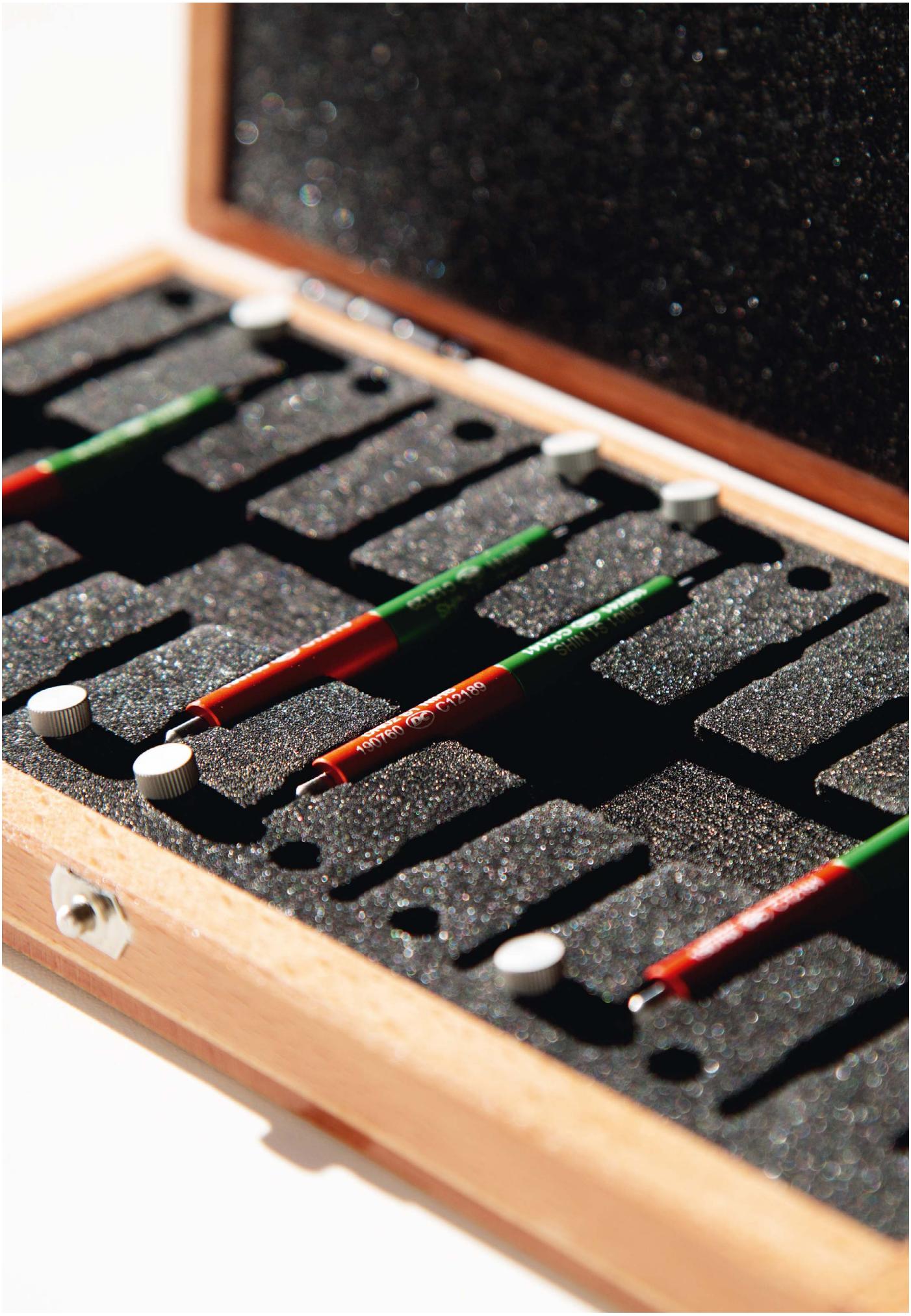
Gewindelehrring
Bague de filetage
Ring gauge

Konform nach
Conforme selon
Compliance with

Produkt / Produit / Product	Gewinde / Filetage / Thread	Toleranz / Tolérance / Tolerance	Lehren-Norm / Norme de Jauge / Gauge-Standard
DN04, DZ04	M		ISO 1502
DN14, DZ14	M		ISO 1502, DC SWISS NI590
DN04, DZ04	M < ø 1mm DIN14		DC SWISS NI589
DN04, DZ04	M	*-NS	DC SWISS NI595
DN04, DZ04	S	NIHS	DC SWISS NI584
DN04, DZ04	S	NIHS NT	STB U758-002D-F
DN14, DZ14	S	NIHS NT	STB U758-002D-F, DC SWISS NI590
DN04, DZ04	UN		ASME B1.2
DN14, DZ14	UN		ASME B1.2, DC SWISS NI590
DN04, DZ04	UNM		DC SWISS NI588
DN14, DZ14	*	TS	Client, DC SWISS NI590
DN04, DZ04	*	TS	Client

Die Prüfdorne sind von DC Nano Tools SA zertifiziert - Akkreditierungsnummer: SCS 0143
Les rapporteurs de contrôle sont certifiés par DC Nano Tools SA - Numéro d'accréditation: SCS 0143
Check plug gauges are certified by DC Nano Tools SA - Accreditation number: SCS 0143

Prüfzertifikat auf Anfrage: info@dcswiss.ch
Certificat de contrôle sur demande: info@dcswiss.ch
Control Certificate on request: info@dcswiss.ch


C12189

JUEGOS DISPONIBLES — AVAILABLE SETS

CALIBRES TAMPONES Y ANILLOS DN
THREAD PLUG GAUGES & RING GAUGES DN

JUEGO UNITARIO — SINGLE SET

CALIBRES ANILLOS DZ
THREAD RING GAUGES DZ

JUEGO UNITARIO — SINGLE SET

CALIBRES TAMPONES / ANILLOS DN
PLUG GAUGES DN / RING GAUGES DN

JUEGOS DE 10 O 20 PIEZAS
SET OF 10 OR 20 ITEMS

Para cada juego, podeis seleccionar el numero exacto de calibres GO/NO GO.

Contactarnos para sus composiciones personal.

You can select the exact number of GO / NO-GO thread gauges for each set.

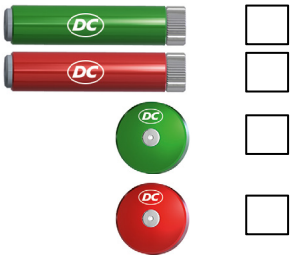
Contact us for any other set compositions.

dcswiss.com / sales@dcswiss.ch / +41 32 491 63 63

PEDIR CALIBRES NANO — NANO THREAD GAUGES ORDER

TIPO DE HERRAMIENTA — TOOL TYPE

☐
☐
☐



☐
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CARACTERÍSTICAS — CHARACTERISTICS

DIMENSIÓN DIMENSION	*TOLERANCIA* TOLERANCE	*NORMA* NORM	*CANTIDAD* QUANTITY	*ESPECIALES* SPECIFICS

OBSERVACIONES — REMARKS

INFORMACIÓN DE ENVÍO — DELIVERY INFORMATION

Por favor, dirija su pedido.
Thank you for initialing your order.

dcswiss.com / info@dcswiss.ch / +41 32 491 63 63

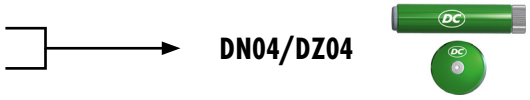
Directorio - Calibres de control NANO para micromecánica y relojeria
Directory - Thread gauges NANO for micromechanics and watchmaking

		Calibres tampon Thread plug gauges			*Calibres anillos* Thread ring gauges				*Contra calibres* Plug check gauges			
Tipo Type		DN01 GO	DN01 GO	DN02 NO-GO	DZ04 GO	DZ14 NO-GO	DN04 GO	DN14 NO-GO	RN05-1 GO	RN15-1 GO	RN05-2 NO-GO	RN15-2 NO-GO
Características Characteristics												
												
M 4H / 5h	ISO DIN 14 ISO DIN 13		158	158	164	164	169	169	174	174	179	179
M 6H / 6g	ISO DIN 13		158	158	164	164	169	169	174	174	179	179
M 5H / 6h	ISO DIN 13		158	158	164	164	169	169	174	174	179	179
MF 4H / 4h	ISO DIN 13		159	159	165	165	170	170				
MF 6H / 6g	ISO DIN 13		159	159	165	165	170	170	175	175	180	180
MF 6h	ISO DIN 13				165	165	170	170	175	175	180	180
UNC 2B / 2A	ASME B1.1		160	160	166	166	171	171	176	176	181	181
UNC 3B / 3A	ASME B1.1		160	160	166	166	171	171	176	176	181	181
UNF 2B / 2A	ASME B1.1		160	160	166	166	171	171	176	176	181	181
UNF 3B / 3A	ASME B1.1		160	160	166	166	171	171	176	176	181	181
S NIHS 3G	NIHS	161										
S NIHS 4H	NIHS		161									
S NIHS 4H / 3G	NIHS			161								
S NIHS	NIHS				167	167	172	172	177	177	182	182
S NIHS NT	NIHS		162	162	167	167	172	172	177	177	182	182
SF NIHS 3G	NIHS	163										
SF NIHS 4H	NIHS		163									
SF NIHS 4H / 3G	NIHS			163								
SF NIHS	NIHS				168	168	173	173	178	178	183	183
SF NIHS NT	NIHS								178	178	183	183
SL	SL 15-01		163	163								

		Calibres de desgáste WEAR Master plug gauges WEAR		*Patrones* Calibration thread plug gauges
Tipo **Type**		**RN05-3 WEAR**	**RN15-3 WEAR**	**EN00**
Características **Characteristics**				
				
M 4H / 5h	ISO DIN 14 ISO DIN 13			
M 6H / 6g	ISO DIN 14 ISO DIN 13	184	184	
M 5H / 6h	ISO DIN 13	184	184	
MF 4H / 4h	ISO DIN 13			
MF 6H / 6g	ISO DIN 13	185	185	
MF 6h	ISO DIN 13	185	185	
S NIHS	NIHS			186

Usar — Use

RN05-1
RN05-2



DN04/DZ04

RN15-1
RN15-2

DN14/DZ14

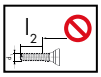
Pictogramas - Pictographs

"Pasa"
"Go"

"No pasa"
"No-Go"

6H *Tolerancia 6H, "Pasa"*
Tolerance 6H, "Go"

6g *Tolerancia 6g, "No pasa"*
Tolerance 6g, "No-Go"

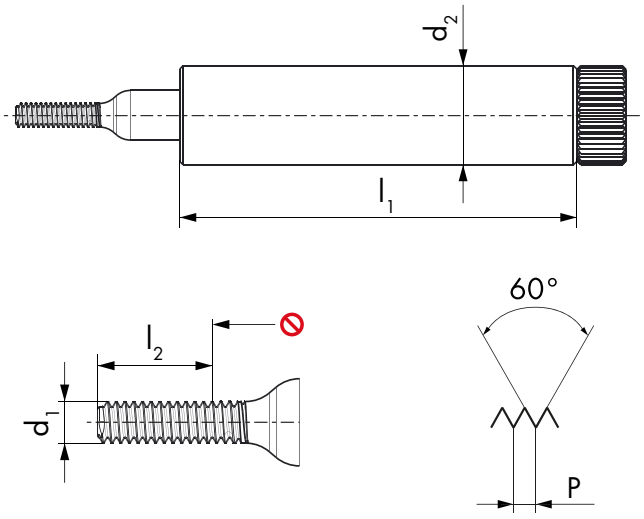


No debe superarse la longitud máxima de medición l2
Max. measuring length l2 must not be exceeded

PHYN. KL *Phynox KL*
Phynox KL

LH *Sobre pedido, todos los calibres de roscas son igualmente a la entrega para roscado a izquierda*
All gauges can be supplied with a left-hand thread upon request

nano



DN01 GO	DN02 NO-GO	DN01 GO	DN02 NO-GO
			
4H	4H	6H	6H

Ø d_1 M	P mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
0.3	0.08	24	0.9	6	● 192778	● 192786		
0.35	0.09	24	1.05	6	● 192779	● 192787		
0.4	0.1	24	1.2	6	● 192780	● 192788		
0.5	0.125	24	1.5	6	● 192781	● 192789		
0.6	0.15	24	1.8	6	● 192782	● 192790		
0.7	0.175	24	2.1	6	● 192783	● 192791		
0.8	0.2	24	2.4	6	● 192784	● 192792		
0.9	0.225	24	2.7	6	● 192785	● 192793		
1	0.25	24	3	6	● 191113	● 191127	● 191421 [1]	● 191424 [1]
1.2	0.25	24	3.6	6	● 191114	● 191128	● 191422 [1]	● 191425 [1]
1.4	0.3	24	4.2	6	● 191115	● 191129	● 191423 [1]	● 191426 [1]
1.6	0.35	24	4.5	6			● 191427	● 191433
1.8	0.35	24	4.5	6			● 191428	● 191434
2	0.4	24	4.5	6			● 191429	● 191435
2.3	0.4	24	4.5	6			● 191430	● 191436
2.5	0.45	24	4.5	6			● 191431	● 191437
2.6	0.45	24	4.5	6			● 191432	● 191438

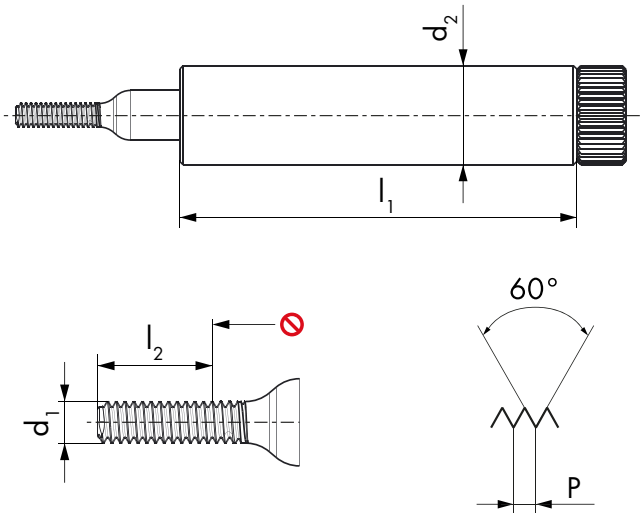
[1] Tol. 5H

All nano thread plug gauges are SCS-certified and the paid certificate is available on request.

MF ISO DIN 13 ISO 1502

VHM CAR

nano



DN01 GO	DN02 NO-GO	DN01 GO	DN02 NO-GO

4H	4H	6H	6H

Ø d_1 MF	P mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
1.4	0.2	24	4.2	6	● 191116	● 191130		
1.6	0.2	24	3	6	● 191117	● 191131		
1.8	0.2	24	3	6	● 191118	● 191132		
2	0.2	24	3	6	● 191119	● 191133		
2	0.25	24	3	6	● 192794	● 192797		
2.2	0.2	24	3	6	● 191120	● 191134		
2.2	0.25	24	3	6	● 191121	● 191135		
2.3	0.2	24	3	6	● 191122	● 191136		
2.3	0.25	24	3	6	● 191123	● 191137		
2.5	0.2	24	3	6	● 191124	● 191138		
2.5	0.25	24	3	6	● 191125	● 191139		
2.5	0.35	24	4.5	6			● 192795	● 192798
2.6	0.35	24	4.5	6			● 192796	● 192799

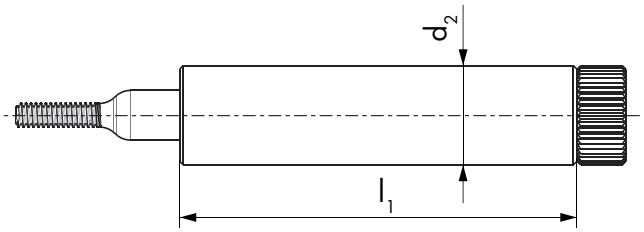
All nano thread plug gauges are SCS-certified and the paid certificate is available on request.

