boehlerit

棒料剝皮刀
Bar peeling



Boehlerit -
硬質合金開發領域的先驅

作為硬質合金領域的先驅，Boehlerit集團是全球領先的切削刀具製造商之一，專注於金屬及複合材料的機械加工，並提供耐磨防護解決方案。自1932年成立以來，這家家族企業始終致力於透過各類切削材料、半成品、精密刀具以及涵蓋銑削、車削、切槽和成型加工的刀具系統，為全球客戶確保生產過程的可靠性與高效性。公司擁有約700名員工，在冶金領域具備全面的專業知識，能協助客戶實現製程優化，達到最高品質標準，並提升刀俱生產效率，進而建構競爭優勢。Boehlerit集團在歐洲和亞洲設有三個生產基地，並擁有由50多家國際子公司及分銷合作夥伴組成的網絡，業務遍及全球。Boehlerit集團與其兩家法律上獨立的姊妹公司--Leitz和Bilz--共同構成了活躍於全球市場的Brucklacher集團。

Boehlerit –
Pioneer in carbide development

www.boehlerit.com

As a carbide pioneer, the Boehlerit Group is one of the world's leading manufacturers of cutting tools for machining of metal and composite materials and wear protection solutions. With cutting materials, semi-finished products, precision tools and tool systems for milling, turning, grooving and forming, the family-owned company has been ensuring process reliability and efficiency worldwide since 1932. Around 700 employees offer customers comprehensive expertise in all aspects of metallurgy in order to realise process-optimised production technologies, the highest quality and a head start in tool productivity. With three production sites in Europe and Asia, as well as a network of more than 50 international subsidiaries and distribution partners, the carbide and tool specialist is globally present. Together with its two legally independent sister companies Leitz and Bilz, the Boehlerit Group forms the globally active Brucklacher Group



生產基地

Boehlerit集團樹立了國際品質標準。公司在其尖端的生產設施中，每年持續投入資金，用於引進新的生產技術並擴大產能。在奧地利、德國和土耳其，研發成果轉化為高品質的產品。

Production sites

The Boehlerit Group sets international quality standards. Every year, the company invests in new production technologies and in the expansion of capacities at its advanced production sites. High-quality products made in Austria, Germany and Turkey incorporate the latest research and development findings.



Boehlerit Kapfenberg (Headquarter)
in der Steiermark/Österreich Styria/Austria



Boehlerit Sert Metal
in Istanbul/Türkei Turkey



Boehlerit Deutschland
in Oberkochen Deutschland/Germany

Vetriebsstandorte siehe https://www.boehlerit.com/vertrieb
Sales organisations see https://www.boehlerit.com/vertrieb

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Boehlerit 是歐洲領先的硬質合金製造商之一。自 1932 年以來，該公司憑藉深厚的專業知識，致力於生產硬質合金及各類冶金行業專用工具。Boehlerit 的全面承諾不僅體現了其對創新、持續品質改進和技術專長的追求，更彰顯了其在冶金技術領域源遠流長的深厚累積。

1991 年併入 Leitz 集團後，Boehlerit 確立了其作為切削材料卓越中心的地位。這一轉變使公司能夠充分發揮協同效應，從而推動了新服務與生產技術的發展。

豐富的經驗與精深的專業知識，構成了公司所有產品與服務的核心。在冶金領域，Boehlerit 大幅擴展了其旋轉剝皮加工（rotary peeling）的刀具產品線，涵蓋了剝皮頭、刀夾、可轉位刀片以及相關的工程服務。除了標準產品系列外，Boehlerit 還展現出中型私人企業所特有的靈活性，能夠為客戶快速、經濟高效地提供客製化解決方案。

Boehlerit is one of Europe's major carbide producers. It has been producing carbides and very special tools for the steel mill industry with great expertise since 1932. Boehlerit's total committment stands on the one hand for innovation, permanent qualitative development and know-how, and on the other hand for its long tradition in steel industry mill. Following its incorporation in the Leitz Group in 1991, Boehlerit has established itself as the cutting materials competence centre. By now the company has been able to take full advantage of the resulting synergies of new services and new production technologies. This extensive experience and concentrated know-how is the core of services and products. As a main focus in steel mill industry Boehlerit has extended the tool programme for bar peeling with bar peeling heads, cartridges, indexable inserts and engineering performance. In addition to its standard programme Boehlerit has the extra advantage of having the flexibility that comes from a medium-sized company. As a result specific special solutions can be realized for the customer quickly and economically.

棒料剝皮 - 定義
Bar peeling - Definition

旋切加工（Peel turning）－亦稱旋轉剝皮加工－是要求極為嚴苛的機械加工製程之一。在此過程中，關鍵的技術高度集中於刀具與工件的接觸點。憑藉創新的切削材料與塗層解決方案，以及針對性的幾何結構設計（特別是斷屑結構和支撐倒角），Boehlerit在提升此類以效率為導向的加工工藝性能方面發揮著決定性作用。Boehlerit 是旋切加工領域公認的技術領導者。此製程通常作為鍛造圓棒料、軋製或鑄造圓鋼的初始加工工序，也用於厚壁管材的粗旋切加工。其主要目的是去除氧化層、軋製氧化皮及潛在的表面裂紋，同時確保半成品達到預期的表面品質、尺寸精度和圓度要求。

Bar peeling, also known as peeling, is one of the most sophisticated chip-removal processes in modern machining. At Boehlerit, we bring innovation directly to the point of action—where performance truly matters.With cutting-edge materials, advanced coating technologies, and tailor-made geometries—especially in chip breaker stages and support chamfers—we set new standards for efficiency and reliability. Boehlerit is proud to be among the global technology leaders in bar peeling.This process represents the first machining step for forged cylindrical bars, rolled or cast round steel, and the rough peeling of thick-walled tubes. Its purpose is to remove oxide layers, scale, and potential surface cracks, ensuring flawless semi-finished products with superior surface quality, dimensional accuracy, and perfect roundness.

反向縱向車削

從製程工程的角度來看，旋轉剝皮加工可以被視為縱向車削的一種運動學反向形式。工件透過一個被稱為「剝皮刀頭」的旋轉刀具進行同心加工。剝皮刀頭上裝有若干個刀夾，每個刀夾內均安裝有多個切削刃（即轉位刀片）。通常採用四個刀夾，但根據具體配置，刀夾數量也可在三到八個之間。這些轉位刀片既用於粗加工，也用於隨後的精加工階段，從而確保了工件的表面品質和尺寸精度。

在旋轉剝皮加工中，刀具進行旋轉，同時施加徑向進給；而縱向進給則是透過進給裝置中的驅動輥帶動工件移動來實現的。旋轉剝皮製程通常適用於直徑在 20 到 120 mm之間的工件。在實際應用中，直徑在 6 到 600 mm之間的棒材均可進行經濟高效的剝皮加工。在這些常見的直徑範圍內，加工精度可達到 IT8 級。旋轉剝皮的特徵是進給速度極快且切削深度大，屬於重型加工範疇。對於標準材料，其進給速度可高達每轉 18 mm——這遠高於傳統車削製程所能達到的水平。使用刀夾系統時，切削深度最高可達 15 mm。例如，在加工直徑為 80 mm的棒材時，剝皮機僅需一個切削刃，便可在三到四個小時內完成 600 到 800 件工件的加工。這充分體現了所用轉位刀片的高性能。這些轉位刀片的尺寸也反映了重型加工的特點：普通的轉位刀片重量約為 10 克，而 Boehlerit 產品系列中最重的剝皮刀片重量可達 450 克左右。

棒料剝皮 - 定義
Bar peeling - Definition

Reverse Longitudinal Turning

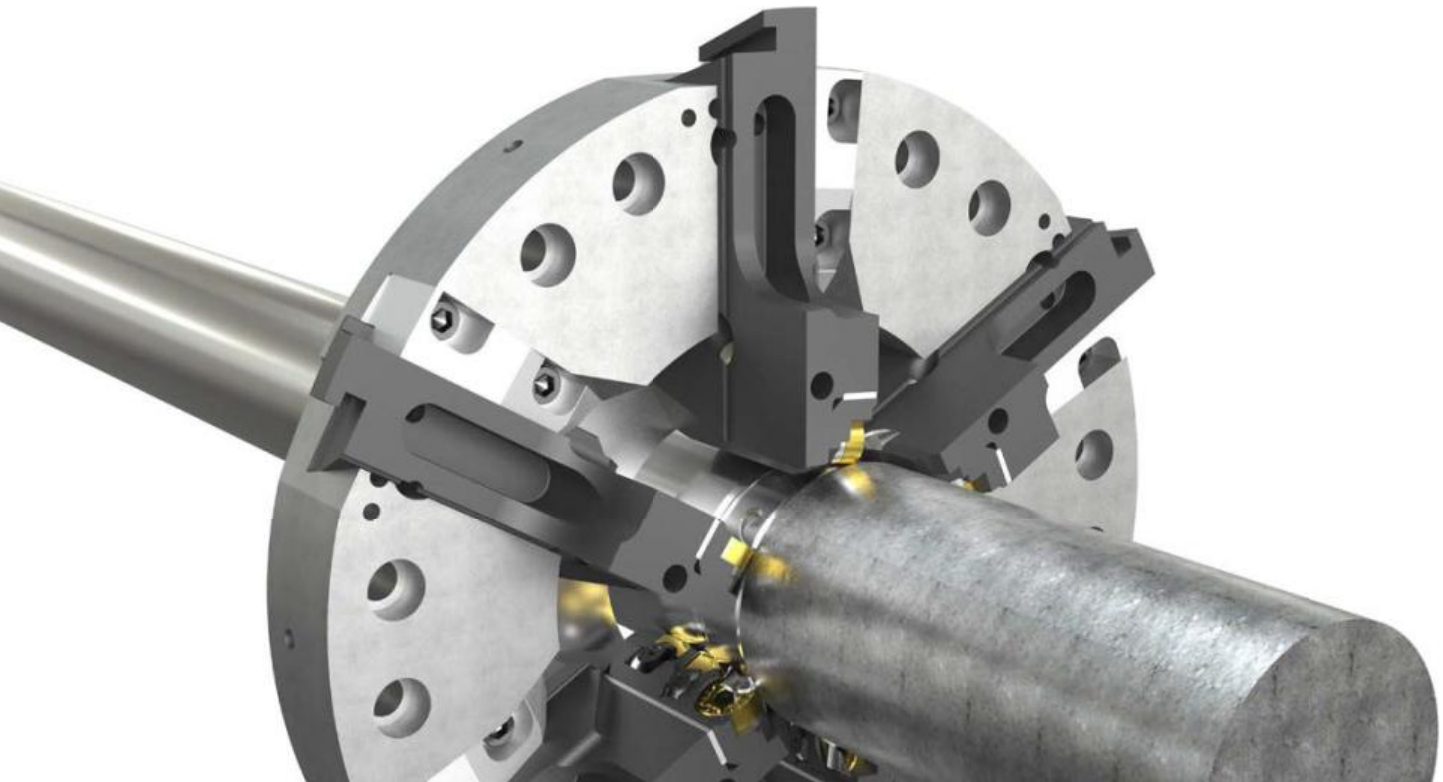
From a process engineering perspective, bar peeling is a kinematically reversed form of longitudinal turning. In this process, the workpiece is machined concentrically by a rotating tool called the peeling head. The peeling head is equipped with several cassettes, each carrying multiple cutting edges in the form of indexable inserts. Typically, four cassettes are installed, although versions with three up to eight cassettes also exist. The indexable inserts used serve both for roughing and for subsequent finishing of the surface and dimensional accuracy. During the bar peeling process, the tool rotates, while the infeed occurs radially, and the feed motion is provided by the workpiece via the drive rollers in the loading unit. The diameter ranges in which peeling is applied are usually between 20 and 120 millimeters. Economical peeling generally covers bars from six millimeters up to 600 millimeters in diameter. Within these common diameter ranges, tolerances up to IT8 can be achieved. Bar peeling is characterized by extremely high feed rates and cutting depths, making it a form of heavy-duty machining. With standard materials, feed rates of up to 18 millimeters per revolution are possible—many times higher compared to conventional turning. Cutting depths with cassette systems can reach up to 15 millimeters. For example, when machining bars with a diameter of 80 millimeters, 600 to 800 pieces can be processed in three to four hours using only one cutting edge on a peeling machine. This illustrates the performance capability of the indexable inserts used. The dimensions of these inserts reflect the heavy-duty nature of the process: while a conventional indexable insert weighs about 10 grams, the heaviest peeling insert in the Boehlerit product range weighs around 450 grams.

挑戰與過程可靠性

許多用戶認為重型加工（特別是旋轉剝皮加工）伴隨著許多挑戰。此類加工過程通常在大量冷卻液中進行，導致操作人員難以直接監控加工狀況。由於機械負荷極高，長時間運轉後可能會出現振動或導向問題。此外，所加工的材料（如不鏽鋼或鎳基合金）往往具有較高的加工難度；而且，鍛造棒材也未必能達到理想的直線度和圓度。加工過程的可靠性在很大程度上取決於操作人員的經驗。防止可轉位刀片破損至關重要，因為一旦發生破損，可能會對刀片座、剝皮頭、棒本身以及進給機構中的導輥造成嚴重損壞。要達到最佳的製程控制，不僅需要結合操作人員的專業經驗，還需根據尺寸精度、表面品質、切屑形狀以及刀片磨損情況來評估加工結果。核心挑戰在於針對具體應用，量身訂做製程參數及可轉位刀片的幾何形狀。這通常需要與刀片製造商密切合作，對切削材料成分及幾何參數（如切削刃長度、斷屑槽設計以及支撐倒棱的配置）進行精細調整。

Challenges and Process Reliability

Many users associate heavy-duty machining in peeling with certain difficulties. The processes operate under enormous amounts of coolant and are hardly visible to the machine operator. Due to the high loads, vibrations or guiding issues can occur over time. In addition, materials that are technically demanding to machine—such as stainless steels or nickel-based alloys—are often processed. Forged bars are also frequently bent and out of round. Process reliability depends heavily on the operator's experience. It is particularly important to avoid the breakage of indexable inserts, as this can cause significant damage to the cassettes, the peeling head, the bar, and the guide rollers in the loading unit. For optimal process control, evaluating results based on dimensional accuracy, surface quality, chip formation, wear on the indexable inserts, and personal experience is crucial. The challenge lies in adapting the process parameters and the geometry of the inde-xable inserts to the specific applications. This is usually done in close cooperation with the insert manufacturer to optimize cutting material compositions and geometries—such as cutting edge length, chipbreaker design, and support chamfer configuration.



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Boehlerit,
重型加工領域的合作夥伴
Boehlerit, your partner for heavy duty machining

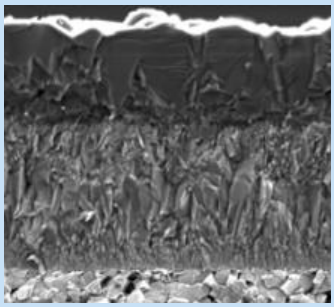
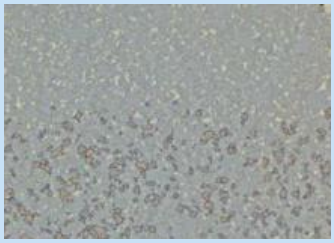
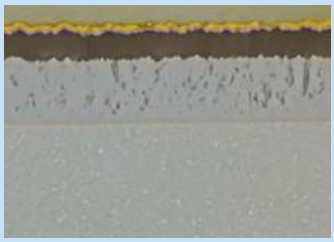
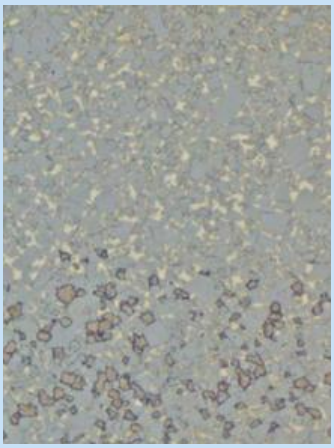
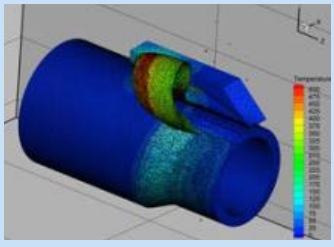


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技術優勢
Technological advantages

客戶獲益
Customer benefits

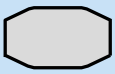
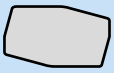
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專用於不鏽鋼和高溫合金。 Nanolock 結合層－層介面處的互鎖式設計。 Specially for stainless materials and superalloys. Nanolock adhesion layer- interlocked design of cross-over between layers		更優的塗層附著力和極其光滑的表面處理，確保了更順暢的排屑（降低了材料黏附的傾向），從而延長了刀具壽命。 Optimised adhesion of layers as well as extreme smooth surface condition guarantees a better chip flow (lower stickering tendency) and increased tool life.
適用於各類應用領域的 P05 – P40 材質 P05 - P40 substrates for different applications areas		穩固的材質可確保在加工各類鋼材時達到最高水準的加工可靠性。 Stable substrates ensure highest machining security with different steel qualities.
利用專門的可轉位刀片設計，實現最佳的切屑與熱量排出效果 Optimal chip- and heat flow with special insert designs		不同的幾何形狀可實現多種鋼材牌號的最佳加工。 Different geometries enable an optimal machining of different types of steel qualities.
用於低合金及高合金碳鋼機械加工的專用塗層 Special layer for machining of low and high alloyed carbon steels (yellow)		專為高切削速度及難加工材料設計的特厚CVD塗層：BCP05P、BCP10P和BCP15P。 BCP05P, BCP10P and BCP15P with especially thick CVD layer for high cutting speeds and hard materials.
材質 旋轉剝皮加工系列產品採用多種鎢鋼材質；這些材質經過精心匹配，能夠涵蓋從粗加工到精加工的廣泛應用領域，適用於鑄鐵、鋼、不銹鋼、高溫合金及鋁等多種材料。 **Substrates** Various carbide substrates are used to produce the range of bar peeling grades fine-tuned to cover an extensive range of applications: from roughing to finishing, from cast to stainless steel materials supperalloy and aluminium.		這確保了可靠的加工性能，能夠妥善滿足客戶的各項需求－無論是減少後刀面磨損、增強切削刃抗崩刃的穩定性，或是提升抗熱裂（龜裂）及月牙窪磨損的能力。 This is how we ensure that every customer requirement is met: be it minimal flank wear, resistance to chipping of the cutting edge, resistance to thermal cracking or crater wear.
動態有限元素法（FEM）設計技術 Dynamic FEM Design (Finite Elemente Method) technology		性能穩健的刀具，具備優異的抗疲勞強度及最佳的排屑性能 Stable tools with excellent endurance strengths characteristics and optimized chip flow

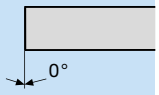
可轉位刀片標記系統
用於剝皮加工（**Boehlerit** 標準）
Designation system for indexable inserts for bar peeling (Boehlerit standard)

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L
Grundform
Ground form

J		- -
L		90°
R		- -
S		- -
T		60°
U		- -
W		75°
X		85°

N
Freiwinkel
Clearance angle

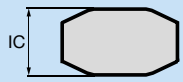
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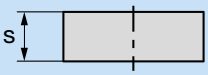
G
Toleranzklasse
Tolerance class

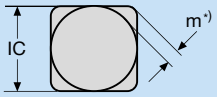
Zulässige Abweichung für
Tolerances

	m	s	d
A	±0,005[1)]	±0,025	±0,025
C	±0,013	±0,025	±0,025
E	±0,025	±0,025	±0,025
F	±0,005[1)]	±0,025	±0,013
G	±0,025	±0,13	±0,025
H	±0,013	±0,025	±0,013
J	±0,005[1)]	±0,025	±0,05 – ±0,15
K	±0,013[1)]	±0,025	±0,05 – ±0,15
L	±0,025	±0,025	±0,05 – ±0,15
M	±0,08 – ±0,20	±0,13	±0,05 – ±0,15
U	±0,13 – ±0,38	±0,13	±0,08 – ±0,25

	D	m	d
M	6,35	±0,08	±0,05
	9,52	±0,08	±0,05
	12,7	±0,13	±0,08
	15,88	±0,15	±0,10
	19,05	±0,15	±0,10
	25,4	±0,18	±0,13
U	6,35	±0,13	±0,08
	9,52	±0,13	±0,08
	12,7	±0,20	±0,13
	15,88	±0,27	±0,18
	19,05	±0,27	±0,18
	25,4	±0,38	±0,25





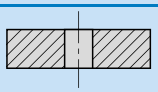
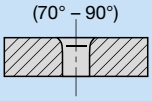
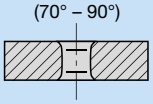
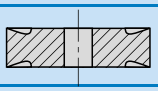
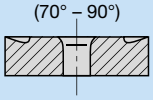
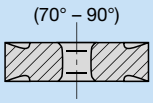
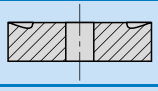
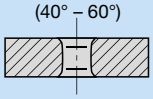
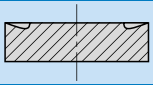
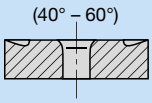
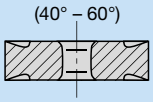
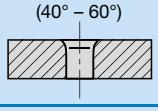


Wendeschneidplatte mit gerader Seitenanzahl
Indexable insert with equal number of sides

1) gelten in der Regel für Wendeschneidplatten mit geschliffenen Planschneiden.
*) Der Berechnung der „m“- Maße liegt der genaue Zoll-Radius zugrunde.

1) generally used for ground indexable inserts.
*) The calculation for the “m” measurement is based on the precise radius in inches.

F
Spanformer, Befestigung
Chip breaker, fixation

A	
B	(70° – 90°) 
C	(70° – 90°) 
F	
G	
H	(70° – 90°) 
J	(70° – 90°) 
M	
N	
Q	(40° – 60°) 
R	
T	(40° – 60°) 
U	(40° – 60°) 
W	(40° – 60°) 

X mit Besonderheit nach Zeichnung
with special feature according to drawing

( ) Kegelwinkel für Schraube
( ) Cone angle for screw

可轉位刀片標記系統
用於剝皮加工（**Boehlerit** 標準）
Designation system for indexable inserts for bar peeling (Boehlerit standard)

20
Schneidkantenlänge
Lenght of cutting edge

Als Schneidkantenlänge wird die Länge der Nebenschneide in mm angegeben, wobei die Stellen nach dem Komma nicht angeführt werden.
Bei runden Wendeschneidplatten wird der Durchmesser in mm angegeben.

The length of the secondary cutting edge is indicated in mm, figures behind the comma not shown.
For round carbide inserts the diameter in mm is given.

l_n = 09 mm
l_n = 10 mm
l_n = 13 mm
l_n = 14 mm
l_n = 15 mm
l_n = 17 mm
l_n = 20 mm
l_n = 28 mm
l_n = 38 mm
l_n = 50 mm

10
Dicke
Thickness

Als Kennzahl wird die Dicke der Wendeschneidplatte in mm angegeben, Ziffern hinter dem Komma bleiben unberücksichtigt. Ergibt sich eine einstellige Kennzahl, so wird eine 0 (Null) vorangestellt.

The thickness of the indexable insert in mm is given as the identification code. Figures after the comma are not included.
If a single-figure identificaton code is calculated, a zero is placed in front.

05 s = 05,94 mm
06 s = 06,35 mm
07 s = 07,14 mm
07 s = 07,45 mm
07 s = 07,54 mm
07 s = 07,94 mm
08 s = 08,00 mm
09 s = 09,52 mm
10 s = 10,00 mm
10 s = 10,20 mm
10 s = 10,54 mm
11 s = 11,25 mm
12 s = 12,00 mm
12 s = 12,20 mm
12 s = 12,70 mm
13 s = 13,00 mm
14 s = 14,00 mm
17 s = 17,96 mm
18 s = 18,00 mm

BML
Spanformstufe
Chip groove

Spanformstufen entsprechend den Boehlerit Spanformstufengeometrien.

Chip groove according to Boehlerit geometries of chip grooves

BS = **B**oehlerit **S**pecial
BSF = **B**oehlerit **S**mall **F**inishing
BF = **B**oehlerit **F**inishing
BFM = **B**oehlerit **F**inishing **M**edium
BM = **B**oehlerit **M**edium
BML = **B**oehlerit **M**edium **L**arge
BMS = **B**oehlerit **M**edium **S**mall
BL = **B**oehlerit **L**arge
BU = **B**oehlerit **U**niversal
BX = **B**oehlerit **E**xtra

H20/M20/W20
Fasenausführung
Edge preparation

Fasenausführung nach Boehlerit Werksnorm

Edge preparation according to Boehlerit standard

H20 = hart / hard
M20 = mittel / medium
W20 = weich / soft

牌號總覽
Grade overview

Sorte Grade	ISO	Anwendungsbereich Application range 01 05 10 15 20 25 30 35 40 45 50	Werkstoffgruppe Material group P Stahl / Steel	M Rostfrei / Stainless	K Grauguss / Grey cast iron	N NE-Metalle / Non-ferrous metals	S Hochwarmfest / High temperature materials	H Harte Werkstoffe / Hard materials	Farbliche Darstellung der WSP je nach Beschichtung Color guide for inserts depending on coating
BCM05P	HCM05			□			□		
BCP05P	HCP05		■						
BWN05P	HCN05			□		■	□		
BCP10P	HC-P10		■						
BCP15P	HC-P15		■						
BCP25P	HC-P25		■	□			□		
BCM25P	HC-M25		□	■					
BCM30P	HC-M30		□	■					
BCP30P	HC-P30		■	□			□		
BCP31P	HC-P31		■						
BCP35P	HC-P35			■					
BCM35P	HC-M35			■			□		
BCP40P	HCP40		■						

Anwendungsschwerpunkt
Application peak



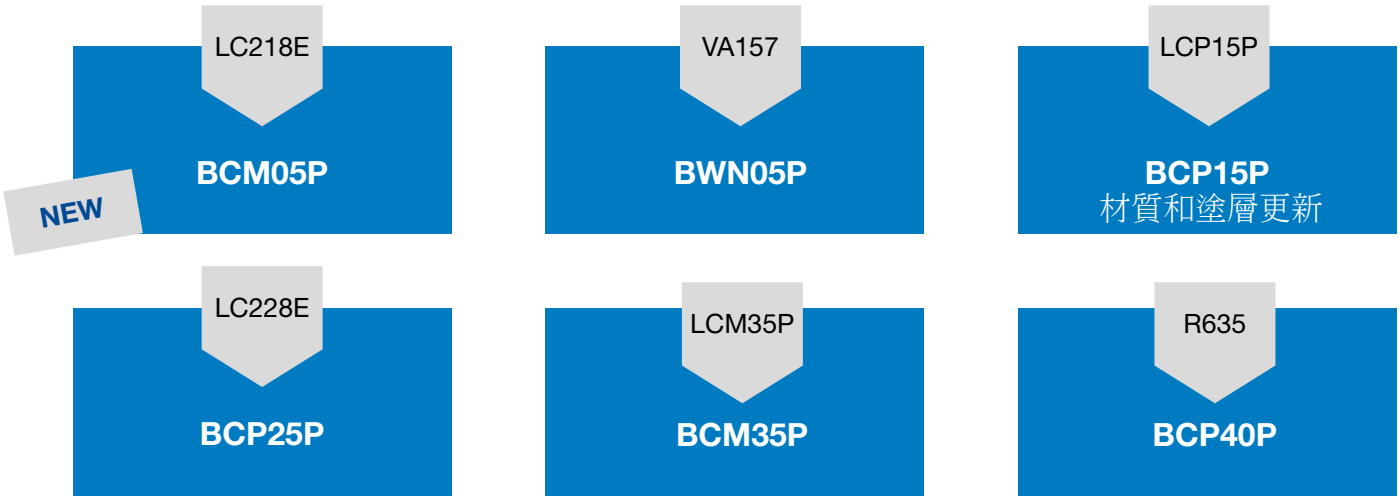
Gesamtbereich nach ISO 513
Full range to ISO 513

01 05 10 15 20 25 30 35 40 45 50

■ Hauptanwendung
Main application

□ Weitere Anwendungen
Further applications

牌號更新
Change of grade designation



推薦牌號
Recommended carbide grades

boehlerit

Werkstoffgruppe Material group	Gliederung der Werkstoff-Hauptgruppen und Kennbuchstaben Mainworkpiece material groups and their characteristics letters 材料 Material		硬度 Brinell hardness HB	牌號 Grade
P	非合金鋼 Unalloyed steel P1 + P2	geglüht annealed 0,15% - 45% C	140 - 155	BCP30P BCP40P
		vergütet heat treated 0,15 % - 45% C	290	BCP10P BCP15P
	低合金鋼 Low-alloy steel P3	geglüht annealed ≥ 0,45 % C	185	BCP25P BCP30P BCP40P
		vergütet heat treated ≥ 0,45 % C	290 - 340	BCP05P BCP10P
	高合金鋼與高合金工具鋼 High-alloy steel and high alloy tool steel P4 + P5	geglüht gehärtet und angelassen	180 - 210	BCP25P/BCP30P
		annealed hardened and tempered	290 - 325	BCP05P/BCP10P/BCP15P
M	肥粒體 / 麻田散體不鏽鋼 Stainless steel ferritic M1 + M2	ferritisch / martensitisch geglüht martensitisch vergütet ferritic / martensitic annealed	190 - 210 200 - 260	BCM25P/BCM30P/BCM35P BCM05P/BCM25P
	奧式不鏽鋼 (300系列) Stainless steel austenitic M1 + M2	austenitisch abgeschreckt austenitic quenched	170 - 190	BCM25P BCM30P/BCM35P
K	鑄鐵 cast iron Al-Si-Legierungen alloys K1 + K2 + K3		160 - 260	BCP05P/BCP15P
N	非鐵金屬 鋁、銅 Nonferrous materials Aluminium, copper N1 + N2 + N3		100 - 140	BWN05P
S	耐熱合金 Heat resistant alloys S3 + S4	Ni-Basis, CO-Basis, geglüht Ni-Base, Co-Base, annealed	240 - 380	BCM05P/BCM25P
	鈦及鈦合金 Titanium and titanium alloys S1 + S2		250 - 340	BCM05P/BCM25P/BWN05
H	耐熱鋼、球墨鑄鐵 Heat resistant steel ductile graphite iron H1 + H2 + H3 + H4	gehärtet und angelassen hardened and tempered	170 - 220	BCP15P

硬質合金 (鎢鋼) 牌號的推薦應用領域
Recommended application areas for our carbides

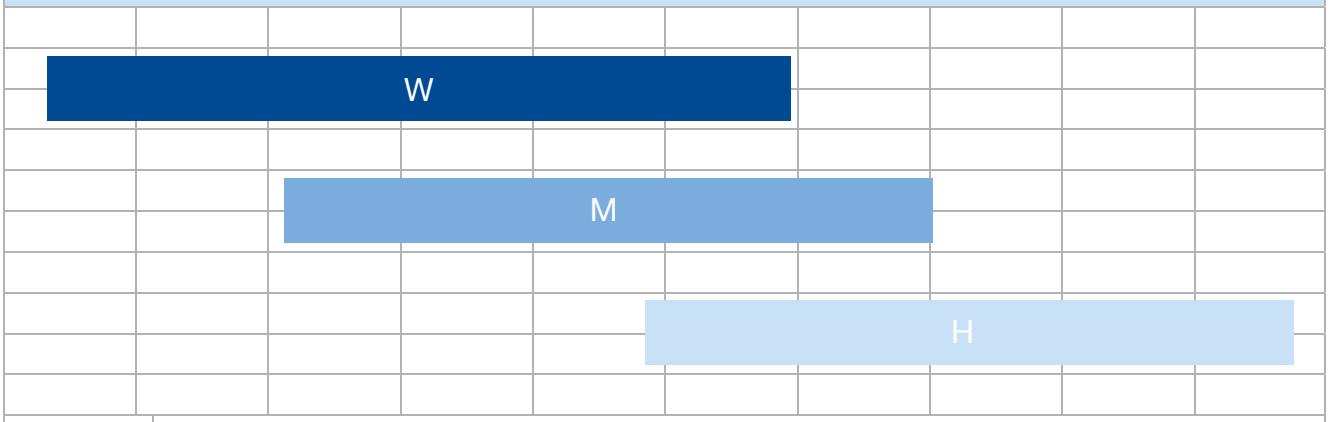
材料的拉伸強度 [N/mm^2] Tensile strength of materials



布氏硬度 [HB] Material hardness in Brinell

刀片刃口應用推薦
Recommended application areas for edge conditions

刃口設計的推薦應用領域
Recommended application areas for our various edge conditions



H (hart)	**所有材料（經調質處理）－工具鋼、調質鋼、不鏽鋼、高溫合金**
H (hard)	All materials (tempered) - Tool steel, tempered steel, stainless steel, super alloys
M (mittel)	**所有材料（處於其天然硬化狀態）－工具鋼、易切削鋼、不鏽鋼、高溫合金**
M (medium)	All materials (basic hardness) - Tool steel, free cutting-steel, stainless steel, super alloys
W (weich)	**所有材料（退火態）－結構鋼、易切削鋼；不穩定的加工工況（振動）**
W (weak)	All materials (annealed) - Construction steel, free cutting-steel, unstable machining conditions (vibration)

Typ W



在主切削刃、副切削刃及圓弧部位設有倒角；提供多種圓弧配置，且主、副切削刃上的倒角角度相同。

Clearance chamfer on main and secondary cuttingedge, across the radius in different radius executions with the same angle.