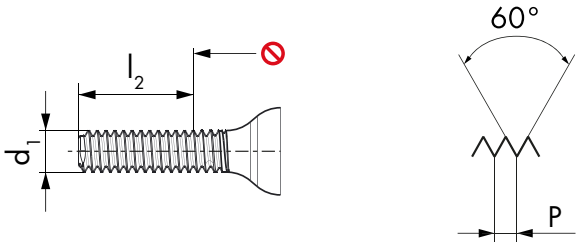
UNC, UNF

ASME B1.1
ASME B1.2

VHM CAR

nano





DN01 GO	DN02 NO-GO	DN01 GO	DN02 NO-GO
2B	2B	3B	3B

Ø d_1 UNC	P TPI	Ø d_1 mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
1	64	1.854	24	6.35	6	191577	191580	191583	191586
2	54	2.184	24	6.35	6	191578	191581	191584	191587
3	48	2.515	24	6.35	6	191579	191582	191585	191588

Ø d_1 UNF	P TPI	Ø d_1 mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
0	80	1.524	24	4.76	6	191637	191641	191645	191649
1	72	1.854	24	4.76	6	191638	191642	191646	191650
2	64	2.184	24	4.76	6	191639	191643	191647	191651
3	56	2.515	24	4.76	6	191640	191644	191648	191652

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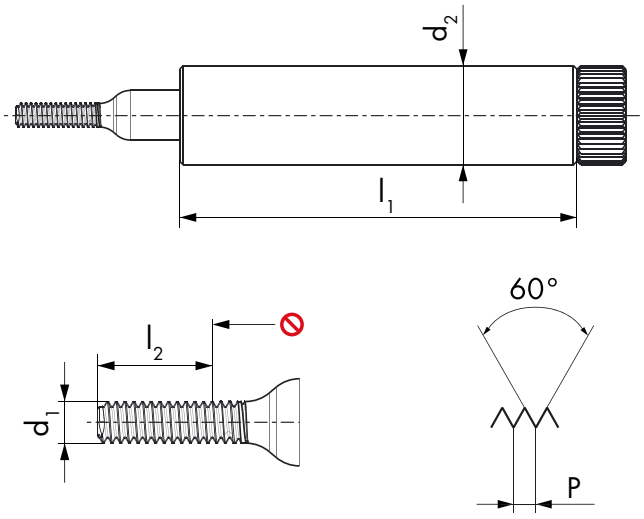
nano



DN01 GO	DN01 GO	DN02 NO-GO	

NIHS 3G | NIHS 4H | NIHS 4H/3G

Ø d_1 S	P mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID
0.3	0.08	24	0.9	6	● 190733	● 193242	● 190752
0.35	0.09	24	1.05	6	● 190734	● 193243	● 190753
0.4	0.1	24	1.2	6	● 190735	● 193244	● 190754
0.5	0.125	24	1.5	6	● 190736	● 193245	● 190755
0.6	0.15	24	1.8	6	● 190737	● 193246	● 190756
0.7	0.175	24	2.1	6	● 190738	● 193247	● 190757
0.8	0.2	24	2.4	6	● 190739	● 193248	● 190758
0.9	0.225	24	2.7	6	● 190740	● 193249	● 190759
1	0.25	24	3	6	● 190741	● 193250	● 190760
1.2	0.25	24	3.6	6	● 190742	● 193251	● 190761
1.4	0.3	24	4.2	6	● 190743	● 193252	● 190762

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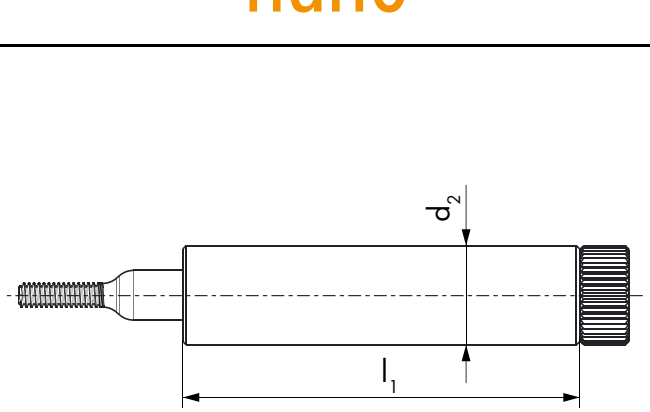
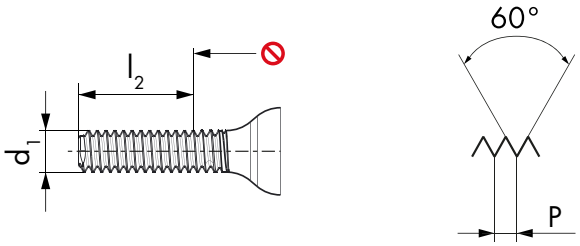
S NIHS NT
STB U758-002D-F

VHM CAR

nano

DN01 GO	DN02 NO-GO		





NIHS NT

NIHS NT

Ø d_1 S	P mm	l_1 mm	l_2 GO mm	d_2	ID	ID
0.3	0.08	24	0.9	6	● 190771	● 190790
0.35	0.09	24	1.05	6	● 190772	● 190791
0.4	0.1	24	1.2	6	● 190773	● 190792
0.5	0.125	24	1.5	6	● 190774	● 190793
0.6	0.15	24	1.8	6	● 190775	● 190794
0.7	0.175	24	2.1	6	● 190776	● 190795
0.8	0.2	24	2.4	6	● 190777	● 190796
0.9	0.225	24	2.7	6	● 190778	● 190797
1	0.25	24	3	6	● 190779	● 190798
1.2	0.25	24	3.6	6	● 190780	● 190799
1.4	0.3	24	4.2	6	● 190781	● 190800

[1] Tol. 5H

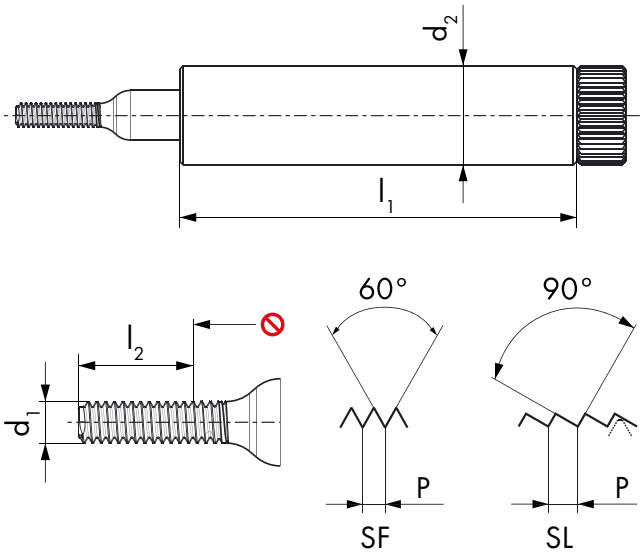
All nano thread plug gauges are SCS-certified and the paid certificate is available on request.

SF NIHS
DC SWISS NI584

SL SL 15-01
SAFELOCK NI586

VHM CAR

nano



DN01 GO	DN01 GO	DN02 NO-GO	
			
NIHS 3G	NIHS 4H	NIHS 4H/3G	

Ø d_1 SF	P mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID
1.4	0.2	24	4.2	6	● 190744	● 193256	● 190763
1.6	0.2	24	3	6	● 190745	● 193257	● 190764
1.8	0.2	24	3	6	● 190746	● 193258	● 190765
2	0.2	24	3	6	● 190747	● 193259	● 190766
2.2	0.2	24	3	6	● 190748	● 193260	● 190767
2.2	0.25	24	3	6	● 190749	● 193261	● 190768
2.5	0.2	24	3	6	● 190750	● 193262	● 190769
2.5	0.25	24	3	6	● 190751	● 193263	● 190770

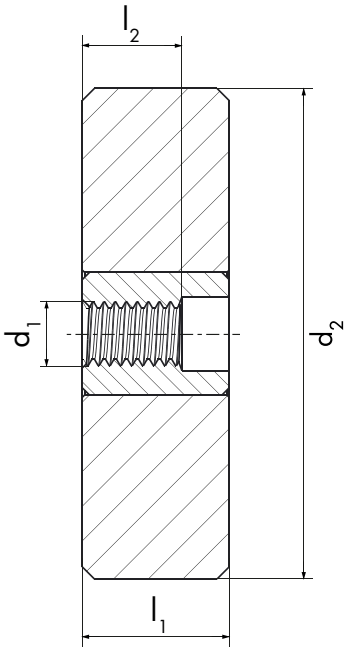
Ø d_1 SL	P mm	l_1 mm	l_2 GO mm	d_2	ID	ID
0.5	0.1	24	1.5	6	● 600178	● 600186
0.6	0.125	24	1.8	6	● 600179	● 600187
0.7	0.15	24	2.1	6	● 600180	● 600188
0.8	0.15	24	2.4	6	● 600181	● 600189
0.9	0.175	24	2.7	6	● 600182	● 600190
1	0.2	24	3	6	● 600183	● 600191
1.2	0.2	24	3.6	6	● 600184	● 600192
1.4	0.25	24	4.2	6	● 600185	● 600193

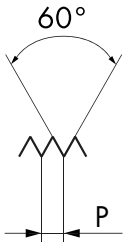
All nano thread plug gauges are SCS-certified and the paid certificate is available on request.

M ISO DIN 14 / ISO DIN 13
DC SWISS NI589 / ISO 1502

PHYN. KL

nano





DZ04 GO	DZ14 NO-GO	DZ04 GO	DZ14 NO-GO

5h	5h	6g	6g

Ø d_1 M	P mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
0.5	0.125	6	0.75	20	● 192845	● 192853		
0.6	0.15	6	0.9	20	● 192846	● 192854		
0.7	0.175	6	1.05	20	● 192847	● 192855		
0.8	0.2	6	1.2	20	● 192848	● 192856		
0.9	0.225	6	1.35	20	● 192849	● 192857		
1	0.25	6	1.5	20			● 191473 [1]	● 191476 [1]
1.2	0.25	6	1.8	20			● 191474 [1]	● 191477 [1]
1.4	0.3	6	2.1	20			● 191475 [1]	● 191478 [1]
1.6	0.35	6	2.4	20			● 191479	● 191485
1.8	0.35	6	2.7	20			● 191480	● 191486
2	0.4	6	3	20			● 191481	● 191487
2.3	0.4	6	3.45	20			● 191482	● 191488
2.5	0.45	6	3.75	20			● 191483	● 191489
2.6	0.45	6	3.9	20			● 191484	● 191490

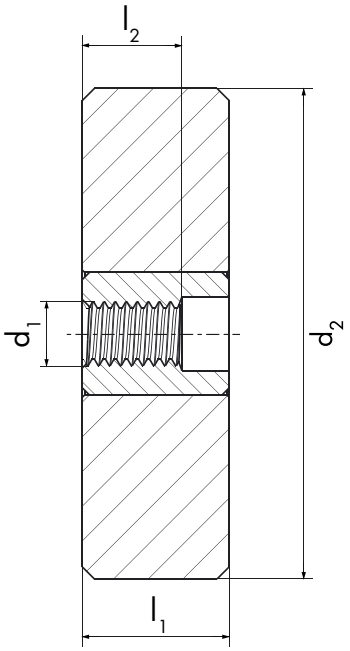
[1] Tol. 6h

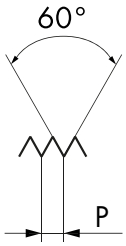
All nano ring gauges have a certificate of measurement, established with SCS certified plug check gauges. The paid certificate is available on request.

MF ISO DIN 13 ISO 1502

PHYN. KL

nano





DZ04 GO	DZ14 NO-GO	DZ04 GO	DZ14 NO-GO

4h	4h	6g	6g

Ø d_1 MF	P mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
1.4	0.2	6	2.1	20	● 194887	● 194888	● 192858 [1]	● 192871 [1]
1.6	0.2	6	1.8	20	● 191201	● 191215	● 191229	● 191243
1.8	0.2	6	1.8	20	● 191202	● 191216	● 191230	● 191244
2	0.2	6	1.8	20	● 190711	● 190710	● 191231	● 191245
2	0.25	6	2.25	20	● 194872	● 190690	● 194876	● 194877
2.2	0.2	6	1.8	20	● 191204	● 191218	● 191232	● 191246
2.2	0.25	6	2.25	20	● 191205	● 191219	● 191233	● 191247
2.3	0.2	6	1.8	20	● 191206	● 191220	● 191234	● 191248
2.3	0.25	6	2.25	20	● 191207	● 191221	● 191235	● 191249
2.5	0.2	6	1.8	20	● 191208	● 191222	● 191236	● 191250
2.5	0.25	6	2.25	20	● 194873	● 191223	● 191237	● 191251
2.5	0.35	6	3.75	20			● 192869	● 192882
2.6	0.35	6	3.9	20			● 192870	● 192883

[1] Tol. 6h

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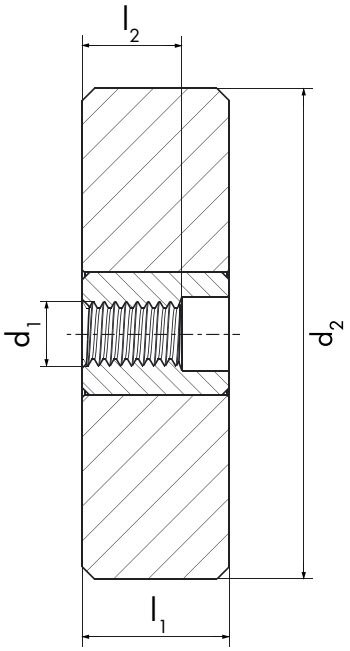
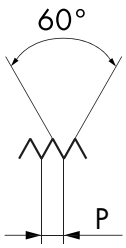
UNC, UNF ASME B1.1 ASME B1.2

PHYN. KL

nano





	DZ04 GO	DZ14 NO-GO	DZ04 GO	DZ14 NO-GO
				
	2A	2A	3A	3A

Ø d_1 UNC	P TPI	Ø d_1 mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
1	64	1.854	6	2.78	20	191601	191604	191607	191610
2	56	2.184	6	3.28	20	191602	191605	191608	191611
3	48	2.515	6	3.77	20	191603	191606	191609	191612

Ø d_1 UNF	P TPI	Ø d_1 mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
0	80	1.524	6	2.29	20	191669	191673	191677	191681
1	72	1.854	6	2.78	20	191670	191674	191678	191682
2	64	2.184	6	3.28	20	191671	191675	191679	191683
3	56	2.515	6	3.77	20	191672	191676	191680	191684

All nano ring gauges have a certificate of measurement, established with SCS certified plug check gauges. The paid certificate is available on request.

S NIHS / NIHS NT
DC SWISS NI584 / STB U758-002D-F

PHYN. KL

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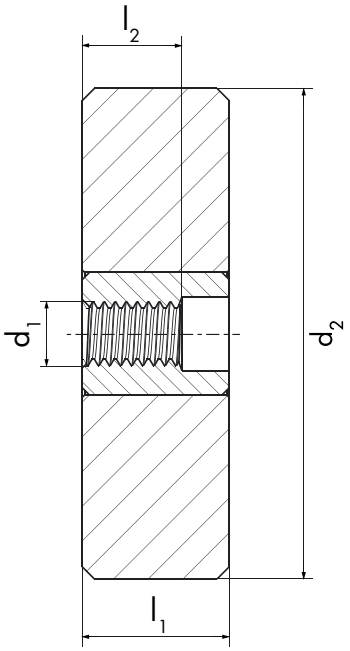

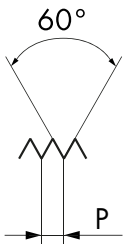

DZ04 GO	DZ14 NO-GO	DZ04 GO	DZ14 NO-GO

NIHS	NIHS	NIHS NT	NIHS NT

Ø d_1 S	P mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
0.5	0.125	6	0.75	20	● 190812	● 190831	● 190850	● 190869
0.6	0.15	6	0.9	20	● 190813	● 190832	● 190851	● 190870
0.7	0.175	6	1.05	20	● 190814	● 190833	● 190852	● 190871
0.8	0.2	6	1.2	20	● 190815	● 190834	● 190853	● 190872
0.9	0.225	6	1.35	20	● 190816	● 190835	● 190854	● 190873
1	0.25	6	1.5	20	● 190817	● 190836	● 190855	● 190874
1.2	0.25	6	1.8	20	● 190818	● 190837	● 190856	● 190875
1.4	0.3	6	2.1	20	● 190819	● 190838	● 190857	● 190876

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SF NIHS
DC SWISS NI584

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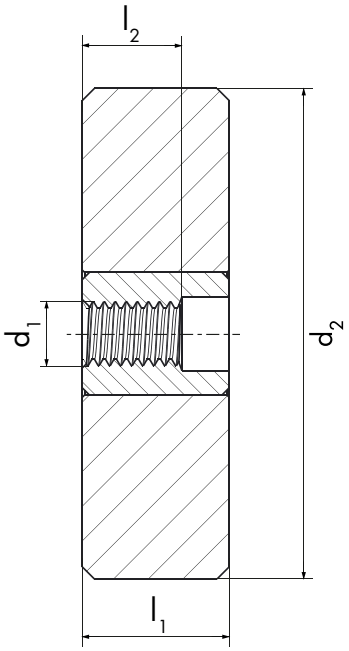
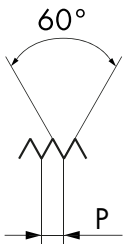
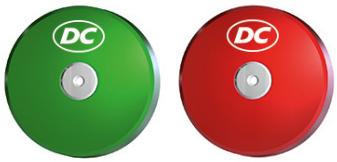
DZ04 GO	DZ14 NO-GO		





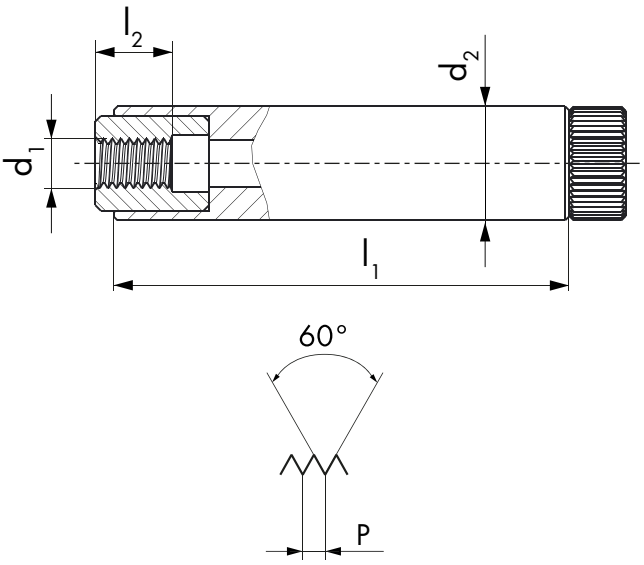


NIHS NIHS

Ø d_1 SF	P mm	l_1 mm	l_2 GO mm	d_2	ID	ID
1.4	0.2	6	2.1	20	190820	190839
1.6	0.2	6	1.8	20	190821	190840
1.8	0.2	6	1.8	20	190822	190841
2	0.2	6	1.8	20	190823	190842
2.2	0.2	6	1.8	20	190824	190843
2.2	0.25	6	2.25	20	190825	190844
2.5	0.2	6	1.8	20	190826	190845
2.5	0.25	6	2.25	20	190827	190846

All nano ring gauges have a certificate of measurement, established with SCS certified plug check gauges. The paid certificate is available on request.

nano



DN04 GO	DN14 NO-GO	DN04 GO	DN14 NO-GO
			
5h	5h	6g	6g

Ø d_1 M	P mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
0.5	0.125	24	0.75	6	● 192803	● 192811		
0.6	0.15	24	0.9	6	● 192804	● 192812		
0.7	0.175	24	1.05	6	● 192805	● 192813		
0.8	0.2	24	1.2	6	● 192806	● 192814		
0.9	0.225	24	1.35	6	● 192807	● 192815		
1	0.25	24	1.5	6			● 191447 [1]	● 191450 [1]
1.2	0.25	24	1.8	6			● 191448 [1]	● 191451 [1]
1.4	0.3	24	2.1	6			● 191449 [1]	● 191452 [1]
1.6	0.35	24	2.4	6			● 191453	● 191459
1.8	0.35	24	2.7	6			● 191454	● 191460
2	0.4	24	3	6			● 191455	● 191461
2.3	0.4	24	3.45	6			● 191456	● 191462
2.5	0.45	24	3.75	6			● 191457	● 191463
2.6	0.45	24	3.9	6			● 191458	● 191464

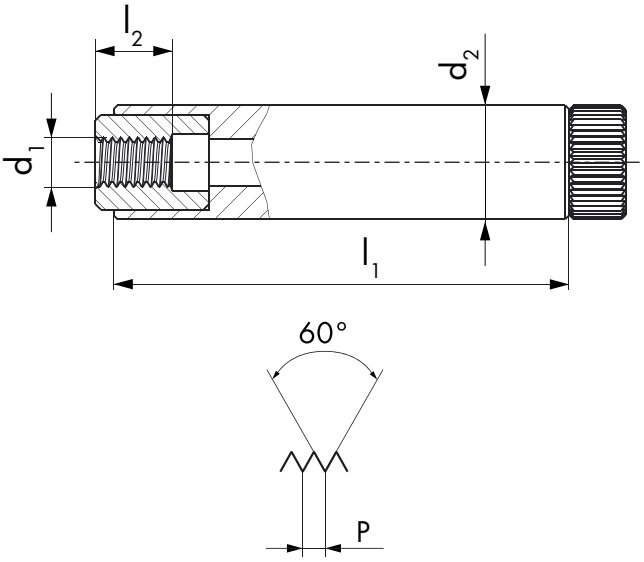
[1] Tol. 6h

All nano ring gauges have a certificate of measurement, established with SCS certified plug check gauges. The paid certificate is available on request.

MF ISO DIN 13 ISO 1502

PHYN. KL

nano



DN04 GO	DN14 NO-GO	DN04 GO	DN14 NO-GO
			
4h	4h	6g	6g

Ø d_1 MF	P mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
1.4	0.2	24	2.1	6	194885	194886	192816 [1]	192829 [1]
1.6	0.2	24	1.8	6	191145	191159	191173	191187
1.8	0.2	24	1.8	6	191146	191160	191174	191188
2	0.2	24	1.8	6	191147	191161	191175	191189
2	0.25	24	2.25	6	194870	194871	194874	194875
2.2	0.2	24	1.8	6	191148	191162	191176	191190
2.2	0.25	24	2.25	6	191149	191163	191177	191191
2.3	0.2	24	1.8	6	191150	191164	191178	191192
2.3	0.25	24	2.25	6	191151	191165	191179	191193
2.5	0.2	24	1.8	6	191152	191166	191180	191194
2.5	0.25	24	2.25	6	191153	191167	191181	191195
2.5	0.35	24	3.75	6			192827	192840
2.6	0.35	24	3.9	6			192828	192841

[1] Tol. 6h

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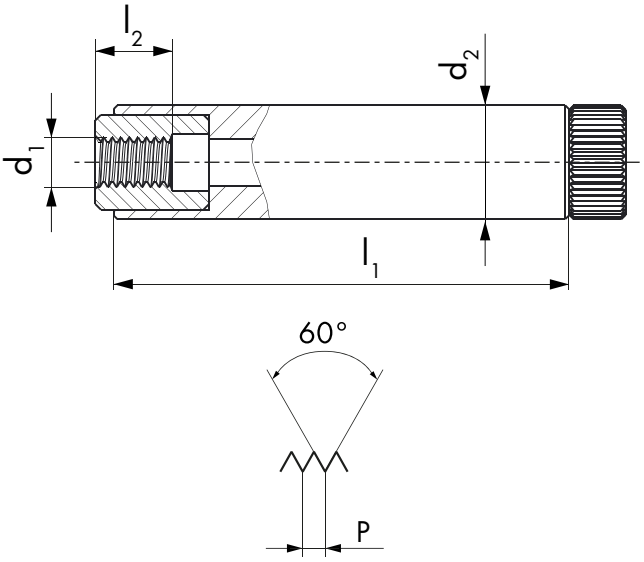
UNC, UNF ASME B1.1 ASME B1.2

PHYN. KL

nano



	DN04 GO	DN14 NO-GO	DN04 GO	DN14 NO-GO
				
	2A	2A	3A	3A

Ø d_1 UNC	P TPI	Ø d_1 mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
1	64	1.854	24	2.78	6	● 191589	● 191592	● 191595	● 191598
2	56	2.184	24	3.28	6	● 191590	● 191593	● 191596	● 191599
3	48	2.515	24	3.77	6	● 191591	● 191594	● 191597	● 191600

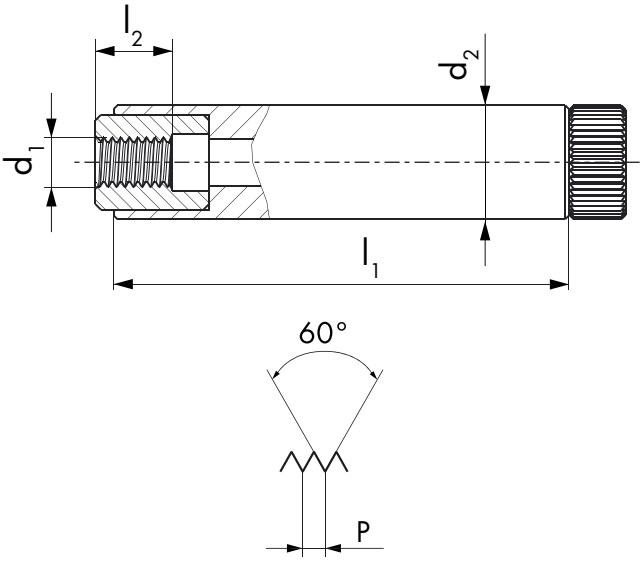
Ø d_1 UNF	P TPI	Ø d_1 mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
0	80	1.524	24	2.29	6	● 191653	● 191657	● 191661	● 191665
1	72	1.854	24	2.78	6	● 191654	● 191658	● 191662	● 191666
2	64	2.184	24	3.28	6	● 191655	● 191659	● 191663	● 191667
3	56	2.515	24	3.77	6	● 191656	● 191660	● 191664	● 191668

All nano ring gauges have a certificate of measurement, established with SCS certified plug check gauges. The paid certificate is available on request.

S NIHS / NIHS NT
DC SWISS NI584 / STB U758-002D-F

PHYN. KL

nano



DN04 GO	DN14 NO-GO	DN04 GO	DN14 NO-GO
			
NIHS	NIHS	NIHS NT	NIHS NT

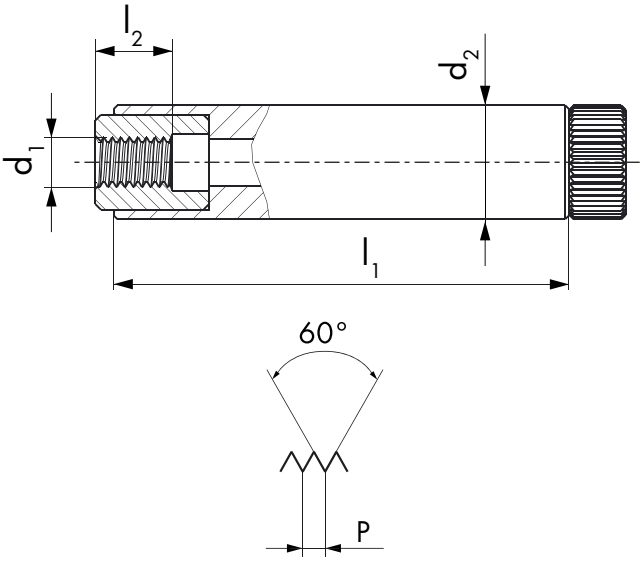
Ø d_1 S	P mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
0.5	0.125	24	0.75	6	190888	190907	190926	190945
0.6	0.15	24	0.9	6	190889	190908	190927	190946
0.7	0.175	24	1.05	6	190890	190909	190928	190947
0.8	0.2	24	1.2	6	190891	190910	190929	190948
0.9	0.225	24	1.35	6	190892	190911	190930	190949
1	0.25	24	1.5	6	190893	190912	190931	190950
1.2	0.25	24	1.8	6	190894	190913	190932	190951
1.4	0.3	24	2.1	6	190895	190914	190933	190952

All nano ring gauges have a certificate of measurement, established with SCS certified plug check gauges. The paid certificate is available on request.

SF NIHS
DC SWISS NI584

PHYN. KL

nano

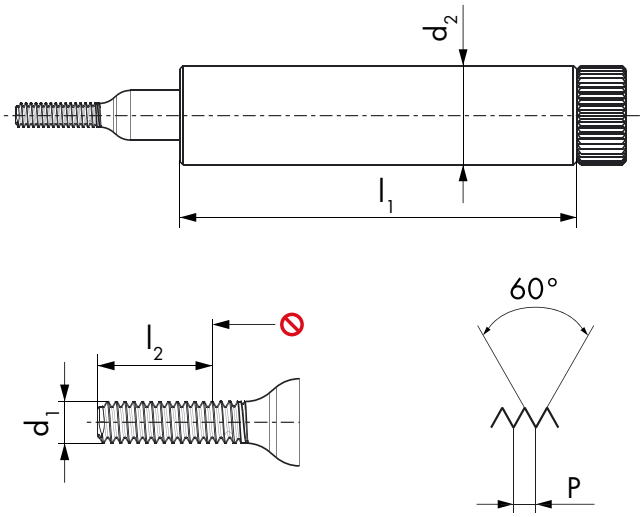


DN04 GO	DN14 NO-GO		
			
NIHS	NIHS		

Ø d_1 SF	P mm	l_1 mm	l_2 GO mm	d_2	ID	ID
1.4	0.2	24	2.1	6	● 190896	● 190915
1.6	0.2	24	1.8	6	● 190897	● 190916
1.8	0.2	24	1.8	6	● 190898	● 190917
2	0.2	24	1.8	6	● 190899	● 190918
2.2	0.2	24	1.8	6	● 190900	● 190919
2.2	0.25	24	2.25	6	● 190901	● 190920
2.5	0.2	24	1.8	6	● 190902	● 190921
2.5	0.25	24	2.28	6	● 190903	● 190922

All nano ring gauges have a certificate of measurement, established with SCS certified plug check gauges. The paid certificate is available on request.

nano



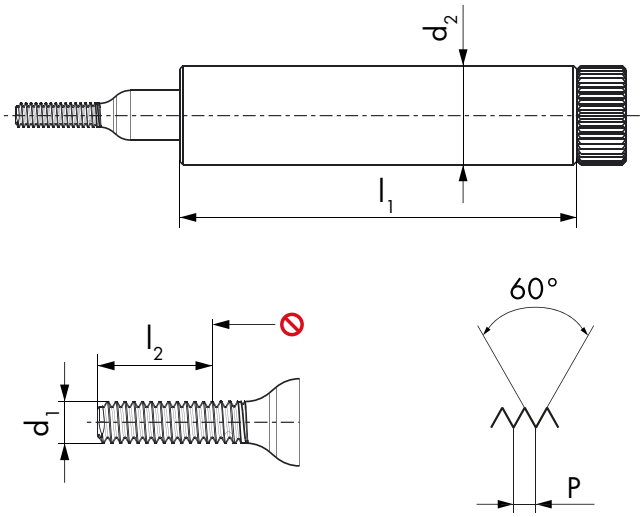
RN05-1 GO	RN15-1 GO	RN05-1 GO	RN15-1 GO
			
5h	5h	6g	6g

Ø d_1 M	P mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
0.3	0.08	24	0.61	6	● 192884	● 192892		
0.35	0.09	24	0.71	6	● 192885	● 192893		
0.4	0.1	24	0.8	6	● 192886	● 192894		
0.5	0.125	24	1	6	● 192887	● 192895		
0.6	0.15	24	1.2	6	● 192888	● 192896		
0.7	0.175	24	1.4	6	● 192889	● 192897		
0.8	0.2	24	1.6	6	● 192890	● 192898		
0.9	0.225	24	1.8	6	● 192891	● 192899		
1	0.25	24	2	6			● 191499 [1]	● 191508 [1]
1.2	0.25	24	2.3	6			● 191500 [1]	● 191509 [1]
1.4	0.3	24	2.7	6			● 191501 [1]	● 191510 [1]
1.6	0.35	24	3.1	6			● 191517	● 191535
1.8	0.35	24	3.4	6			● 191518	● 191536
2	0.4	24	3.8	6			● 191519	● 191537
2.3	0.4	24	4.25	6			● 191520	● 191538
2.5	0.45	24	4.65	6			● 191521	● 191539
2.6	0.45	24	4.8	6			● 191522	● 191540

[1] Tol. 6h

SCS certificate included.

nano



RN05-1 GO	RN15-1 GO	RN05-1 GO	RN15-1 GO
			
6h	6h	6g	6g

Ø d_1 MF	P mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
1.4	0.2	24	2.5	6	● 192932	● 192945		
1.6	0.2	24	2.2	6	● 192933	● 192946		
1.8	0.2	24	2.2	6	● 192934	● 192947		
2	0.2	24	2.2	6	● 192935	● 192948		
2	0.25	24	2.75	6	● 192936	● 192949		
2.2	0.2	24	2.2	6	● 192937	● 192950		
2.2	0.25	24	2.75	6	● 192938	● 192951		
2.3	0.2	24	2.2	6	● 192939	● 192952		
2.3	0.25	24	2.75	6	● 192940	● 192953		
2.5	0.2	24	2.2	6	● 192941	● 192954		
2.5	0.25	24	2.75	6	● 192942	● 192955		
2.5	0.35	24	4.45	6			● 192943	● 192956
2.6	0.35	24	4.6	6			● 192944	● 192957

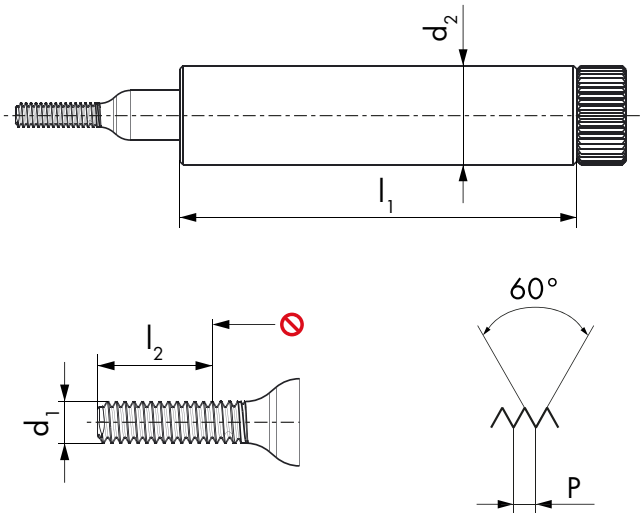
SCS certificate included.