Typ M



沿著主、副切削刃及圓弧部位設置倒棱；主、副切削刃上的倒棱具有不同的圓弧半徑和角度配置。

Clearance chamfer on main and secondary cuttingedge, across the Radius in different radius and angle executions.

Typ H



沿著副切削刃設定的倒角，提供多種半徑和角度配置。

Clearance chamfer on secondary cuttingedge in different radius and angle executions.

剝皮刀幾何結構概述
Overview of bar peeling geometries

<table>
<tr><td rowspan="3">JNGF 2008...</td><td>JNGF 2008 BF
</td><td>JNGF 2008 BFM
</td></tr>
<tr><td>JNGF 2008 BMS 9S
</td><td></td></tr>
<tr><td>進給量最高可達 17 mm/rev
切削深度最高可達 1.5 mm；
剝皮直徑最大可達 Ø 60 mm
適用於小直徑的單刀片系統
BF = Boehlerit 精加工
BFM = Boehlerit 精至半精加工
BMS 9S = Boehlerit 半精至粗加工（針對較小尺寸，R=9）</td><td>Field of application
Feed up to 17 mm/rev.
Cutting depth up to 1,5 mm
Peeling diameter up to Ø 60 mm
Single peeling system for small diameters
BF = Boehlerit finishing
BFM = Boehlerit finishing medium
BMS 9S = Boehlerit medium small (R=9)</td></tr>
<tr><td>JNGF 2012...</td><td>JNGF 2012 BML
</td><td>JNGF 2012 BMS 9S
</td></tr>
<tr><td>應用領域
進給量最高可達 17 mm/rev
切削深度最高可達 2.5 mm
適用於各種直徑的單刀或串聯式系統
BML = Boehlerit 中大型
BMS 9S = Boehlerit 中小型 (R=9)</td><td>Field of application
Feed up to 17 mm/rev.
Cutting depth up to 2,5 mm
Single or tantem system system for small diameters
BML = Boehlerit medium large
BMS 9S = Boehlerit medium small (R=9)</td></tr>
</table>

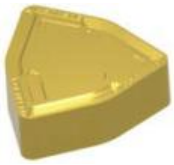
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Color illustration does not have to correspond to the original!

剝皮刀幾何結構概述
Overview of bar peeling geometries

LNGF 2010...	**LNGF 2010 BML** 	**LNGF 2010 BF** 
	LNGF 2010 BM 	
	應用領域 進給量最高可達 17 mm/rev 切削深度最高可達 3.0 mm 適用於各種直徑的單件或串聯式系統 BML = Boehlerit 中重型（Medium Large） BF = Boehlerit 精加工（Finishing） BM = Boehlerit 中型（Medium）	**Field of application** Feed up to 17 mm/rev. Cutting depth up to 3,0 mm Single or tantem system system for small diameters BML = Boehlerit medium large BF = Boehlerit finishing BM = Boehlerit medium
LNGF 2012...	**LNGF 2012 BML** 	**LNGF 2012 BF** 
	應用領域 進給量最高可達 17 mm/rev 切削深度最高可達 3.0 mm 適用重加工中各類直徑的單件或串聯式系統 BML = Boehlerit 中大型 BMS 9S = Boehlerit 中小型 (R=9)	**Field of application** Feed up to 17 mm/rev. Cutting depth up to 3,0 mm Single or tantem system system for small diameters for heavy applications BML = Boehlerit medium large BMS 9S = Boehlerit medium small (R=9)
LNGF 2812...	**LNGF 2812 BML** 	
	應用範圍：進給量最高可達 26 mm/rev 切削深度：最高可達 3.0 mm 適用於各種直徑的單刀或串聯式系統 BML = Boehlerit 中大型系列 BF = Boehlerit 精加工系列	**Field of application** Feed up to 26 mm/rev. Cutting depth up to 3,0 mm Single or tantem system system for all diameters BML = Boehlerit medium large BF = Boehlerit finishing

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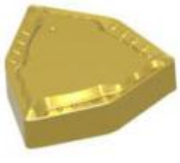
UNGF 1712...	**UNGF 1712 BF** 	
	應用範圍： 進給量最高可達 14 mm/rev 切削深度：最高可達 4.0 mm 適用於高難度加工工況 BF = Boehlerit 精加工	**Field of application** Feed up to 14 mm/rev. Cutting depth up to 4,0 mm For difficult applications BF = Boehlerit finishing

XNMF 1513...	**XNMF 1513 BF** 	**XNMF 1513 BM** 
	XNMF 1513 BML 	
	應用範圍 進給量最高可達 12 mm/rev 切削深度最高可達 8.0 mm 適用各種直徑，可採用單刀或串聯(多刀)配置 BF = Boehlerit 精加工 (Finishing) BM = Boehlerit 中等加工 (Medium) BML = Boehlerit 中重型加工 (Medium Large)	**Field of application** Feed up to 12 mm/rev. Cutting depth up to 8,0 mm Single or tandem system for all diameters BF = Boehlerit finishing BM = Boehlerit medium BML = Boehlerit medium large

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剝皮刀幾何結構概述
Overview of bar peeling geometries

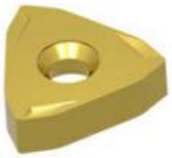
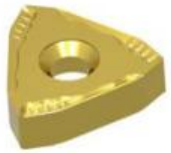
XNMU 1513...	**XNMU 1513 BF** 	**XNMU 1513 BM** 
	XNMU 1513 BML 	
	應用範圍 進給量最高可達 12 mm/rev 切削深度最高可達 8.0 mm 適用於各種直徑的單刀或串聯式系統 BF = Boehlerit 精加工 (Finishing) BM = Boehlerit 中等加工 (Medium) BML = Boehlerit 中重型加工 (Medium Large)	**Field of application** Feed up to 12 mm/rev. Cutting depth up to 8,0 mm Single or tandem system for all diameters BF = Boehlerit finishing BM = Boehlerit medium BML = Boehlerit medium large
XNMU 1514...	**XNMU 1514 BML** 	
	應用範圍 進給量最高可達 12 mm/rev 切削深度最高可達 8.0 mm 適用於各種直徑的單刀或串聯式系統 BF = Boehlerit 精加工 (Finishing) BM = Boehlerit 中等加工 (Medium) BML = Boehlerit 中重型加工 (Medium Large)	**Field of application** Feed up to 12 mm/rev. Cutting depth up to 8,0 mm Single or tandem system for all diameters BF = Boehlerit finishing BM = Boehlerit medium BML = Boehlerit medium large

XNMF 1609...	**XNMF 1609 BML** 	
	應用領域 進給量最高可達 13 mm/rev 切削深度最高可達 6.0 mm 適用於各種直徑的單工位或串聯式系統 BML = Boehlerit Medium Large（中大型）	**Field of application** Feed up to 13 mm/rev. Cutting depth up to 6,0 mm Single or tandem system for all diameters BML = Boehlerit medium large

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剝皮刀幾何結構概述
Overview of bar peeling geometries

WNGU 0906...	**WNGU 0906 BM** 	
	應用領域 進給量最高可達 7 mm/rev 切削深度最高可達 2.5 mm 剝皮直徑最高可達 Ø 60 mm 適用於各種直徑的單機或串聯系統 BM = Boehlerit 中等	**Field of application** Feed up to 7 mm/rev. Cutting depth up to 2,5 mm Peelingdiameters up to Ø 60mm Single or tandem system for all diameters BM = Boehlerit medium
WNGU 1309...	**WNGU 1309 BX** 	**WNGU 1309 BM** 
	應用領域 進給量最高可達 10 mm/rev 切削深度最高可達 3.0 mm 適用於直徑最大 Ø 200 mm 的工件（單套或串聯系統） BX = Boehlerit extra（高耐磨/高效能） BM = Boehlerit medium（通用/中等性能）	**Field of application** Feed up to 10 mm/rev. Cutting depth up to 3,0 mm Single or tandem system for diameters up to Ø 200 mm BX = Boehlerit extra BM = Boehlerit medium

TNGJ 1407..	**TNGJ 1407 BF** 	**TNGJ 1407 BML** 
	應用領域 進給量最高可達 11 mm/rev 切削深度最高可達 1.8 mm 單刀片系統，最大直徑可達 Ø 60 mm BF = Boehlerit 精加工 BML = Boehlerit 中/大型加工	**Field of application** Feed up to 11 mm/rev. Cutting depth up to 1,8 mm Single peeling system up to Ø 60 mm BF = Boehlerit finishing BML = Boehlerit medium large
TNGJ 2010...	**TNGJ 2010 BM** 	**TNGJ 2010 BML** 
	應用領域 進給量最高可達 17 mm/rev 切削深度最高可達 2.5 mm 適用於各種直徑的單件或串聯系統 BM = Boehlerit 中型 BML = Boehlerit 中大型	**Field of application** Feed up to 17 mm/rev. Cutting depth up to 2,5 mm Single or tandem system for all diameters BM = Boehlerit medium BML = Boehlerit medium large

Farbliche Abbildung muss nicht dem Original entsprechen!
Color illustration does not have to correspond to the original!

剝皮刀幾何結構概述
Overview of bar peeling geometries

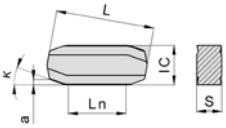
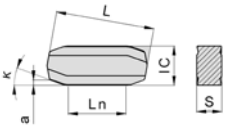
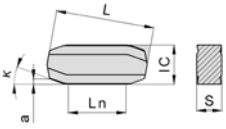
TNGJ 2208...	**TNGJ 2208 BML** 	
	應用領域 進給量最高可達 18 mm/rev 切削深度最高可達 1.3 mm BML = Boehlerit 中大型	**Field of application** Feed up to 18 mm/rev. Cutting depth up to 1,3 mm BML = Boehlerit medium large
XNGF 1010...	**XNGF 1010 BF** 	**XNGF 1010 BL** 
	應用領域 進給量最高可達 8 mm/rev 切削深度最高可達 4.0 mm 適用於各種直徑的單件或串聯系統 BF = Boehlerit 精加工 BL = Boehlerit 大切深加工	**Field of application** Feed up to 8 mm/rev. Cutting depth up to 4,0 mm Single or tandem system for all diameters BF = Boehlerit finishing BL = Boehlerit large
XNGJ 1010...	**XNGJ 1010 BF** 	**XNGJ 1010 BL** 
	應用領域 進給量最高可達 8 mm/rev 切削深度最高可達 4.0 mm 適用於各種直徑的單件或串聯系統 BF = Boehlerit 精加工 BL = Boehlerit 大切深加工	**Field of application** Feed up to 8 mm/rev. Cutting depth up to 4,0 mm Single or tandem system for all diameters BF = Boehlerit finishing BL = Boehlerit large

Farbliche Abbildung muss nicht dem Original entsprechen!
Color illustration does not have to correspond to the original!

剝皮刀幾何結構概述
Overview of bar peeling geometries

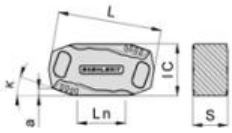
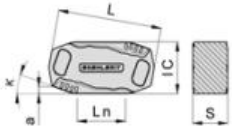
RNMH 2008...	**RNMH 2008 BML** 	
	應用領域 切削深度可達 3.0 mm 串聯系統，直徑可達 Ø 100 mm BML = Boehlerit 中大型	**Field of application** Cutting depth up to 3,0 mm Tandem system up to Ø 100 mm BML = Boehlerit medium large
RNMH 2810...	**RNMH 2810 BML** 	
	應用領域 切削深度可達 5.0 mm 串聯系統，直徑可達 130 mm BML = Boehlerit 中大型	**Field of application** Cutting depth up to 5,0 mm Tandem system up to Ø 130 mm BML = Boehlerit medium large
RNMH 3812...	**RNMH 3812 BML** 	
	應用領域 切削深度可達 7.0 mm 串聯系統，直徑可達 Ø 350 mm BML = Boehlerit 中大型	**Field of application** Cutting depth up to 7,0 mm Tandem system up to Ø 350 mm BML = Boehlerit medium large
RNMH 5018...	**RNMH 5018 BML** 	**RNMH 5018 BL** 
	應用領域 切削深度可達 9.0 mm 串聯系統，最大直徑可達最大Ø BML = Boehlerit 中大型	**Field of application** Cutting depth up to 9,0 mm Tandem system up to max. Ø BML = Boehlerit medium large

Farbliche Abbildung muss nicht dem Original entsprechen!
Color illustration does not have to correspond to the original!

CEDC = Anzahl der Schneidkanten CEDC = Number of cutting edges	**Artikelbezeichnung** **Item code**	Schneidstoff-sorte Cutting materials	Bestell-Nr. Ordering No.	Verfügbarkeit Availability	Abmessungen [mm] Dimensions [mm]						
					L	ln	IC	s	D1	a	κ
  CEDC = 4	**JNGF 2008 BF H10**	BCP15P	5243918	◑	30,07	20	12	7,54		1,8	20°
	JNGF 2008 BF H20	BCP15P	5243920	◑	30,07	20	12	7,54		1,8	20°
	JNGF 2008 BF M20	BCP15P	5243923	●	30,07	20	12	7,54		1,8	20°
	JNGF 2008 BF M20	BCP25P	5243922	●	30,07	20	12	7,54		1,8	20°
	JNGF 2008 BF W20	BCP40P	5243959	●	30,07	20	12	7,54		1,8	20°
	JNGF 2008 BF W30	BCP40P	5243961	●	30,07	20	12	7,54		1,8	20°
	JNGF 2008 BF H20	BCM05P	5243919	◑	30,07	20	12	7,54		1,8	20°
	JNGF 2008 BF M20	BCM05P	5243921	●	30,07	20	12	7,54		1,8	20°
  CEDC =4	**JNGF 2008 BFM H20**	BCP15P	5243929	◑	30,07	20	12	7,54		1,5	20°
	JNGF 2008 BFM H20	BCP25P	5243928	●	30,07	20	12	7,54		1,5	20°
	JNGF 2008 BFM M20	BCP15P	5243956	◑	30,07	20	12	7,54		1,5	20°
	JNGF 2008 BFM M20	BCP25P	5243947	●	30,07	20	12	7,54		1,5	20°
	JNGF 2008 BFM W20	BCP15P	5243958	◑	30,07	20	12	7,54		1,5	20°
	JNGF 2008 BFM W20	BCP25P	5243957	●	30,07	20	12	7,54		1,5	20°
	JNGF 2008 BFM W20	BCP40P	5244924	◑	30,07	20	12	7,54		1,5	20°
	JNGF 2008 BFM H10	BCM05P	5243924	◑	30,07	20	12	7,54		1,5	20°
	JNGF 2008 BFM H20	BCM05P	5243927	●	30,07	20	12	7,54		1,5	20°
	JNGF 2008 BFM H30	BCM05P	5243945	◑	30,07	20	12	7,54		1,5	20°
	JNGF 2008 BFM M20	BCM05P	5243946	◑	30,07	20	12	7,54		1,5	20°
  CEDC = 4	**JNGF 2008 BMS 9S H20**	BCP05P	5225637	◑	30,07	20	12	7,54		1,5	20°
	JNGF 2008 BMS 9S H20	BCP25P	5243970	◑	30,07	20	12	7,54		1,5	20°
	JNGF 2008 BMS 9S M20	BCP25P	5243976	●	30,07	20	12	7,54		1,5	20°
	JNGF 2008 BMS 9S W20	BCP25P	5243978	◑	30,07	20	12	7,54		1,5	20°
	JNGF 2008 BMS 9S W20	BCP40P	5243980	◑	30,07	20	12	7,54		1,5	20°
	JNGF 2008 BMS 9S H20	BCM05P	5243966	◑	30,07	20	12	7,54		1,5	20°
	JNGF 2008 BMS 9S M11	BCM05P	5243973	◑	30,07	20	12	7,54		1,5	20°
	JNGF 2008 BMS 9S M20	BCM05P	5243975	●	30,07	20	12	7,54		1,5	20°

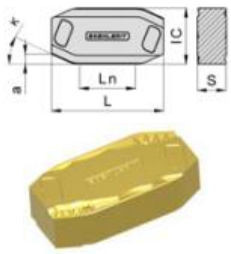
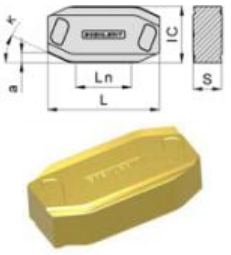
Bestellbeispiel Order example: 10 Stück 10 pieces JNGF 2008 BF H10 BCP15P
Sortenübersicht Seite 10 Grade overview, see page 10

● Verfügbar ab Lager available from stock
◑ Kurzfristig lieferbar available at short notice
○ Auf Anfrage on demand

CEDC = Anzahl der Schneidkanten CEDC = Number of cutting edges	**Artikelbezeichnung** **Item code**	Schneidstoff-sorte Cutting materials	Bestell-Nr. Ordering No.	Verfügbarkeit Availability	Abmessungen [mm] Dimensions [mm]						
					L	l_n	IC	s	D_1	a	κ
 	**JNGF 2012 BML H20**	BCP05P	5221809	●	36,45	20	18	12		2,5	20°
	JNGF 2012 BML H20	BCP10P	5243777	●	36,45	20	18	12		2,5	20°
	JNGF 2012 BML H20	BCP15P	5243752	●	36,45	20	18	12		2,5	20°
	JNGF 2012 BML H40	BCP15P	5243734	◑	36,45	20	18	12		2,5	20°
	JNGF 2012 BML M20	BCP10P	5243778	●	36,45	20	18	12		2,5	20°
	JNGF 2012 BML M20	BCP15P	5243761	◑	36,45	20	18	12		2,5	20°
	JNGF 2012 BML M20	BCP25P	5243756	●	36,45	20	18	12		2,5	20°
	JNGF 2012 BML W30	BCP15P	5243766	●	36,45	20	18	12		2,5	20°
	JNGF 2012 BML W30	BCP25P	5243763	●	36,45	20	18	12		2,5	20°
	JNGF 2012 BML W30	BCP30P	5243779	●	36,45	20	18	12		2,5	20°
	JNGF 2012 BML W30	BCP40P	5243771	●	36,45	20	18	12		2,5	20°
	JNGF 2012 BML W50	BCP25P	5243772	●	36,45	20	18	12		2,5	20°
	JNGF 2012 BML H20	BCM05P	5243750	●	36,45	20	18	12		2,5	20°
	JNGF 2012 BML H20	BCM25P	5082596	○	36,45	20	18	12		2,5	20°
	JNGF 2012 BML H30	BCM05P	5243753	◑	36,45	20	18	12		2,5	20°
	JNGF 2012 BML H40	BCM05P	5243737	◑	36,45	20	18	12		2,5	20°
	JNGF 2012 BML M20	BCM05P	5243754	◑	36,45	20	18	12		2,5	20°
	JNGF 2012 BML M20	BCM25P	5082605	○	36,45	20	18	12		2,5	20°
	JNGF 2012 BML W30	BCM05P	5243762	●	36,45	20	18	12		2,5	20°
	JNGF 2012 BML W30	BCM35P	5243765	●	36,45	20	18	12		2,5	20°
	JNGF 2012 BML W50	BCM35P	5243741	◑	36,45	20	18	12		2,5	20°
CEDC = 4											
 	**JNGF 2012 BMS 9S M20**	BCP25P	5243773	◑	36,45	20	18	12		2,5	20°
	JNGF 2012 BMS 9S H20	BCM05P	5243749	●	36,45	20	18	12		2,5	20°
CEDC = 4											

Bestellbeispiel Order example: 10 Stück 10 pieces JNGF 2012 BML H20 BCP05P
Sortenübersicht Seite 10 Grade overview, see page 10

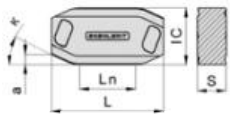
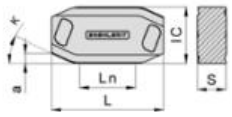
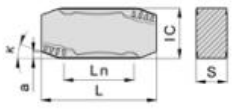
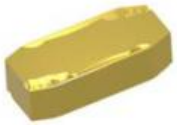
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◑ Kurzfristig lieferbar available at short notice
○ Auf Anfrage on demand

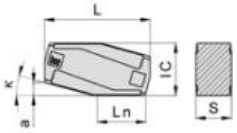
CEDC = Anzahl der Schneidkanten CEDC = Number of cutting edges	**Artikelbezeichnung** **Item code**	Schneidstoff-sorte Cutting materials	Bestell-Nr. Ordering No.	Verfügbarkeit Availability	Abmessungen [mm] Dimensions [mm]						
					L	ln	IC	s	D1	a	κ
	**LNGF 2010 BML H20**	BCP10P	5243283	●	39,95	20	20	10		3,0	25°
	LNGF 2010 BML H20	BCP15P	5243010	●	39,95	20	20	10		3,0	25°
	LNGF 2010 BML H20	BCP25P	5243009	◑	39,95	20	20	10		3,0	25°
	LNGF 2010 BML H30	BCP15P	5243012	◑	39,95	20	20	10		3,0	25°
	LNGF 2010 BML M20	BCP10P	5243284	●	39,95	20	20	10		3,0	25°
	LNGF 2010 BML M20	BCP15P	5243261	●	39,95	20	20	10		3,0	25°
	LNGF 2010 BML M20	BCP25P	5243260	●	39,95	20	20	10		3,0	25°
	LNGF 2010 BML W20	BCP15P	5243274	◑	39,95	20	20	10		3,0	25°
	LNGF 2010 BML W20	BCP25P	5243265	◑	39,95	20	20	10		3,0	25°
	LNGF 2010 BML W20	BCP30P	5243285	●	39,95	20	20	10		3,0	25°
	LNGF 2010 BML W20	BCP40P	5243275	●	39,95	20	20	10		3,0	25°
	LNGF 2010 BML H20	BCM05P	5243008	●	39,95	20	20	10		3,0	25°
	LNGF 2010 BML H20	BCM25P	5082623	●	39,95	20	20	10		3,0	25°
	LNGF 2010 BML M20	BCM05P	5243019	◑	39,95	20	20	10		3,0	25°
	LNGF 2010 BML M20	BCM25P	5082627	●	39,95	20	20	10		3,0	25°
	LNGF 2010 BML W20	BCM05P	5243264	◑	39,95	20	20	10		3,0	25°
	LNGF 2010 BML W20	BCM25P	5112773	◑	39,95	20	20	10		3,0	25°
CEDC = 4	**LNGF 2010 BML W20**	BCM35P	5243267	◑	39,95	20	20	10		3,0	25°
	**LNGF 2010 BF SC H20**	BCP10P	5239021	●	39,95	20	20	10		3,0	25°
	LNGF 2010 BF H20	BCP15P	5243004	●	39,95	20	20	10		3,0	25°
	LNGF 2010 BF SC M20	BCP10P	5243286	●	39,95	20	20	10		3,0	25°
	LNGF 2010 BF SC M20	BCP15P	5205551	●	39,95	20	20	10		3,0	25°
	LNGF 2010 BF SC W20	BCP30P	5239022	●	39,95	20	20	10		3,0	25°
	LNGF 2010 BF M20	BCM05P	5243005	○	39,95	20	20	10		3,0	25°
CEDC = 4											

CEDC = Anzahl der Schneidkanten CEDC = Number of cutting edges	**Artikelbezeichnung** **Item code**	Schneidstoff-sorte Cutting materials	Bestell-Nr. Ordering No.	Verfügbarkeit Availability	Abmessungen [mm] Dimensions [mm]						
					L	ln	IC	s	D1	a	κ
	**LNGF 2010 BM H27**	BWN05P	5243276	●	39,95	20	20	10		3,0	25°
CEDC = 4											

Bestellbeispiel Order example: 10 Stück 10 pieces LNGF 2010 BML H20 BCP10P
Sortenübersicht Seite 10 Grade overview, see page 10

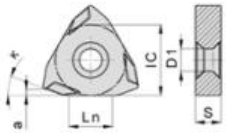
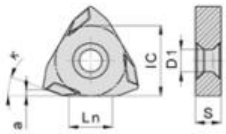
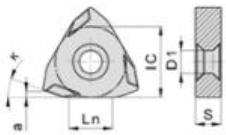
● Verfügbar ab Lager available from stock
◑ Kurzfristig lieferbar available at short notice
○ Auf Anfrage on demand

CEDC = Anzahl der Schneidkanten CEDC = Number of cutting edges	**Artikelbezeichnung** **Item code**	Schneidstoff-sorte Cutting materials	Bestell-Nr. Ordering No.	Verfügbarkeit Availability	Abmessungen [mm] Dimensions [mm]						
					L	ln	IC	s	D1	a	κ
	**LNGF 2012 BML M20**	BCP25P	5243699	●	39,95	20	20	12		3,0	25°
	LNGF 2012 BML H20	BCM05P	5243698	●	39,95	20	20	12		3,0	25°
	LNGF 2012 BML W20	BCM25P	5082635	◑	39,95	20	20	12		3,0	25°
	LNGF 2012 BML W20	BCM30P	5082637	○	39,95	20	20	12		3,0	25°
	LNGF 2012 BML W20	BCM35P	5243700	●	39,95	20	20	12		3,0	25°
											
CEDC = 4											
	**LNGF 2012 BF M20**	BCP25P	5243695	○	39,95	20	20	12		3,0	25°
	LNGF 2012 BF M10	BCM05P	5243693	○	39,95	20	20	12		3,0	25°
	LNGF 2012 BF W30	BCM25P	5082645	○	39,95	20	20	12		3,0	25°
	LNGF 2012 BF W30	BCM35P	5243696	○	39,95	20	20	12		3,0	25°
											
CEDC = 4											
	**LNGF 2812 BML M20**	BCM05P	5243701	●	46,00	28	20	12		3,0	25°
	LNGF 2812 BML M20	BCM25P	5243701	○	46,00	28	20	12		3,0	25°
	LNGF 2812 BML W30	BCM35P	5243703	○	46,00	28	20	12		3,0	25°
											
CEDC = 4											

CEDC = Anzahl der Schneidkanten CEDC = Number of cutting edges	**Artikelbezeichnung** **Item code**	Schneidstoff-sorte Cutting materials	Bestell-Nr. Ordering No.	Verfügbarkeit Availability	Abmessungen [mm] Dimensions [mm]						
					L	ln	IC	s	D1	a	κ
	**UNGF 1712 BF H20**	BCP10P	5243987	◑	36,45	17	18	12		4,0	15°
	UNGF 1712 BF M20	BCP25P	5243998	●	36,45	17	18	12		4,0	15°
	UNGF 1712 BF M20	BCP30P	5219646	◑	36,45	17	18	12		4,0	15°
	UNGF 1712 BF M20	BCP31P	5243995	◑	36,45	17	18	12		4,0	15°
	UNGF 1712 BF W30	BCP15P	5244004	◑	36,45	17	18	12		4,0	15°
	UNGF 1712 BF W30	BCP25P	5244002	◑	36,45	17	18	12		4,0	15°
	UNGF 1712 BF W30	BCP31P	5243999	◑	36,45	17	18	12		4,0	15°
	UNGF 1712 BF H10	BCM05P	5243989	●	36,45	17	18	12		4,0	15°
	UNGF 1712 BF H20	BCM05P	5243992	◑	36,45	17	18	12		4,0	15°
	UNGF 1712 BF H20	BCM25P	5087453	◑	36,45	17	18	12		4,0	15°
	UNGF 1712 BF M20	BCM05P	5243996	◑	36,45	17	18	12		4,0	15°
	UNGF 1712 BF M20	BCM25P	5082770	●	36,45	17	18	12		4,0	15°
	UNGF 1712 BF W30	BCM05P	5244001	●	36,45	17	18	12		4,0	15°
	UNGF 1712 BF W30	BCM35P	5244003	◑	36,45	17	18	12		4,0	15°
CEDC = 4											

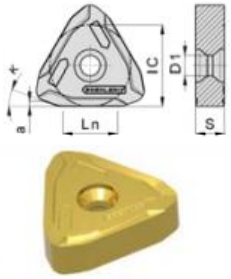
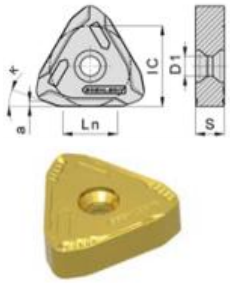
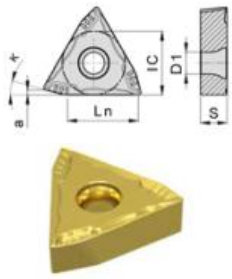
Bestellbeispiel Order example: 10 Stück 10 pieces LNGF 2012 BML M20 BCP25P
Sortenübersicht Seite 10 Grade overview, see page 10