UNC, UNF

ASME B1.1
DC SWISS NI582

VHM CAR

nano



	RN05-1 GO	RN15-1 GO	RN05-1 GO	RN15-1 GO
				
	2A	2A	3A	3A

Ø d_1 UNC	P TPI	Ø″ d_1 mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
1	64	1.854	24	3.58	6	● 191613	● 191619	● 191625	● 191631
2	56	2.184	24	4.18	6	● 191614	● 191620	● 191626	● 191632
3	48	2.515	24	4.83	6	● 191615	● 191621	● 191627	● 191633

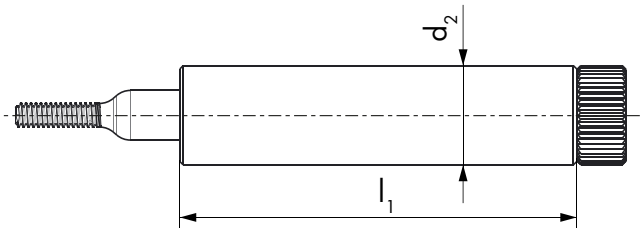
Ø d_1 UNF	P TPI	Ø″ d_1 mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
0	80	1.524	24	2.92	6	● 191685	● 191693	● 191701	● 191709
1	72	1.854	24	3.49	6	● 191686	● 191694	● 191702	● 191710
2	64	2.184	24	4.07	6	● 191687	● 191695	● 191703	● 191711
3	56	2.515	24	4.68	6	● 191688	● 191696	● 191704	● 191712

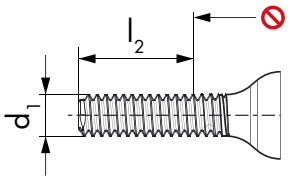
SCS certificate included.

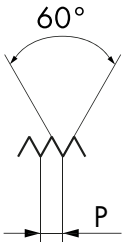
S NIHS / NIHS NT
DC SWISS NI584 / DC SWISS NI585

VHM CAR

nano







RN05-1 GO	RN15-1 GO	RN05-1 GO	RN15-1 GO
			
NIHS	NIHS	NIHS NT	NIHS NT

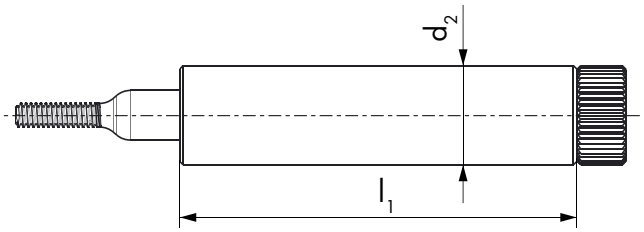
Ø d_1 S	P mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
0.3	0.08	24	0.61	6	190961	190999	191037	191075
0.35	0.09	24	0.71	6	190962	191000	191038	191076
0.4	0.1	24	0.8	6	190963	191001	191039	191077
0.5	0.125	24	1	6	190964	191002	191040	191078
0.6	0.15	24	1.2	6	190965	191003	191041	191079
0.7	0.175	24	1.4	6	190966	191004	191042	191080
0.8	0.2	24	1.6	6	190967	191005	191043	191081
0.9	0.225	24	1.8	6	190968	191006	191044	191082
1	0.25	24	2	6	190969	191007	191045	191083
1.2	0.25	24	2.3	6	190970	191008	191046	191084
1.4	0.3	24	2.7	6	190971	191009	191047	191085

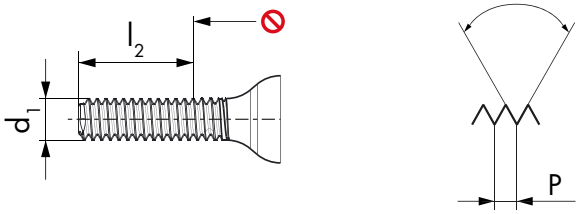
SCS certificate included.

SF NIHS / NIHS NT
DC SWISS NI584 / DC SWISS NI585

VHM CAR

nano





RN05-1 GO	RN15-1 GO	RN05-1 GO	RN15-1 GO
			
NIHS	NIHS	NIHS NT	NIHS NT

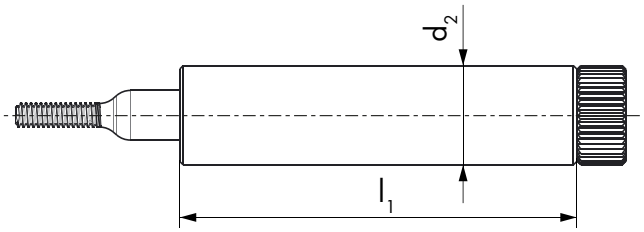
Ø d_1 SF	P mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
1.4	0.2	24	2.5	6	190972	191010	191048	191086
1.6	0.2	24	2.2	6	190973	191011	191049	191087
1.8	0.2	24	2.2	6	190974	191012	191050	191088
2	0.2	24	2.2	6	190975	191013	191051	191089
2.2	0.2	24	2.2	6	190976	191014	191052	191090
2.2	0.25	24	2.75	6	190977	191015	191053	191091
2.5	0.2	24	2.2	6	190978	191016	191054	191092
2.5	0.25	24	2.75	6	190979	191017	191055	191093

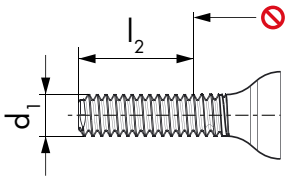
SCS certificate included.

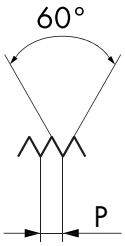
M ISO DIN 14 / ISO DIN 13
DC SWISS NI589 / ISO 1502

VHM CAR

nano







RN05-2 NO-GO	RN15-2 NO-GO	RN05-2 NO-GO	RN15-2 NO-GO
			
5h	5h	6g	6g

Ø d_1 M	P mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
0.3	0.08	24	0.61	6	● 192900	● 192908		
0.35	0.09	24	0.71	6	● 192901	● 192909		
0.4	0.1	24	0.8	6	● 192902	● 192910		
0.5	0.125	24	1	6	● 192903	● 192911		
0.6	0.15	24	1.2	6	● 192904	● 192912		
0.7	0.175	24	1.4	6	● 192905	● 192913		
0.8	0.2	24	1.6	6	● 192906	● 192914		
0.9	0.225	24	1.8	6	● 192907	● 192915		
1	0.25	24	2	6			● 191502 [1]	● 191511 [1]
1.2	0.25	24	2.3	6			● 191503 [1]	● 191512 [1]
1.4	0.3	24	2.7	6			● 191504 [1]	● 191513 [1]
1.6	0.35	24	3.1	6			● 191523	● 191541
1.8	0.35	24	3.4	6			● 191524	● 191542
2	0.4	24	3.8	6			● 191525	● 191543
2.3	0.4	24	4.25	6			● 191526	● 191544
2.5	0.45	24	4.65	6			● 191527	● 191545
2.6	0.45	24	4.8	6			● 191528	● 191546

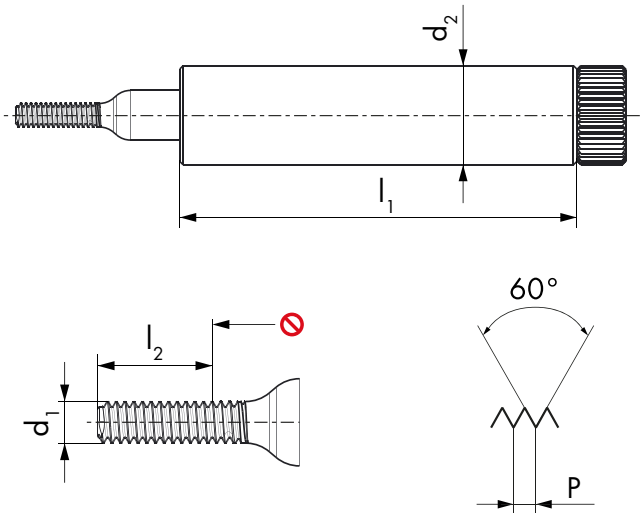
[1] Tol. 6h

SCS certificate included.

MF ISO DIN 13 ISO 1502

VHM CAR

nano



RN05-2 NO-GO	RN15-2 NO-GO	RN05-2 NO-GO	RN15-2 NO-GO
			
6h	6h	6g	6g

Ø d_1 MF	P mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
1.4	0.2	24	2.5	6	● 192958	● 192971		
1.6	0.2	24	1.6	6	● 192959	● 192972		
1.8	0.2	24	1.6	6	● 192960	● 192973		
2	0.2	24	1.6	6	● 192961	● 192974		
2	0.25	24	2	6	● 192962	● 192975		
2.2	0.2	24	1.6	6	● 192963	● 192976		
2.2	0.25	24	2	6	● 192964	● 192977		
2.3	0.2	24	1.6	6	● 192965	● 192978		
2.3	0.25	24	2	6	● 192966	● 192979		
2.5	0.2	24	1.6	6	● 192967	● 192980		
2.5	0.25	24	2	6	● 192968	● 192981		
2.5	0.35	24	4.45	6			● 192969	● 192982
2.6	0.35	24	4.6	6			● 192970	● 192983

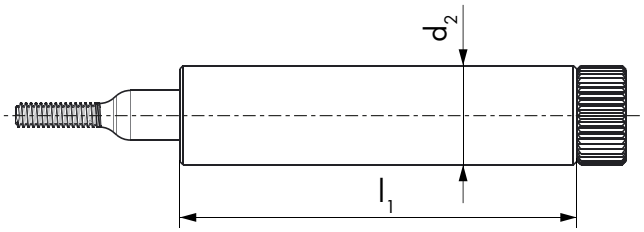
SCS certificate included.

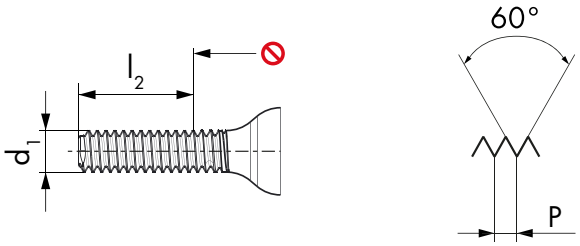
UNC, UNF

ASME B1.1
DC SWISS NI582

VHM CAR

nano





	RN05-2 NO-GO	RN15-2 NO-GO	RN05-2 NO-GO	RN15-2 NO-GO
				
	2A	2A	3A	3A

Ø d_1 UNC	P TPI	Ø d_1 mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
1	64	1.854	24	3.58	6	● 191616	● 191622	● 191628	● 191634
2	56	2.184	24	4.18	6	● 191617	● 191623	● 191629	● 191635
3	48	2.515	24	4.83	6	● 191618	● 191624	● 191630	● 191636

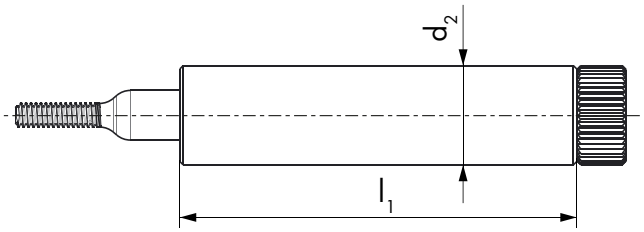
Ø d_1 UNF	P TPI	Ø d_1 mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
0	80	1.524	24	2.92	6	● 191689	● 191697	● 191705	● 191713
1	72	1.854	24	3.49	6	● 191690	● 191698	● 191706	● 191714
2	64	2.184	24	4.07	6	● 191691	● 191699	● 191707	● 191715
3	56	2.515	24	4.68	6	● 191692	● 191700	● 191708	● 191716

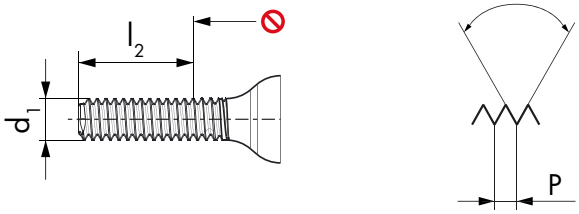
SCS certificate included.

S NIHS / NIHS NT
DC SWISS NI584 / DC SWISS NI585

VHM CAR

nano





RN05-2 NO-GO	RN15-2 NO-GO	RN05-2 NO-GO	RN15-2 NO-GO
			
NIHS	NIHS	NIHS NT	NIHS NT

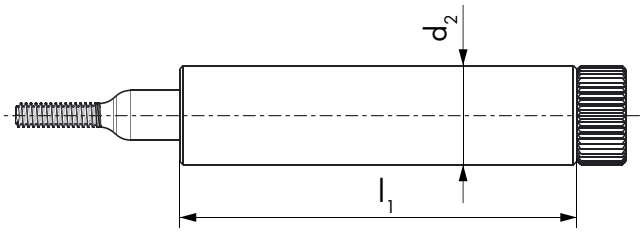
Ø d_1 S	P mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
0.3	0.08	24	0.61	6	190980	191018	191056	191094
0.35	0.09	24	0.71	6	190981	191019	191057	191095
0.4	0.1	24	0.8	6	190982	191020	191058	191096
0.5	0.125	24	1	6	190983	191021	191059	191097
0.6	0.15	24	1.2	6	190984	191022	191060	191098
0.7	0.175	24	1.4	6	190985	191023	191061	191099
0.8	0.2	24	1.6	6	190986	191024	191062	191100
0.9	0.225	24	1.8	6	190987	191025	191063	191101
1	0.25	24	2	6	190988	191026	191064	191102
1.2	0.25	24	2.3	6	190989	191027	191065	191103
1.4	0.3	24	2.7	6	190990	191028	191066	191104

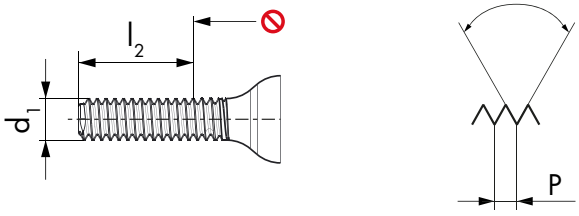
SCS certificate included.

SF NIHS / NIHS NT
DC SWISS NI584 / DC SWISS NI585

VHM CAR

nano



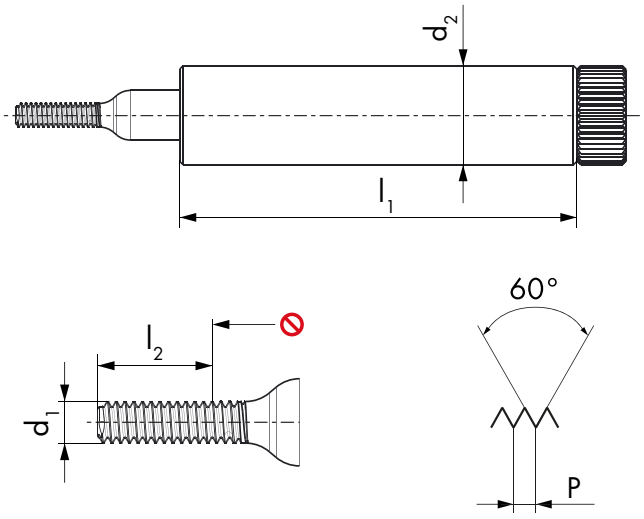


RN05-2 NO-GO	RN15-2 NO-GO	RN05-2 NO-GO	RN15-2 NO-GO
			
NIHS	NIHS	NIHS NT	NIHS NT

Ø d_1 SF	P mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
1.4	0.2	24	2.5	6	190991	191029	191067	191105
1.6	0.2	24	1.6	6	190992	191030	191068	191106
1.8	0.2	24	1.6	6	190993	191031	191069	191107
2	0.2	24	1.6	6	190994	191032	191070	191108
2.2	0.2	24	1.6	6	190995	191033	191071	191109
2.2	0.25	24	2	6	190996	191034	191072	191110
2.5	0.2	24	1.6	6	190997	191035	191073	191111
2.5	0.25	24	2	6	190998	191036	191074	191112

SCS certificate included.

nano



RN05-3 WEAR	RN15-3 WEAR	RN05-3 WEAR	RN15-3 WEAR
			
6h	6h	6g	6g

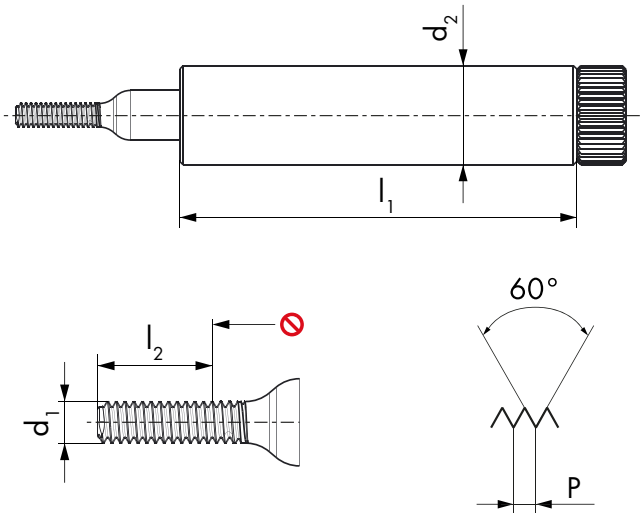
Ø d_1 M	P mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
1	0.25	24	2	6	● 191505	● 191514		
1.2	0.25	24	2.3	6	● 191506	● 191515		
1.4	0.3	24	2.7	6	● 191507	● 191516		
1.6	0.35	24	3.1	6			● 191529	● 191547
1.8	0.35	24	3.4	6			● 191530	● 191548
2	0.4	24	3.8	6			● 191531	● 191549
2.3	0.4	24	4.25	6			● 191532	● 191550
2.5	0.45	24	4.65	6			● 191533	● 191551
2.6	0.45	24	4.8	6			● 191534	● 191552

SCS certificate included.

MF ISO DIN 13 ISO 1502

VHM CAR

nano



RN05-3 WEAR	RN15-3 WEAR	RN05-3 WEAR	RN15-3 WEAR
			
6h	6h	6g	6g

Ø d_1 MF	P mm	l_1 mm	l_2 GO mm	d_2	ID	ID	ID	ID
1.4	0.2	24	2.5	6	● 192984	● 192997		
1.6	0.2	24	1.6	6	● 192985	● 192998		
1.8	0.2	24	1.6	6	● 192986	● 192999		
2	0.2	24	1.6	6	● 192987	● 193000		
2	0.25	24	2	6	● 192988	● 193001		
2.2	0.2	24	1.6	6	● 192989	● 193002		
2.2	0.25	24	2	6	● 192990	● 193003		
2.3	0.2	24	1.6	6	● 192991	● 193004		
2.3	0.25	24	2	6	● 192992	● 193005		
2.5	0.2	24	1.6	6	● 192993	● 193006		
2.5	0.25	24	2	6	● 192994	● 193007		
2.5	0.35	24	4.45	6			● 192995	● 193008
2.6	0.35	24	4.6	6			● 192996	● 193009

SCS certificate included.

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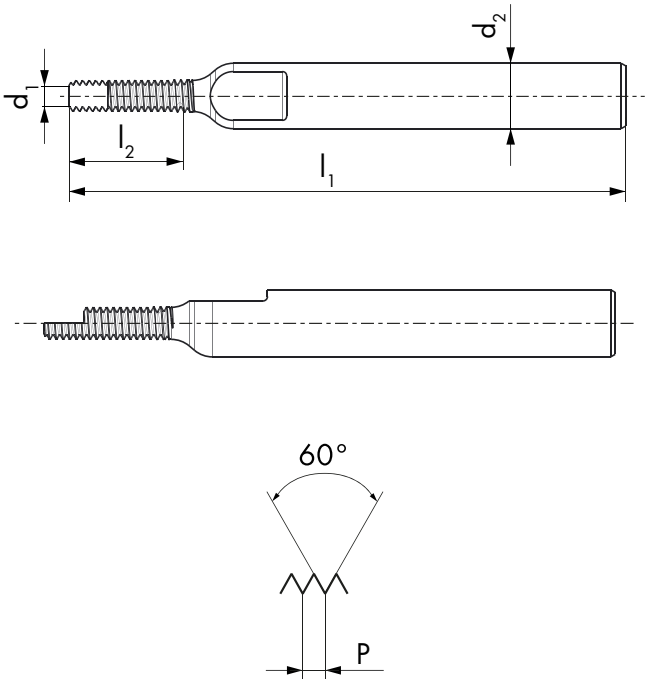

EN00

NIHS

Ø d_1 S	P mm	l_1 mm	l_2 GO mm	d_2	ID
0.3	0.08	39	1.28	3	192747
0.35	0.09	39	1.44	3	192748
0.4	0.1	39	1.6	3	192749
0.5	0.125	39	2	3	192750
0.6	0.15	39	2.4	3	192751
0.7	0.175	39	2.8	3	192752
0.8	0.2	39	3.2	3	192753
0.9	0.225	39	3.6	3	192754
1	0.25	39	4	3	192755
1.2	0.25	39	4	3	192756
1.4	0.3	39	4.8	3	192757

El Patrón roscado DC SWISS sirve para calibrar las maquinas de medición. Todos los patrones de nuestro programa son disponibles o sobre pedido en caso de ser especifico. Son entregados con un certificado de homologación SCS que confirma que la producción a seguido estrictamente el proceso de medición al final de la fabricación según ISO 17025. Atesta de la calidad del equipo metrologíco de DC NANO TOOLS SA (SCS 0143) centro de competencia y miembro del grupo DC SWISS.

The DC SWISS calibration thread plug gauge is used for the calibration of measuring machines. The calibration gauges from our catalogue, or made to your specific requirements, are delivered with a SCS measurement certificate. This confirms that the control process during production has been conscientiously followed to ISO 17025. It attests to the quality of the metrological equipment of DC NANO TOOLS SA (SCS 0143), centre of competence and member of the DC Group.

SCS certificate included.

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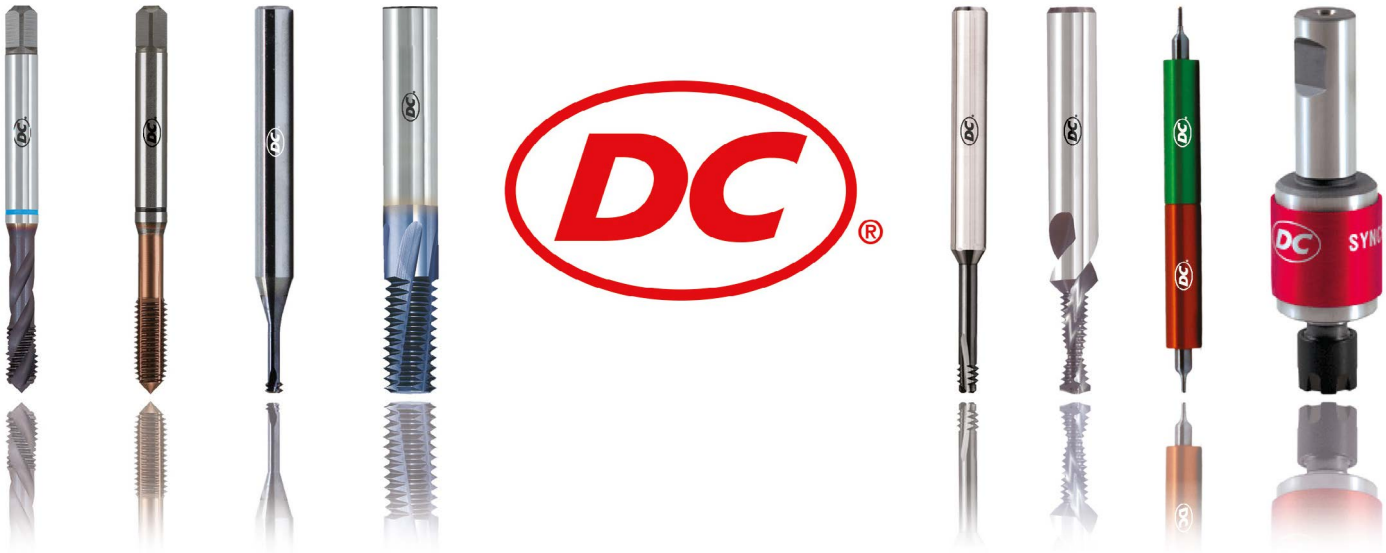

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TABLA DE DUREZA — HARDNESS CHART

HRC *Dureza Rockwell* Hardness Rockwell	HB *Dureza Brinell* Hardness Brinell	HV *Dureza Vickers* Hardness Vickers	N/mm² Mpa *Resistencia a la tracción* Tensile strength
25	253	266	854
26	259	273	873
27	265	279	897
28	272	286	919
29	279	294	944
30	287	302	970
31	295	310	995
32	303	318	1024
33	311	327	1052
34	320	336	1082
35	328	345	1111
36	337	355	1139
37	346	364	1168
38	354	373	1198
39	363	382	1227
40	373	392	1262
41	382	402	1296
42	392	412	1327
43	402	423	1362
44	413	434	1401
45	424	446	1442
46	436	459	1481
47	448	471	1524
48	460	484	1572
49	474	499	1625
50	488	513	1675
51	502	528	1733
52	518	545	1793
53	532	560	1845
54	549	578	1912
55	566	596	1979
56	585	615	2050
57	603	634	2121
58	621	654	2200
59		675	
60		698	
61		720	
62		746	
63		773	

Tabla de equivalencia de dureza, extracto de ISO EN 18265; 2003 / anteriormente DIN 50150. Valores redondeados
Conversion chart for hardness values, extract from ISO EN 18265; 2003 / formerly DIN 50150. Rounded values.

PULGADAS-MM — INCHES-MM

Ø" d_1	Ø mm	TPI UN													G (BSP) Rp	Ø mm
		UNC	UNF	UNEF	4	6	8	12	16	20	28	32	W(BSW)	BSF		
0	1.52		80										48			
1/16"	1.59														28	7.72
1	1.85	64	72													
2	2.18	56	64													
3/32"	2.38															
3	2.51	48	56													
4	2.84	40	48													
5	3.17	40	44													
1/8"	3.17												40		28	9.72
6	3.50	32	40													
5/32"	3.96												32			
8	4.16	32	36													
3/16"	4.76												24	32		
10	4.82	24	32													
12	5.48	24	28	32												
7/32"	5.55												24	28		
1/4"	6.35	20	28	32									20	26	19	13.15
9/32"	7.14													26		
5/16"	7.93	18	24	32						20	28					
3/8"	9.52	16	24	32						20	28		16	20	19	16.66
7/16"	11.11	14	20	28					16			32	14	18		
1/2"	12.70	13	20	28					16			32	12	16	14	20.95
9/16"	14.28	12	18	24					16	20	28	32	12	16		
5/8"	15.87	11	18	24				12	16	20	28	32	11	14	14	22.91
11/16"	17.46			24				12	16	20	28	32		14		
3/4"	19.05	10	16	20				12			28	32	10	12	14	26.44
13/16"	20.64			20				12	16		28	32		12		
7/8"	22.22	9	14	20				12	16		28	32	9	11	14	30.20
15/16"	23.81			20				12	16		28	32				
1"	25.40	8	12	20					16		28	32	8	10	11	33.24
1 1/16"	26.99			18			8	12	16	20	28					
1 1/8"	28.57	7	12	18			8		16	20	28		7	9	11	37.89
1 3/16"	30.16			18			8	12	16	20	28					
1 1/4"	31.75	7	12	18			8		16	20	28		7	9	11	41.91
1 5/16"	33.34			18			8	12	16	20	28					
1 3/8"	34.92	6	12	18			8		16	20	28		6	8	11	44.32
1 7/16"	36.51			18		6	8	12	16	20	28					
1 1/2"	38.10	6	12	18			8		16	20	28		6	8	11	47.80
1 9/16"	39.69			18		6	8	12	16	20						
1 5/8"	41.28			18		6	8	12	16	20			5	8		
1 11/16"	42.86			18		6	8	12	16	20						
1 3/4"	44.45	5				6	8	12	16	20			5	7	11	53.74
1 13/16"	46.04					6	8	12	16	20						
1 7/8"	47.63					6	8	12	16	20			4 1/2			
1 15/16"	49.21					6	8	12	16	20						
2"	50.80	4 1/2				6	8	12	16	20			4 1/2	7	11	59.61
2 1/8"	53.97					6	8	12	16	20						
2 1/4"	57.15	4 1/2				6	8	12	16	20			4	6	11	65.71
2 3/8"	60.32					6	8	12	16	20						
2 1/2"	63.50	4				6	8	12	16	20			4	6	11	75.18
2 5/8"	66.67				4	6	8	12	16	20						
2 3/4"	69.85	4				6	8	12	16	20			3 1/2	6	11	81.53
2 7/8"	73.02				4	6	8	12	16	20						
3"	76.20	4				6	8	12	16	20			3 1/2	5	11	87.88
3 1/8"	79.37				4	6	8	12	16							
3 1/4"	82.55	4				6	8	12	16				3 1/4	5	11	93.98
3 3/8"	85.72				4	6	8	12	16							
3 1/2"	88.90	4				6	8	12	16				3 1/4	4 1/2	11	100.33
3 5/8"	92.07				4	6	8	12	16							
3 3/4"	95.25	4				6	8	12	16				3	4 1/2	11	106.68
3 7/8"	98.42				4	6	8	12	16							
4"	101.60	4				6	8	12	16				3	4 1/2	11	113.03

TABLA DE CONVERSIÓN — CONVERSION TABLE

Ø d_1	Vc m/min															
	1	2	3	4	5	6	8	10	12	15	20	25	30	40	50	60
	min^{-1}															
1	318	637	955	1273	1592	1910	2546	3183	3820	4775	6366	7958	9549	12732	15915	19099
2	159	318	477	637	796	955	1273	1592	1910	2387	3183	3979	4775	6366	7958	9549
3	106	212	318	424	531	637	849	1061	1273	1592	2122	2653	3183	4244	5305	6366
4	80	159	239	318	398	477	637	796	955	1194	1592	1989	2387	3183	3979	4775
5	64	127	191	255	318	382	509	637	764	955	1273	1592	1910	2546	3183	3820
6	53	106	159	212	265	318	424	531	637	796	1061	1326	1592	2122	2653	3183
8	40	80	119	159	199	239	318	398	477	597	796	995	1194	1592	1989	2387
10	32	64	95	127	159	191	255	318	382	477	637	796	955	1273	1592	1910
12	27	53	80	106	133	159	212	265	318	398	531	663	796	1061	1326	1592
14	23	45	68	91	114	136	182	227	273	341	455	568	682	909	1137	1364
16	20	40	60	80	99	119	159	199	239	298	398	497	597	796	995	1194
18	18	35	53	71	88	106	141	177	212	265	354	442	531	707	884	1061
20	16	32	48	64	80	95	127	159	191	239	318	398	477	637	796	955
25	13	25	38	51	64	76	102	127	153	191	255	318	382	509	637	764
30	11	21	32	42	53	64	85	106	127	159	212	265	318	424	531	637
35	9	18	27	36	45	55	73	91	109	136	182	227	273	364	455	546
40	8	16	24	32	40	48	64	80	95	119	159	199	239	318	398	477
45	7	14	21	28	35	42	57	71	85	106	141	177	212	283	354	424
50	6	13	19	25	32	38	51	64	76	95	127	159	191	255	318	382