● Verfügbar ab Lager available from stock
◑ Kurzfristig lieferbar available at short notice
○ Auf Anfrage on demand

CEDC = Anzahl der Schneidkanten CEDC = Number of cutting edges	**Artikelbezeichnung** **Item code**	Schneidstoff-sorte Cutting materials	Bestell-Nr. Ordering No.	Verfügbarkeit Availability	Abmessungen [mm] Dimensions [mm]						
					L	ln	IC	s	D1	a	κ
  CEDC = 6	**TNGJ 1407 BF H20**	BCP15P	5244177	○		14	21,96	7	7,0	1,8	20°
	TNGJ 1407 BF H20	BCM05P	5244174	●		14	21,96	7	7,0	1,8	20°
  CEDC = 6	**TNGJ 1407 BML M20**	BCP25P	5244186	●		14	21,96	7	7,0	1,8	20°
	TNGJ 1407 BML M20	BCP40P	5244187	●		14	21,96	7	7,0	1,8	20°
	TNGJ 1407 BML W30	BCP40P	5244197	◑		14	21,96	7	7,0	1,8	20°
	TNGJ 1407 BML W60	BCP40P	5244200	●		14	21,96	7	7,0	1,8	20°
	TNGJ 1407 BML H20	BCM05P	5244181	●		14	21,96	7	7,0	1,8	20°
	TNGJ 1407 BML M20	BCM05P	5244184	◑		14	21,96	7	7,0	1,8	20°
	TNGJ 1407 BML W30	BCM25P	5082728	◑		14	21,96	7	7,0	1,8	20°
	TNGJ 1407 BML W60	BCM25P	5093247	◑		14	21,96	7	7,0	1,8	20°
  CEDC = 6	**TNGJ 1407 BML H27**	BWN05P	5244188	●		14	21,96	7	7,0	1,8	20°

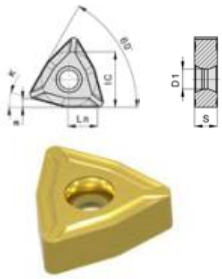
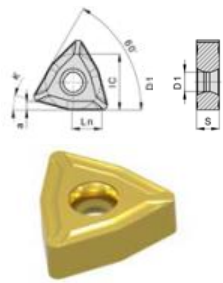
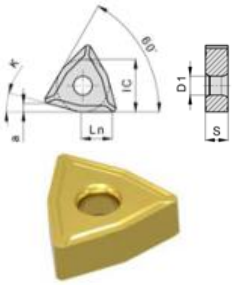
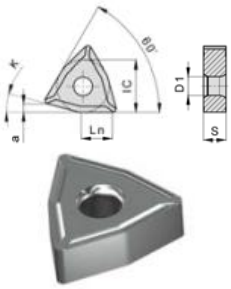
Bestellbeispiel Order example: 10 Stück 10 pieces TNGJ 1407 BF H20 BCP15P
Sortenübersicht Seite 10 Grade overview, see page 10

● Verfügbar ab Lager available from stock
◑ Kurzfristig lieferbar available at short notice
○ Auf Anfrage on demand

CEDC = Anzahl der Schneidkanten CEDC = Number of cutting edges	**Artikelbezeichnung** **Item code**	Schneidstoff-sorte Cutting materials	Bestell-Nr. Ordering No.	Verfügbarkeit Availability	Abmessungen [mm] Dimensions [mm]						
					L	ln	IC	s	D1	a	κ
 CEDC = 6	**TNGJ 2010 BM H20**	BCP15P	5244131	◑		20	28,50	10	7,0	2,5	20°
	TNGJ 2010 BM M20	BCP25P	5244172	○		20	28,50	10	7,0	2,5	20°
	TNGJ 2010 BM H20	BCM05P	5244130	◑		20	28,50	10	7,0	2,5	20°
	TNGJ 2010 BM H20	BCM25P	5082668	◑		20	28,50	10	7,0	2,5	20°
	TNGJ 2010 BM M20	BCM25P	5082692	◑		20	28,50	10	7,0	2,5	20°
 CEDC = 6	**TNGJ 2010 BML H20**	BCP10P	5228515	◑		20	28,50	10	7,0	2,5	20°
	TNGJ 2010 BML H20	BCP15P	5244134	●		20	28,50	10	7,0	2,5	20°
	TNGJ 2010 BML M20	BCP15P	5244137	◑		20	28,50	10	7,0	2,5	20°
	TNGJ 2010 BML M20	BCP25P	5244136	●		20	28,50	10	7,0	2,5	20°
	TNGJ 2010 BML W30	BCP15P	5244148	●		20	28,50	10	7,0	2,5	20°
	TNGJ 2010 BML H20	BCM05P	5244132	●		20	28,50	10	7,0	2,5	20°
	TNGJ 2010 BML M20	BCM05P	5244135	◑		20	28,50	10	7,0	2,5	20°
	TNGJ 2010 BML M20	BCM25P	5082748	○		20	28,50	10	7,0	2,5	20°
	TNGJ 2010 BML W30	BCM05P	5244143	◑		20	28,50	10	7,0	2,5	20°
	TNGJ 2010 BML W30	BCM35P	5244147	◑		20	28,50	10	7,0	2,5	20°
 CEDC = 3	**TNGJ 2208 BML M10**	BCP25P	5244178	◑		22	19,05	8	6,5	1,3	15°
	TNGJ 2208 BML M10	BCP40P	5244180	●		22	19,05	8	6,5	1,3	15°
	TNGJ 2208 BML H10	BCM05P	5244175	◑		22	19,05	8	6,5	1,3	15°
	TNGJ 2208 BML M10	BCM05P	5244176	●		22	19,05	8	6,5	1,3	15°

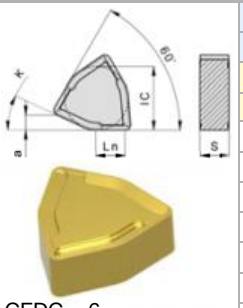
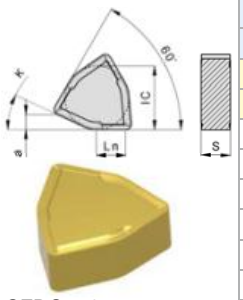
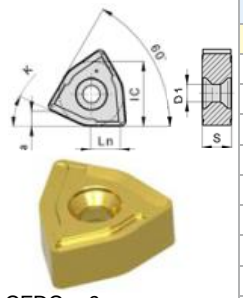
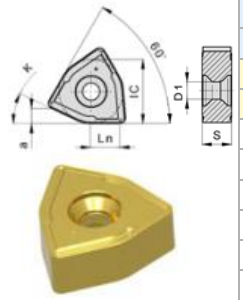
Bestellbeispiel Order example: 10 Stück 10 pieces TNGJ 2010 BM H20 BCP15P
Sortenübersicht Seite 10 Grade overview, see page 10

● Verfügbar ab Lager available from stock
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CEDC = Anzahl der Schneidkanten CEDC = Number of cutting edges	**Artikelbezeichnung** **Item code**	Schneidstoff-sorte Cutting materials	Bestell-Nr. Ordering No.	Verfügbarkeit Availability	Abmessungen [mm] Dimensions [mm]						
					L	ln	IC	s	D1	a	κ
 CEDC = 6	**WNGU 0906 BM W05**	BCM05P	5244090	○		9	15,88	6	5,5	3,0	15°
	WNGU 0906 BM W10	BCM05P	5244092	◑		9	15,88	6	5,5	3,0	15°
 CEDC = 6	**WNGU 1309 BM H05**	BCP25P	5244101	●		13	22,23	9	6,5	3,0	15°
	WNGU 1309 BM H05	BCM05P	5244097	◑		13	22,23	9	6,5	3,0	15°
 CEDC = 6	**WNGU 1309 BX M10**	BCP15P	5244169	◑		13	22,23	9	7,93	3,0	15°
	WNGU 1309 BX M10	BCP25P	5244167	●		13	22,23	9	7,93	3,0	15°
	WNGU 1309 BX M10	BCM05P	5244166	●		13	22,23	9	7,93	3,0	15°
	WNGU 1309 BX M10	BCM25P	5082781	◑		13	22,23	9	7,93	3,0	15°
 CEDC = 6	**WNGU 1309 BX H30**	BWN05P	5244154	○		13	22,23	9	7,93	3,0	15°
	WNGU 1309 BX M01	BWN05P	5244094	○		13	22,23	9	7,93	3,0	15°

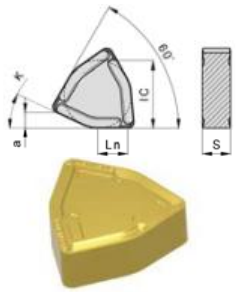
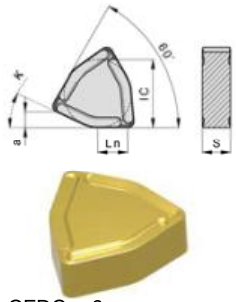
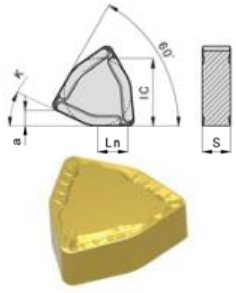
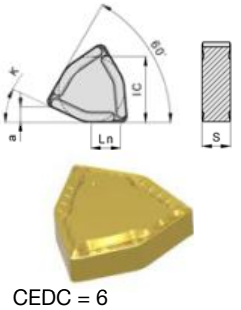
Bestellbeispiel Order example: 10 Stück 10 pieces WNGU 0906 BM W05 BCM05P
Sortenübersicht Seite 10 Grade overview, see page 10

● Verfügbar ab Lager available from stock
◑ Kurzfristig lieferbar available at short notice
○ Auf Anfrage on demand

CEDC = Anzahl der Schneidkanten CEDC = Number of cutting edges	**Artikelbezeichnung** **Item code**	Schneidstoff-sorte Cutting materials	Bestell-Nr. Ordering No.	Verfügbarkeit Availability	Abmessungen [mm] Dimensions [mm]						
					L	ln	IC	s	D1	a	κ
 CEDC = 6	**XNGF 1010 BL M20**	BCP15P	5244288	◑		10	22,23	10		4,0	25°
	XNGF 1010 BL M20	BCP25P	5244287	◑		10	22,23	10		4,0	25°
	XNGF 1010 BL M20	BCM05P	5244285	◑		10	22,23	10		4,0	25°
	XNGF 1010 BL M20	BCM25P	5082819	●		10	22,23	10		4,0	25°
 CEDC = 6	**XNGF 1010 BF M20**	BCP15P	5244294	○		10	22,23	10		4,0	25°
	XNGF 1010 BF M20	BCP25P	5244291	◑		10	22,23	10		4,0	25°
	XNGF 1010 BF M20	BCM05P	5244289	◑		10	22,23	10		4,0	25°
	XNGF 1010 BF M20	BCM25P	5244291	●		10	22,23	10		4,0	25°
 CEDC = 6	**XNGJ 1010 BL M20**	BCP25P	5244309	◑		10	22,23	10	6,0	4,0	25°
	XNGJ 1010 BL H02	BCM05P	5244307	◑		10	22,23	10	6,0	4,0	25°
 CEDC = 6	**XNGJ 1010 BF M10**	BCP15P	5244305	●		10	22,23	10	6,0	4,0	25°
	XNGJ 1010 BF M10	BCP25P	5244296	○		10	22,23	10	6,0	4,0	25°
	XNGJ 1010 BF M10	BCM05P	5244295	○		10	22,23	10	6,0	4,0	25°
	XNGJ 1010 BF M10	BCM25P	5082786	◑		10	22,23	10	6,0	4,0	25°

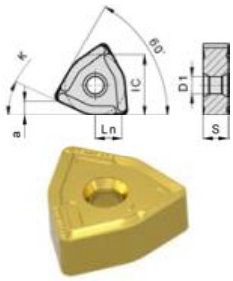
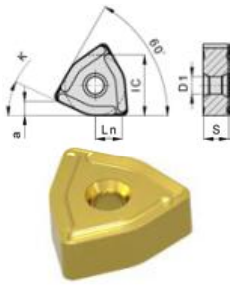
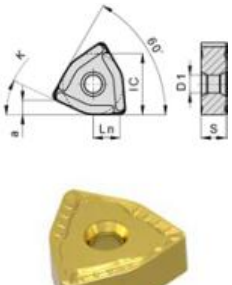
Bestellbeispiel Order example: 10 Stück 10 pieces XNGF 1010 BL M20 BCP15P
Sortenübersicht Seite 10 Grade overview, see page 10

● Verfügbar ab Lager available from stock
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CEDC = Anzahl der Schneidkanten CEDC = Number of cutting edges	**Artikelbezeichnung** **Item code**	Schneidstoff-sorte Cutting materials	Bestell-Nr. Ordering No.	Verfügbarkeit Availability	Abmessungen [mm] Dimensions [mm]						
					L	ln	IC	s	D1	a	κ
 CEDC = 6	**XNMF 1513 BF H30**	BCP25P	5244038	◑		15	31,75	13		8,0	25°
	XNMF 1513 BF H40	BCP25P	5244040	◑		15	31,75	13		8,0	25°
	XNMF 1513 BF H40	BCM05P	5244039	○		15	31,75	13		8,0	25°
	XNMF 1513 BF H40	BCM25P	5146852	◑		15	31,75	13		8,0	25°
	XNMF 1513 BF M20	BCM35P	5244041	●		15	31,75	13		8,0	25°
 CEDC = 6	**XNMF 1513 BM H40**	BCP15P	5244046	●		15	31,75	13		8,0	25°
	XNMF 1513 BM H40	BCP25P	5244045	○		15	31,75	13		8,0	25°
	XNMF 1513 BM H40	BCM05P	5244044	◑		15	31,75	13		8,0	25°
	XNMF 1513 BM H40	BCM25P	5082842	◑		15	31,75	13		8,0	25°
	XNMF 1513 BM W30	BCM30P	5082844	◑		15	31,75	13		8,0	25°
	XNMF 1513 BM W30	BCM35P	5244057	◑		15	31,75	13		8,0	25°
 CEDC = 6	**XNMF 1513 BML H40**	BCP25P	5244051	●		15	31,75	13		8,0	25°
	XNMF 1513 BML H40	BCM05P	5244050	●		15	31,75	13		8,0	25°
	XNMF 1513 BML H44	BCM05P	5244048	●		15	31,75	13		8,0	25°
	XNMF 1513 BML W20	BCM05P	5244052	◑		15	31,75	13		8,0	25°
	XNMF 1513 BML W20	BCM30P	5082826	◑		15	31,75	13		8,0	25°
	XNMF 1513 BML W20	BCM35P	5244053	●		15	31,75	13		8,0	25°
 CEDC = 6	**XNMF 1609 BML W20**	BCP15P	5244089	○		15	28,58	9,5		6,0	30°
	XNMF 1609 BML W20	BCP25P	5244082	●		15	28,58	9,5		6,0	30°
	XNMF 1609 BML W20	BCM05P	5244080	●		15	28,58	9,5		6,0	30°
	XNMF 1609 BML W20	BCM25P	5082837	○		15	28,58	9,5		6,0	30°
	XNMF 1609 BML W20	BCM35P	5244084	○		15	28,58	9,5		6,0	30°

Bestellbeispiel Order example: 10 Stück 10 pieces XNMF 1513 BF H30 BCP25P
Sortenübersicht Seite 10 Grade overview, see page 10

● Verfügbar ab Lager available from stock
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CEDC = Anzahl der Schneidkanten CEDC = Number of cutting edges	**Artikelbezeichnung** **Item code**	Schneidstoff-sorte Cutting materials	Bestell-Nr. Ordering No.	Verfügbarkeit Availability	Abmessungen [mm] Dimensions [mm]						
					L	ln	IC	s	D1	a	κ
 CEDC = 6	**XNMU 1513 BF H40**	BCP25P	5244059	○		15	31,75	13	9,0	8,0	25°
	XNMU 1513 BF H30	BCM25P	5171180	○		15	31,75	13	9,0	8,0	25°
	XNMU 1513 BF H40	BCM05P	5244058	○		15	31,75	13	9,0	8,0	25°
	XNMU 1513 BF M20	BCM25P	5171145	○		15	31,75	13	9,0	8,0	25°
 CEDC = 6	**XNMU 1513 BM H25**	BCP10P	5216533	◑		15	31,75	13	9,0	8,0	25°
	XNMU 1513 BM H40	BCP25P	5244060	◑		15	31,75	13	9,0	8,0	25°
	XNMU 1513 BM H40	BCM25P	5082849	●		15	31,75	13	9,0	8,0	25°
 CEDC = 6	**XNMU 1513 BML H40**	BCP10P	5244107	◑		15	31,75	13	9,0	8,0	25°
	XNMU 1513 BML H40	BCP15P	5244099	◑		15	31,75	13	9,0	8,0	25°
	XNMU 1513 BML H40	BCP25P	5244091	●		15	31,75	13	9,0	8,0	25°
	XNMU 1513 BML W20	BCP30P	5244103	◑		15	31,75	13	9,0	8,0	25°
	XNMU 1513 BML H40	BCM05P	5244065	●		15	31,75	13	9,0	8,0	25°
	XNMU 1513 BML H40	BCM25P	5082855	◑		15	31,75	13	9,0	8,0	25°
	XNMU 1513 BML W20	BCM30P	5082858	○		15	31,75	13	9,0	8,0	25°
	XNMU 1513 BML W20	BCM35P	5244100	●		15	31,75	13	9,0	8,0	25°
	XNMU 1513 BML W30	BCM35P	5244102	○		15	31,75	13	9,0	8,0	25°
	XNMU 1514 BML H40	BCP15P	5244076	○		15	31,75	14	9,0	8,0	25°
	XNMU 1514 BML H40	BCP25P	5244074	●		15	31,75	14	9,0	8,0	25°
	XNMU 1514 BML H40	BCM25P	5082865	○		15	31,75	14	9,0	8,0	25°
	XNMU 1514 BML H40	BCM05P	5244061	●		15	31,75	14	9,0	8,0	25°
	XNMU 1514 BML W20	BCM35P	5244074	○		15	31,75	14	9,0	8,0	25°

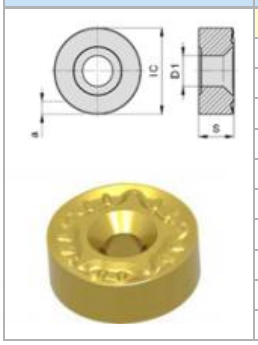
Bestellbeispiel Order example: 10 Stück 10 pieces XNMU 1513 BF H40 BCP25P
Sortenübersicht Seite 10 Grade overview, see page 10

● Verfügbar ab Lager available from stock
◑ Kurzfristig lieferbar available at short notice
○ Auf Anfrage on demand

CEDC = Anzahl der Schneidkanten CEDC = Number of cutting edges	**Artikelbezeichnung** **Item code**	Schneidstoff-sorte Cutting materials	Bestell-Nr. Ordering No.	Verfügbarkeit Availability	Abmessungen [mm] Dimensions [mm]						
					L	l_n	IC	s	D_1	a	κ
	**RNMH 2008 BML**	BCP25P	5244319	●			20,00	8	7,0	3,0	
	RNMH 2008 BML	BCM05P	5244311	●			20,00	8	7,0	3,0	
	RNMH 2810 BML	BCP25P	5244337	○			28,57	10	8,8	5,0	
	RNMH 2810 BML	BCM05P	5244333	●			28,57	10	8,8	5,0	
	RNMH 2810 BML	BCM25P	5082647	●			28,57	10	8,8	5,0	
	RNMH 2810 BML	BCM35P	5244335	○			28,57	10	8,8	5,0	
	RNMH 3812 BML	BCP25P	5244380	●			38,00	12	12,7	7,0	
	RNMH 3812 BML	BCP30P	5222371	◑			38,00	12	12,7	7,0	
	RNMH 3812 BML	BCP35P	5215304	◑			38,00	12	12,7	7,0	
	RNMH 3812 BML	BCM05P	5244338	●			38,00	12	12,7	7,0	
	RNMH 3812 BML	BCM25P	5082653	●			38,00	12	12,7	7,0	
	RNMH 3812 BML	BCM30P	5082654	●			38,00	12	12,7	7,0	
	RNMH 3812 BML	BCM35P	5244379	●			38,00	12	12,7	7,0	
	RNMH 3812 BML	BWN05P	5244381	◑			38,00	12	12,7	7,0	
	RNMH 5018 BML	BCP25P	5244411	◑			50,00	18	12,7	9,0	
	RNMH 5018 BML	BCP30P	5222370	◑			50,00	18	12,7	9,0	
	RNMH 5018 BML	BCP35P	5197995	●			50,00	18	12,7	9,0	
	RNMH 5018 BML	BCM05P	5244408	●			50,00	18	12,7	9,0	
	RNMH 5018 BML	BCM25P	5082660	●			50,00	18	12,7	9,0	
	RNMH 5018 BML	BCM30P	5082662	●			50,00	18	12,7	9,0	
	RNMH 5018 BML	BCM35P	5244410	●			50,00	18	12,7	9,0	
	RNMH 5018 BL	BCM35P	5244385	●			50,00	18	12,7	9,0	

Bestellbeispiel Order example: 10 Stück 10 pieces RNMH 2008 BML BCP25P
Sortenübersicht Seite 10 Grade overview, see page 10

● Verfügbar ab Lager available from stock
◑ Kurzfristig lieferbar available at short notice
○ Auf Anfrage on demand

CEDC = Anzahl der Schneidkanten CEDC = Number of cutting edges	**Artikelbezeichnung** **Item code**	Schneidstoff-sorte Cutting materials	Bestell-Nr. Ordering No.	Verfügbarkeit Availability	Abmessungen [mm] Dimensions [mm]						
					L	l_n	IC	s	D_1	a	κ
	**RNMH 5013 BML**	BCM35P	5244384	●			50,00	13	12,7	9,0	

Bestellbeispiel Order example: 10 Stück 10 pieces RNMH 5013 BML BCM35P
Sortenübersicht Seite 10 Grade overview, see page 10

● Verfügbar ab Lager available from stock
◑ Kurzfristig lieferbar available at short notice
○ Auf Anfrage on demand

磨損原因
Causes of wear

後刀面磨損



可能原因: ■不適合的切削材料
■ 切削速度過高
解決方法: ■選擇更耐磨的切削材料
■ 降低切削速度

沖刷磨損



可能原因: ■冷卻液添加不當
■ 前角過小
■ 切削速度和/或進給速度過高
解決方法: ■優化冷卻液供應
■ 使用具有正前角的刀片
■ 降低切削速度和/或進給量

缺口磨損



可能原因: ■氧化
■ 機械磨損
解決方法: ■選擇塗層較薄的切削材料
■ 降低切削速度和進給

積屑瘤



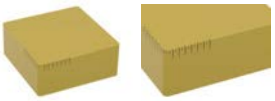
可能原因: ■缺乏冷卻
■ 切削速度過低
■ 切削材料不當
解決方法: ■優化冷卻
■ 提高切削速度
■ 採用 TiN 塗層

塑性變形



可能原因: ■切削速度過高
■ 斷屑槽過窄
■ 可能塗層受損
解決方法: ■降低切削速度
■ 選擇其他刀片幾何

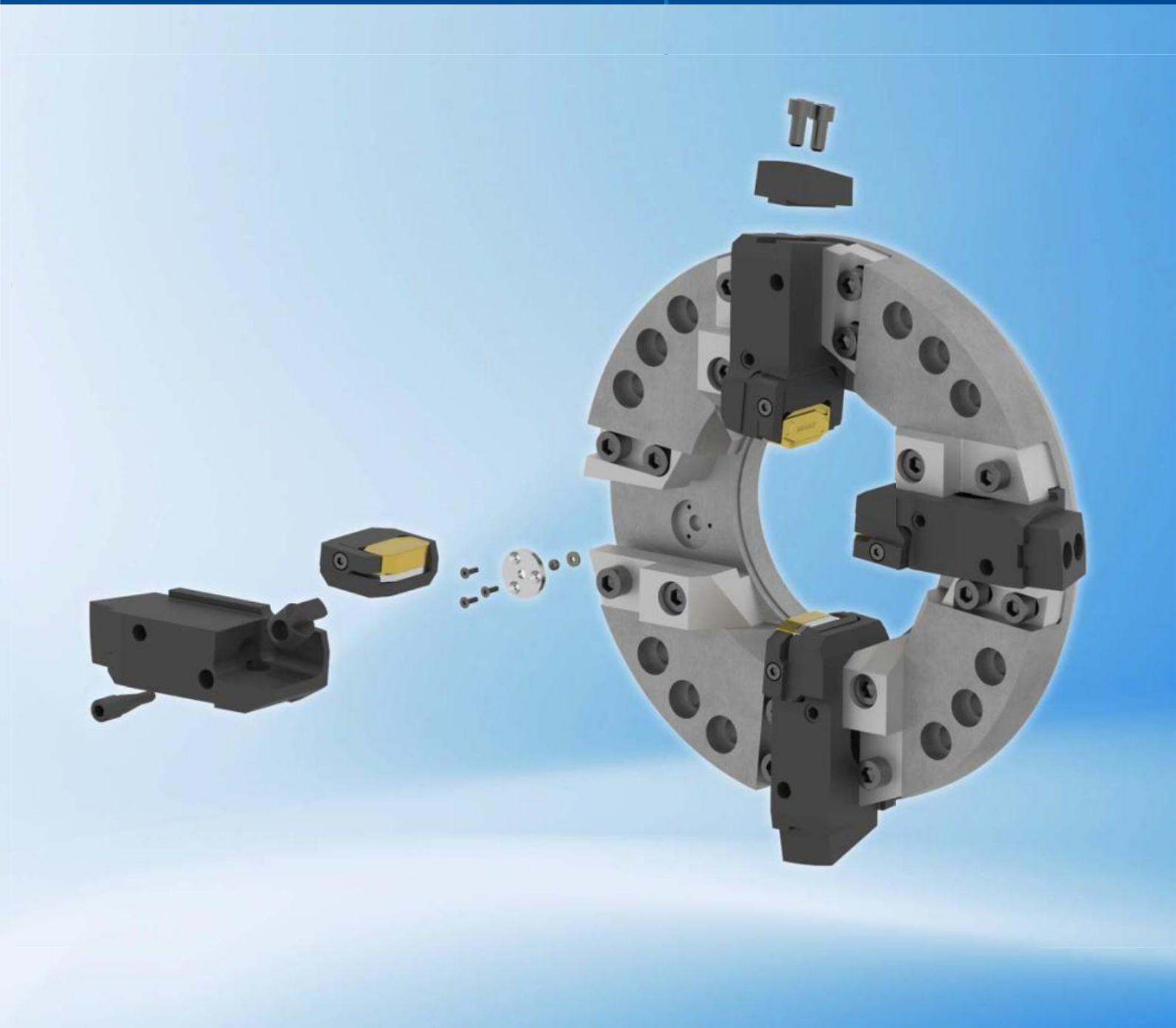
梳狀裂紋

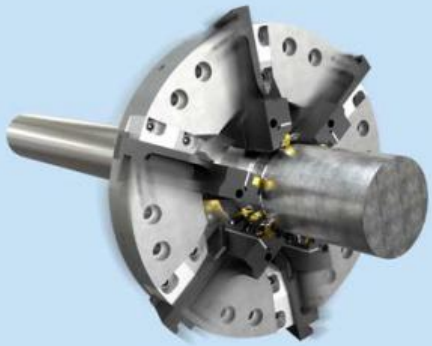


可能原因: ■切削速度過高
■ 切削刃處的溫度波動
解決方法: ■降低切削速度
■ 乾式加工或充足的冷卻潤滑劑供應

boehlerit

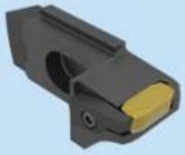
剝皮刀具
Bar peeling tools





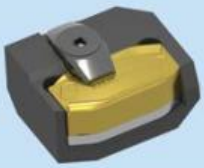
剝皮刀頭 Peeling head

刀片滑塊 Insert slide

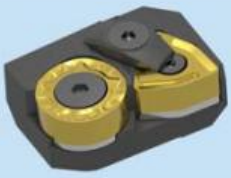


刀夾滑塊 Cartridge slide

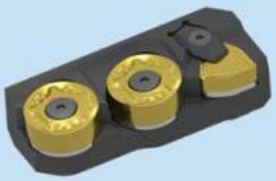




單刀夾 Single cartridge



雙刀夾 Tandem cartridge

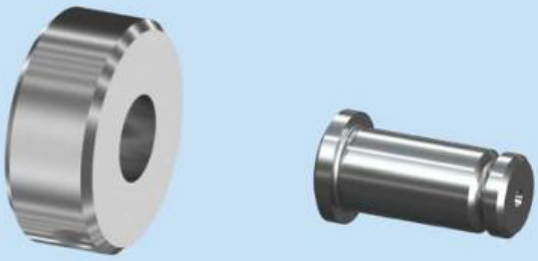


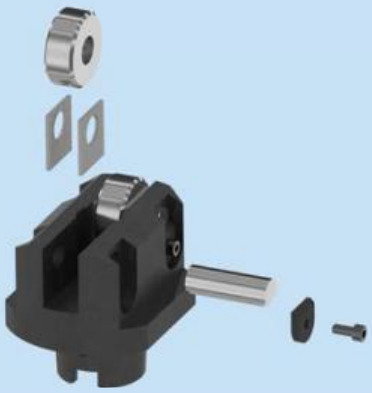
三刀夾 Trio cartridge

每台剝皮機都採用其獨特的刀具系統，因此不存在通用的刀夾或刀座。Boehlerit 提供專用的刀夾和刀座，無需進行常規的調整操作。
這不僅顯著縮短了調試時間並降低相關成本，還能實現更優異的表面品質和更嚴格的尺寸公差。
我們可依各類剝皮機的需求，客製化生產並供應可轉位刀片刀夾、刀座以及易損件。
此外，在進行現場評估、諮詢並與客戶充分溝通後，我們還能依照客戶的特定要求，量身設計全新的刀具系統。

Individual tooling systems are in use on bar peeling machines.Therefore no standard holders and cartridges are on the market. Boehlerit offers special holders and cartridges with better accuracy to avoid continuous adjustment. Set-up times and costs can be minimised. With Boehlerit bar peeling tooling systems you also enjoy the advantage for better results in surface and tolerances quality. Any customer design carbide holders, cartridge holders and wear parts are produced and delivered to order.
After assessing the current situation, providing consultation, and coordinating with the customer, we also design new tooling systems tailored to the customer's specific requirements.