DIÁMETRO DEL AGUJERO — CORE HOLES

M ISO DIN 14 4H5H (*recomendado* / recommended)

Ø	P	Ø *Núcleo* - Core Ø nut		
d_1	mm	Ø mini	Ø maxi	Ø guide line
0.3	**0.080**	0.223	0.240	0.23
0.35	**0.090**	0.264	0.286	0.28
0.4	**0.100**	0.304	0.330	0.32
0.5	**0.125**	0.380	0.415	0.41
0.6	**0.150**	0.456	0.502	0.50
0.7	**0.175**	0.532	0.585	0.58
0.8	**0.200**	0.608	0.665	0.66
0.9	**0.225**	0.684	0.745	0.74

M DIN 13, ISO 261, *5H / 6H

Ø	P	Ø *Núcleo* - Core Ø nut		
d_1	mm	Ø mini	Ø maxi	Ø guide line
***1**	**0.25**	0.729	0.785	0.75
***1.1**	**0.25**	0.829	0.885	0.85
***1.2**	**0.25**	0.929	0.985	0.95
***1.4**	**0.30**	1.075	1.142	1.10
1.6	**0.35**	1.221	1.321	1.25
1.7	**0.35**	1.321	1.421	1.35
1.8	**0.35**	1.421	1.521	1.45
2	**0.40**	1.567	1.679	1.60
2.2	**0.45**	1.713	1.838	1.75
2.3	**0.40**	1.867	1.979	1.90
2.5	**0.45**	2.013	2.138	2.05
2.6	**0.45**	2.113	2.238	2.15
3	**0.50**	2.459	2.599	2.50
3.5	**0.60**	2.850	3.010	2.90
4	**0.70**	3.242	3.422	3.30
4.5	**0.75**	3.688	3.878	3.75
5	**0.80**	4.134	4.334	4.20
6	**1.00**	4.917	5.153	5.00
7	**1.00**	5.917	6.153	6.00
8	**1.25**	6.647	6.912	6.80
9	**1.25**	7.647	7.912	7.80
10	**1.50**	8.376	8.676	8.50
11	**1.50**	9.376	9.676	9.50
12	**1.75**	10.106	10.441	10.20
14	**2.00**	11.835	12.210	12.00
16	**2.00**	13.835	14.210	14.00
18	**2.50**	15.294	15.744	15.50
20	**2.50**	17.294	17.744	17.50
22	**2.50**	19.294	19.744	19.50
24	**3.00**	20.752	21.252	21.00
27	**3.00**	23.752	24.252	24.00
30	**3.50**	26.211	26.771	26.50
33	**3.50**	29.211	29.771	29.50
36	**4.00**	31.670	32.270	32.00
39	**4.00**	34.670	35.270	35.00
42	**4.50**	37.129	37.799	37.50
45	**4.50**	40.129	40.799	40.50
48	**5.00**	42.587	43.297	43.00
52	**5.00**	46.587	47.297	47.00
56	**5.50**	50.046	50.796	50.50

MF DIN 13, ISO 261, *4H / 6H

Ø	P	Ø *Núcleo* - Core Ø nut		
d_1	mm	Ø mini	Ø maxi	Ø guide line
***1.4**	**0.20**	1.183	1.221	1.20
***1.6**	**0.20**	1.383	1.421	1.40
***1.8**	**0.20**	1.583	1.621	1.60
***2**	**0.20**	1.783	1.821	1.80
***2**	**0.25**	1.729	1.774	1.75
***2.2**	**0.20**	1.983	2.021	2.00
***2.2**	**0.25**	1.929	1.974	1.95
***2.3**	**0.20**	2.083	2.121	2.10
***2.3**	**0.25**	2.029	2.074	2.05
***2.5**	**0.20**	2.283	2.321	2.30
***2.5**	**0.25**	2.229	2.274	2.25
2.5	**0.35**	2.121	2.221	2.15
2.6	**0.35**	2.221	2.321	2.25
3	**0.35**	2.621	2.721	2.65
3.5	**0.35**	3.121	3.221	3.15
4	**0.50**	3.459	3.599	3.50
4.5	**0.50**	3.959	4.099	4.00
5	**0.50**	4.459	4.599	4.50
5.5	**0.50**	4.959	5.099	5.00
6	**0.75**	5.188	5.378	5.25
7	**0.75**	6.188	6.378	6.25
8	**0.75**	7.188	7.378	7.25
8	**1.00**	6.917	7.153	7.00
9	**0.75**	8.188	8.378	8.25
9	**1.00**	7.917	8.153	8.00
10	**0.75**	9.188	9.378	9.25
10	**1.00**	8.917	9.153	9.00
10	**1.25**	8.647	8.912	8.80
11	**0.75**	10.188	10.378	10.25
11	**1.00**	9.917	10.153	10.00
12	**1.00**	10.917	11.153	11.00
12	**1.25**	10.647	10.912	10.80
12	**1.50**	10.376	10.676	10.50
14	**1.00**	12.917	13.153	13.00
14	**1.25**	12.647	12.912	12.80
14	**1.50**	12.376	12.676	12.50
15	**1.00**	13.917	14.153	14.00
15	**1.50**	13.376	13.676	13.50
16	**1.00**	14.917	15.153	15.00
16	**1.50**	14.376	14.676	14.50
17	**1.00**	15.917	16.153	16.00
17	**1.50**	15.376	15.676	15.50
18	**1.00**	16.917	17.153	17.00
18	**1.50**	16.376	16.676	16.50
18	**2.00**	15.835	16.210	16.00
20	**1.00**	18.917	19.153	19.00
20	**1.50**	18.376	18.676	18.50
20	**2.00**	17.835	18.210	18.00
22	**1.00**	20.917	21.153	21.00
22	**1.50**	20.376	20.676	20.50
22	**2.00**	19.835	20.210	20.00
24	**1.00**	22.917	23.153	23.00
24	**1.50**	22.376	22.676	22.50
24	**2.00**	21.835	22.210	22.00
25	**1.00**	23.917	24.153	24.00
25	**1.50**	23.376	23.676	23.50
25	**2.00**	22.835	23.210	23.00

DIÁMETRO DEL AGUJERO — CORE HOLES

MF DIN 13, ISO 261, 6H

Ø	P	*Ø Núcleo* - Core Ø nut		
d_1	mm	Ø mini	Ø maxi	Ø guide line
27	**1.50**	25.376	25.676	25.50
27	**2.00**	24.835	25.210	25.00
28	**1.00**	26.917	27.153	27.00
28	**1.50**	26.376	26.676	26.50
28	**2.00**	25.835	26.210	26.00
30	**1.00**	28.917	29.153	29.00
30	**1.50**	28.376	28.676	28.50
30	**2.00**	27.835	28.210	28.00
32	**1.50**	30.376	30.676	30.50
32	**2.00**	29.835	30.210	30.00
33	**1.50**	31.376	31.676	31.50
33	**2.00**	30.835	31.210	31.00
35	**1.50**	33.376	33.676	33.50
36	**1.50**	34.376	34.676	34.50
36	**2.00**	33.835	34.210	34.00
36	**3.00**	32.752	33.252	33.00
39	**1.50**	37.376	37.676	37.50
39	**2.00**	36.835	37.210	37.00
39	**3.00**	35.752	36.252	36.00
40	**1.50**	38.376	38.676	38.50
40	**2.00**	37.835	38.210	38.00
40	**3.00**	36.752	37.252	37.00
42	**1.50**	40.376	40.676	40.50
42	**2.00**	39.835	40.210	40.00
42	**3.00**	38.752	39.252	39.00
45	**1.50**	43.376	43.676	43.50
45	**2.00**	42.835	43.210	43.00
45	**3.00**	41.752	42.252	42.00
48	**1.50**	46.376	46.676	46.50
48	**2.00**	45.835	46.210	46.00
48	**3.00**	44.752	45.252	45.00
50	**1.50**	48.376	48.676	48.50
50	**2.00**	47.835	48.210	48.00
50	**3.00**	46.752	47.252	47.00
52	**1.50**	50.376	50.676	50.50
52	**2.00**	49.835	50.210	50.00
52	**3.00**	48.752	49.252	49.00
55	**2.00**	52.835	53.210	53.00
60	**2.00**	57.835	58.210	58.00

MF EN 60423:1994, 7H

Ø	P	*Ø Núcleo* - Core Ø nut		
d_1	mm	Ø mini	Ø maxi	Ø guide line
8	**1.00**	6.917	7.217	7.00
10	**1.00**	8.917	9.217	9.00
12	**1.50**	10.376	10.751	10.50
16	**1.50**	14.376	14.751	14.50
20	**1.50**	18.376	18.751	18.50
25	**1.50**	23.376	23.751	23.50
32	**1.50**	30.376	30.751	30.50
40	**1.50**	38.376	38.751	38.50
63	**1.50**	61.376	61.751	61.50

UNC ASME B1.1, 2B

Ø"	P	P	*Ø Núcleo* - Core Ø nut		
d_1	TPI	mm	Ø mini	Ø maxi	Ø guide line
1	**64**	0.397	1.425	1.582	1.45
2	**56**	0.454	1.695	1.871	1.75
3	**48**	0.529	1.941	2.146	2.00
4	**40**	0.635	2.157	2.385	2.25
5	**40**	0.635	2.487	2.697	2.55
6	**32**	0.794	2.642	2.895	2.75
8	**32**	0.794	3.302	3.530	3.40
10	**24**	1.058	3.683	3.962	3.80
12	**24**	1.058	4.344	4.597	4.40
1/4"	**20**	1.270	4.979	5.257	5.10
5/16"	**18**	1.411	6.401	6.731	6.50
3/8"	**16**	1.588	7.798	8.153	8.00
7/16"	**14**	1.814	9.144	9.550	9.30
1/2"	**13**	1.954	10.592	11.023	10.80
9/16"	**12**	2.117	11.989	12.446	12.20
5/8"	**11**	2.309	13.386	13.868	13.60
3/4"	**10**	2.540	16.307	16.840	16.60
7/8"	**9**	2.822	19.177	19.761	19.50
1"	**8**	3.175	21.971	22.606	22.30
1 1/8"	**7**	3.629	24.638	25.349	25.00
1 1/4"	**7**	3.629	27.813	28.524	28.20
1 3/8"	**6**	4.233	30.353	31.115	30.80
1 1/2"	**6**	4.233	33.528	34.290	34.00
1 3/4"	**5**	5.080	38.964	39.827	39.50
2"	**4.5**	5.644	44.679	45.593	45.30

UNJC ISO 3161:1999, 3B

Ø"	P	P	*Ø Núcleo* - Core Ø nut		
d_1	TPI	mm	Ø mini	Ø maxi	Ø guide line
4	**40**	0.635	2.228	2.393	2.30
5	**40**	0.635	2.558	2.723	2.60
6	**32**	0.794	2.733	2.939	2.80
8	**32**	0.794	3.393	3.599	3.45
10	**24**	1.058	3.795	4.064	3.90
12	**24**	1.058	4.455	4.704	4.55
1/4"	**20**	1.270	5.113	5.387	5.20
5/16"	**18**	1.411	6.563	6.833	6.70
3/8"	**16**	1.588	7.978	8.255	8.10
7/16"	**14**	1.814	9.347	9.639	9.40
1/2"	**13**	1.954	10.798	11.095	10.90
9/16"	**12**	2.117	12.228	12.482	12.40
5/8"	**11**	2.309	13.627	13.904	13.80
3/4"	**10**	2.540	16.576	16.881	16.70

DIÁMETRO DEL AGUJERO — CORE HOLES

UNF ASME B1.1, 2B

ø"	P	P	Ø *Núcleo* - Core Ø nut		
d_1	TPI	mm	Ø mini	Ø maxi	Ø guide line
0	**80**	0.318	1.182	1.305	1.20
1	**72**	0.353	1.474	1.612	1.50
2	**64**	0.397	1.756	1.912	1.80
3	**56**	0.454	2.025	2.197	2.10
4	**48**	0.529	2.271	2.458	2.35
5	**44**	0.577	2.551	2.740	2.60
6	**40**	0.635	2.820	3.022	2.90
8	**36**	0.706	3.404	3.606	3.50
10	**32**	0.794	3.963	4.165	4.05
12	**28**	0.907	4.496	4.724	4.60
1/4"	**28**	0.907	5.360	5.588	5.50
5/16"	**24**	1.058	6.782	7.035	6.90
3/8"	**24**	1.058	8.382	8.636	8.50
7/16"	**20**	1.270	9.729	10.033	9.80
1/2"	**20**	1.270	11.329	11.607	11.40
9/16"	**18**	1.411	12.751	13.081	12.90
5/8"	**18**	1.411	14.351	14.681	14.50
3/4"	**16**	1.588	17.323	17.678	17.50
7/8"	**14**	1.814	20.270	20.675	20.40
1"	**12**	2.117	23.114	23.571	23.30
1 1/8"	**12**	2.117	26.289	26.746	26.50
1 1/4"	**12**	2.117	29.464	29.921	29.70
1 3/8"	**12**	2.117	32.639	33.096	32.80
1 1/2"	**12**	2.117	35.814	36.271	36.00

UNJF ISO 3161:1999, 3B

ø"	P	P	Ø *Núcleo* - Core Ø nut		
d_1	TPI	mm	Ø mini	Ø maxi	Ø guide line
0	**80**	0.318	1.217	1.298	1.25
1	**72**	0.353	1.511	1.603	1.55
2	**64**	0.397	1.798	1.902	1.85
3	**56**	0.454	2.073	2.189	2.10
4	**48**	0.529	2.329	2.466	2.35
5	**44**	0.577	2.614	2.764	2.65
6	**40**	0.635	2.888	3.053	2.95
8	**36**	0.706	3.480	3.663	3.55
10	**32**	0.794	4.054	4.255	4.10
12	**28**	0.907	4.602	4.816	4.70
1/4"	**28**	0.907	5.466	5.662	5.55
5/16"	**24**	1.058	6.906	7.109	7.00
3/8"	**24**	1.058	8.494	8.679	8.60
7/16"	**20**	1.270	9.876	10.084	10.00
1/2"	**20**	1.270	11.463	11.661	11.55
9/16"	**18**	1.411	12.913	13.122	13.05
5/8"	**18**	1.411	14.501	14.702	14.60
3/4"	**16**	1.588	17.506	17.722	17.60
7/8"	**14**	1.814	20.460	20.706	20.60
1"	**12**	2.117	23.340	23.594	23.50

UNEF ASME B1.1, 2B

ø"	P	P	Ø *Núcleo* - Core Ø nut		
d_1	TPI	mm	Ø mini	Ø maxi	Ø guide line
12	**32**	0.794	4.623	4.826	4.70
1/4"	**32**	0.794	5.487	5.689	5.60
5/16"	**32**	0.794	7.087	7.264	7.20
3/8"	**32**	0.794	8.662	8.864	8.75
7/16"	**28**	0.907	10.135	10.337	10.25
1/2"	**28**	0.907	11.710	11.938	11.85
9/16"	**24**	1.058	13.132	13.385	13.20
5/8"	**24**	1.058	14.732	14.986	14.80
11/16"	**24**	1.058	16.307	16.560	16.40
3/4"	**20**	1.270	17.679	17.957	17.80
13/16"	**20**	1.270	19.254	19.558	19.40
7/8"	**20**	1.270	20.854	21.132	21.00
1"	**20**	1.270	24.029	24.307	24.10

UN ASME B1.1, 2B

ø"	P	P	Ø *Núcleo* - Core Ø nut		
d_1	TPI	mm	Ø mini	Ø maxi	Ø guide line
5/16"	**20**	1.270	6.554	6.858	6.70
3/8"	**20**	1.270	8.154	8.432	8.30
9/16"	**20**	1.270	12.904	13.208	13.00
5/8"	**20**	1.270	14.504	14.782	14.60
1 1/8"	**8**	3.175	25.146	25.781	25.50
1 1/4"	**8**	3.175	28.321	28.956	28.70
1 3/8"	**8**	3.175	31.496	32.131	31.80
1 1/2"	**8**	3.175	34.671	35.306	35.00
1 5/8"	**8**	3.175	37.846	38.481	38.20
1 3/4"	**8**	3.175	41.021	41.656	41.40
1 7/8"	**8**	3.175	44.196	44.831	44.50
2"	**8**	3.175	47.371	48.006	47.70
2 1/4"	**8**	3.175	53.721	54.356	54.10
2 1/2"	**8**	3.175	60.071	60.706	60.40

UNS ASME B1.1, 2B

ø"	P	P	Ø *Núcleo* - Core Ø nut		
d_1	TPI	mm	Ø mini	Ø maxi	Ø guide line
10	**36**	0.706	4.064	4.216	4.10
10	**40**	0.635	4.141	4.292	4.20
10	**56**	0.454	4.344	4.445	4.40
1/4"	**36**	0.706	5.588	5.740	5.65
1/4"	**40**	0.635	5.665	5.816	5.70
1/4"	**48**	0.529	5.766	5.892	5.80
1/4"	**56**	0.454	5.868	5.969	5.90
5/16"	**36**	0.706	7.163	7.340	7.25
3/8"	**36**	0.706	8.763	8.940	8.80
7/16"	**24**	1.058	9.957	10.210	10.00
1/2"	**24**	1.058	11.557	11.811	11.60
1"	**14**	1.814	23.445	23.825	23.60

DIÁMETRO DEL AGUJERO — CORE HOLES

G (BSP) DIN EN ISO 228

ø"	P	P	Ø Núcleo - Core Ø nut		
d_1	TPI	mm	Ø mini	Ø maxi	Ø guide line
1/16"	**28**	0.907	6.561	6.843	6.75
1/8"	**28**	0.907	8.566	8.848	8.75
1/4"	**19**	1.337	11.445	11.890	11.60
3/8"	**19**	1.337	14.950	15.395	15.20
1/2"	**14**	1.814	18.631	19.172	18.90
5/8"	**14**	1.814	20.587	21.128	20.90
3/4"	**14**	1.814	24.117	24.658	24.40
7/8"	**14**	1.814	27.877	28.418	28.20
1"	**11**	2.309	30.291	30.931	30.70
1 1/8"	**11**	2.309	34.939	35.579	35.30
1 1/4"	**11**	2.309	38.952	39.592	39.30
1 3/8"	**11**	2.309	41.365	42.005	41.80
1 1/2"	**11**	2.309	44.845	45.485	45.20
1 3/4"	**11**	2.309	50.788	51.428	51.20
2"	**11**	2.309	56.656	57.296	57.00
2 1/4"	**11**	2.309	62.752	63.392	63.10
2 1/2"	**11**	2.309	72.226	72.866	72.60
3"	**11**	2.309	84.926	85.566	85.30

W (BSW) BS 84, (DIN11 - 1970)

ø"	P	P	Ø Núcleo - Core Ø nut		
d_1	TPI	mm	Ø mini	Ø maxi	Ø guide line
(3/32")	**48**				1.80
1/8"	**40**	0.635	2.362	2.591	2.50
(5/32")	**32**				3.10
3/16"	**24**	1.058	3.406	3.744	3.60
(7/32")	**24**				4.40
1/4"	**20**	1.270	4.724	5.156	4.90
5/16"	**18**	1.411	6.129	6.588	6.40
3/8"	**16**	1.588	7.493	7.988	7.70
7/16"	**14**	1.814	8.791	9.332	9.10
1/2"	**12**	2.117	9.987	10.589	10.30
5/8"	**11**	2.309	12.918	13.558	13.30
3/4"	**10**	2.540	15.799	16.484	16.20
7/8"	**9**	2.822	18.613	19.355	19.25
1"	**8**	3.175	21.336	22.149	21.90

PG DIN 40430

ø	P	P	Ø Núcleo - Core Ø nut		
d_1	TPI	mm	Ø mini	Ø maxi	Ø guide line
7	**20**	1.270	11.28	11.43	11.35
9	**18**	1.411	13.86	14.01	13.90
11	**18**	1.411	17.26	17.41	17.30
13.5	**18**	1.411	19.06	19.21	19.10
16	**18**	1.411	21.16	21.31	21.20
21	**16**	1.588	26.78	27.03	26.80
29	**16**	1.588	35.48	35.73	35.50
36	**16**	1.588	45.48	45.73	45.50
42	**16**	1.588	52.48	52.73	52.50
48	**16**	1.588	57.78	58.03	57.80

TR ISO 2901-2904, DIN 103, 7H

ø	P	Ø Núcleo - Core Ø nut		
d_1	mm	Ø mini	Ø maxi	Ø guide line
10	**2**	8	8.236	8.20
12	**3**	9	9.315	9.25
14	**3**	11	11.315	11.25
16	**4**	12	12.375	12.25
18	**4**	14	14.375	14.25
20	**4**	16	16.375	16.25
22	**5**	17	17.450	17.25
24	**5**	19	19.450	19.25
26	**5**	21	21.450	21.25
28	**5**	23	23.450	23.25
30	**6**	24	24.500	24.25
32	**6**	26	26.500	26.25

S NIHS 06-10, 3G5H (*Tol. estándar* - standard)

ø	P	Ø Núcleo - Core Ø nut		
d_1	mm	Ø mini	Ø maxi	Ø guide line
0.3	**0.080**	0.223	0.240	0.23
0.35	**0.090**	0.264	0.286	0.28
0.4	**0.100**	0.304	0.330	0.32
0.5	**0.125**	0.380	0.415	0.41
0.6	**0.150**	0.456	0.502	0.50
0.7	**0.175**	0.532	0.585	0.58
0.8	**0.200**	0.608	0.665	0.66
0.9	**0.225**	0.684	0.745	0.74
1	**0.250**	0.760	0.825	0.82
1.2	**0.250**	0.960	1.025	1.02
1.4	**0.300**	1.112	1.185	1.18

SF Fine Thread NIHS 06-10, 3G5H (*Tol. estándar*- standard tol.)

ø	P	Ø Núcleo - Core Ø nut		
d_1	mm	Ø mini	Ø maxi	Ø guide line
1.4	**0.200**	1.208	1.265	1.26
1.6	**0.200**	1.408	1.465	1.46
1.8	**0.200**	1.608	1.665	1.66
2	**0.200**	1.808	1.865	1.86
2.2	**0.200**	2.008	2.065	2.06
2.2	**0.250**	1.960	2.025	2.02
2.5	**0.200**	2.308	2.365	2.36
2.5	**0.250**	2.260	2.325	2.32

SL Safelock SL 15-01

ø	P	Ø Núcleo - Core Ø nut		
d_1	mm	Ø mini	Ø maxi	Ø guide line
0.3	**0.060**	0.264	0.278	0.27
0.35	**0.060**	0.314	0.328	0.32
0.4	**0.080**	0.356	0.372	0.36
0.5	**0.100**	0.448	0.466	0.46
0.6	**0.125**	0.538	0.559	0.55
0.7	**0.150**	0.628	0.651	0.64
0.8	**0.150**	0.728	0.751	0.74
0.9	**0.175**	0.818	0.844	0.83
1	**0.200**	0.908	0.936	0.92
1.2	**0.200**	1.108	1.136	1.12
1.4	**0.250**	1.288	1.321	1.30

DIÁMETRO DE TORNEADO — TURNED DIAMETERS

M DIN 13, ISO 261, *6h / 6g

Ø	P	Ø Exterior Thread outside Ø		
d_1	mm	Ø mini	Ø maxi	Ø guide line
*1	0.25	0.933	1.000	0.97
*1.1	0.25	1.033	1.100	1.07
*1.2	0.25	1.133	1.200	1.17
*1.4	0.30	1.325	1.400	1.36
1.6	0.35	1.496	1.581	1.54
1.7	0.35	1.596	1.681	1.64
1.8	0.35	1.696	1.781	1.74
2	0.40	1.886	1.981	1.93
2.2	0.45	2.080	2.180	2.13
2.3	0.40	2.186	2.300	2.23
2.5	0.45	2.380	2.480	2.43
2.6	0.45	2.480	2.600	2.53
3	0.50	2.874	2.980	2.92
3.5	0.60	3.354	3.479	3.41
4	0.70	3.838	3.978	3.91
4.5	0.75	4.338	4.478	4.40
5	0.80	4.826	4.976	4.90
6	1.00	5.794	5.974	5.88
7	1.00	6.794	6.974	6.88
8	1.25	7.760	7.972	7.87
9	1.25	8.760	8.972	8.87
10	1.50	9.732	9.968	9.85
11	1.50	10.732	10.968	10.85
12	1.75	11.701	11.966	11.83
14	2.00	13.682	13.962	13.82
16	2.00	15.682	15.962	15.82
18	2.50	17.623	17.958	17.79
20	2.50	19.623	19.958	19.79
22	2.50	21.623	21.958	21.79
24	3.00	23.577	23.952	23.76
27	3.00	26.577	26.952	26.76
30	3.50	29.522	29.947	29.73
33	3.50	32.522	32.947	32.73
36	4.00	35.465	35.940	35.70
39	4.00	38.465	38.940	38.70
42	4.50	41.437	41.937	41.69
45	4.50	44.437	44.937	44.69
48	5.00	47.399	47.929	47.66
52	5.00	51.399	51.929	51.66
56	5.50	55.365	55.925	55.65

MF DIN 13, ISO 261, 6g

Ø	P	Ø Exterior Thread outside Ø		
d_1	mm	Ø mini	Ø maxi	Ø guide line
2.5	0.35	2.396	2.481	2.44
3	0.35	2.896	2.981	2.94
3.5	0.35	3.396	3.481	3.44
4	0.50	3.874	3.980	3.93
4.5	0.50	4.374	4.480	4.43
5	0.50	4.874	4.980	4.93
5.5	0.50	5.374	5.480	5.43
6	0.75	5.838	5.978	5.90
7	0.75	6.838	6.978	6.90
8	0.75	7.838	7.978	7.90

MF DIN 13, ISO 261, 6g

Ø	P	Ø Exterior Thread outside Ø		
d_1	mm	Ø mini	Ø maxi	Ø guide line
8	1.00	7.794	7.974	7.88
9	0.75	8.838	8.978	8.90
9	1.00	8.794	8.974	8.88
10	0.75	9.838	9.978	9.90
10	1.00	9.794	9.974	9.88
10	1.25	9.760	9.972	9.86
11	0.75	10.838	10.978	10.90
11	1.00	10.794	10.974	10.88
12	1.00	11.794	11.974	11.88
12	1.25	11.760	11.972	11.86
12	1.50	11.732	11.968	11.85
14	1.00	13.794	13.974	13.88
14	1.25	13.760	13.972	13.86
14	1.50	13.732	13.968	13.85
15	1.00	14.794	14.974	14.88
15	1.50	14.732	14.968	14.85
16	1.00	15.794	15.974	15.88
16	1.50	15.732	15.968	15.85
17	1.00	16.794	16.974	16.88
17	1.50	16.732	16.968	16.85
18	1.00	17.794	17.974	17.88
18	1.50	17.732	17.968	17.85
18	2.00	17.682	17.962	17.82
20	1.00	19.794	19.974	19.88
20	1.50	19.732	19.968	19.85
20	2.00	19.682	19.962	19.82
22	1.00	21.794	21.974	21.88
22	1.50	21.732	21.968	21.85
22	2.00	21.682	21.962	21.82
24	1.00	23.794	23.974	23.88
24	1.50	23.732	23.968	23.85
24	2.00	23.682	23.962	23.82
25	1.00	24.794	24.974	24.88
25	1.50	24.732	24.968	24.85
25	2.00	24.682	24.962	24.82
27	1.00	26.794	26.974	26.88
27	1.50	26.732	26.968	26.85
27	2.00	26.682	26.962	26.82
28	1.00	27.794	27.974	27.88
28	1.50	27.732	27.968	27.85
28	2.00	27.682	27.962	27.82
30	1.00	29.794	29.974	29.88
30	1.50	29.732	29.968	29.85
30	2.00	29.682	29.962	29.82
30	3.00	29.577	29.952	29.76
32	1.50	31.732	31.968	31.85
32	2.00	31.682	31.962	31.82
33	1.50	32.732	32.968	32.85
33	2.00	32.682	32.962	32.82
33	3.00	32.577	32.952	32.76
35	1.50	34.732	34.968	34.85
36	1.50	35.732	35.968	35.85
36	2.00	35.682	35.962	35.82
36	3.00	35.577	35.952	35.76
39	1.50	38.732	38.968	38.85
39	2.00	38.682	38.962	38.82
39	3.00	38.577	38.952	38.76

DIÁMETRO DE TORNEADO — TURNED DIAMETERS

MF DIN 13, ISO 261, 6g

Ø	P	Ø Exterior Thread outside Ø		
d_1	mm	Ø mini	Ø maxi	Ø guide line
40	**1.50**	39.732	39.968	39.85
40	**2.00**	39.682	39.962	39.82
40	**3.00**	39.577	39.952	39.76
42	**1.50**	41.732	41.968	41.85
42	**2.00**	41.682	41.962	41.82
42	**3.00**	41.577	41.952	41.76
45	**1.50**	44.732	44.968	44.85
45	**2.00**	44.682	44.962	44.82
45	**3.00**	44.577	44.952	44.76
48	**1.50**	47.732	47.968	47.85
48	**2.00**	47.682	47.962	47.82
48	**3.00**	47.577	47.952	47.76
50	**1.50**	49.732	49.968	49.85
50	**2.00**	49.682	49.962	49.82
50	**3.00**	49.577	49.952	49.76
52	**1.50**	51.732	51.968	51.85
52	**2.00**	51.682	51.962	51.82
52	**3.00**	51.577	51.952	51.76
52	**4.00**	51.465	51.940	51.70

UNC ASME B1.1, 2A

Ø"	P	P	Ø Exterior Thread outside Ø		
d_1	TPI	mm	Ø mini	Ø maxi	Ø guide line
1	**64**	0.397	1.743	1.838	1.79
2	**56**	0.454	2.066	2.169	2.12
3	**48**	0.529	2.383	2.496	2.44
4	**40**	0.635	2.695	2.824	2.76
5	**40**	0.635	3.026	3.154	3.09
6	**32**	0.794	3.333	3.484	3.41
8	**32**	0.794	3.991	4.142	4.07
10	**24**	1.058	4.618	4.800	4.71
12	**24**	1.058	5.279	5.461	5.37
1/4"	**20**	1.270	6.117	6.322	6.22
5/16"	**18**	1.411	7.687	7.907	7.80
3/8"	**16**	1.588	9.254	9.491	9.37
7/16"	**14**	1.814	10.816	11.076	10.95
1/2"	**13**	1.954	12.386	12.661	12.52
9/16"	**12**	2.117	13.958	14.246	14.10
5/8"	**11**	2.309	15.528	15.834	15.68
3/4"	**10**	2.540	18.677	19.004	18.84
7/8"	**9**	2.822	21.824	22.176	22.00
1"	**8**	3.175	24.969	25.349	25.16
1 1/8"	**7**	3.629	28.103	28.519	28.31
1 1/4"	**7**	3.629	31.278	31.694	31.49
1 3/8"	**6**	4.233	34.402	34.864	34.63
1 1/2"	**6**	4.233	37.577	38.039	37.81
1 3/4"	**5**	5.080	43.860	44.381	44.12
2"	**4.5**	5.644	50.168	50.726	50.45
2 1/4"	**4.5**	5.644	56.518	57.076	56.80
2 1/2"	**4**	6.350	62.817	63.421	63.12
2 3/4"	**4**	6.350	69.165	69.768	69.47
3"	**4**	6.350	75.515	76.118	75.82
3 1/4"	**4**	6.350	81.862	82.466	82.16
3 1/2"	**4**	6.350	88.212	88.816	88.51
3 3/4"	**4**	6.350	94.560	95.163	94.86
4"	**4**	6.350	100.910	101.513	101.21