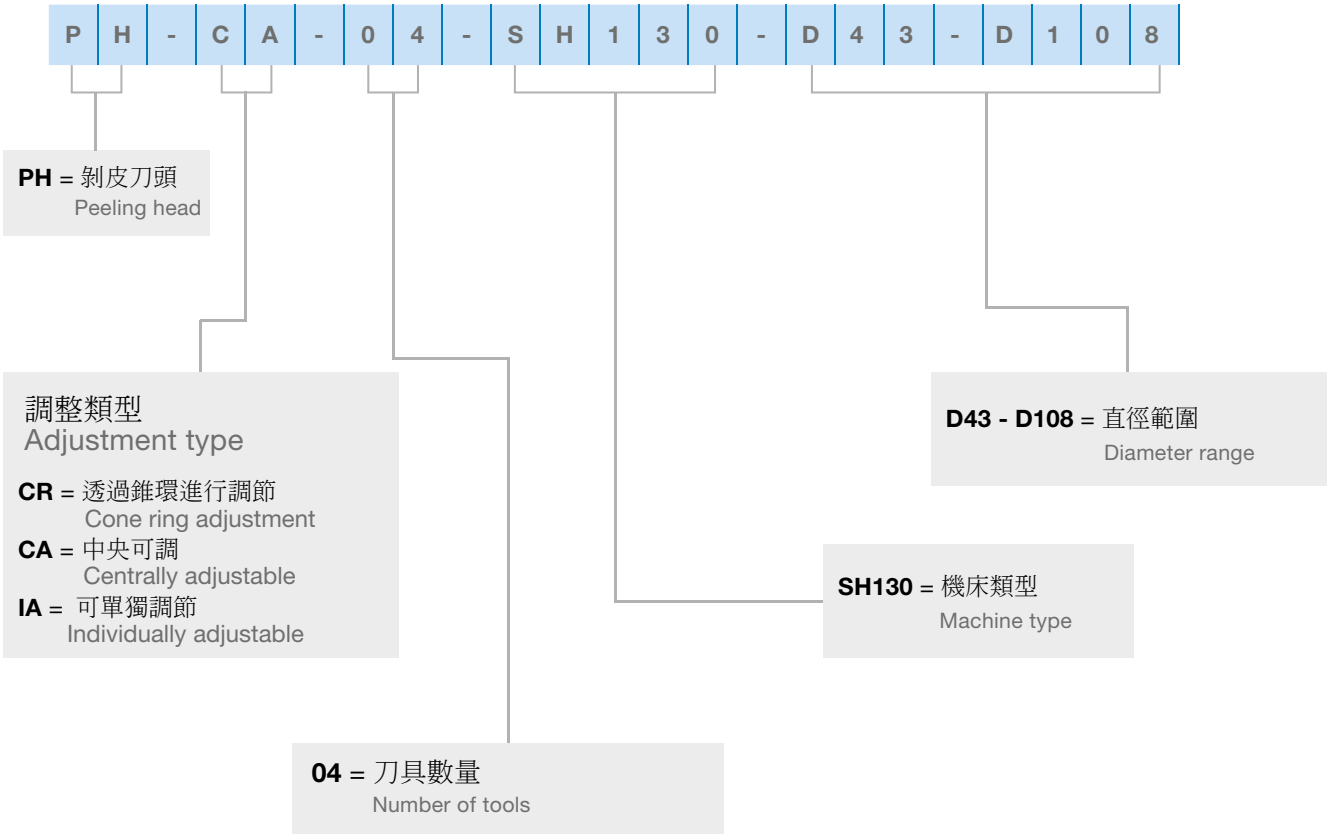
進出料導向系統的滾輪和軸
Rolls and axles for entry- and exit guide system



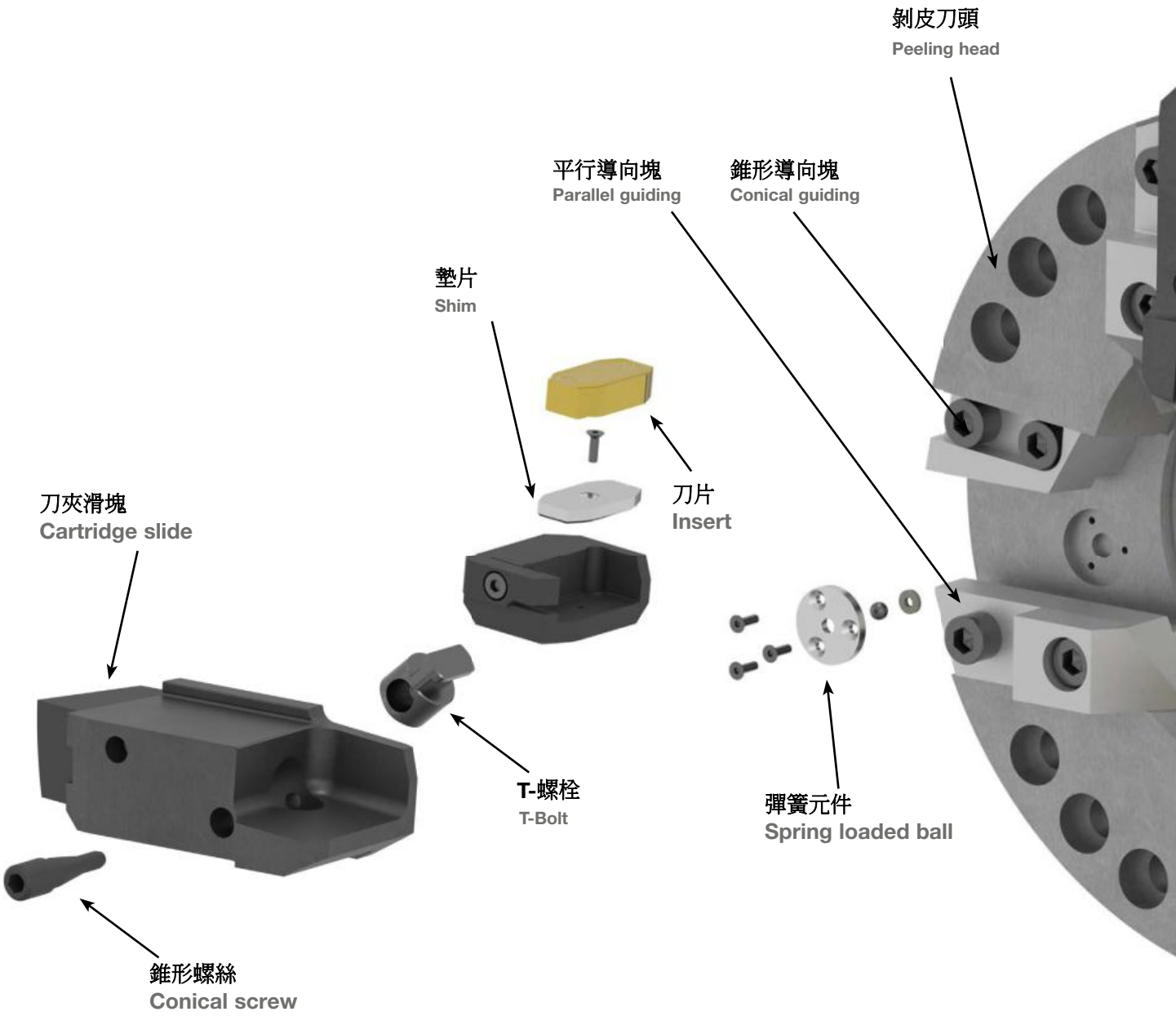


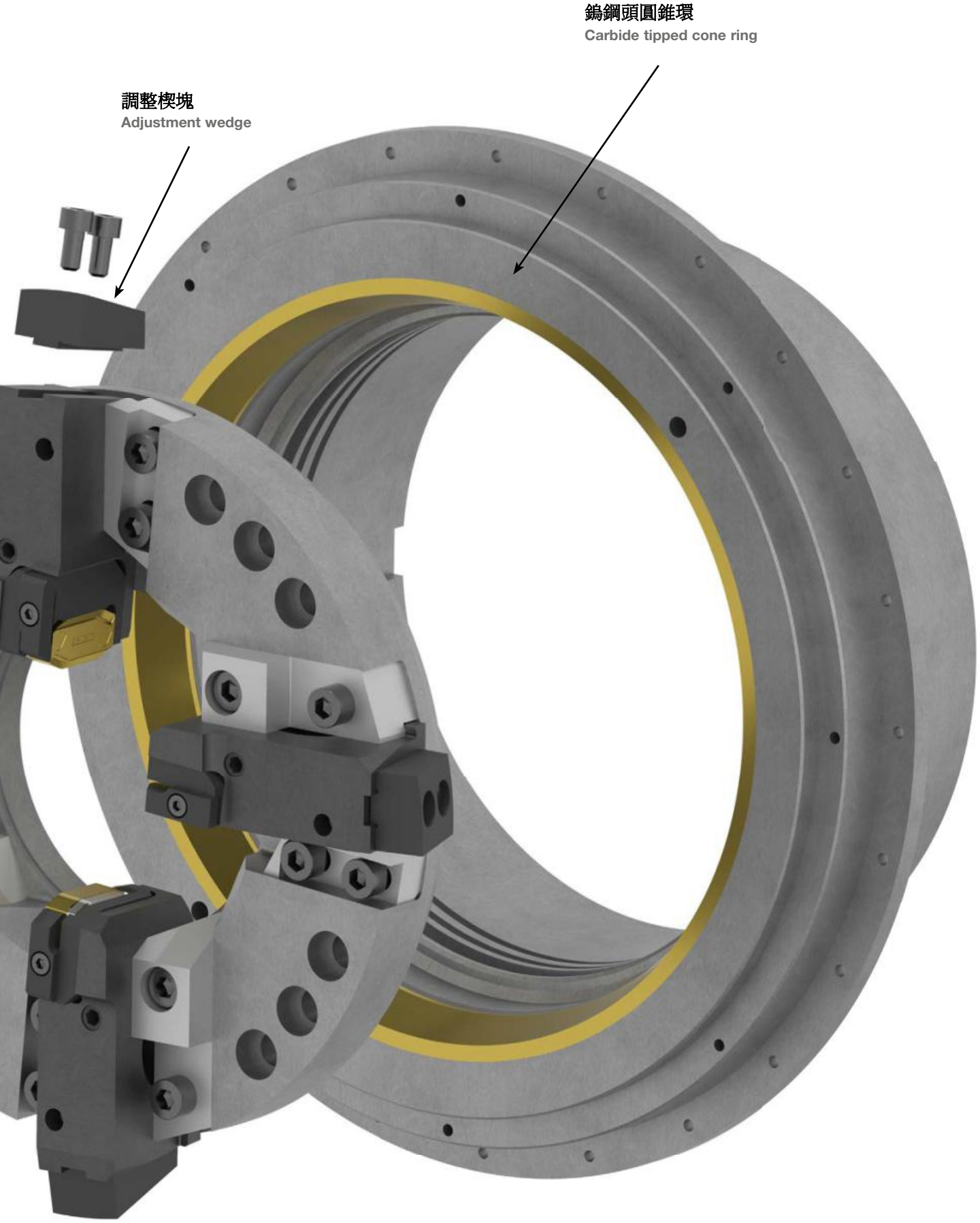
進料輥支架 Entry guide roller holder

剝皮刀頭命名系統
Designation system of bar peeling head

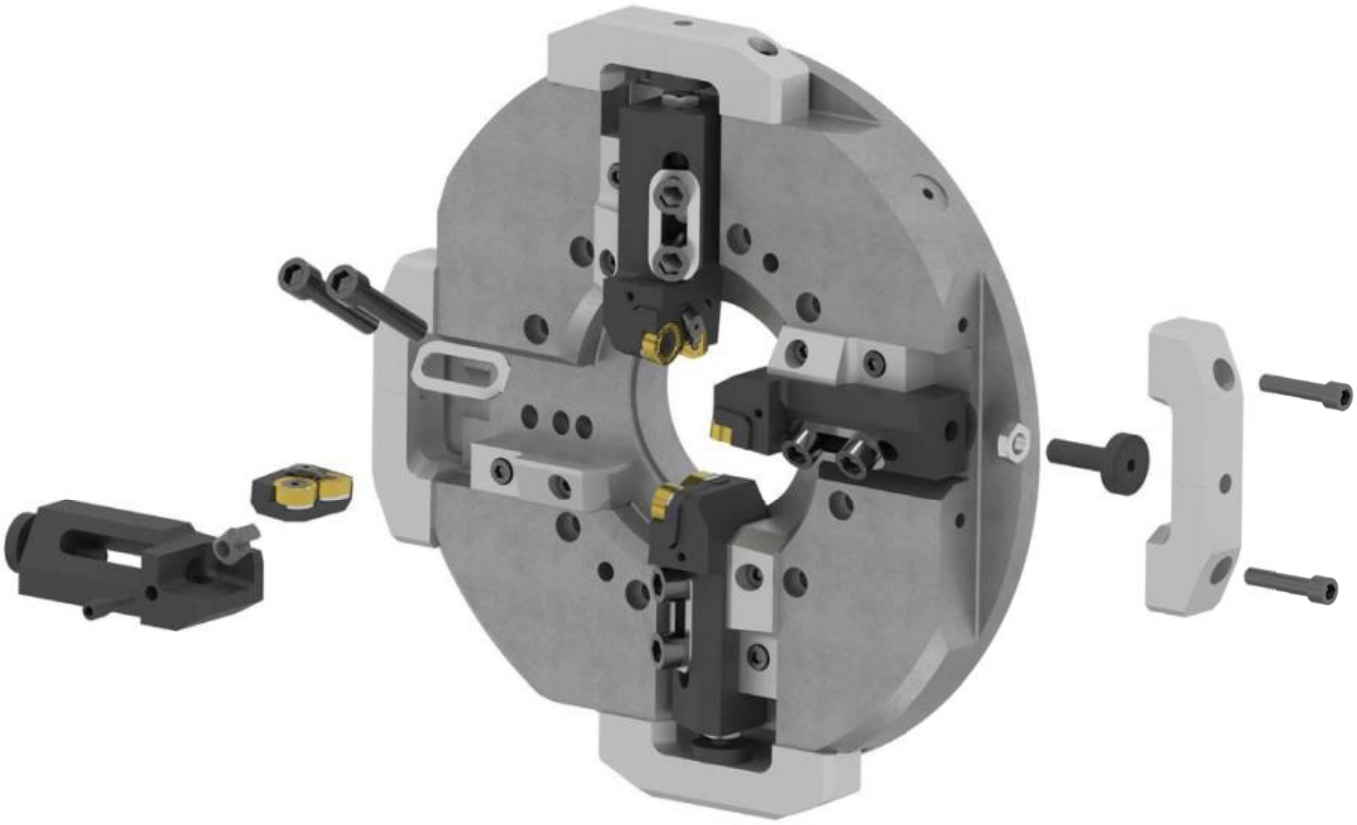


註：另有其他版本可供選擇！
Hint: Other designs are also possible!



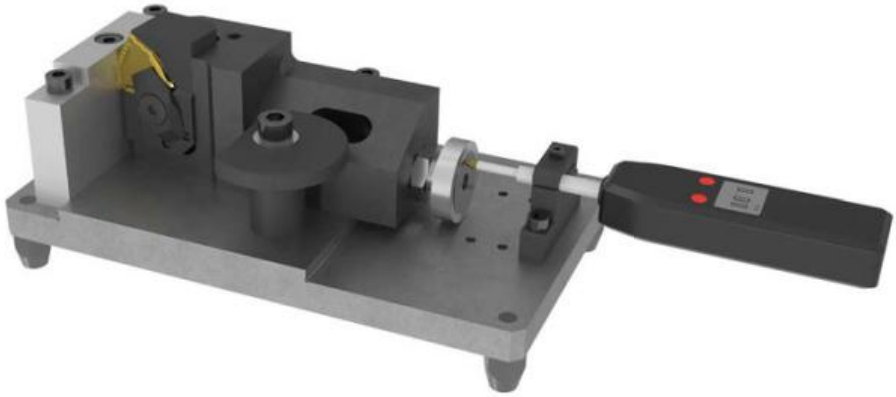


顏色僅供示意可能與實體不符！
Color illustration does not have to correspond to the original!



預調裝置用於將可獨立調整的剝皮刀頭上的刀柄設定至正確的長度。透過這種方式，可以精確調整所有刀柄的長度，從而達到預期的剝皮直徑。此外，這還能確保所有可轉位刀片在切削過程中都能參與切削。刀柄安裝完成後，仍可微調。關於調整刀柄的正確操作步驟，將在後續章節中進行說明。

To accurately set the lengths of the tool holders for the single-adjustable peeling head, a presetting device is utilized. This ensures precise ad-justment of all holder lengths to achieve the specified peeling diameter. Furthermore, it guarantees that all indexable inserts engage correctly during the cutting process. Fine adjustment of the holders can also be performed later while installed in the machine. The detailed procedure for configuring the tool holders is outlined in the following sections.



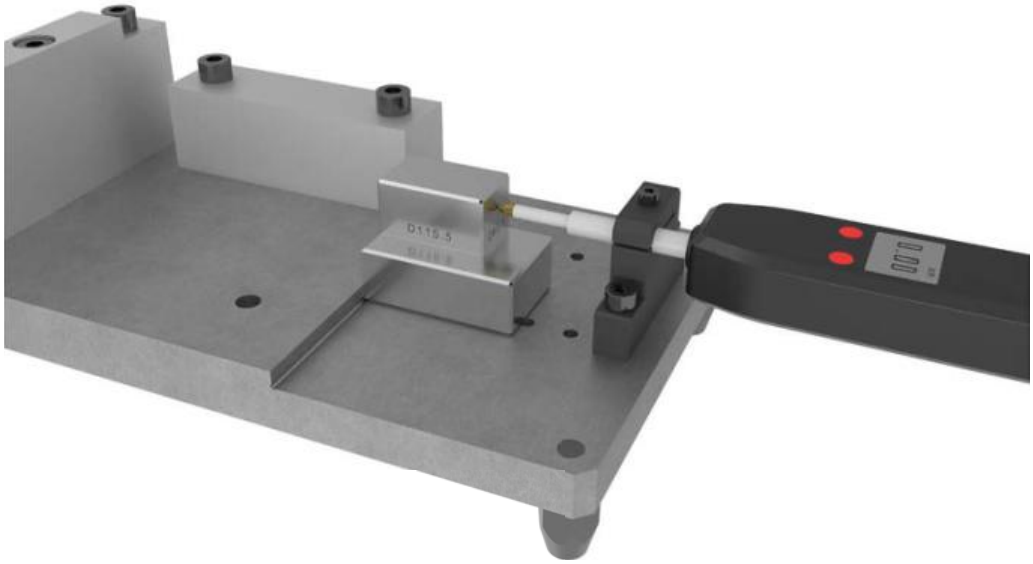
長度調整

根據所需直徑，選擇相應直徑範圍的刀柄。
利用量塊，將長度精確設定在這些直徑範圍的中點位置。

Length Adjustment

Depending on the required diameter, select the tool holders corresponding to the appropriate diameter ranges. Using the end gauge, set the lengths exactly at the midpoint of the specified diameter range.

可單獨調節的剝皮頭
Single-adjustable bar peeling head



量塊上標示其所設定的直徑數值（位於與測頭接觸的表面上）。隨後，將千分錶在該位置進行歸零。對於較大的直徑（此時刀柄長度會相應縮短），可將千分錶支架向前移動（見下圖）。若需將刀柄調整至其他直徑，則必須計算出相應的長度差。下文將透過一個範例來示範該計算過程。

The end gauge is marked on the surface where the scanner contacts, indicating the diameter to be set. The dial indicator is then zeroed at this position. For larger diameters (where tool holders become shorter), the indicator mount can be moved further forward (see figure below). To adjust the tool holder to a different diameter, it is necessary to calculate the corresponding length difference. An example of this calcula-tion is provided below.

例如，需將刀座設定為直徑 77 mm。

$$\text{長度差異} = \frac{\text{設定直徑 - 待設定的直徑}}{2}$$

$$\text{長度差異} = \frac{91{,}5 - 77\ \text{mm}}{2} = 7{,}25\ \text{mm}$$

因此，刀座的長度必須比最終尺寸長 7.25 mm。此長度可透過刀座上的緊定螺絲進行調節，並透過鎖緊固定螺帽予以固定。



The tool holder should be adjusted to a diameter of 77 mm.

$$\text{Length Difference} = \frac{\text{Set Diameter - Target Diameter}}{2}$$

$$\text{Length Difference} = \frac{91{,}5 - 77\ \text{mm}}{2} = 7{,}25\ \text{mm}$$

The tool holder must therefore be adjusted to be 7.25 mm longer than the end gauge. The length adjustment is carried out via the adjustment screw in the holder and secured by tightening the lock nut.

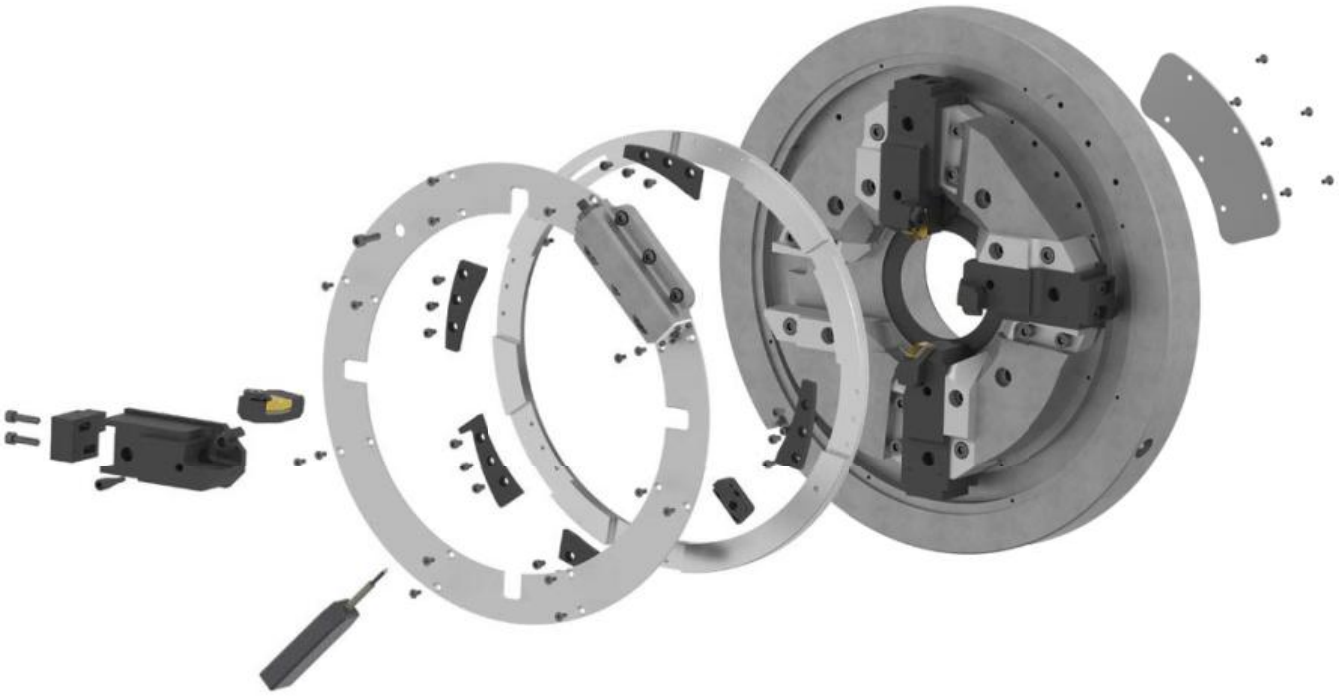
中心調節式剝皮刀頭
Centrally adjustable bar peeling head

中心調節式剝皮刀頭說明：

此剝皮刀頭採用特殊設計，配備了中心調節機構和強化結構。直徑調節透過一根主軸實現，該主軸連接至一個裝有凸輪盤的調節環；使調節環相對於剝皮刀頭轉動，即可同時調節全部四個滑塊。設定的直徑既可透過主軸上的刻度環讀取，也可透過插入剝皮刀頭孔內的千分錶（或百分錶）來測量。調節環配有鎖緊螺絲，可防止其意外轉動。此外，剝皮刀頭也經過了動平衡檢測；若有質量分佈不對稱的情況，則會進行相應的平衡校正。滑塊由一根錐形導桿固定在剝皮頭內，該導桿同時也用於調節間隙。根據所需的加工直徑範圍，需選用不同的滑塊。每個滑塊上均裝有標準的剝皮刀座，並透過T型塊和夾緊螺絲進行固定。當刀具達到使用壽命極限時，只需鬆開夾緊螺絲，取下裝有磨損可轉位刀片的刀片座，並換上新的即可。在此過程中，滑塊無需從剝皮頭內拆出。但在安裝空間極為狹小的情況下，可能需要將滑塊一併拆下，以便更換可轉位刀片。

Description of centrally adjustable peelinq head:

The peeling head is a special construction with central adjustment and a reinforced structure. The diameter adjustment ensures on a spind-le via an adjusting ring with curve discs, by rotating the ring relative to the peeling head. This causes simultaneous adjustment of all four cartridge slides. The diameter adjustment can be read on a scale ring of the spindle or via a dial gauge that can be inserted into a borehole in the peeling head. The adjusting ring is secured against rotation by a screw. Additionally, the peeling head is checked for imbalance, and any asymmetric mass distribution is compensated if necessary. The cartridge slides keep in the peeling head by a conical guide bar, which is used to adjust the clearance. Depending on the required diameter range, different cartridge slides are used. Each cartridge slide carries a standard rotary peeling cartridge, which is fixed via a T-piece and a clamping screw. When the end of the tool life is reached, only the clam-ping screws need to be loosened, the cartridges with the worn indexable inserts are removed and replaced with new ones. The cartridge slides remain in the peeling head. In very tight spaces, it may also be necessary to remove the cartridge slides to change the indexable inserts.



直徑調節
Diameter adjustment

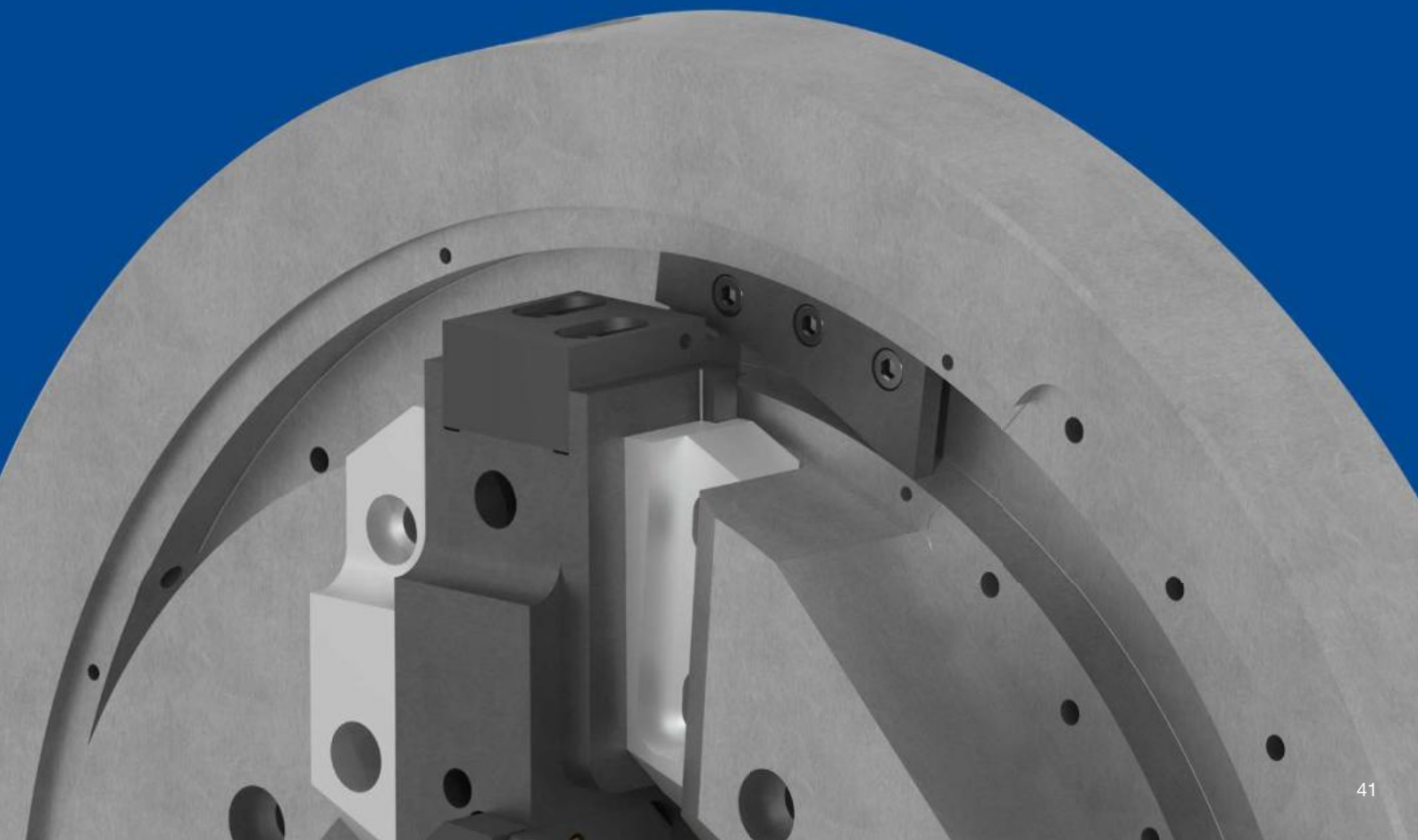
直徑透過主軸進行調節，具體方式是利用一個配有凸輪段的調節環，該調節環由驅動裝置帶動。調節環相對於剝皮刀頭轉動時，四個卡夾式滑塊會同步移動。

Diameter adjustment is performed via a spindle using an adjustment ring with cam segments, which are moved by the driver. By rotating the ring relative to the peeling head, all four cassette slides are adjusted simultaneously.

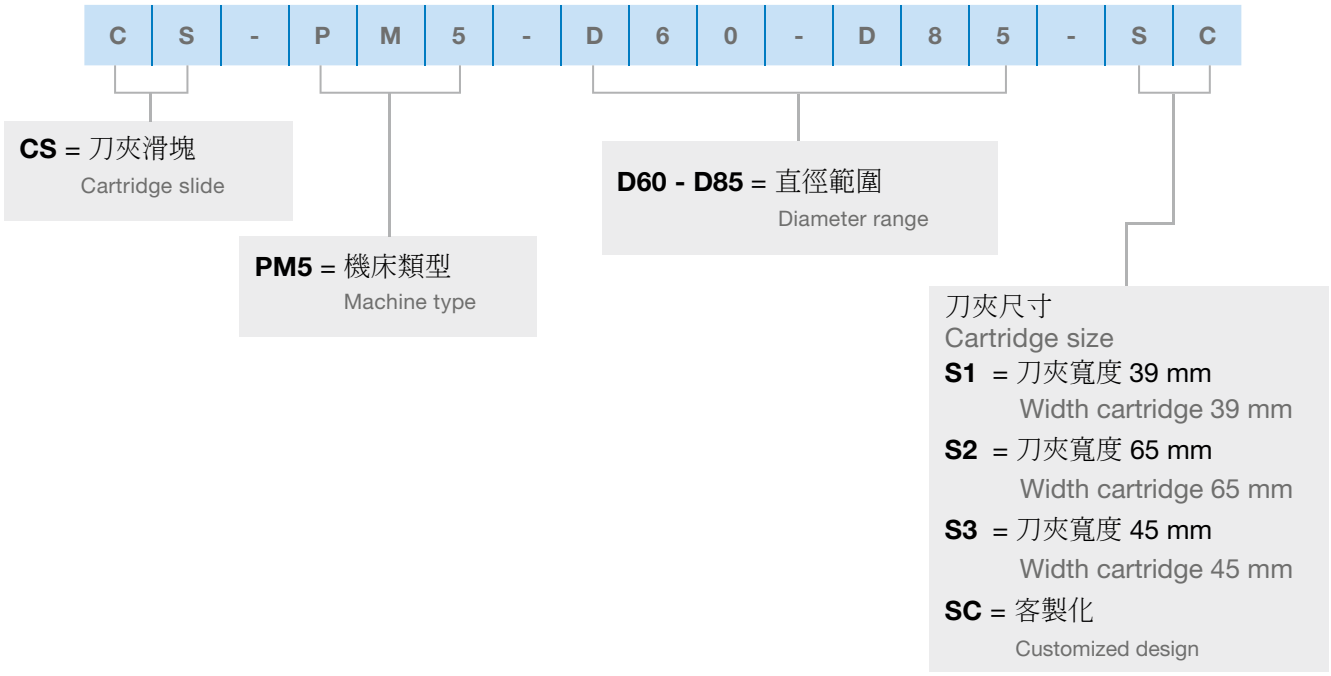


透過重新調整凸輪段的位置，可以改變刀座的長度。

By adjusting the cam segments, the length of the tool holders is set.



刀座型號系統
Designation system for tool holder



剝皮刀具刀柄的編號系統
Designation system for peeling holder

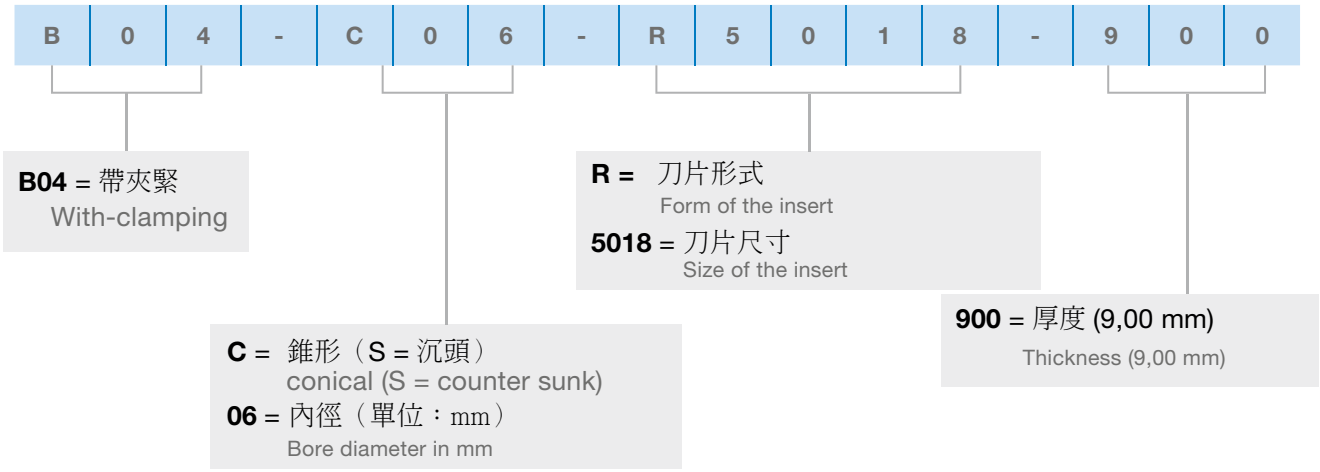


備品的編號系統
Designation system for spare parts

墊片命名系統
Designation system shim

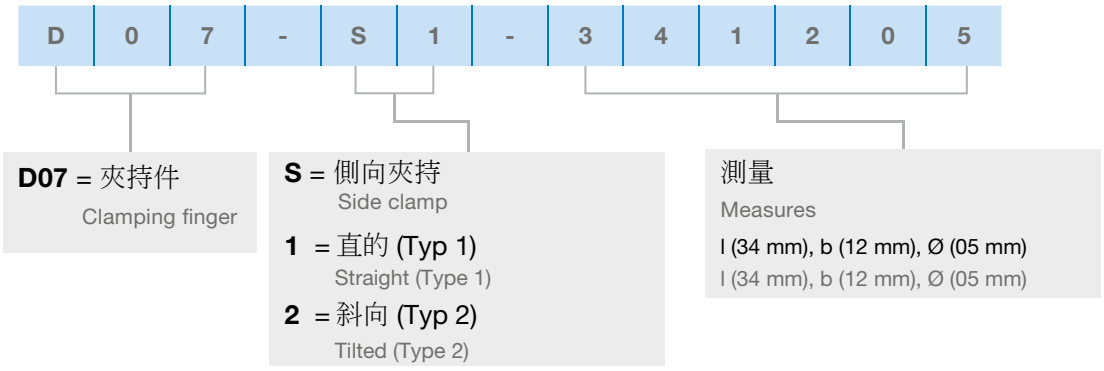


備品的編號系統
Designation system for spare parts



夾緊元件命名系統
Designation system clamping elements







剝皮刀
Bar peeling tools

全球範圍內，有許多專門從事棒料剝皮的機械製造商。長期以來，這些原始設備製造商（OEM）各自開發了專有的工裝系統，並針對其特定機型進行了量身定制。以下列舉了部分此類機械製造商，以及它們為剝皮加工應用所提供的系統。

You meet world-wide different machine producers, who are specialized in the area of bar peeling. In the course of time each of these OEMs have specialised on customized tooling systems. Below you can find an extract from the different machine producers and its tooling systems for bar peeling.

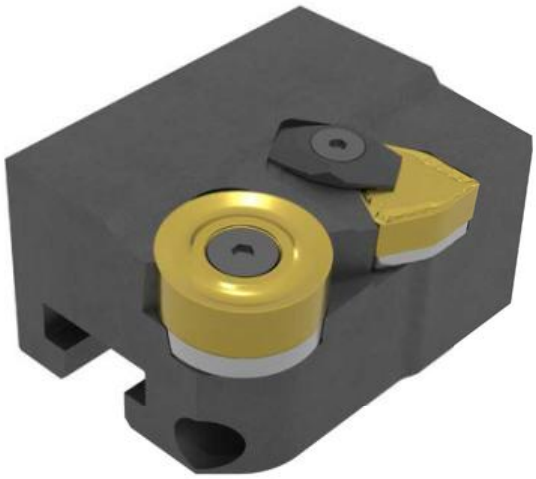
Bültmann





Hetran

Landgraf



Danieli

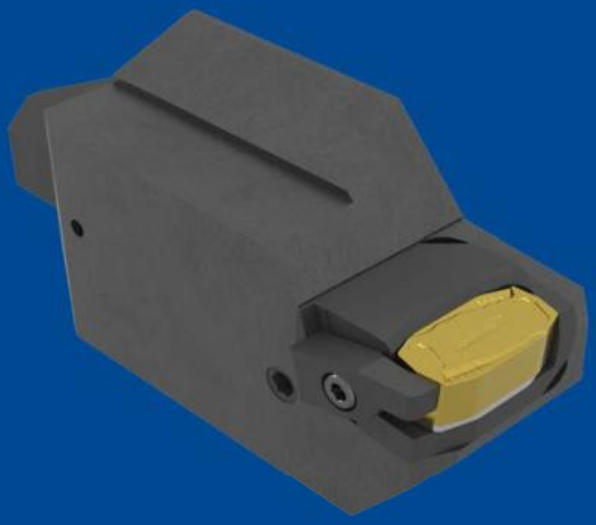


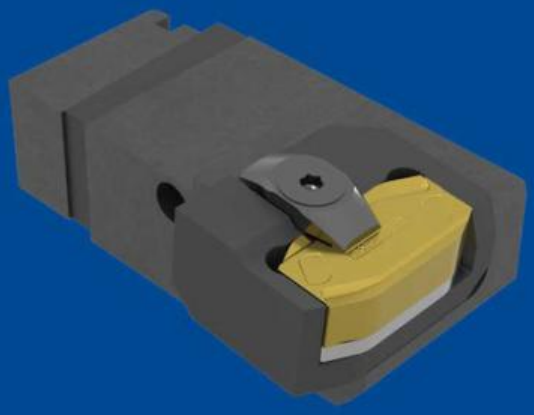


Calow

boehlerit

Daisho





Mair

Kieserling

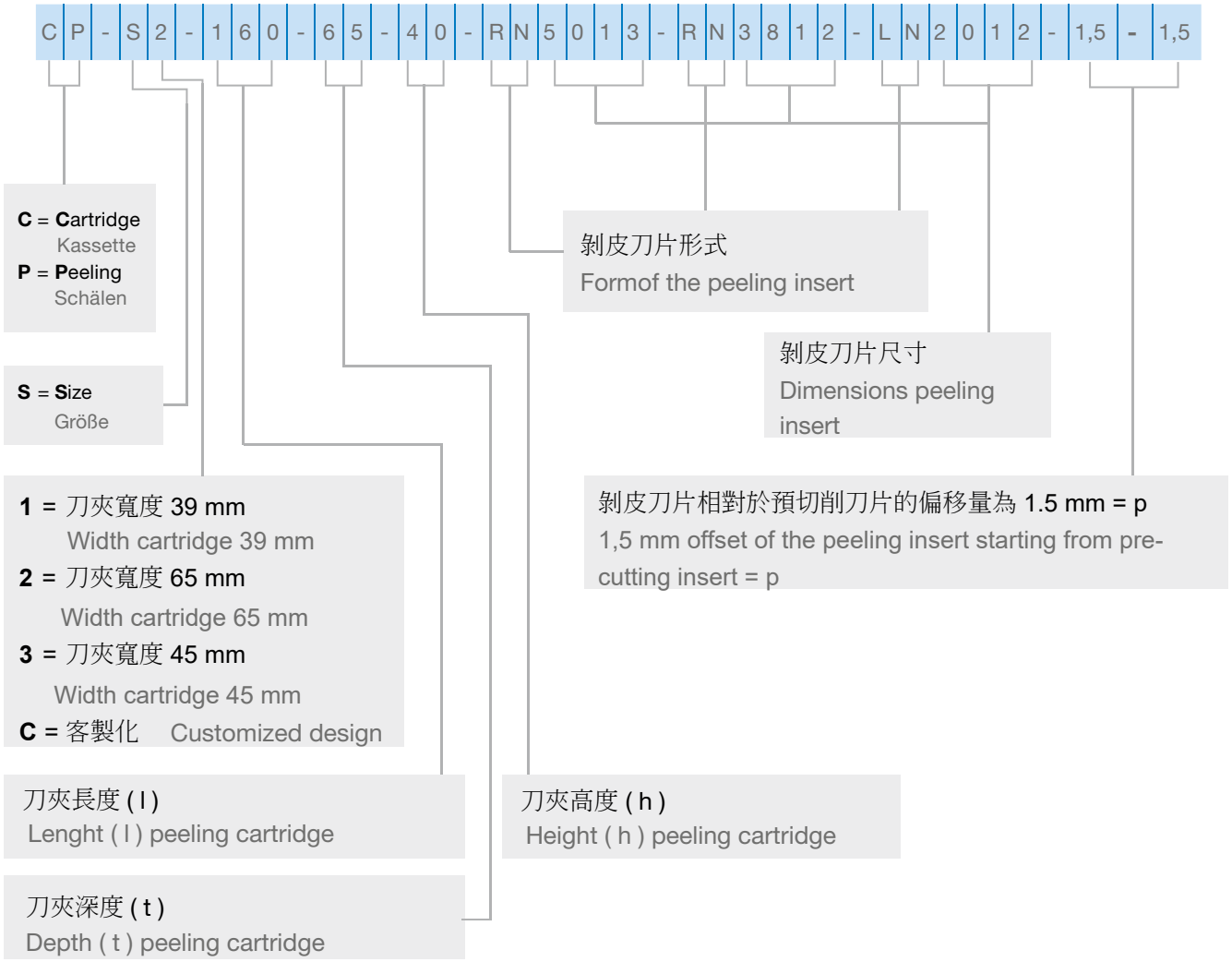


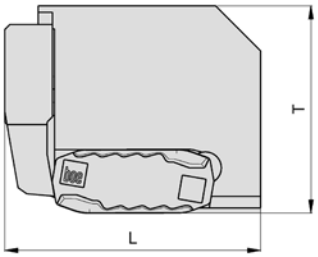


Farmer Norton

刀夾命名系統
Cartridge designation system

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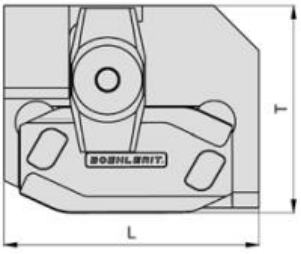


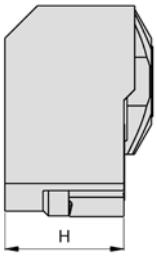
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				BN20186282			

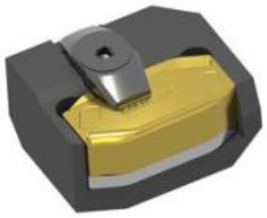
Ersatzteile Spare parts — **Bestellbezeichnungen** Ordering codes

 V01-A0040 6407828	 V01-A0020 6407824	 M3x10 ISO10642 für Auflageplatte shim B03-JN2008-250 5244748	 M5x12 ISO4762 für Klemmfinger for clamping finger D07-S2-331405 5244848	 Klemmfinger Clamping finger D07-S2-331405 5244848	 Auflageplatte shim B03-JN2008-250 5244748

Bestellbeispiel Order example: 1 Stück 1 piece CP-S1-48-39-22-JN-2008







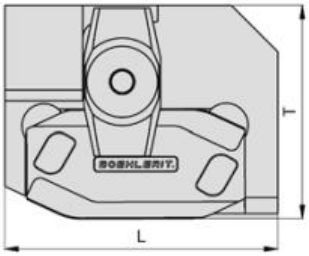
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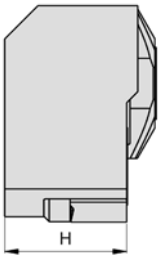
Ersatzteile Spare parts — **Bestellbezeichnungen** Ordering codes

 V01-A0040 6407828	 V01-A0020 6407824	 M3x10 ISO10642 für Auflageplatte for shim B03-LN2010-476 5244751	 M6x12 ISO10642 für Spannscheibe for clamping disc B04-O271406 5244871	 Spannscheibe Clamping disc B04O271406 5244871	 Auflageplatte shim B03-LN2010-476 5244751

Bestellbeispiel Order example: 1 Stück 1 piece CP-S1-48-39-22-LN-2010

Verfügbar ab Lager. Sonderanfertigungen entsprechend der Kundenanforderungen möglich.
Available from stock. Special designs can be supplied by customer request.





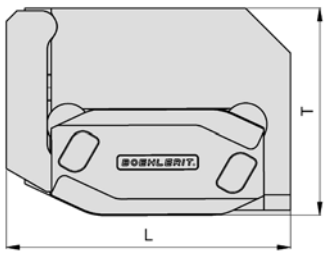


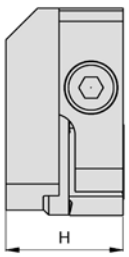
Abmessungen [mm] Dimensions [mm]				Artikelbezeichnung Item code	Bestell-Nr. Ordering No.	Verfügbarkeit Availability	Wendeschneidplatte Insert
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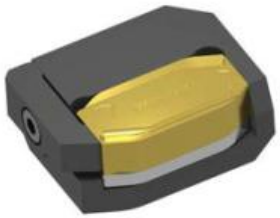
Ersatzteile Spare parts — **Bestellbezeichnungen** Ordering codes

 V01-A0040 6407828	 V01-A0020 6407824	 M3x10 ISO10642 für Auflageplatte for shim B03-LN2010-476 5244751	 M6x12 ISO10642 für Spannscheibe Clamping disc D04O271406 5244871	 Spannscheibe Clamping disc D04O271406 5244871	 Auflageplatte shim B03-LN2010-476 5244751

Bestellbeispiel Order example: 1 Stück 1 piece CP-S1-50-39-22-LN-2010







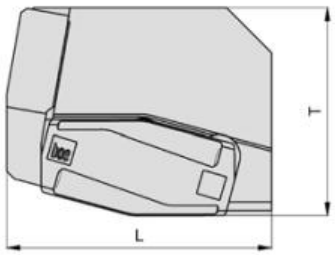
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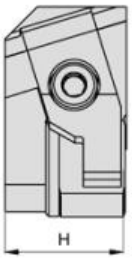
Ersatzteile Spare parts — **Bestellbezeichnungen** Ordering codes

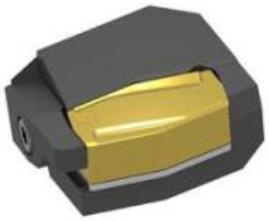
 V01-A0040 6407828	 V01-A0020 6407824	 M3x10 ISO10642 für Auflageplatte for shim B03-LN2010-476 5244751	 M5x12 ISO4762 für Klemmfinger for clamping finger D07-S1-341206 5244904	 Klemmfinger Clamping finger D07-S1-341206 5244904	 Auflageplatte shim B03-LN2010-476 5244751

Bestellbeispiel Order example: 1 Stück 1 piece CP-S1-54-39-22-LN-2010

Verfügbar ab Lager. Sonderanfertigungen entsprechend der Kundenanforderungen möglich.
Available from stock. Special designs can be supplied by customer request.





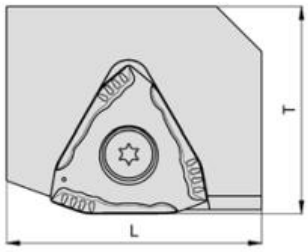


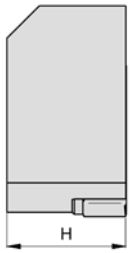
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				BN20210300			

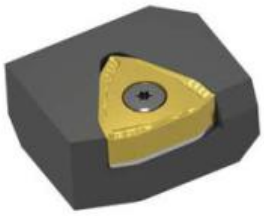
Ersatzteile Spare parts — **Bestellbezeichnungen** Ordering codes

 V01-A0040 6407828	 V01-A0020 6407824	 M3x10 ISO10642 für Auflageplatte for shim B03-UN1712-250 5244760	 M5x12 ISO4762 für Klemmfinger for clamping finger D07-S2-331405 5244848	 Klemmfinger Clamping finger D07-S2-331405 5244848	 Auflageplatte shim B03-UN1712-250 5244760

Bestellbeispiel Order example: 1 Stück 1 piece CP-S1-50-39-22-UN-1712







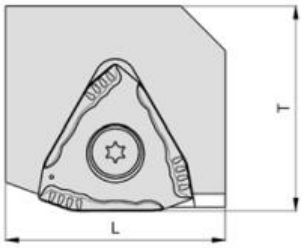
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				BN90013691			

Ersatzteile Spare parts — **Bestellbezeichnungen** Ordering codes

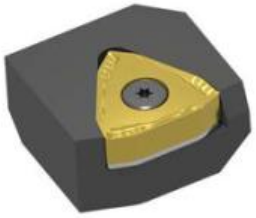
 V04-T2000 6407847	 A07-60180 6401296	 Auflageplatte shim B04-C06-T1407-200 5244761			

Bestellbeispiel Order example: 1 Stück 1 piece CP-S1-48-39-22-TN-1407

Verfügbar ab Lager. Sonderanfertigungen entsprechend der Kundenanforderungen möglich.
Available from stock. Special designs can be supplied by customer request.



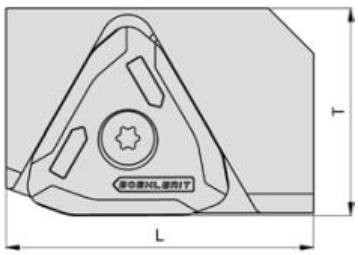


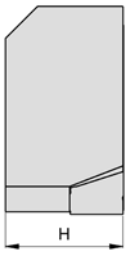


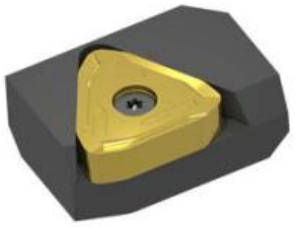
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				BN20210304			

Ersatzteile Spare parts		Bestellbezeichnungen Ordering codes			
 V04-T2000 6407847	 A07-60180 6401296	 Auflageplatte shim B04-C06-T1407-200 5244761			

Bestellbeispiel Order example: 1 Stück 1 piece CP-S1-42-39-22-TN-1407





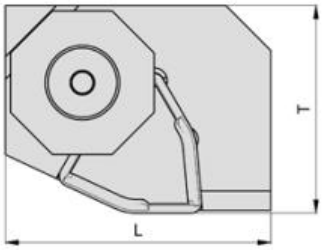


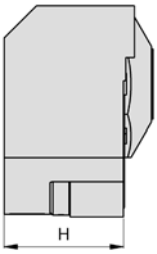
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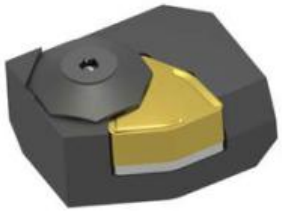
Ersatzteile Spare parts		Bestellbezeichnungen Ordering codes			
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Bestellbeispiel Order example: 1 Stück 1 piece CP-S1-58-39-22-TN-2010

Verfügbar ab Lager. Sonderanfertigungen entsprechend der Kundenanforderungen möglich.
Available from stock. Special designs can be supplied by customer request.





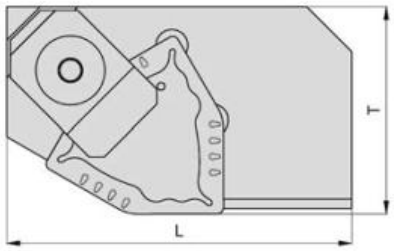


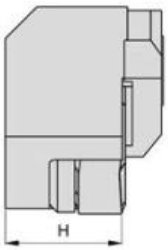
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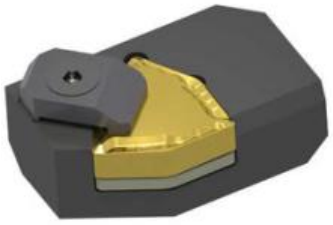
Ersatzteile Spare parts — **Bestellbezeichnungen** Ordering codes

 V01-A0040 6407828	 V01-A0030 6407826	 M5x10 ISO10642 für Auflageplatte for shim B04-S06-X1010-350 5244764	 M6x16 ISO10642 für Spannscheibe for clamping disc D04O272706 5244884	 Spannscheibe Clamping disc D04O272706 5244884	 Auflageplatte shim B04-S06-X1010-350 5244764

Bestellbeispiel Order example: 1 Stück 1 piece CP-S1-50-39-22-XN-1010







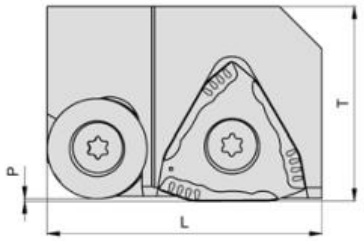
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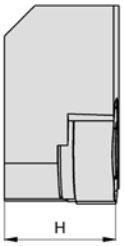
Ersatzteile Spare parts — **Bestellbezeichnungen** Ordering codes

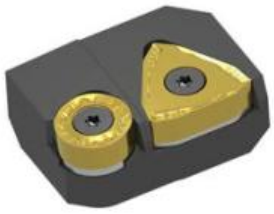
 V01-A0040 6407828	 M6x12 ISO10642 für Auflageplatte for shim B04-S06-X1609-476 5244964	 M6x16 ISO10642 für Klemmfinger for clamping finger D07-T1-281806 5244885	 Klemmfinger Clamping finger D07-T1-281806 5244885	 Auflageplatte shim B04-S06-X1609-476 5244964

Bestellbeispiel Order example: 1 Stück 1 piece CP-S1-65-39-22-XN-1609

Verfügbar ab Lager. Sonderanfertigungen entsprechend der Kundenanforderungen möglich.
Available from stock. Special designs can be supplied by customer request.





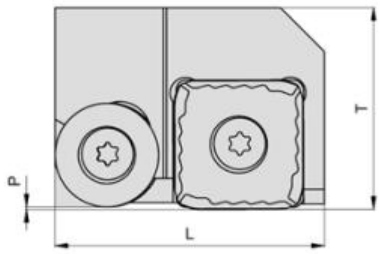


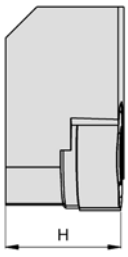
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				BN20210494			

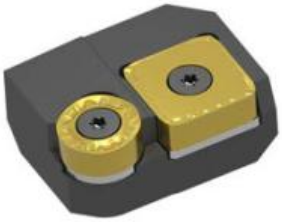
Ersatzteile Spare parts — **Bestellbezeichnungen** Ordering codes

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Bestellbeispiel Order example: 1 Stück 1 piece CP-S1-55-39-22-RN2008-TN1407-0,5







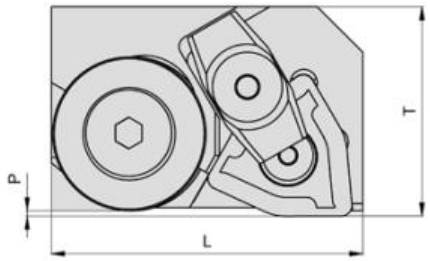
Abmessungen [mm] Dimensions [mm]				Artikelbezeichnung Item code	Bestell-Nr. Ordering No.	Verfügbarkeit Availability	Wendeschneidplatte Insert
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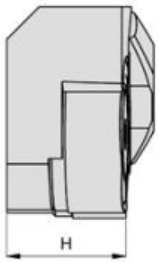
Ersatzteile Spare parts — **Bestellbezeichnungen** Ordering codes

 V04-T2000 6407847	 A07-60180 für for RNMH2008 TNGJ1708 6401296	 Auflageplatte shim B04-C07-S1708-300 5244772	 Auflageplatte shim B04-C06-R2008-300 5244771		

Bestellbeispiel Order example: 1 Stück 1 piece CP-S1-52-39-22-RN2008-SN2008-0,5

Verfügbar ab Lager. Sonderanfertigungen entsprechend der Kundenanforderungen möglich.
Available from stock. Special designs can be supplied by customer request.





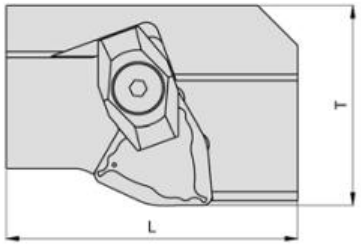


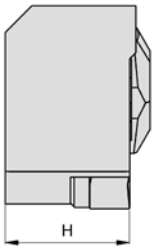
Abmessungen [mm] Dimensions [mm]				**Artikelbezeichnung** Item code	**Bestell-Nr.** Ordering No.	**Verfügbarkeit** Availability	**Wendeschneidplatte** Insert
l	t	h	p				
58	38	22	1	**CP-S1-58-39-22-RN2810-XN1010-1**	5189221	○	 RN2810/XN1010-... Seite 31/28
				BN20200065			

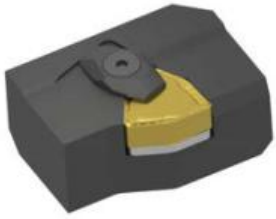
Ersatzteile Spare parts — **Bestellbezeichnungen** Ordering codes

 V01-A0050 6407829	 V01-A0040 6407828	 V01-A0030 6407826	 M5x10 ISO10642 für Auflageplatte for shim B04-S06-X1010-350 5244764	 M6x16 ISO10642 für Spann-scheibe for clamping disc D04O271406 5244871	 M8x20 ISO10642 für for RNMH2810	 Spannscheibe clamping disc D04O271406 5244871	 Auflageplatte shim B04-C08-R2810-300 5244773	 Auflageplatte shim B04-S06-X1010-350 5244764

Bestellbeispiel Order example: 1 Stück 1 piece CP-S1-58-39-22-RN2810-XN1010-1







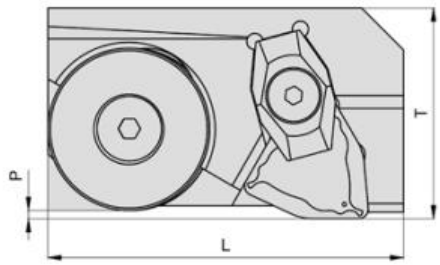
Abmessungen [mm] Dimensions [mm]				**Artikelbezeichnung** Item code	**Bestell-Nr.** Ordering No.	**Verfügbarkeit** Availability	**Wendeschneidplatte** Insert
l	t	h	p				
95	65	40	-	**CP-S2-95-65-40-XN-1513**	5151991	○	 XNMF1513... Seite 29
				BN20209869			

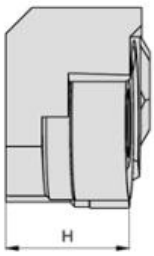
Ersatzteile Spare parts — **Bestellbezeichnungen** Ordering codes

 V01-A0050 6407829	 M8x12 ISO10642 für Auflageplatte for shim B04-S09-X1513-600 5244768	 M8x16 ISO10642 für Spannscheibe for clamping disc D04O382408 5244857	 Spannscheibe clamping disc D04O382408 5244857	 Auflageplatte shim B04-S09-X1513-600 5244768

Bestellbeispiel Order example: 1 Stück 1 piece CP-S2-95-65-40-XN-1513

Verfügbar ab Lager. Sonderanfertigungen entsprechend der Kundenanforderungen möglich.
Available from stock. Special designs can be supplied by customer request.