UNF ASME B1.1, 2A

Ø"	P	P	Ø Exterior Thread outside Ø		
d_1	TPI	mm	Ø mini	Ø maxi	Ø guide line
0	**80**	0.318	1.431	1.511	1.47
1	**72**	0.353	1.751	1.838	1.79
2	**64**	0.397	2.073	2.169	2.12
3	**56**	0.454	2.393	2.496	2.44
4	**48**	0.529	2.713	2.827	2.77
5	**44**	0.577	3.036	3.157	3.10
6	**40**	0.635	3.356	3.484	3.42
8	**36**	0.706	4.006	4.145	4.08
10	**32**	0.794	4.651	4.803	4.73
12	**28**	0.907	5.296	5.461	5.38
1/4"	**28**	0.907	6.160	6.324	6.24
5/16"	**24**	1.058	7.727	7.909	7.82
3/8"	**24**	1.058	9.315	9.497	9.41
7/16"	**20**	1.270	10.874	11.079	10.98
1/2"	**20**	1.270	12.462	12.666	12.56
9/16"	**18**	1.411	14.031	14.251	14.14
5/8"	**18**	1.411	15.619	15.839	15.73
3/4"	**16**	1.588	18.774	19.011	18.89
7/8"	**14**	1.814	21.923	22.184	22.05
1"	**12**	2.117	25.065	25.354	25.21
1 1/8"	**12**	2.117	28.240	28.529	28.38
1 1/4"	**12**	2.117	31.415	31.704	31.56
1 3/8"	**12**	2.117	34.588	34.876	34.73
1 1/2"	**12**	2.117	37.763	38.051	37.91

UNEF ASME B1.1, 2A

Ø"	P	P	Ø Exterior Thread outside Ø		
d_1	TPI	mm	Ø mini	Ø maxi	Ø guide line
12	**32**	0.794	5.312	5.463	5.39
1/4"	**32**	0.794	6.173	6.324	6.25
5/16"	**32**	0.794	7.760	7.912	7.84
3/8"	**32**	0.794	9.348	9.499	9.42
7/16"	**28**	0.907	10.920	11.084	11.00
1/2"	**28**	0.907	12.507	12.672	12.59
9/16"	**24**	1.058	14.075	14.257	14.17
5/8"	**24**	1.058	15.662	15.844	15.75
11/16"	**24**	1.058	17.250	17.432	17.34
3/4"	**20**	1.270	18.812	19.016	18.91
13/16"	**20**	1.270	20.339	20.604	20.50
7/8"	**20**	1.270	21.987	22.191	22.09
15/16"	**20**	1.270	23.572	23.776	23.67
1"	**20**	1.270	25.159	25.364	25.26
1 1/8"	**18**	1.411	28.319	28.539	28.43
1 1/4"	**18**	1.411	31.491	31.711	31.60
1 1/2"	**18**	1.411	37.841	38.061	37.95

UN ASME B1.1, 2A

Ø"	P	P	Ø Exterior Thread outside Ø		
d_1	TPI	mm	Ø mini	Ø maxi	Ø guide line
5/16"	**20**	1.270	7.702	7.907	7.80
3/8"	**20**	1.270	9.289	9.494	9.39
9/16"	**20**	1.270	14.049	14.254	14.15
5/8"	**20**	1.270	15.637	15.841	15.74

DIÁMETRO DE TORNEADO — TURNED DIAMETERS

UN ASME B1.1, 2A

ø"	P	P	Ø Exterior Thread outside Ø		
d_1	TPI	mm	Ø mini	Ø maxi	Ø guide line
1 1/8"	8	3.175	28.141	28.521	28.33
1 1/4"	8	3.175	31.316	31.696	31.51
1 3/8"	8	3.175	34.489	34.869	34.68
1 1/2"	8	3.175	37.664	38.044	37.85
1 5/8"	8	3.175	40.839	41.219	41.03
1 3/4"	8	3.175	44.011	44.391	44.20
1 7/8"	8	3.175	47.186	47.566	47.38
2"	8	3.175	50.361	50.741	50.55
2 1/4"	8	3.175	56.709	57.089	56.90
2 1/2"	8	3.175	63.059	63.439	63.25
2 3/4"	8	3.175	69.406	69.786	69.60
3"	8	3.175	75.753	76.133	75.94

UNS ASME B1.1, 2A

ø"	P	P	Ø Exterior Thread outside Ø		
d_1	TPI	mm	Ø mini	Ø maxi	Ø guide line
10	36	0.706	4.664	4.803	4.73
10	40	0.635	4.674	4.803	4.74
10	56	0.454	4.705	4.808	4.76
1/4"	36	0.706	6.188	6.327	6.26
1/4"	40	0.635	6.198	6.327	6.26
1/4"	48	0.529	6.216	6.329	6.27
1/4"	56	0.454	6.226	6.329	6.28
5/16"	36	0.706	7.775	7.914	7.84
3/8"	36	0.706	9.360	9.499	9.43
7/16"	24	1.058	10.902	11.084	10.99
1/2"	24	1.058	12.487	12.669	12.58
1"	14	1.814	25.096	25.356	25.23

G (BSP) DIN EN ISO 228

ø"	P	P	Ø Exterior Thread outside Ø		
d_1	TPI	mm	Ø mini	Ø maxi	Ø guide line
1/16"	28	0.907	7.509	7.723	7.62
1/8"	28	0.907	9.514	9.728	9.62
1/4"	19	1.337	12.907	13.157	13.03
3/8"	19	1.337	16.412	16.662	16.54
1/2"	14	1.814	20.671	20.955	20.81
5/8"	14	1.814	22.627	22.911	22.77
3/4"	14	1.814	26.157	26.441	26.30
7/8"	14	1.814	29.917	30.201	30.06
1"	11	2.309	32.889	33.249	33.07
1 1/8"	11	2.309	37.537	37.897	37.72
1 1/4"	11	2.309	41.550	41.910	41.73
1 3/8"	11	2.309	43.963	44.323	44.14
1 1/2"	11	2.309	47.443	47.803	47.62
1 3/4"	11	2.309	53.386	53.746	53.57
2"	11	2.309	59.254	59.614	59.43
2 1/4"	11	2.309	65.276	65.710	65.49
2 1/2"	11	2.309	74.750	75.184	74.97
2 3/4"	11	2.309	81.100	81.534	81.32
3"	11	2.309	87.450	87.884	87.67
3 1/2"	11	2.309	99.896	100.330	100.11

W (BSW) BS 84

ø"	P	P	Ø Exterior Thread outside Ø		
d_1	TPI	mm	Ø mini	Ø maxi	Ø guide line
1/4"	20	1.270	6.165	6.319	6.24
5/16"	18	1.411	7.737	7.904	7.82
3/8"	16	1.588	9.312	9.489	9.40
7/16"	14	1.814	10.884	11.074	10.98
1/2"	12	2.117	12.456	12.662	12.56
5/8"	11	2.309	15.613	15.832	15.72
3/4"	10	2.540	18.771	19.004	18.89
7/8"	9	2.822	21.979	22.225	22.10
1"	8	3.175	25.138	25.400	25.27
1 1/8"	7	3.629	28.296	28.575	28.44
1 1/4"	7	3.629	31.465	31.750	31.61
1 1/2"	6	4.233	37.793	38.100	37.95
1 3/4"	5	5.080	44.117	44.450	44.28
2"	4.5	5.644	50.449	50.800	50.62
2 1/4"	4	6.350	56.779	57.150	56.96
2 1/2"	4	6.350	63.119	63.500	63.31

PG DIN 40430

ø	P	P	Ø Exterior Thread outside Ø		
d_1	TPI	mm	Ø mini	Ø maxi	Ø guide line
7	20	1.270	12.3	12.5	12.40
9	18	1.411	15.0	15.2	15.10
11	18	1.411	18.4	18.6	18.50
13. 5	18	1.411	20.2	20.4	20.30
16	18	1.411	22.3	22.5	22.40
21	16	1.588	28.0	28.3	28.15
29	16	1.588	36.7	37.0	36.85
36	16	1.588	46.7	47.0	46.85
42	16	1.588	53.7	54.0	53.85
48	16	1.588	59.0	59.3	59.15

TR ISO 2901-2904, DIN 103, 7e

ø	P	Ø Exterior Thread outside Ø		
d_1	mm	Ø mini	Ø maxi	Ø guide line
10	2	9.820	10.000	9.91
12	3	11.764	12.000	11.88
14	3	13.764	14.000	13.88
16	4	15.700	16.000	15.85
18	4	17.700	18.000	17.85
20	4	19.700	20.000	19.85
22	5	21.665	22.000	21.83
24	5	23.665	24.000	23.83
26	5	25.665	26.000	25.83
28	5	27.665	28.000	27.83
30	6	29.625	30.000	29.81
32	6	31.625	32.000	31.81

CUESTIONARIO TÉCNICO

FRESA DE ROSCAR

Offertar ☐ *Resultado de prueba* ☐ *Reclamación* ☐

Agente : _____ *Responsable :* _____

Cliente : _____ *E-mail :* _____

Tel. o fax : _____ *Fecha :* _____

1. Tipo de herramienta : _____

Ø del útil : _____ *Dimensiones :* _____

Particularidad : _____ *Tolerancia :* _____

2. Referencia del material : _____

No del material : _____ *Dureza :* _____ *N/mm2 /HB/HRC*

Norma : _____ *Alargamiento :* _____ *%*

3. Roscado : ☐*interior* ☐*exterior* ***Agujero :*** ☐*ciego* ☐*pasante*

Longitud roscada : _____ *mm*

Taladro previo Ø : _____ *Profundidad :* _____ *mm*

Previo despejado Ø : _____ *Profundidad :* _____ *mm*

4. Velocidad de corte (Vc) : _____ *m/min* _____ *1/min*

Avance (f) : _____ *mm/rev.* ***Avance (fz) :*** _____ *mm/diente*

5. Máquina : _____ ☐*lubrificación interior*

Posición de trabajo : ☐*horizontal* ☐*vertical*

Fijación herramienta : ☐*pinza* ☐*mandril* ☐*Weldon / Whistle Notch* ☐*sujección termicá / en frio*

6. Lubrifiante : ☐*taladrina* ☐*aceite* ☐*aire* ☐*microlubrificación*

Producto : _____

7. Razón de cambio del útil ☐*desgaste* ☐*rotura del macho*

☐*roscado incorrecto (controlado con calibre)* ☐*error de máquina*

8. Comparación de rendimiento

Macho en prueba : _____

Rendimiento y observación : _____

Observación : _____

copia a mandar a : DC SWISS SA - CH-2735 Malleray info@dcswiss.ch

TECHNICAL QUESTIONNAIRE

THREAD MILLING AND THREAD WHIRLING

Enquiry ☐ Test result ☐ Complaint ☐

Agency : _____ Contact : _____

Customer : _____ E-mail : _____

Phone or fax : _____ Date : _____

1. Tool type : _____

Tool Ø : _____ Pitch : _____

Serie : _____ Coating : _____

2. Material group : _____

Material N° : _____ Hardness : _____ N/mm² /HB/HRC

Norm : _____ Elongation : _____ %

3. Thread : ☐internal ☐external **Hole :** ☐blind ☐through

Threaded length : _____ mm

Core hole Ø : _____ Depth : _____ mm

Counter-bore Ø : _____ Depth : _____ mm

4. Cutting speed (V_c) : _____ m/min _____ 1/min

Feed (f) : _____ mm/rev. **Feed (f_z) :** _____ mm/tooth

5. Machine : _____ ☐internal coolant

Working position : ☐horizontal Tool attachment : ☐collet ☐Weldon / Whistle Notch

☐vertical ☐hydraulic chuck ☐hot / cold shrunk

6. Lubricant : ☐emulsion ☐oil ☐air ☐mist

Product : _____

7. Tool change reason : ☐tool wear ☐tool breakage

☐incorrect threading (inspected with gauge) ☐programme error

8. Efficiency comparison

Tool under test : _____

Performance and observations : _____

Remarks : _____

copy to be sent to DC SWISS SA - CH-2735 Malleray info@dcswiss.ch

CONDICIONES DE ENTREGA

Pedidos	*Los pedidos que no puedan ser entregados de stock serán confirmados. Los artículos que ya no están en stock, pero todavía mencionados en el catálogo serán considerados como ejecuciones especiales y facturados como tales. Toda anulación de pedido debe ser aceptada por las dos partes y formulada por escrito.*
Ofertas y confirmaciones de pedidos	*Dado el constante desarrollo en la materia, las descripciones que figuran en nuestras ofertas, los documentos que las acompañan, las indicaciones de peso, medidas, ilustraciones y dibujos tienen carácter de indicaciones aproximadas. Estas informaciones tienen carácter obligatorio solamente en caso que éste último se especifique expresamente.*
Precios	*Nuestros precios implican entregas libres de gastos salida de fabrica o punto de venta y no comprenden gastos de embalaje, flete, portes ni seguros. En caso de aumento de precios, nos reservamos el derecho de facturar las herramientas confirmadas a los nuevos precios.*
Forma de pago	*Las facturas se pagan a los 30 días. En caso de incumplimiento de dicho plazo, un interés moratorio, a contar desde el vencimiento y calculado sobre la base de la tasa de descuento del momento, podrá exigirse. Los gastos de ree bolso, de emisión de letras, etc., son a cargo del comprador.*
Reserva de propiedad	*El material queda de nuestra entera propiedad hasta el pago íntegro del precio total, gastos complementarios incluidos.*
Envíos	*Las mercancías se remiten por cuenta y riesgo del cliente.*
Plazos de entrega	*Los plazos de entrega se calculan lo más justo posible pero a título indicativo. En caso de demora, ninguna reclamación será aceptada ni los pedidos podrán cancelarse por este motivo.*
Fabricaciones especiales	*Por razones técnicas de fabricación, nos reservamos el derecho de entregar un 15% de más o de menos sobre las cantidades de herramientas especiales pedidas, o en pequeñas cantidades por 1 o 2 piezas.*
Garantía	*Las herramientas reconocidas por nosotros como defectuosas son reemplazadas, sin ninguna clase de compensación.*
Reclamaciones	*Toda reclamación deberá llegarnos en un plazo máximo de 2 semanas después de recibir la mercancía.*
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Condiciones especiales	*En caso de fuerza mayor, interrupción parcial o total de nuestra explotación, nos reconocemos el derecho a rescindir todos o parte de nuestros compromisos de entrega.*
Jurisdicción	*Los litigios se someten a la justicia suiza y la jurisdicción de la cual dependen es Moutier (Suiza).*

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Orders	Orders, which cannot be delivered from stock, will be acknowledged. Items, which do not belong any more to our standard programme, although still featured in the catalogue, will be invoiced as «specials». Orders may only be cancelled by mutual written agreement.
Quotations and acknowledgements	For reasons of constant development in this field, all descriptions mentioned in our quotations, annexed documents, weight indications, measurements as well as illustrations and drawings are approximate indications. These technical data have binding value only if expressively specified.
Prices	Our prices are quoted for deliveries ex works Malleray, excluding VAT, packing, insurance, freight, customs' and legalisation duties. Should prices increase, we reserve the right to invoice tools already acknowledged at the new prices.
Payment	Payments must be made in advance or against irrevocable and confirmed documentary credit to be opened in our favour with a Swiss bank. All banking commissions and charges have to be borne by the buyer.
Right of ownership	We reserve the right of ownership of all goods supplied until the sales price, plus all incidental charges, have fully been paid.
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Delivery	Confirmed delivery dates are non-binding. We will do our utmost to maintain them. However, we cannot accept responsibility of direct or consequential losses due to delayed deliveries.
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Guarantee	Tools recognised to be defective by DC will be replaced free of charge, but without prejudice.
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DC PROGRAMME OVERVIEW

THREAD CUTTING

THREAD FORMING

RIGID TAPPING

TAPPING CHUCKS

THREAD WHIRLING

THREAD MILLING

THREAD DIES

THREAD GAUGES

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SWISSQUALITY

ATENCIÓN

Un problema tecnico o una negligencia pueden ser el origen que un herramienta se rompa parcial o totalmente, pudiendo afectar a la integridad física del operario. Es de obligado cumplimiento seguir escrupulosamente las normativas de seguridad y de salud de las empresas activas en el tratamiento de los metales. El uso de gafas de protección es indispensable. El reafilado de utiles de roscado provoca partículas peligrosas para la salud y debe ser ejecutado según las instrucciones de seguridad necesarias.

WARNING

Thread tools can break or shatter either through technical failure or negligence, and can endanger the health of the operator. Always obey the safety and health regulations, also the wearing of safety glasses is compulsory.
The grinding of threading tools causes hazardous particles, and must be performed only under most rigorous safety standards.

Thread whirl cutters — Thread milling cutters — Thread gauges

Fresas torbellino — Fresas de roscar — Calibres

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