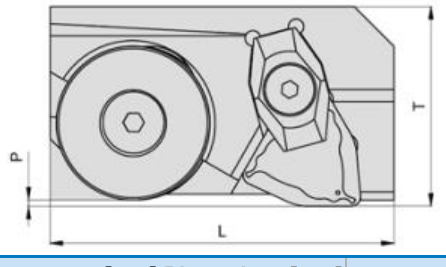


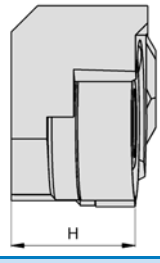
Abmessungen [mm] Dimensions [mm]				Artikelbezeichnung Item code	Bestell-Nr. Ordering No.	Verfügbarkeit Availability	Wendeschneidplatte Insert
l	t	h	p				
110	65	40	2,5	**CP-S2-110-65-40-RN5018-XN1513-2,5**	5218099	○	 RN5018/XN1513-... Seite 31/29
				BN20209701			

Ersatzteile Spare parts — **Bestellbezeichnungen** Ordering codes

 V01-A0050 6407829	 V01-A0060 6407830	 M10x35 ISO10642 für for RNMH5018	 M8x12 ISO10642 für Auflageplatte for shim B04-S09-X1513-600 5244768	 M8x16 ISO10642 für Spannscheibe for clamping disc D04O382408 5244857	 Spannscheibe clamping disc D04O382408 5244857	 Auflageplatte shim B04-S09-X1513-600 5244768	 Auflageplatte shim B04-C12-R5018-900 5244777

Bestellbeispiel Order example: 1 Stück 1 piece CP-S2-110-65-40-RN5018-XN1513-2,5







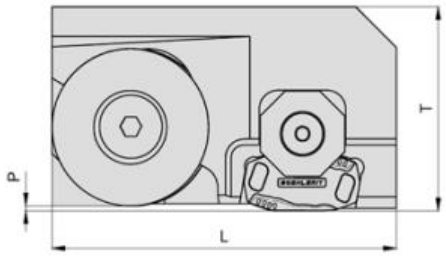
Abmessungen [mm] Dimensions [mm]				Artikelbezeichnung Item code	Bestell-Nr. Ordering No.	Verfügbarkeit Availability	Wendeschneidplatte Insert
l	t	h	p				
112	65	40	2	**CP-S2-112-65-40-RN5018-XN1513-2**	6413535	○	 RN5018/XN1513... Seite 31/29
				BN20210302			

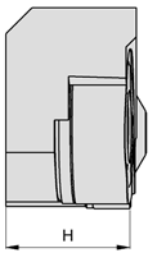
Ersatzteile Spare parts — **Bestellbezeichnungen** Ordering codes

 V01-A0050 6407829	 V01-A0060 6407830	 M10x35 ISO10642 für for RNMH5018	 M8x12 ISO10642 für Auflageplatte for shim D04-O-382408 5244857	 M8x16 ISO10642 für Spann-scheibe for clamping disc D04O382408 5244857	 Spannscheibe clamping disc D04O382408 5244857	 Auflageplatte shim B04-S09-X1513-600 5244768	 Auflageplatte shim B04-C12-R5018-900 5244777

Bestellbeispiel Order example: 1 Stück 1 piece CP-S2-112-65-40-RN5018-XN1513-2

Verfügbar ab Lager. Sonderanfertigungen entsprechend der Kundenanforderungen möglich.
Available from stock. Special designs can be supplied by customer request.





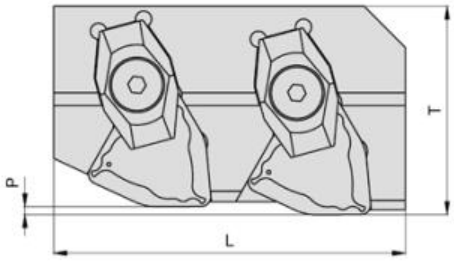


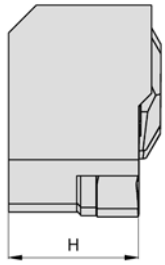
Abmessungen [mm] Dimensions [mm]				Artikelbezeichnung Item code	Bestell-Nr. Ordering No.	Verfügbarkeit Availability	Wendeschneidplatte Insert
l	t	h	p				
110	65	40	1,5	**CP-S2-110-65-40-RN5018-JN2012-1,5**	5148076	●	 RN5018/JN2012-... Seite 31/22
				BN20209677			

Ersatzteile Spare parts — **Bestellbezeichnungen** Ordering codes

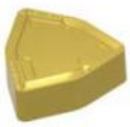
 V01-A0020 6407824	 V01-A0040 6407828	 V01-A0050 6407829	 M10x35 ISO10642 für for RNMH5018	 M3x8 ISO10642 für Auflage-platte for shim B03-JN2012-250 5244755	 M6x16 ISO10642 für Spann-scheibe for clamping disc D04O272706 5244884	 Spannscheibe clamping disc D04O272706 5244884	 Auflageplatte shim B04-C12-R5018-500 5244778	 Auflageplatte shim B03-JN2012-250 5244775

Bestellbeispiel Order example: 1 Stück 1 piece CP-S2-110-65-40-RN5018-JN2012-1,5







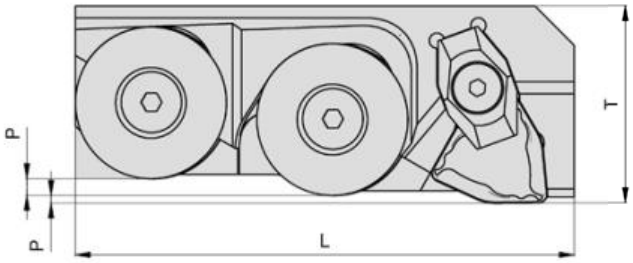
Abmessungen [mm] Dimensions [mm]				Artikelbezeichnung Item code	Bestell-Nr. Ordering No.	Verfügbarkeit Availability	Wendeschneidplatte Insert
l	t	h	p				
110	65	40	2,5	**CP-S2-110-65-40-XN1513-XN1513-2,5**	5154393	●	 XN1513... Seite 29
				BN20209674			

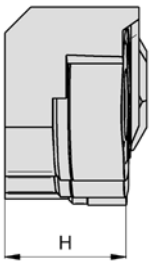
Ersatzteile Spare parts — **Bestellbezeichnungen** Ordering codes

 V01-A0050 6407829	 M8x12 ISO10642 für Auflageplatte for shim B04-S09-X1513-600 5244768	 M8x16 ISO10642 für Spannscheibe for clamping disc D04O382408 5244857	 Spannscheibe clamping disc D04O382408 5244857	 Auflageplatte shim B04-S09-X1513-600 5244768

Bestellbeispiel Order example: 1 Stück 1 piece CP-S2-110-65-40-XN1513-XN1513-2,5

Verfügbar ab Lager. Sonderanfertigungen entsprechend der Kundenanforderungen möglich.
Available from stock. Special designs can be supplied by customer request.







Abmessungen [mm] Dimensions [mm]				**Artikelbezeichnung** Item code	**Bestell-Nr.** Ordering No.	**Verfügbarkeit** Availability	**Wendeschneidplatte** Insert
l	t	h	p				
165	65	40	5,0/2,5	**CP-S2-165-65-40-RN5018-RN5018-XN1513-5,5-2,5**	5066698	○	 RN5018/ XN1513... Seite 31/29
				BN20209090			

Ersatzteile Spare parts — **Bestellbezeichnungen** Ordering codes

 V04-T3000 5165649	 Spannschraube clamping screw A02-80250 6401272 für for XNMU 1513	 V01-A0050 6407829	 V01-A0060 6407830	 M10x35 ISO10642 für for RNMH 5018
 M8x12 ISO10642 für Auflageplatte for shim B04-S09-X1513-600 52444768	 M8x16 ISO10642 für Spannscheibe for clamping disc D04O382408 5244857	 Spannscheibe clamping disc D04O382408 5244857	 Auflageplatte shim B04-S09-X1513-600 52444768	 Auflageplatte shim B04-C12-R5018-500 5244778

Bestellbeispiel Order example: 1 Stück 1 piece CP-S2-165-65-40-RN5018-RN5018-XN1513-5,5-2,5

Verfügbar ab Lager. Sonderanfertigungen entsprechend der Kundenanforderungen möglich.
Available from stock. Special designs can be supplied by customer request.

boehlerit

棒料端部加工刀具
Tools for bar end machining



棒材端部加工：倒角與銑削
Bar end machining chamfering and milling

Boehlerit 面銑刀盤（配整體式刀夾）

根據倒角尺寸、角度、可轉位刀片以及工具機行程，單一刀座組件即可在預定的直徑範圍內進行倒角加工。

優勢：
無需對倒角刀座組件進行調整；倒角尺寸由工具機的運動軌跡決定。



Boehlerit Chamfering head with Monoblock cartridge,

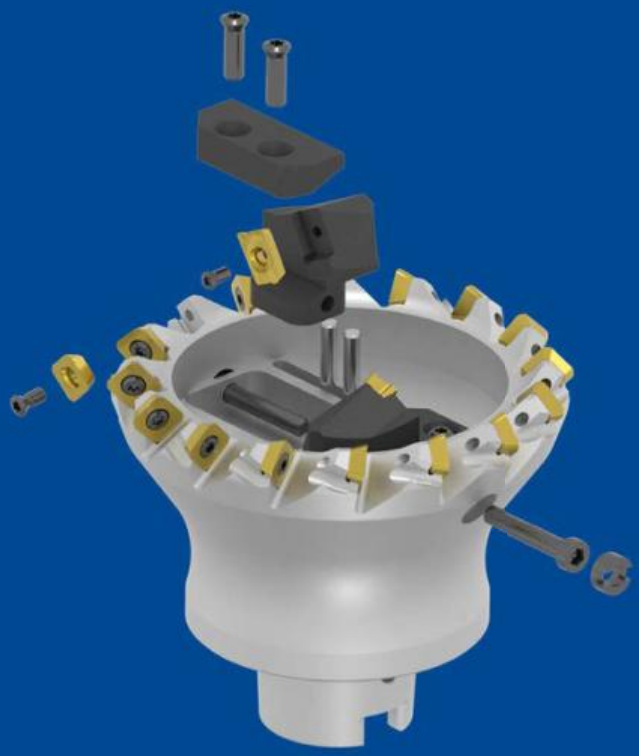
Depending on chamfer size, angle, insert type and machine stroke one cartridge can cover a defined diameter range.

Advantage:
No adjustment of the chamfering cartridge needed, chamfer size is defined by the stroke of the machine.

附有可調式倒角刀片的 Boehlerit 倒角刀頭

根據特定型號，可透過銑刀圓週上的調整螺絲，對一個或兩個倒角刀片進行無級調節，並利用夾緊楔塊將其固定到位。

優勢：
針對每種倒角角度，只需一組倒角刀片，即可覆蓋該系統所涵蓋的全部直徑範圍。



Boehlerit chamfering head with adjustable chamfering cartridge

Depending on the execution of the cutter, one or two cartridges can be adjusted by rotating the adjustment screw on the milling cutter, after positioning the cartridge is fixed with a clamp.

Advantage:
The chamfering cartridge can be adjusted to the correct position using a scale on the head and then secured with a clamping screw.

Boehlerit 面銑/倒角刀盤

軸向進給運動可在單次工序中同時完成端面加工與倒角加工。端面加工刀片始終位於中心位置，而倒角刀片則可透過調整螺絲調整至所需直徑。

優勢：
僅需一次定位，縮短了加工週期；同時在加工小直徑工件時，加工過程也更加穩定。



Boehlerit Facing/Chamfering head

By an axial movement of the machine, chamfering and facing can be done in one step. The facing cartridge is always in center and the chamfering cartridge can be adjusted to the bar diameter with an adjustment screw.

Advantage:
Shorter cycle time because of one positioning movement and more stable application on small diameters.

Boehlerit 簡易倒角刀頭

這是一種經濟實惠的解決方案，適用於各種適配器，不受尺寸限制。

優勢：
利用刀頭上的刻度，可將端面銑削刀夾調整至正確位置，隨後透過夾緊螺絲將其固定。



Boehlerit simple Chamfering head

Cheap solution which can be adapted to any Adapter in all dimensions.

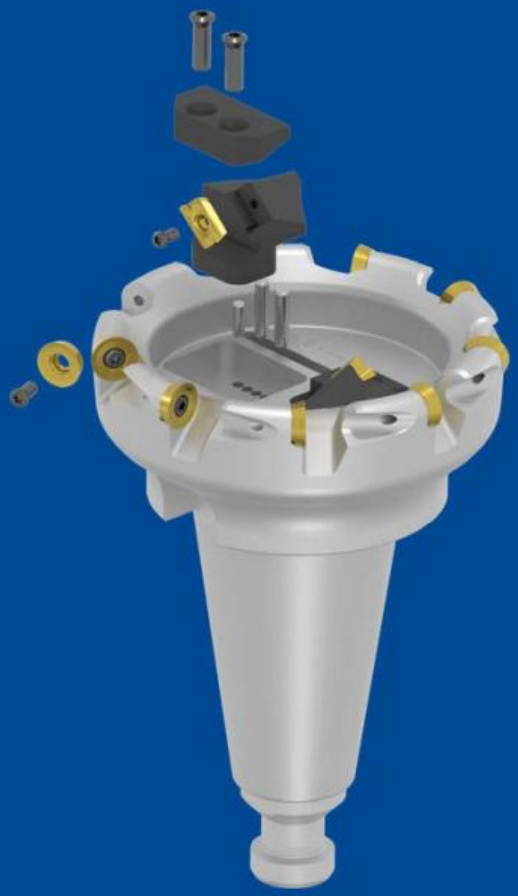
Advantage:
The chamfering cartridge can be adjusted to the correct position threw a scale on the head, where it will be tightened with a clamping screw.

棒材端部加工：倒角與銑削
Bar end machining chamfering and milling

Boehlerit面銑刀，配備可透過插入式定位進行調整的刀片座

將倒角組件放置在不同的安裝位置即可進行調整；可加工的直徑範圍取決於工具機的軸向行程、倒角尺寸以及倒角角度。組件就位後，會透過一個夾緊楔塊進一步固定。

優勢：
針對每種倒角角度，只需一組倒角組件，即可覆蓋該系統所能處理的所有直徑範圍。

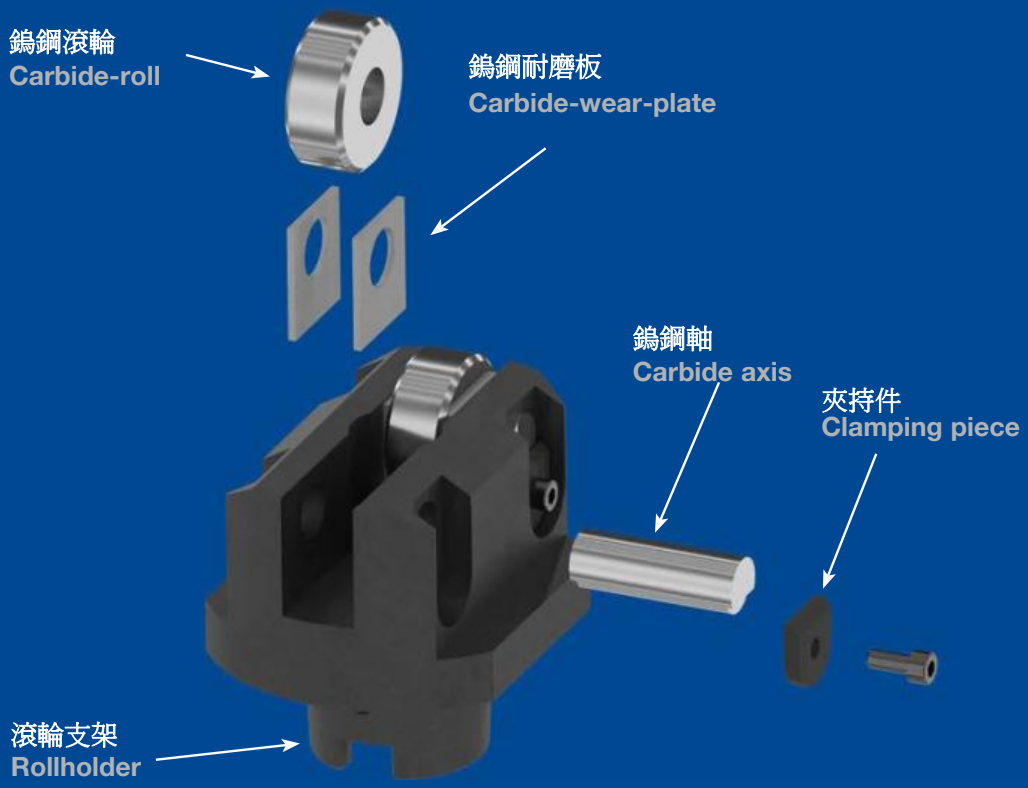


Boehlerit Chamfering head with adjustable cartridges threw pin positioning

A pin on the cartridge allows positioning in several positions on the cutter, which allow defined diameter ranges depending on chamfer size, angle, insert and stroke of the machine. After positioning the cartridge is fixed with a clamp.

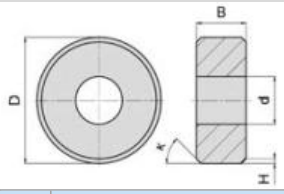
Advantage:
Just one set of chamfering cartridges for each chamfer angle needed to cover the whole diameter range of the cutter.

出入料引導系統
Entry- and exit guide system



Hartmetall Rollen
Carbide rolls

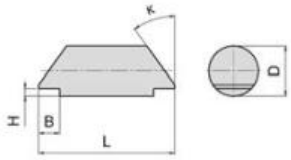




Außendurchmesser Outer diameter **D**	Innendurchmesser Inner diameter **d**	Breite Width **B**	Fasenwinkel außen Outer chamfer angle **K**	Fasenbreite außen Outer chamfer width **H**
28	15	10 12 20	35° 45°	1 2,5
35	15 20	12 14 19	15° 30° 45°	3 3,25 3,5
40	12 15 20	12 15 16 22	45°	1 1,5 4
50	20	14 16 20	45°	3 5
80	25 32	26	45°	3,5
90	40	41 60 68	45°	-

Hartmetall Achsen
Carbide axis

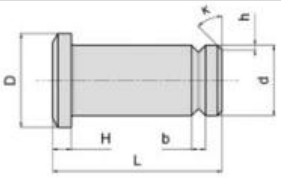




Durchmesser Diameter **D**	Länge Length **L**	Absatzhöhe Shoulder height **H**	Absatzbreite Shoulder width **B**	Schrägenwinkel Bevel angle **K**
12	33	1,5	3,75 4	36°
15	33 35 44 45	1,5 4,5 11	2,5 4 6	45° 30° 36°

Hartmetall Bolzen
Carbide pins





Durchmesser Diameter **d**	Kopf-Durchmesser Head Diameter **D**	Kopfhöhe Height of head **H**	Gesamtlänge Total length **L**	Nutbreite Groove width **b**	Fasenwinkel Chamfer angle **K**	Fasenbreite Chamfer width **h**
15	24	4,5	29 32 41 47 58	3,5 4,2	35°	6,5
18	25	5 6	49 55	5 4,2 9	-	-
20	25 28 30	5	35 52 60 65	1,2 8	-	-

Weitere Abmessungen sind auf Anfrage erhältlich.
Additional dimensions are available upon request.

Maße und Einheiten Dimensions and units	Anwendungs-Formeln Application formulas
a_p = Schnitttiefe in mm Depths of cut in mm	Schnittgeschwindigkeit in [m/min] Cutting speed in [m/min]
Q = Zerspanungsvolumen in [cm³/min] Chip removal rate [cm³/min]	$V_c = \frac{d_1 \times \pi \times n}{1000}$
V_c = Schnittgeschwindigkeit in [m/min] Cutting speed in [m/min]	Drehzahl in [U/min] Revolutions of spindle [rev/min]
f_n = Vorschubgeschwindigkeit in [m/min] Feed rate in [m/min]	$n = \frac{V_c \times 1000}{\pi \times d_1}$
f = Vorschub in [mm/u] Feed in [mm/Rev.]	Vorschubgeschwindigkeit f_n [m/min] Feed rate f_n [m/min]
d_1 = Strangdurchmesser [mm] Bar-diameter [mm]	$V_f = f \times n$
n = Drehzahl in [U/min] Revolutions of spindle [rev/min]	Vorschub pro Umdrehung f [mm/U] Feed per revolution f [mm/rev.]
	$f_n = \frac{V_f}{n}$
	Zerspanungsvolumen Q [cm³/min] Chip removal rate Q [cm³/min]
	$Q = a_p \times f \times V_c$

Berechnungsbeispiele:
Calculation example:

Wendeschneidplatte Insert : **LNGF-2010-BML-H20 LC218E**

Durchmesser Bar diameter : **Ø 48,6 - 46,2 mm**
Schnitttiefe (a_p) Depth of cut (a_p): **1,2 mm**
Gewählte Schnittgeschwindigkeit Chosen cutting speed (V_c) : **110 m/min**
Vorschub pro Umdrehung (f_n) Feed per rev. (f_n) : **14 mm/U** **mm/rev**

Berechnung Drehzahl :
Calculation of rev. number :

$$n = \frac{v_c \times 1000}{\pi \times d_1} \qquad n = \frac{110 \times 1000}{\pi \times 46{,}2} = 757{,}9 \text{ U/min rev/min}$$

Berechnung Vorschub :
Calculation of feed rate :

$$V_f = f_n \times n$$

$V_f = 14 \times 757{,}9 = 10.611$ m/min ~ 10.6 m/min

Berechnung Zerspanungsvolumen :
Calculation of chip removal rate :

$$Q = a_p \times f \times f_n$$

Q= 1,2mm x 14mm/U x 110m/min
Q= 0,12cm x 1,4 cm/U x 11000cm/min = 1.848 cm³/min

Härte-Vergleichstabelle
Hardness-comparison table

Zugfestigkeit Rm Tensile strength RM N/mm²	Vickershärte Vickers hardness HV	Brinellhärte Brinell hardness HB	Rockwell-härte Rockwell hardness HRC
255	80	76	
270	85	80,7	
285	90	85,5	
305	95	90,2	
320	100	95	
335	105	99,8	
350	110	105	
370	115	109	
385	120	114	
400	125	119	
415	130	124	
430	135	128	
450	140	133	
465	145	138	
480	150	143	
495	155	147	
510	160	152	
530	165	156	
545	170	162	
560	175	166	
575	180	171	
595	185	176	
610	190	181	
625	195	185	
640	200	190	
660	205	195	
675	210	199	
690	215	204	
705	220	209	
720	225	214	
740	230	219	
755	235	223	
770	240	228	20,3
785	245	233	21,3
800	250	238	22,2
820	255	242	23,1
835	260	247	24
850	265	252	24,8
865	270	257	25,6
880	275	261	26,4
900	280	266	27,1
915	285	271	27,8
930	290	276	28,5
950	295	280	29,2
965	300	285	29,8
995	310	295	31
1030	320	304	32,2
1060	330	314	33,3
1095	340	323	34,4

Zugfestigkeit Rm Tensile strength RM N/mm²	Vickershärte Vickers hardness HV	Brinellhärte Brinell hardness HB	Rockwell-härte Rockwell hardness HRC
1125	350	333	35,5
1155	360	342	36,6
1190	370	352	37,7
1220	380	361	38,8
1155	390	371	39,8
1290	400	380	40,8
1320	410	390	41,8
1350	420	399	42,7
1385	430	409	43,6
1420	440	418	44,5
1455	450	428	45,3
1485	460	437	46,1
1520	470	447	46,9
1555	480	(456)	47,7
1595	490	(466)	48,4
1630	500	(475)	49,1
1665	510	(485)	49,8
1700	520	(494)	50,5
1740	530	(504)	51,1
1775	540	(513)	51,7
1810	550	(523)	52,3
1845	560	(532)	53,0
1880	570	(542)	53,6
1920	580	(551)	54,1
1955	590	(561)	54,7
1995	600	(570)	55,2
2030	610	(580)	55,7
2070	620	(589)	56,3
2105	630	(599)	56,8
2145	640	(608)	57,3
2180	650	(618)	57,8
	660		58,3
	670		58,8
	680		59,2
	690		59,7
	700		60,1
	720		61
	740		61,8
	760		62,5
	780		63,3
	800		64
	820		64,7
	840		65,3
	860		65,9
	880		66,4
	900		67
	920		67,5
	940		68

Zugfestigkeit Tensile strength	N/mm²	Rm
Vickershärte Vickers hardness	Diamantpyramide 1368, Prüfkraft F ≥ 98 N Diamond pyramid 136°, Test force F ≥ 98 N	HV
Brinellhärte Brinell hardness	0,102 x F/D2 = 30 N/mm²	HB
Kalkuliert mit: Calculated from: HB=0,95 x HV	F = Prüfkräfte in N, D = Kegeldurchmesser in mm F = Test force in N, D = Ball diameter in mm	
Härte Rockwell C Rockwell hardness C	Diamantkegel 120°, Gesamtprüfkraft 1471±9 N Diamond cone 120° , Total test force 1471±9 N	HRC

ISO 513	BZG	Deutschland Germany	Deutschland Germany	Europa Europe	Europa Europe	Italien Italy	
		W-Nr. Mat.-No.	**DIN**	**W.-Nr. EN**	**DIN EN**	**UNI**	
P - Stahl / P - steel Magnetweicheisen, Baustahl, Stahlguss, Einsatzsthl, Nitierstahl, Automatenstahl, Vergütungsstahl, Kugellagerstahl, Federstahl, Werkzeugstahl, Rostfreierstahl ferritisch/ martensitisch Magnetic steel, construction steel, steel castings, cementation steel, nirtiding steel, free cutting steel, heat treatable steel, bearing steel, spring steel, alloyed steel, stainless steel ferritic/ martensitic	**P1**	1.0037	St 37-2		S25GT	Fe360B	
		1.0044	St 44-2		S 235 JR	Fe430B	
		1.0050	St 50-2		E 295	Fe490	
		1.0060	St 60-2		E 335	Fe590	
		1.0301	C10		C10	C10	
		1.0401	C 15		C15	C15, C16, 1C15	
		1.0402	C 22		C22	C20, C21	
		1.0406	C25			C25	
		1.0420	GS-38				
		1.0501	C 35		C35	C35, 1C35	
		1.0503	C 45		C45	C45, 1C45	
		1.0511	C40			C40	
		1.0528	C30			C30	
		1.0535	C 55		C55	C55, 1C55	
		1.0540	C50			C50	
		1.0570	St 52-3		S 355 JR G3	Fe510B	
		1.0601	C 60		C60	C60, 1C60	
		1.0711	9S20		10S20	9S20	
		1.0715	9 SMn 28		11SMn30	9SMn28	
		1.0718	9 SMnPb 28		11SMnPb30	CF9SMnPb28	
		1.0722	10 SPb 20		10SPb20	CF10SPb20	
		1.0726	35 S 20		35S20	35S20	
		1.0736	9 SMn 36		11SMn37	9SMn36, CF9SMn36	
		1.0737	9 SMnPb 36		11SMnPb37	9SMnPb36, CF9SMnPb36	
		1.1013	RFe100				
		1.1014	RFe80				
		1.1015	RFe60				
		1.1141	Ck 15		C15E	C16	
		1.1157	40 Mn 4		40Mn4		
		1.1158	Ck 25		C25E		
		1.1167	36 Mn 5		36Mn5		
		1.1170	28 Mn 6		28Mn6	C28Mn	
		1.1183	Cf 35		C35G	C36, C38	
		1.1191	Ck 45		C45E	C45	
		1.1203	Ck 55		C55E	C50	
		1.1213	Cf 53		C53G	C53	
		1.1221	Ck 60		C60E	C60	
		1.1231	Ck67			C67	
		1.1248	Ck75			C75	
		1.1249	Cf70				
		1.1274	Ck 101		C101E, C100S	C100	
		1.1545	C 105 W 1		C105U	C100KU	
		1.1663	C 125 W		C125W, C125U		
		1.2067	100 Cr 6		99Cr6, 102Cr6		
	P2	1.0904	55 Si 7		56Si7		

	Spanien Spain	Frankreich France	USA U.S.A.	Herstellerbezeichnung Brand Name
	UNE	**AFNOR**	**AISI/SAE**	**AISI / SAE**
		E 24-2	1013	
		E 28-2	1021	
		A 50-2	A 570 (50)	
		A 60-2	A 572 (65)	
		C10	1010	
	F.111	C18RR, XC18	J 409 Grade 1015	
	1C22, F112	AF42C20, XC25, 1C22	1020	
		AF 50 C 30	1025	
			A 27	
	F.113	C35,1C35,AF55,C35	1035	
	F.114	1C45, AF 65 C 45	1045	
		AF 60 C 40	1040	
			1030	
	F.115	C54, 1C55, AF 70 C 55	1055	
			1050	
			1024	
	F.115	C60, 1C60, AF70C55	1060	
			1212	
	F.2111 - 11SMn28	S250	1213	
	F.2112 - 11SMnPb28	S250Pb	12L13, 12L14, J 403 Grade 12L14, J 1397 Grade 12L14	
	10SPb20	10PbF2		
	F.210G	35MF6	J 403 Grade 1141	
	F.2113 - 12 SMn 35	S300	J 403 Grade 1213, J 403 Grade 1215, J 1392 Grade 1213	
	F.2114 - 12 SMnPb 35	S300Pb	J 403 Grade 12L14, J 1397 Grade 12L14	
	F.1511 - C 16 k, F.1110 - C 15 k	XC12	1015	
		35M5	1035, 1041	
	F.1120 - C 25 k, C25K (F1120)	2C25	1025	
	F.1203 - 36 Mn5	40M5	1335	
	28Mn6	20M5	1027	
	0	XC38H1TS	1035	
	F1140-C45k, F1142-C48k	C45RR, XC42H1, XC45, 2C45, XC48, XC48H1	1045	
	F.1150 - C 55 k	XC55H1, 2C55, XC54	1055	
		XC48H1TS	1050, 1055	
	F.511, F.512	C60RR, XC60, 2C60	1060	
		XC 68	1070	
			1074	
		C100RR, C100, XC100, E 100	1095	
	F515, F516	C105E2U, Y1105	W110	
	F.5123 C120	Y2120	W112	
	F.5230 100 Cr6, F.1310 - 100 Cr6, F.131	100Cr6RR, 100C6, Y100C6	L3, 52100, L1	
	F.1440 - 56 Si 7	55S7	9255	

Werkstoff - Vergleichstabelle
Comparison table of materials to be machined

ISO 513	BZG	Deutschland Germany	Deutschland Germany	Europa Europe	Europa Europe	Italien Italy	
		W-Nr. Mat.-No.	**DIN**	**W.-Nr. EN**	**DIN EN**	**UNI**	
P - Stahl / P - steel Magnetweicheisen, Baustahl, Stahlguss, Einsatzsthl, Nitierstahl, Automatenstahl, Vergütungsstahl, Kugellagerstahl, Federstahl, Werkzeugstahl, Rostfreierstahl ferritisch/ martensitisch Magnetic steel, construction steel, steel castings, cementation steel, nitriding steel, free cutting steel, heat treatable steel, bearing steel, spring steel, alloyed steel, stainless steel ferritic/ martensitic	**P2**	1.2080	X 210 Cr 12		X210Cr12	X205Cr12KU	
		1.2311	40CrMnMo7		40CrMnNiMo8-6		
		1.2312	40CrMnMoS8-6		40CrMnNiMoS8-6-4		
		1.2365	32CrMoV12-28			30CrMoV12-27 KU	
		1.2419	105 WCr 6		107WCr5, 105WCr6, 100WCr6	107WCr5KU	
		1.2542	45 WCrV 7		45WCrV8, 45WCrV7	45WCrV8KU	
		1.2714	56NiCrMoV7		55NiCrMoV7		
		1.2738	40CrMnNiMo8-6-4				
		1.2767	45NiCrMo16			40NiCrMoV16 KU	
		1.2833	100 V 1		100V1	102V2KU	
		1.3505	100 Cr 6		100Cr6	100Cr6	
		1.3536	100CrMo7-3				
		1.5415	15 Mo 3		16Mo3	16Mo3 (KG KW)	
		1.5423	16 Mo 5		16Mo5	16Mo5KG, 16Mo5KW	
		1.5622	14 Ni 6		14Ni6	14Ni6KG, 14Ni6KT	
		1.5662	X 8 Ni 9		X8Ni9	X10Ni9, X12Ni09	
		1.5680	12 Ni 19		X12Ni5, 12Ni19		
		1.5710	36 NiCr 6		36NiCr6		
		1.5732	14 NiCr 10		14NiCr10	16NiCr11	
		1.5752	14 NiCr 14		15NiCr13		
		1.5919	15CrNi6		15CrNi6	16CrNi4	
		1.6511	36 CrNiMo 4		36CrNiMo4	38NiCrMo7 (KB)	
		1.6523	21NiCrMo2, 20NiCrMo2-2		21NiCrMo2	20NiCrMo2	
		1.6546	40 NiCrMo 22		40NiCrMo2-2, 40NiCrMo2KD	40NiCrMo2 (KB)	
		1.6580	30CrNiMo8		30CrNiMo8	30CrNiMo8	
		1.6582	34 CrNiMo 6		34CrNiMo6	35NiCrMo6KB	
		1.6587	18CrNiMo7-6		17CrNiMo6, 18CrNiMo7-6	18NiCrMo7	
		1.6657	14 NiCrMo 134		14NiCrMo13-4	15NiCrMo13	
		1.6773	36NiCrMo16			36NiCrMo16	
		1.7005	45Cr2			45Cr2	
		1.7015	15 Cr 3		15Cr2KD		
		1.7033	34 Cr 4		34Cr4	34Cr4(KB)	
		1.7034	37Cr4			36CrMn4	
		1.7035	41 Cr 4		41Cr4	41Cr4, 41Cr4KB	
		1.7043	38Cr4			38Cr4	
		1.7045	42 Cr 4		42Cr4	41Cr4	
		1.7108	60SiCr7			60SiCr8	
		1.7131	16 MnCr 5		16MnCr5	16MnCr5	
		1.7147	20MnCr5			20MnCr5	
		1.7176	55 Cr 3		55Cr3	55Cr3	
		1.7218	25 CrMo 4		25CrMo4	25CrMo4 (KB)	
		1.7220	34 CrMo 4		34CrMo4	34CrMo4KB, 35CrMo4, 35CrMo4F	

	Spanien Spain	Frankreich France	USA U.S.A.	Herstellerbezeichnung Brand Name
	UNE	**AFNOR**	**AISI/SAE**	**AISI / SAE**
	F.5212 X210 Cr12	X200Cr12, Z200C12	D3	
				M200
		32CDV12-28	H10	W320
	F.5233 105 WCr5, F.523	105WC13		
	F.5241 45 WCrSi 8, F.524, F524145WCrSi 8	45WCrV8, 45WCrV20	S1	
				W500
				M238
		Y35NCD16		
		C105E2UV1, Y1105V, 100V2	W210	
	F.5230 100 Cr6, F.1310-100 Cr 6, F.131	Y100C6, 100C6, 100Cr6	L3, 52100	
	F.2601-16 Mo 3	15D3, 15Mo3	ASTM A20, GR	
	F.2602-16Mo5		4520	
	F.2641-15Ni6	16N6, 15N6, 15Ni6	ASTM A350 LF5	
	F.2645-X8 Ni09	Z8N9, 9Ni490	ASTM A353	
		Z18N5, 5Ni390	2515, 2517	
		35NC6	3135	
	F.1540-15NiCr11	14NC11	3415	
		14NC11, 12NC15, 14NC12, 13NiCr14	3310, 3415, 9314	
		16 NC 6	4320	
	F.1280-35NiCrMo4	40NCD3, 36CrNiMo4, 35NCD5	9840	
	F1552-20NiCrMo2, F1534-20NiCrMo3	20NCD2, 22NCD2	J 1268 Grade 8620H, 8620	
	F1204-40NiCrMo2, F1205-40NiCrMo2DF	40NCD2	8740	
		30CrNiMo8, 30NCD8		
	F1272-40NiCrMo7, 34CrNiMo6	35NCD6, 34CrNiMo6, 34CrNiMo8	4340	
	F.1560-14 NiCrMo13, F.156	18NCD6	4320	
	F1560-14NiCrMo13, F.1569-14NiCrMo131	16NCD13		
		12C3, 15Cr2, 18C3	5132	
	F.8221-35 Cr 4, F.224	32C4, 34Cr4	5132	
		38 4	5135	
	38Cr4, 38Cr41, 42Cr4, F.1202-42Cr4	42C4, 41Cr4	5140	
	F1201, F1202, F1206, F.1202-42Cr4	42C4, 42C4TS	5140, 5140H	
		#NV	9262	
	F.1515-16 MnCr5, F.151	16MC5, 16MC4, 16MnCr5	J 1268 Grade 4118H, C5115	
		20 MC 5	5120	
	F.1431-55 Cr3, F.143	55Cr3, 55C3	5155	
	F8372-AM26CrMo4, F8330-AM25CrMo4, F1256-30CrMo4-1, F.222	25CD4, 25CrMo4	4130	
	F8331-AM34CrMo4, F8231-34CrMo4, F1250-35CrMo4, F1254-35CrMo4DF, F.125	35CD4, 34CrMo4, 35CD4 / 34CrMo5	4135, 4137, J 1268 Grade 4135H	

Werkstoff - Vergleichstabelle
Comparison table of materials to be machined

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ISO 513	BZG	Deutschland Germany	Deutschland Germany	Europa Europe	Europa Europe	Italien Italy	
		W-Nr. Mat.-No.	**DIN**	**W.-Nr. EN**	**DIN EN**	**UNI**	
P - Stahl / P - steel Magnetweicheisen, Baustahl, Stahlguss, Einsatzsthl, Nitierstahl, Automatenstahl, Vergütungsstahl, Kugellagerstahl, Federstahl, Werkzeugstahl, Rostfreierstahl ferritisch/ martensitisch Magnetic steel, construction steel, steel castings, cementation steel, nirtiding steel, free cutting steel, heat treatable steel, bearing steel, spring steel, alloyed steel, stainless steel ferritic/ martensitic	P2	1.7223	41 CrMo 4		41CrMo4	41CrMo4	
		1.7225	42 CrMo 4		42CrMo4	38CrMo4KB, 42CrMo4, G40CrMo4	
		1.7228	50CrMo4		50CrMo4	50CrMo4	
		1.7243	18CrMo4			18CrMo4	
		1.7262	15 CrMo 5		15CrMo5		
		1.7335	13 CrMo 4 4		13CrMo4-5	14CrMo3, 16CrMo3	
		1.7361	32 CrMo 12		32CrMo12	32CrMo12	
		1.7380	10 CrMo 9 10		10CrMo9-10	12CrMo9 (KW KG), G14CrMo9, 10	
		1.7715	14 MoV 6 3		14MoV6-3		
		1.8159	50 CrV 4, 51CrV4			50CrV4	
		1.8507	34CrAlMo5		34CrAlMo5-10	34CrAlMo7	
		1.8509	41 CrAlMo 7		41CrAlMo7	41CrAlMo7	
		1.8515	31CrMo12		31CrMo12	31CrMo12	
		1.8519	31CrMoV9		31CrMoV9	31CrMoV10	
		1.8523	39 CrMoV 13 9		39CrMoV13-9		
	P3	1.1269	Ck85			C85	
		1.2085	X33CrS16			35CrMo8 KU	
		1.2316	X36CrMo17			X37CrMoV5-1 KU	
		1.2343	X38CrMoV5-1			X37CrMoV5-1 KU	
		1.2344	X 40 CrMoV 5 1		X40CrMoV5-1	X40CrMoV511KU	
		1.2363	X 100 CrMoV 5 1		X100CrMoV5-1	X100CrMoV51KU	
		1.2379	X153CrMoV12				
		1.2436	X 210 CrW 12		X210CrW12-1, X210CrW12	X215CrW121KU	
		1.2567	X30WCrV5-3		X30WCrV5-3	X30WCrV5-3 KU	
		1.2581	X 30 WCrV 9 3		X30WCrV9-3	X30WCrV9-3 KU	
		1.2601	X 165 CrMoV 12		X165CrMoV12	X165CrMoW12KU	
		1.3243	S 6-5-2-5		HS6-5-2-5	HS6-5-2-5	
		1.3255	S 18-1-2-5		HS18-1-2-5	HS18-1-1-5	
		1.3343	S 6-5-2		HS6-5-2	HS6-5-2-5	
		1.3348	S 2-9-2		HS2-9-2	HS2-9-2	
		1.3355	S 18-0-1		HS18-0-1	HS18-0-1	
		1.3401	X 120 Mn 12		X120Mn12	G-X120Mn12	
		1.5021	48Si7			48Si7	
		1.5026	55Si7			55Si7	
		1.5027	60Si7			60Si7	
		1.7701	51CrMoV4			51CrMoV4	
	P4	1.4000	X 7 Cr 13		X6Cr13	X6Cr13	
		1.4001	X 7 Cr 14		X7Cr14	X6Cr13	
		1.4002	X6CrAl13		X6CrAl13	X6CrAl13	
		1.4005	X12CrS13			X12CrS13	
		1.4006	X 10 Cr 13, X 12 Cr 13		X12Cr13, X10Cr13	X12Cr13, X10Cr13	
		1.4016	X6Cr17		X6Cr17	X8Cr17	

	Spanien Spain	Frankreich France	USA U.S.A.	Herstellerbezeichnung Brand Name
	UNE	**AFNOR**	**AISI/SAE**	**AISI / SAE**
	F8332-AM42CrMo4, F8232-42CrMo4, F1252-40CrMo4	42CD4TS	4140	
	F8332-AM42CrMo4, F8232-42CrMo4, F1252-40CrMo4	42CD4, 42CrMo4	4140	
		50CrMo4	4150	
	F.1551-12CrMo4	12CD4		
	F.2631-14CrMo45	15CD3.05, 15CD4.05	A387 Grade 12Cl2, ASTM A182	
	F.124.A	30CD12		
	TU.H	12CD9.10, 10CrMo9-10, 10CrMo9-11	A387 Grade 22, A387 Grade 22Cl2, ASTM A182	
	F.2621-13 MoCrV6			
	F.1430-51CrV4	50CV4, 51CrV4, 50CrV4	6150	
		30 CAD 6.12	A355CI-D	
	F.1740-41CrAlMo7	40CAD6.12	Nitralloy 135	
		30 CD 12	A/B	
		-		
		40CDV12		
		C90	1086	
				M314
				M303, M303HH
		Z38CDV5	H11	W300
	F.5318 X40 CrMoV5	X40CrMoV5, Z40CDV5	H13, P20	
	F.5227 X100 CrMoV5	X100CrMoV5, Z100CDV5	A2, D2	
			D2	K110
	F.5213 X210 CrW12, F.521	X210CrW12-1, Z210CW12-01, Z 210 CW 12	D6	
		Z32WCV5	H14	
	F.5323 X30 WCrV9	X30WCrV9, Z30WCV9	O1, H21	
	F.5211 X160 CrMoV12			
	F.5613 6-5-2-5	Z85WDKCV06- 05-05-04-02, Z90WDKCV06- 05-05-04-02	S7, M35	
	F.5530 18-1-1-5	Z80WKCV18- 05-04-01	T4	
	F.5603 6-5-2	Z85WDCV06- 05-04-02	M2	
	F.5607 2-9-2	Z100DCWV09- 04-02-02	M7	
	F.5520 18-0-1	Z80WCV18-04-01	T1	
	F.82551-AM-X 120 Mn 12	Z120M12, Z120Mn12		
		55S7, 56SC7	9255	
		60Si7	9260	
	F.3110-X6 Cr13	Z6013, Z6Cr13, Z8C12	403, 13/6	
	F.8401-AM-X12 Cr13	Z3014, Z8C13FF	403, 410S, 429	
		Z 8 CA 12	405	
		Z 11 CF 13	416	
	F.3401-X12 Cr13	Z12C13, Z12Cr13, Z10C13	410	N100
	F.3113-X8 Cr17	Z8C17, Z6Cr17	430	N200

ISO 513	BZG	Deutschland Germany	Deutschland Germany	Europa Europe	Europa Europe	Italien Italy	
		W-Nr. Mat.-No.	**DIN**	**W.-Nr. EN**	**DIN EN**	**UNI**	
P - Stahl / P - steel Magnetweicheisen, Baustahl, Stahlguss, Einsatzsthl, Nitierstahl, Automatenstahl, Vergütungsstahl, Kugellagerstahl, Federstahl, Werkzeugstahl, Rostfreierstahl ferritisch/ martensitisch Magnetic steel, construction steel, steel castings, cementation steel, nirtiding steel, free cutting steel, heat treatable steel, bearing steel, spring steel, alloyed steel, stainless steel ferritic/ martensitic	**P4**	1.4021	X20Cr13			X20Cr13	
		1.4028	X30Cr13		X20Cr13	X30Cr13	
		1.4034	X 46 Cr 13		X46Cr13	X40Cr14	
		1.4057	X 20 CrNi 17 2		X19CrNi17-2, X17CrNi16-2	X16CrNi16	
		1.4104	X 12 CrMoS 17		X14CrMoS17	X10CrS17	
		1.4113	X 6 CrMo 17 1		X6CrMo17-1	X8CrMo17	
		1.4125	X105CrMo17		X105CrMo17	#NV	
		1.4313	X 4 CrNi 13 4		X3CrNiMo13-4	GX6CrNi13 04	
		1.4510	X3CrTi17				
		1.4512	X2CrTi12		X5CrTi12	X6CrTi12	
		1.4542	X5CrNiCuNb16-4				
		1.4545	X5CrNiCu15-5				
		1.4568	X7CrNiAl17-7				
		1.4718	X 45 CrSi 9 3		X45CrSi9-3-1	X45CrSi8	
		1.4724	X 10 CrAl 13, X 10 CrAlSi 13		X10CrAlSi13, X10CrAl13	X10CrAl12	
		1.4742	X 10 CrAl 18, X 10 CrAlSi 18		X10CrAl18, X10CrAlSi18	X8Cr17	
		1.4747	X 80 CrNiSi 20		X80CrNiSi20		
		1.4762	X 10 CrAl 24, X 10 CrAlSi 25		X10CrAl24, X10CrAlSi25	X16Cr26	
	P5	1.1118	GS-24Mn6				
		1.1120	GS-20Mn5				
		1.4027	G-X 20 Cr 14		GX20Cr14		
		1.5419	GS-22Mo4				
		1.5633	GS-24Ni8				
		1.5681	GS-10Ni19				
		1.6309	GS-20MnMoNi5-5				
		1.6571	GS-34CrNiMo6				
		1.6748	GS-40NiCrMo6-5-6				
		1.6750	GS-20NiCrMo3-7				
		1.6760	GS-22NiMoCr5-6				
		1.7231	G42CrMo4				
		1.7357	GS-17CrMo5-5				
		1.7379	GS-18CrMo9-10				

	Spanien Spain	Frankreich France	USA U.S.A.	Herstellerbezeichnung Brand Name
	UNE	**AFNOR**	**AISI/SAE**	**AISI / SAE**
		Z 20 C 13	420	N320
		Z 20 C 13	420	
	F.3405-X46 Cr13	Z40C14, Z40Cr14, Z38C13M, Z44C14	420	T651
	F.3427-X15 CrNi16, F.313, F3427-X19CrNi172	Z15CN16.02	431	N350
	F3117-X10CrS17, F3413-X14CrMoS17	Z10CF17	430F, J 405 Grade 51435	N310
	F3116-X6CrMo171	Z8CD17.01	434	
		Z 100 CD 17	440C	N695
		Z5CN13.4, Z4CND13.4M, Z6CN13-4, Z8CD17-01	CA6. 13/4	
		Z 3 CT 12	409	
		Z 7 CNU 15-05	630	N700
				N701
	F.3220-X 4 ScrSi 09-03	Z45CS9	HNV3	H700
	F.13152-X 10 CrAl13	Z10C13, Z13C13	405	
	F.3153-X 10 CrAl 18	Z10CAS18, Z12CAS18	430	
	F.3222-X 80CrSiNi20-02	Z80CSN20.02	HNV6	
	F.3154-X 10 CrAl24	Z10CAS24, Z12CAS25	446	H100
		Z 20 C13M		,
			A757	
			A 217	

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M - Rostfreier Stahl / M - stainless steel	Austenitisch, ferritisch + austenitisch Austenitic stainless steel, ferritic + austenitic steel (duplex)	**M1**	1.4301	X 5 CrNi 18 10		X5CrNi18-10+F3:F21A3F3:F23F3:F24A3F3:F23F3:FF3:F24	X5CrNi18 10	
			1.4303	X4CrNi18-12			X8CrNi1812	
			1.4305	X 10 CrNiS 18 9		X8CrNiS18-9	X10CrNiS 18.09	
			1.4306	X 2 CrNi 19 11		X2CrNi19-11	"X3CrNi18 11, X2CrNi18 11, GX2CrNi19 10"	
			1.4308	G-X 6 CrNi 18 9		GX5CrNi19-10		
			1.4311	X 2 CrNiN 18 10		X2CrNiN18-10	X2CrNiN18 11	
			1.4319	X3CrNiN17-8			X10CrNi1809	
			1.4401	X 5 CrNiMo 17 12 2		X5CrNiMo17-12-2, X4CrNiMo17-12-2, X5CrNiMo18-10	X5CrNiMo17 12	
			1.4404	X2CrNiMo17-12-2		X3CrNiMo17-12-2	X2CrNiMo1712	
			1.4408	G-X 6 CrNiMo 18 10		GX5CrNiMo19-11-2		
			1.4429	X 2 CrNiMoN 17 13 3		X2CrNiMoN17-13-3	X2CrNiMoN17 13	
			1.4435	X 2 CrNiMo 18 14 3, X 2 CrNiMo 18 12		X2CrNiMo18-14-3	X2CrNiMo17 13	
			1.4438	X 2 CrNiMo 18 16 4		X2CrNiMo18-15-4	X2CrNiMo18 16	
			1.4460	X 4 CrNiMoN 27 5 2		X3CrNiMoN27-5-2	X 3 CrNiMo 27 5 2	
			1.4541	X 6 CrNiTi 18 10		X6CrNiTi18-10	X6CrNiTi18 11	
			1.4550	X 6 CrNiNb 18 10		X6CrNiNb18-10	X6CrNiNb18 11	
			1.4558	X 2 NiCrAlTi 32 20		X2NiCrAlTi32-20		
			1.4563	X 1 NiCrMoCu 31 27 4		X1NiCrMoCu31-27-4		
			1.4571	X 6 CrNiMoTi 17 12 2		X6CrNiMoTi17-12-2	X6CrNiMoTi1712	
			1.4565, 1.4581	G-X 5 CrNiMiNb 18 10				
			1.4583	X 10 CrNiMoNb 18 12		X10CrNiMoNb18-12	X6CrNiMoNb	
			1.4828	X 15 CrNiSi 20 12		X15CrNiSi20-12	X16CrNi23 14	
			1.4841	X15CrNiSi25-20			X22CrNiSi2520	
			1.4878	X 12 CrNiTi 18 9		X12CrNiTi18-9, X10CrNiTi18-10	X6CrNiTi1811	
			1.4864	X 12 NiCrSi 36 16		X12NiCrSi36-16, X12NiCrSi35-16		
			1.4958	X 5 NiCrAlTi31-20		X5NiCrAlTi31-20		
			1.4977			X 40 CoCrNi 20 20		
		M2	1.4362	X2CrNiN23-4 (Ally 2304)				
			1.4462	X2CrNiMoN22-5-3		X2CrNiMoN22-5-3	X2CrNiMoN22-5-3	
			1.4501	X2CrNiMoCuWN25-7-4			X2CrNiMoCu WN25-7-4	
			1.4871	X 53 CrMnNiN 21 9		X53CrMnNiN21-9	X53CrMnNiN21 9	
			1.4310	X 12 CrNi 17 7		X9CrNi18-8, X10CrNi18-8	X12CrNi17 07	

	Spanien Spain	Frankreich France	USA U.S.A.	Herstellerbezeichnung Brand Name
	UNE	**AFNOR**	**AISI/SAE**	**AISI / SAE**
	F.3451-X5 CrNi18-10, F.314, F.3504-X6CrNi19 10, F3504-X5CrNi1810"	Z6CN18.09	304	A500
			305	
	F.3508-X10CrNiS18-09	Z10CNF18.09	303	A506
	F.3503-X 2CrNi19-10, F3503-X 2CrNi18-10	Z1CN18-12, Z2CN18-10, Z3CN19.10M, Z3CN18-10, Z3CN19-11, Z3CN19-11FF	304L	A600
		Z6CN18.10M	---	
	F3541-X2CrNiN1810	Z2CN18.10	304LN	
			302	
	F.3543-X5CrNiMo17-12, F.3543-X6 CrNiMo17- 12-03, F3543-X5CrNiMo17-122"	Z6CND17.11	316	A120
				A200
	F.8414-AM-X7 CrNiMo20 10			
	F3543- X2CrNiMoN17133	Z2CND17.13	316LN	
	F.3533-X2 CrNiMo 17- 12-03, F.3534-X6 CrNiMo 17- 12-03"	Z2CND17.13, Z3CND17-12-03, Z3CND18-14-03		A220
	F3539-X2CrNiMo18164	Z2CND19.15	317L	
	F3309-X8CrNiMo27-05, F3552-X8CrNiMo266	Z3CND25-07Az, Z5CND27-05Az	S32900	
	F.3553-X7 CrNiTi 18-11, F.3523-X 6 CrNiTi 18-11, 09 Ch 18N10T, F3523-X6CrNiTi1810	Z6CNT18.10	321	
	F.3552-X 7 CrNiNb 18-11, F.3524-X 67 CrNiNb 18-11, F3524-X6CrNiNb1810	Z6CNNb18.10	347	
			N08800 Incoloy 800	
			N08028 Alloy 28	
	F.3552-X 6 CrNiMoTi17-12-03, F3535- X6CrNiMoTi17122	Z6NDT17.12	316Ti	A300
		Z6CNDNb	318	
	F3312-X15CrNiSi20-12	Z15CNS20.12	309	
				H525
	F.3523-X 6CrNiTi 18 11	Z6CNT18.12B	321	
	F.3313-X12 CrNi 36-16	Z12NCS35.16	330	
		Z 42 CNKDWNb		
			S32304	Duplex
		Z 2 CND 22.05 Az	S31803	Duplex, A903
				Super Duplex
	F.3217-X53 CrMnNiN 21-09	Z52CMN21.09	EV8	
	F.3517-X12CrNi17 07	Z12CN17.07, Z12CN18.07, Z11CN17-08, Z11CN18-08, Z12CN18-09	301	

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K - Gusswerkstoffe / K - cast iron materials Grauguss, Kugelgraphitguss, Kugelgraphitguss GJS, Temperguss, Gusseisen mit Vermiculargrafit Grey cast iron, nodular cast iron, tempered cast iron, austempered ductile iron	K1	0.6010	GG-10, GG 10	EN-JL 1010	EN-GJL-100	G10	
		0.6015	GG-15, GG 15	EN-JL 1020	EN-GJL-150	G15	
		0.6020	GG-20, GG 20	EN-JL 1030	EN-GJL-200	G20	
		0.6025	GG-25, GG 25	EN-JL 1040	EN-GJL-250	G25	
		0.6030	GG-30, GG 30	EN-JL 1050	EN-GJL-300	G30	
		0.6035	GG-35, GG 35	EN-JL 1060	EN-GJL-350	G35	
		0.6040	GG-40, GG 40		EN-GJL-400		
		0.6660	GGL-NiCr 20 2				
			GG-26Cr, GG 26Cr		EN-GJL-260 Cr		
	K2		GGV 45		EN-GJV-450		
		0.7040	GGG-40	EN-JS 1040	EN-GJS-400-15	GS400-12	
		0.7050	GGG-50	EN-JS 1050	EN-GJS-500-7	GS500-7	
		0.7060	GGG-60	EN-JS 1060	EN-GJS-600-3, EN-GJS-600-3U	GS600-3	
		0.7070	GGG-70	EN-JS 1070	EN-GJS-700-2, EN-GJS-700-2U	GS700-2	
		0.7080	GGG-80	EN-JS 1080	EN-GJS-800-2		
		5.3400	ADI 800		EN-GJS-800-10		
		0.7090	GGG90	EN-JS1090			
		5.3403	ADI 1000		EN-GJS-1050-6		
		5.3404	ADI 1200		EN-GJS-1200-3		
		5.3405	ADI 1400		EN-GJS-1400-1		
	K3	0.8035	GTW-35, GTW-35-04	EN-GJMW-350-4	GTW-35-04, EN-GJMW-350-4		
		0.8040	GTW-40-05, GTW-40		EN-GJMW-400-5, GTW-40-05		
		0.8045	GTW-45-07, GTW-45		EN-GJMW-450-7		
		0.8135	GTS-35-10, GTS-35		EN-GJMB 350-10		
		0.8145	GTS-45-06, GTS-45		EN-GJMB 450-6, GTS-45-06		
		0.8155	GTS-55-04, GTS-55		EN-GJMB 550-4, GTS-55-04		
		0.8165	GTS 65-02, GTS-65		EN-GJMB 650-2, GTS-65-02		
		0.8170	GTS 70-02, GTS-70		EN-GJMB 700-2, GTS-70-02		
		---	GJV-300	---	---		
		---	GJV-400	---	---		
		---	GJV-500	---	---		

	Spanien Spain	Frankreich France	USA U.S.A.	Herstellerbezeichnung Brand Name
	UNE	**AFNOR**	**AISI/SAE**	AISI / SAE
	FG 10	Ft10D, FGL100	ASTM A-48-76	
	FG 15	Ft15D, FGL150	NO 20B	
	FG 20	Ft20D, FGL200	NO 30B	
	FG 25	Ft25D, FGL250	NO 35B	
	FG 30	Ft30D, FGL300	NO 40B	
	FG 35	Ft35D, FGL350	NO 55B	
		Ft40D, FGL400		
		L-NC 20 2		
		FGS 400-12	60/40/18	
		FGS 500-7	70/50/05	
		FGS 600-3	80/55/06	
		FGS 700-2	"100/70/03 120/90/02"	
		MB 35-7		
		MB 40-10		
		MB 45-7		
		MN 35-10	32510	
		MP 50-5	40010	
		MP 60-3	50005	
			60004	
		MP 70-2	70003	

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N- NE-Metalle / N- non ferrous materials Reinaluminium, Aluminiumknetlegierungen, Aluminiumgusslegierungen, Reinkupfer, Kupferknetlegierungen, Messing, Bronze, Graphit Pure aluminium, aluminium wrought alloys, aluminium cast alloys, pure cooper, cooper wrought alloys, cooper-zinc alloys, cooper alloys, graphite	**N1**	3.0205	Al99			9001/1	
		3.0255	Al99.5	EN AW-1050A	Al99.5	4507	
		3.0305	Al99.9				
		3.0505	AlMn0.5Mg0.5				
		3.0615	AlMgSiPb				
		3.0915	AlFeSi			8011	
		3.1255	AlCuSiMn			9002/3	
		3.1325	AlCuMg1			9002/2	
		3.1355	AlCuMg2		EN AW-2024	9002/4	
		3.1371	G-AlCu4TiMg	EN AC-21000	G-AlCu4TiMg		
		3.1645	AlCuMgPb			9002/8	
		3.1655	AlCuBiPb	EN AW-2011	AlCu6BiPb	6362	
		3.1734	Y-Legierung		AlCu4Mg1.5Ni2,	3045	
	N2	3.2134	G-AlSi5Cu1Mg				
		3.2371	G-AlSi7Mg	EN AC-42100	G-AlSi7Mg,	7257	
		3.2373	G-AlSi9Mg	EN AC-43300	G-AlSi9Mg,	3051	
		3.2381	G-AlSi10Mg	EN AC-43000	G-AlSi10Mg,	3051	
		3.2382	GD-AlSi10Mg	EN AC-43400	AlSi10Mg(Fe)	3051	
		3.2383	G-AlSi10MgCu	EN AC-43200	G-AlSi10MgCu,		
		3.2581	G-AlSi12	EN AC-44200	G-AlSi12,	4514	
		3.2582	GD-AlSi12	EN AC-44300	GD-AlSi12,	4514, G-AlSi13	
		3.2583	G-AlSi12 (Cu)	EN AC-47000	G-AlSi12 (Cu)	3048	
		3.3241	G-AlMg3Si				
		3.3261	G-AlMg5Si				
		3.3315	AlMg1	EN AW-5005A	AlMg1C	5764	
		3.3525	AlMg2Mn0.3				
		3.3527	AlMg2Mn0.8				
		3.3541	G-AlMg3				
		3.3545	AlMg4Mn			9005/4	
		3.3555	AlMg5				
		3.3561	G-AlMg5	EN AC-51300	G-AlMg5	3058	
		3.4345	AlZnMgCu0.5	EN AW-7022	AlZnMgCu0.5		
		3.3211					
		3.4335	AlZn4.5Mg1			9007/1	
		3.4365	AlZn5,5MgCu			7075	
	N3	2.0060	E-Cu57				
		2.0065	E-Cu58			5649	
		2.0240	CuZn15	CW502L	CuZn15		
		2.0250	CuZn20				
		2.0265	CuZn30	CW505L	CuZn30		
		2.0280	CuZn33				
		2.0321	CuZn37	CW508L	CuZn37	P-CuZn37	
		2.0360	CuZn40				
		2.0410	CuZn44Pb2			CuZn43Pb2Al	
		2.0550	CuZn40Al2			CuZn37Mn3Al2PbSi	

	Spanien Spain	Frankreich France	USA U.S.A.	Herstellerbezeichnung Brand Name
	UNE	**AFNOR**	**AISI/SAE**	**AISI / SAE**
		1200 (A4)	1200	
	L-3051	A5	1050A	
		3105		
		6012		
		8011		
		2014	2014	
		2017 A (AU4G)	2017A	
		2024 (AU4G1)	2024, AA2024	
	L-2140	A-U5GT	B26	
		2030 (AU4PB)	2030	
	L-3182	A-U5PbBi	2011	
	L-2150	A-U4NT		
	L-2651	A-S7G0.3	B25	
		A7-S10G	A13560	
	L-2560, L-2561	A-S10G	A13600	
	L-2560, L-2561	A-S10G	A413.2	
		A-S9GU	A360.2	
	L-2520, L-2521	A-S13	A413.2	
	L-2520, 21	A-S13, A-S12	A413.0	
	L-2530	A-S12U	413.1	
	L-3350	A-G0, 6	5005A, 5005	
		5251	5251	
		5049	5049	
		5086 (AG4MC)	5086	
	L-3320	A-G6	5056A, 514.1"	
		A-Z5GU0.6		
			6061-T6	
		7020 (AZ5G)	7020	
		7075	7075-T6, AA7075	
			C1100	
		CuA1	C11000	
		CuZn15	C23000	Mittelrottombak,
		CuZn30	C26000	Cartridge Messing,
		CuZn37	C27400	Stimmenmessing,
			C28000	
			C38000	
			C67410	

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N- NE-Metalle / N- non ferrous materials Reinaluminium, Aluminiumknetlegierungen, Aluminiumgusslegierungen, Reinkupfer, Kupferknetlegierungen, Messing, Bronze, Graphit Pure aluminium, aluminium wrought alloys, aluminium cast alloys, pure cooper, cooper wrought alloys, cooper-zinc alloys, cooper alloys, graphite	N3	2.0592	GK-CuZn35Al1,	CC765S	CuZn35Mn2Al1Fe1-C		
		2.0596	GK-CuZn34Al2,	CC764S	CuZn34Mn3Al2Fe1-C		
		2.0855	CuNi2Si			CuNi2Si	
		2.0882	CuNi30Mn1Fe				
		2.0940	CuAl10Fe			5274	
		2.0978	CuAl11Ni6Fe6			CuAl11Fe6Ni6	
		2.0966	CuAl10Ni5Fe4	CW307G	CuAl10Ni5Fe4		
		2.0975	G-CuAl11Ni,	CC333G	G-CuAl11Ni	G-CuAl11Fe4Ni4	
		2.1016	CuSn4				
		2.1020	CuSn6			CuSn7	
		2.1030	CuSn8				
		2.1050	G-CuSn10Zn	CC480K	CuSn10-C		
		2.1052	G-CuSn12, GZ-CuSn12, GC-CuSn12	CC483K	CuSn12-C		
		2.1086	G-CuSn10Zn			7013	
		2.1090	G-CuSn7ZnPb, GZ-CuSn7ZnPb, GC-CuSn7ZnPb	CC493K	CuSn7Zn4Pb7-C		
		2.1096	G-CuSn5ZnPb	CC491K	CuSn5Zn5Pb5-C		
		2.1098	G-CuSn2ZnPb	CC490K	CuSn3Zn8Pb5-C		
		2.1176	G-CuPb10Sn, GZ-CuPb10Sn, GC-CuPb10Sn	CC495K	CuSn10Pb10-C		
		2.1182	G-CuPb15Sn, GZ-CuPb15Sn, GC-CuPb15Sn	CC496K	CuSn7Pb15-C		
		2.1188	G-CuPb20Sn	CC497K	CuSn5Pb20-C		
		2.1247	CuBe2			Classe IV	
		2.1285	CuCo2Be			Classe III	
		2.1293	CuCrZr	CW106C	CuCr1Zr	CuCrZr	
		2.1525	CuSi3Mn			CuSi3Mn1	
			CuAl6.5Fe2.5Sn0.25				
			CuAl13Fe4.5				
Graphit	**N4**						

	Spanien Spain	Frankreich France	USA U.S.A.	Herstellerbezeichnung Brand Name
	UNE	**AFNOR**	**AISI/SAE**	**AISI / SAE**
			C86500	
			C86200	
			C64700	
			C95400	
		CuAl9Ni5Fe3Mn, U-A10N	C63000	
		CuAl11Ni5Fe	B-148-52	
		CuSn6P	C51900	
			C90700	
		"A53-707, CuSn12"	Amcoloy 712, B505	
		U-E12P7U-E8Z2	C90500	
		CuSn7Pb6Zn4	C93200	Rotguss 7
		CuPb5Sn5Zn5	C83600	Rotguss 5
				Alloy 5A
		CuPb10Sn10	C93700	
			C93800	
		CuPb20Sn5	C94100	
			C17200	
			C17510	
			C18200	
			C65500	
			AMPCO 8	AMPCO 8
			AMPCO 6	AMPCO 6
			AMPCO 21	AMPCO 21
			AMPCO 26	AMPCO 26

Werkstoff - Vergleichstabelle
Comparison table of materials to be machined

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S - Superlegierungen / S - super alloys	Reintitan, Titanlegierungen, Reinnickel, Nickellegierungen Pure titanium, titanium alloys, pure nickel, nickel alloys	**S1**	3.7024			Ti99.5		
			3.7025	Ti 1		Ti 99.8		
			3.7034			Ti99.7		
		S2	3.7115.1	TiAl 5 Sn 2		TiAl5Sn2.5		
			3.7124	TiCu2		TiCu2		
			3.7164	TiAl 6 V 4		TiAl6V4		
			3.7165	TiAl6V4				
			3.7174	TiAl6V4Sn2				
		S3	1.3912	Ni36		D 1		
			1.3926	RNi12		FeNi48		
		S4	2.4360	NiCu30Fe		NiCu30		
			2.4375	NiCu30Al		NiCu30Al3Ti		
			2.4630	NiCr20Ti				
			2.4632 / 2.4969	NiCr20Co18Ti				
			2.4642	NiCr30Fe				
			2.4654					
			2.4665	NiCr22Fe18Mo				
			2.4668	NiCr19NbMo		NiCr19Fe19Nb5Mo3		
			2.4669	NiCr15Fe7TiAl		NiCr15Fe7Ti2Al		
			2.4698					
			2.4858	NiCr21Mo		NiFe30Cr21Mo3		
			2.4819			NiMo16Cr15W		
			2.4856	NiCr22Mo9Nb		NiCr22Mo9Nb		
			2.4858	NiCr21Mo				
			2.4952 /2.4631	NiCr20TiAl				

ISO 513		BZG	Deutschland Germany **W-Nr.** Mat.-No.	Deutschland Germany **DIN**	Europa Europe **W.-Nr. EN** Mat.-No. EN	Europa Europe **DIN EN**	Italien Italy **UNI**	
H - gehärtete Werkstoffe,Hartguss H- hardened materials hardened cast iron		**H1**	1.2343 52HRC	X38CrMoV5-1			X37CrMoV5-1 KU	
			1.2767 54HRC	45NiCrMo16			40NiCrMoV16 KU	
		H2	1.2714 60HRC	56NiCrMoV7		55NiCrMoV7		
			1.2842 58HRC	90MnCrV8				
		H3	1.2080 64HRC	X 210 Cr 12		X210Cr12	X205Cr12KU	
			1.2436 63HRC	X 210 CrW 12		X210CrW12-1, X210CrW12	X215CrW121KU	
		H4	0.9620 52HRC	G-X260NiCr42	GX260NiCr42			
			0.9650 53HRC	G-X260Cr27	GX260Cr27			

	Spanien Spain	Frankreich France	USA U.S.A.	Herstellerbezeichnung Brand Name
	UNE	**AFNOR**	**AISI/SAE**	**AISI / SAE**
	Ti-PO1	T-35	R2050	Titanium Grade1
			R54620	
	Ti-P11	T-U2		
	Ti-P63	T-A6V	"4911, 4928, 4935, 4954, 4965, 4967, 6AL4V"	Titanium Grade 5
		T-A6V		
				Invar 36, Alloy 36
				Nilo 48, Alloy 48
		NU30	Monel 400	Monel 400
			AMS 4676, Monel K500	Monel K500
		NC 20 T	Nitronic 75, Nimonic 90/120	Nimonic® 75, Alloy 75
				Nimonic® 90, Alloy 90
			Inconel 690	Inconel 690, Alloy 690
			Waspaloy	
			Alloy X	Hastelloy X
		NC 19 FeNb	Inconel 718	Inconel® 718, Alloy718, Udimet 630
		NC 15 FeTNb	5542G, Inconel X-750	Inconel X-750, Alloy X-750
			Hastelloy C	
		NC 21 FeDU		Incoloy 825
		NC17D	B 574, B 575, B 619, B 622, B 626	Hastelloy® C-276, Alloy C276, Nicrofer 5716 hMoW
		NC 22 FeDNB	Incoloy 825	Inconel® 625, Alloy 625
		NC 21 FeDU	--	Inconel® 825, Alloy 825, Nicrofer® 4221
		NC 20 TA		Alloy 80 A, Nicrofer 7520 Ti

	Spanien Spain	Frankreich France	USA U.S.A.	Herstellerbezeichnung Brand Name
	UNE	**AFNOR**	**AISI/SAE**	AISI / SAE
		Z38CDV5	H11	45 - 54 HRC
		Y35NCD16		
		T61206	L6	54 - 62 HRC
		T31502	O2	
	F.5212 X210 Cr12	X200Cr12, Z200C12	D3	62 - 66 HRC
	F.5213 X210 CrW12, F.521	X210CrW12-1, Z210CW12-01, Z 210 CW 12	D6	
			Ni-Hard 2	50 - 60 HRC
			A532111A 25% CR	

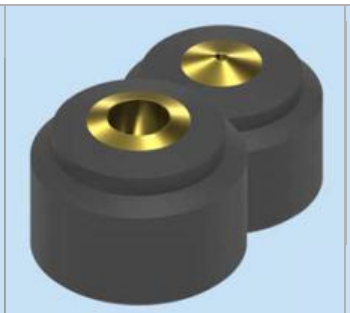
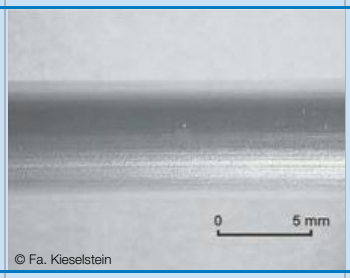
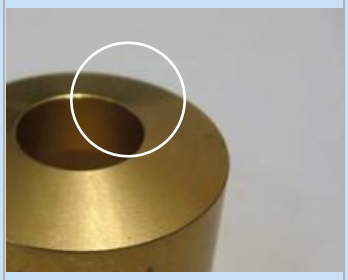
問題排解
Problems and solutions associated with bar peeling applications

加工問題 Effect on the component	原因 Cause of defect	解決方案 Solution
圓棒不圓 Out of round component	刀片安裝錯誤 Incorrect insert setting	檢查刀片，重新調整刀匣滑塊或刀片滑塊 Check insert, set cartridge slide or insert slide
	圓棒未在剝皮刀頭中心 Components are not positioned radially to the peeling head	檢查進出導輪的位置 Check position of the lead-in and lead-out roll
	毛胚直徑尺寸 (ø) 有極大差異 Large raw material deviation (ø)	檢查偏差（原料不圓 = 成品不圓） Check deviation (out of round material = out of round finished product)
顫抖痕 Chatter marks	刀片的刃口倒角太小 Too small edge preparation on inserts	刃口倒角磨大 Grind larger edge preparation
	副切削刃太鋒利 Secondary cutting edge too sharp - SNATCHING	需要更大的刃口處理 Larger edge hone required.
	切削刃位於中心下方 Cutting edge below centre	檢查切削刃高度 Check cutting edge height
	導輪位置錯誤 Incorrect position of the guide roll	檢查安裝位置 Check setting
表面台階(鋸齒狀） Steps in the machined surface	一個或多個刀片的副切削刃與棒料不平行 Secondary cutting edge of one or more inserts not positioned parallel to the bar	檢查副切削刃的位置 Check position of secondary cutting edge(s)
	進給 f_n (mm/U) 大於副切削刃的長度 Feed f_n (mm/rev) is lager than the length of the secondary cutting edge	降低進給，提高切削速度 V_c Reduce feed, increase cutting speed V_c
	刀片在刀座的位置錯誤(髒、夾持不良、磨損） Incorrect position of the inserts in it's seat (dirt, poor fitting, wear)	清潔刀座，檢查夾持狀況，更換刀具 Clean insert seat, check position, renew tool
斷屑不良 Bad chip breakage	進給太低 Feed rate too low	增加進給 Increase feed
	斷屑槽錯誤 Wrong chip breaker geometry	選擇其他斷屑槽 Choose other geometry
	冷卻液不足 Less coolant	增加冷卻液供給 Increase coolant supply
廣泛分佈的磨損 Heavy wear difference from one insert to the other	刀具設定不正確（所用刀片的切削深度不同） Tool not adjusted correctly (different chip depth between inserts)	檢查設定 Check adjustment
	刀具老舊 (刀座磨損) Old tools (insert seat worn)	更新刀具 Renew tool
廣泛分佈的磨損 Heavy wear difference from one insert to the other	進給太快 Feed too high	減少進給 Reduce feed
	刃口倒角錯誤 Incorrect cutting edge chamfer	增加斜面寬度，增加斜面角度 Increase chamfer width, increase bevel angle (edge preparation)
	刃口處理太小 Edge hone too small	更大的刃口處理 Larger honing
	牌號選擇錯誤 Incorrect carbide grade used	選用較硬的牌號 Use tougher grade

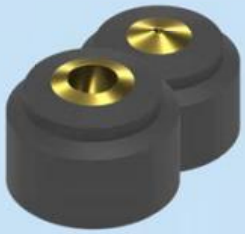
boehlerit

線材剝皮環
Wire shaving rings



穩定： 具備高度安全性，可防止脫落及流程中斷。安裝穩固。 Stable: High security against breakout and process interruption Stable mounts		經過精密製造與硬化處理的鋼材，確保了剝皮環座較長的使用壽命。 Precisely manufactured and hardened steels provide long service life of the drawing peel ring mount.
精確尺寸： 精密製造的環件可確保極嚴的直徑公差。 Precise dimension: Precisely manufactured rings ensure the tightest diameter tolerances	© Fa. Kieselstein	針對多種直徑和材料，實現完美無瑕的表面，公差可達 0.02 mm。 Flawless surfaces and tolerances down to 0.02 mm for a wide range of diameters and materials.
合適的切削刃： 針對鋼材、黑色金屬以及非鐵金屬（銅合金、鈦等）所設計的適當切削刃幾何形狀。 The right cutting edge: Suitable cutting edge geometries for steel and ferrous materials as well as non-ferrous metals (copper alloys, titian, etc.)		客製化倒角設計，可實現理想的表面粗糙度，消除振動與擺動，並減少表面缺陷。 Custom bevel designs for the best surface finish, free from vibration and oscillation and reduction of surface defects.
以耐用性實現高效率： 切削各類材料，既能延長刀具壽命，又能保持一致的精度。 Efficiency through durability: Cutting materials for long tool life with consistent precision.	© Fa. Kieselstein	穩定的基體材料以及特製的CVD和PVD塗層，確保了極高的加工可靠性。 Stable base substrates and special CVD and PVD coatings ensure maximum machining reliability.

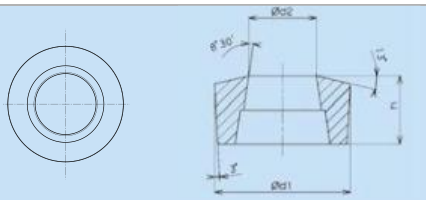
拉絲環和模具
Shaving rings and casings

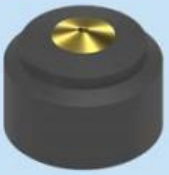


這是一種經濟高效的鋼材及非鐵金屬剝皮加工工藝，適用於直徑約 3 至 20 mm的材料，可實現從卷材到卷材的連續加工。我們可依特定的加工材料及所用剝皮機設備，為您訂製對應的剝皮模具。

The economic method to produce peeled steel and non ferrous metals from coil to coil for diameters from about 3 to 20 mm. Shaving dies designed to the requriements of material and machine on request.

拉絲環
Shaving rings





Artikelbezeichnung Item code	Schneidkantenausführung Cutting edge version	Schneidstoffsorte Cutting material	Verfügbarkeit Availability	Abmessungen [mm] Dimensions [mm]		
				D	d	h
ZSR20 DM4,67	E10	BCP25W	◑	4,67	20	10
ZSR20 DM4,93	E10	BCP25W	◑	4,93	20	10
ZSR20 DM4,97	B25	BCP25W	●	4,97	20	10
ZSR20 DM5,26	E10	BCP25W	◑	5,26	20	10
ZSR20 DM5,36	B20	BCP25W	◑	5,36	20	10
ZSR20 DM5,40	B15	BCP25W	◑	5,40	20	10
ZSR20 DM5,60	B15	BCP25W	◑	5,60	20	10
ZSR20 DM5,90	E10	BCP25W	●	5,90	20	10
ZSR20 DM6,40	E10	BCP25W	◑	6,40	20	10
ZSR20 DM6,90	E10	BCP25W	●	6,90	20	10
ZSR20 DM7,40	E10	BCP25W	●	7,40	20	10
ZSR20 DM8,40	E10	BCP25W	●	8,40	20	10
ZSR20 DM9,40	E10	BCP25W	●	9,40	20	10
ZSR24 DM10,16	E45	BCP30W	●	10,16	24	12
ZSR24 DM14,95	B35	BCP30W	◑	14,95	24	12

牌號總覽
Grade Overview

Sorte Grade	ISO	Anwendungsbereich Application range 01 05 10 15 20 25 30 35 40 45 50	Werkstoffgruppe Material group P Stahl / Steel	M Rostfrei / Stainless	K Grauguss / Grey cast iron	N NE-Metalle / Non-ferrous metals	S Hochwarmfest / High temperature materials	H Harte Werkstoffe / Hard materials	Ziehschälen Wire scarfing
BCP25W	HC-P25		■						●
	HC-M35								●
BCP30W	HC-P30		■						●
	HC-M30			□					●

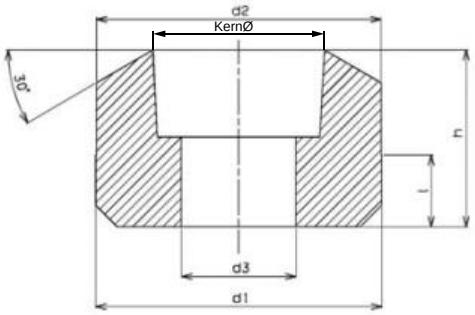
Anwendungsschwerpunkt
Application peak

Gesamtbereich nach ISO 513
Full range to ISO 513

01 05 10 15 20 25 30 35 40 45 50

■ Hauptanwendung
Main application
□ Weitere Anwendungen
Further applications

● Standardsorte
Standard grade

Fassung Casing	Bestellbezeichnung Ordering Code	Abmessungen in mm Sizes in mm					
		Kern ø core ø	d_1	d_2	d_3	h	l
	Fassung ZSR20 D40x30	20,0	40,0	39,8	14,0	28,8	10,0
	Fassung ZSR24 D40x25	24,0	40,0	39,8	16,0	24,6	10,0

boehlerit

SawTec 焊刃圓鋸片

Ø 250 - 460 mm

SawTec brazed

Ø 250 - 460 mm



SawTec 焊刃鋸片 Ø 250 - 460 mm
SawTec brazed Ø 250 - 460 mm

www.boehlerit.com

面向現代製造業的高性能鋸片

憑藉「Sawtec brazed」技術，Boehlerit 為高要求的切削製程提供創新解決方案。鋸齒與鋸體間採用釬焊連接，確保了卓越的穩定性和耐用性，使其成為應對高機械負載應用場景的理想選擇。

Hochleistungssägen für die moderne Fertigung

Mit Sawtec brazed bietet Boehlerit eine innovative Lösung für anspruchsvolle Schnittprozesse. Die gelötete Verbindung der Sägezähne mit dem Blattkörper sorgt für außergewöhnliche Stabilität und Widerstandsfähigkeit – ideal für Anwendungen mit hohen mechanischen Belastungen.

兼具精度與生產效率

由於優質材料和尖端製造工藝，這些鋸片在確保卓越切削品質的同時，磨損極小。其優勢在於：延長刀具使用壽命，減少停機時間，並顯著提升了生產效率。

Precision and productivity combined

Thanks to high-quality materials and stillte-of-the-art manufacturing technologies, the saw blades achieve excellent cutting quality with minimal wear. The result: longer service life, fewer downtimes and significantly increased productivity.

應對極端工況的穩健性能

憑藉著出色的耐磨性和耐熱性，Sawtec 焊刃產品成為金屬加工及其他工業應用領域的理想之選——在這些應用中，設備往往需要在嚴苛條件下保持高精度與高可靠性。

Robustness for extreme conditions

Its high abrasion and heat resistance makes Sawtec brazed the ideal choice for metalworking and other industrial applications where precision and reliability are required under demanding conditions.

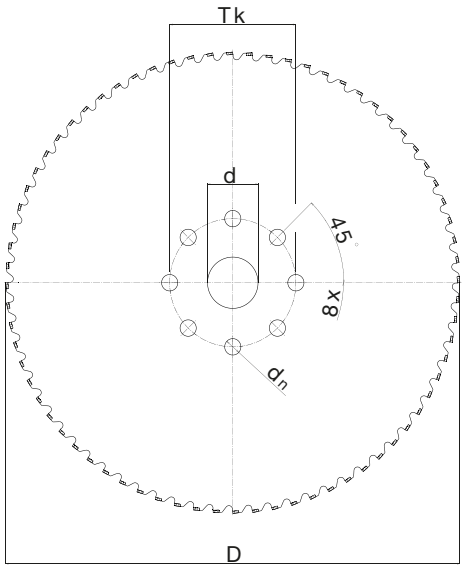
用途廣泛

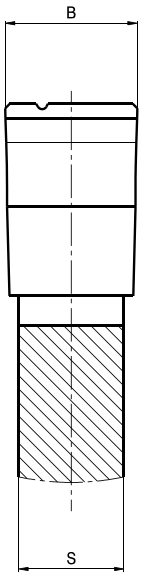
此類鋸片直徑範圍為 250–460 mm，切削寬度為 2–2.8 mm，適用於多種材料－從軟質到硬質材料均可應對。如有需要，亦可提供其他規格尺寸。

Flexible use

Available in diameters from 250–460 mm and cutting widths from 2–2.8 mm, the saw blades cover a wide range of materials – from soft to hard. Other dimensions are available on request.

SawTec gelötet Ø 250 - 460 mm
SawTec brazed Ø 250 - 460 mm



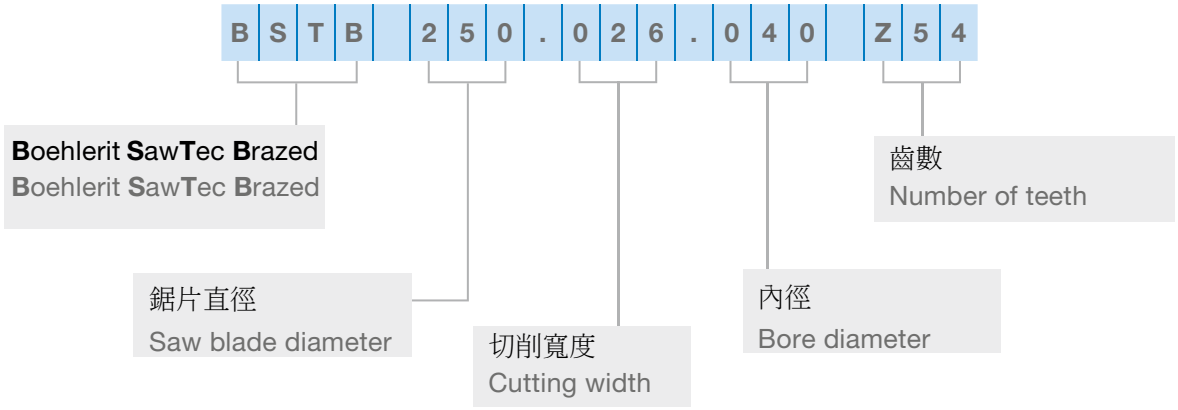




Abmessungen [mm] Dimensions [mm]					max. Abmessungen in mm max. Dimensions in mm	z	N	Artikelbezeichnung Item code	Ident. No. Ordering No.	Verfügbarkeit Availability
D [mm]	B [mm]	d [mm]	TK [mm]	d_n [mm]						
250	2	40	50	9	75	54	4	BSTB 250.020.040 Z54	5227574	○
			50	9		60		BSTB 250.020.040 Z60	5227575	○
			50	9		72		BSTB 250.020.040 Z72	5227576	○
			50	9		80		BSTB 250.020.040 Z80	5227577	○
285	2.1	40/50	64	12	75	60	4	BSTB 285.021.040 Z60	5227578	○
			64	12		72		BSTB 285.021.040 Z72	5227579	○
			80	15		80		BSTB 285.021.050 Z80	5227580	●
			80	15		120		BSTB 285.021.050 Z120	5227581	●
315	2.3	40/50	64	12	85	60	4	BSTB 315.023.040 Z60	5227582	○
			64	12		72		BSTB 315.023.040 Z72	5227583	○
			64	12		80		BSTB 315.023.040 Z80	5227584	○
			65	12		100		BSTB 315.023.040 Z100	5227585	○
			80	15		100		BSTB 315.023.050 Z100	5227586	○
350	2.5	40/50	64	12	100	60	4	BSTB 350.025.040 Z60	5227587	○
			64	12		80		BSTB 350.025.040 Z80	5227588	○
			65	12		100		BSTB 350.025.050 Z100	5227589	●
			65	12		120		BSTB 350.025.050 Z120	5227590	●
360	2.6	50	80	15	100	60	4	BSTB 360.026.050 Z60	5227591	○
			80	15		80		BSTB 360.026.050 Z80	5227592	○
			80	15		100		BSTB 360.026.050 Z100	5227593	○
			80	15		120		BSTB 360.026.040 Z120	5227594	○
425	2.8	40	80	15	125	50	4	BSTB 425.028.040 Z50	5227595	○
			80	15		60		BSTB 425.028.040 Z60	5227596	○
			80	15		80		BSTB 425.028.040 Z80	5227597	○
			80	15		100		BSTB 425.028.040 Z100	5227598	○
460	2.8	40	80	15	150	40	4	BSTB 460.028.040 Z40	5227599	○
			80	15		60		BSTB 460.028.040 Z60	5227600	○
			80	15		80		BSTB 460.028.040 Z80	5227601	○

Bestellbeispiel Order example: 5227574 oder or BSTB 250.020.040 Z54

● Verfügbar ab Lager Available from stock
○ Lieferzeit auf Anfrage Delivery time on request



俯視圖 Top view

D = 鋸片直徑 Saw blade diameter (mm)
d = 內徑 Bore diameter (mm)
z = 齒數 No. of teeth
T = 齒距 Tool pitch (mm)

齒距計算
Calculation of tooth pitch: $T = \frac{D*\pi}{z}$

齒數計算
Calculation of number of teeth: $z = \frac{D*\pi}{T}$

側面圖 Lateral view

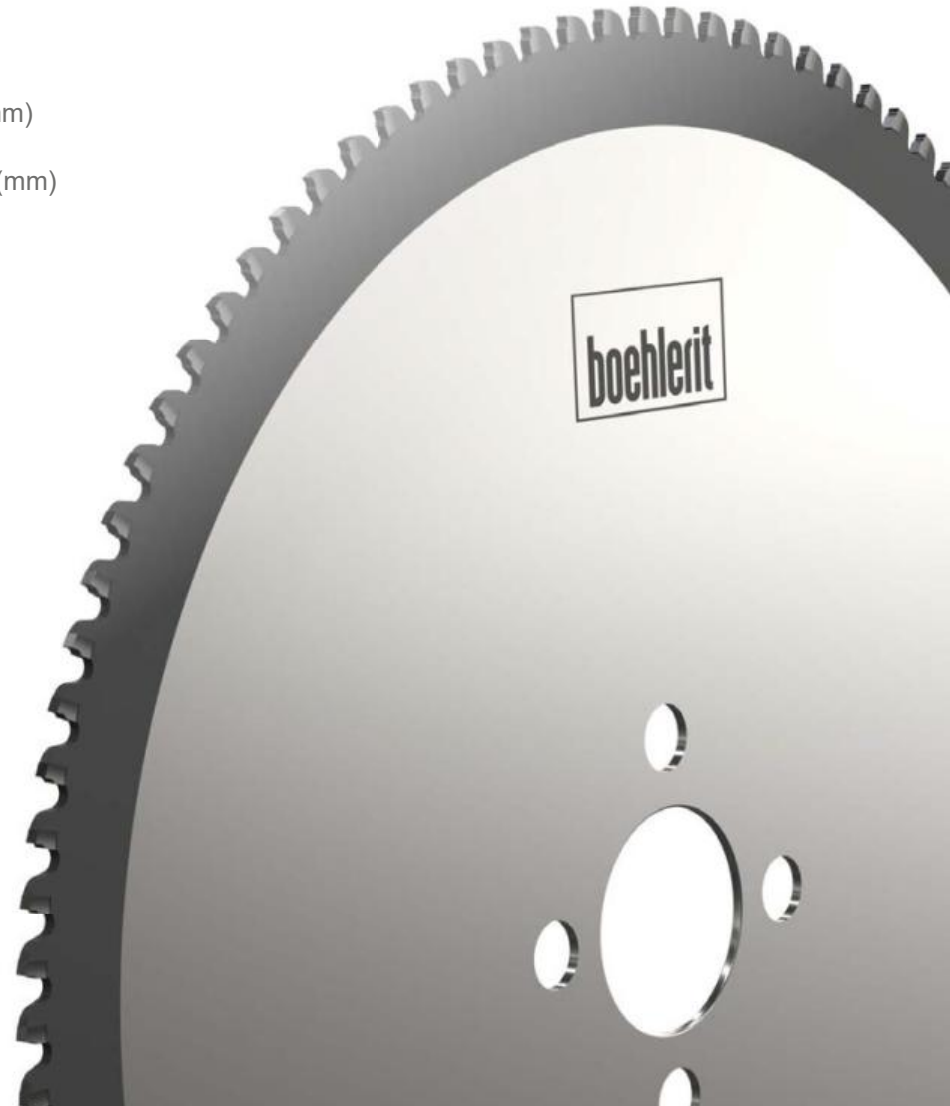
B = 切削寬度 Cutting width (mm)
s = 刀片厚度 Blade thickness (mm)

側孔 Pinholes

N = 側孔數量 Number of pinholes
d_n = 側孔的直徑 Diameter of pinholes (mm)

TK = 側孔的節圓 Pitch circle of pinholes (mm)

例子: 4/12/64 (N/dn/TK)
Example: 4/12/64 (N/dn/TK)



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boehlerit

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