BN 60

- For general machining
- Cost efficiency

- For material application 68 HRC

H

BN 60 Ballnose Cutters - Standard

BN 60 Radiusschaftfräser - Standard
Frese cilindriche a raggio BN 60 - standard
Fraises à bout hémisphérique BN 60 - standard
BN 60 系列 球头 立铣刀

EDP	Ø	N° Z	Helix Angle	B0819	G6110	B0909	RC	Weldon	Tolerance		Page
									Diameter	Tol. µm	
A69	0.5 - 25	2	30°			•			Ø0.1 - Ø2.0	0 / -20	400
A70						•	•		Ø3.0 - Ø6.0	0 / -25	400
A1L	3 - 25	4				•			Ø6.0 - Ø30.0	0 / -30	402

BN 60 Ballnose Cutters - Long

BN 60 Radiusschaftfräser - lang
Frese cilindriche a raggio BN 60 - lunghe
Fraises à bout hémisphérique BN 60 - longues
BN 60 系列 球头 立铣刀 - 中长

EDP	Ø	N° Z	Helix Angle	B0819	G6110	B0909	RC	Weldon	Tolerance		Page
									Diameter	Tol. µm	
A71	1 - 20	2	30°			•			Ø0.1 - Ø2.0	0 / -20	403
A72						•	•		Ø3.0 - Ø6.0	0 / -25	403
									Ø6.0 - Ø30.0	0 / -30	

BN 60 Ballnose Cutters - Extra-Long

BN 60 Radiusschaftfräser - extra-lang
Frese cilindriche a raggio BN 60 - extra-lunghe
Fraises à bout hémisphérique BN 60 - extra-longues
ABN 60 系列 球头 立铣刀 - 加长

EDP	Ø	N° Z	Helix Angle	B0819	G6110	B0909	RC	Weldon	Tolerance		Page
									Diameter	Tol. µm	
A73	1 - 20	2	30°			•			Ø0.1 - Ø2.0	0 / -20	404
A74						•	•		Ø3.0 - Ø6.0	0 / -25	404
									Ø6.0 - Ø30.0	0 / -30	

BN 60 Miniature Ballnose Cutters

BN 60 Kleinst-Radiusschaftfräser
Micro-frese cilindriche a raggio BN 60
Micro-fraises à bout hémisphérique BN 60
BN 60 系列 微型球头 立铣刀

EDP	Ø	N° Z	Helix Angle	B0819	G6110	B0909	RC	Weldon	Tolerance		Page
									Diameter	Tol. µm	
A75	0.2 - 0.9	2	30°			•			Ø0.1 - Ø0.7	0 / -12	406
									Ø0.7 - Ø4.0	0 / -20	

H

BN 60 Miniature Ballnose Cutters with Long Neck

BN 60 Kleinst-Radiusschaftfräser mit langem Hals Micro-frese cilindriche a raggio BN 60 con collo lungo Micro-fraises à bout hémisphérique BN 60 avec cou BN 60 系列 长颈短刃 球头 立铣刀	EDP	Ø	N° Z	Helix Angle	B0819	G6110	B0909	RC	Weldon	Tolerance		Page
										Diameter	Tol. µm	
	A76	0.2 - 4	2	30°			•			Ø0.1 - Ø2.0	0 / -12	407
										Ø3.0 - Ø6.0	0 / -20	
										Ø6.0 - Ø30.0	0 / -30	

BN 60 Miniature Ballnose Cutters with Taper Neck

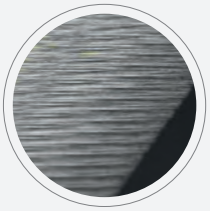
BN 60 Kleinst-Radiusschaftfräser mit kegeligem Hals Micro-frese cilindriche a raggio BN 60 con collo Micro-fraises à bout hémisphérique BN 60 avec cou BN 60 系列 锥颈位 球头 立铣刀	EDP	Ø	N° Z	Helix Angle	B0819	G6110	B0909	RC	Weldon	Tolerance		Page
										Diameter	Tol. µm	
	A77	1 - 12	2	30°			•			Ø0.1 - Ø2.0	0 / -12	412
										Ø3.0 - Ø6.0	0 / -20	
										Ø6.0 - Ø30.0	0 / -30	

BN 60

01

ECCENTRIC GRINDING

Optimum eccentric grinding in order to avoid rubbing, while maintaining maximum cutting tool strength.



02

CUTTING EDGE PREPARATION

Enhances Tool Life

- Less material adhere on the cutting edge
- For stable machining

03

SUPERIOR COATING TO REDUCE FRICTION

- Increases hardness and higher abrasive wear resistance
- Higher thermal resistance
- Smoother chip evacuation

04

SUITABLE FOR MATERIAL GROUPS H

H

DEUTSCH

01 **EXZENTRISCHER SCHLIFF**
Optimaler exzentrischer Schliff zur Reduzierung der Reibung unter Beibehaltung der maximalen Schneidenstabilität

02 **SCHNEIDKANTENBEHANDLUNG**
Verbessert die Werkzeuglebensdauer
· Weniger Materialanhaftungen an der Schneide
· Für stabile Bearbeitung

03 **AUSGEZEICHNETE BESCHICHTUNG ZUR VERRINGERUNG DER REIBUNG**
· Erhöht die Härte und und bietet bessere Verschleißfestigkeit
· Höhere Temperaturbeständigkeit
· Glatte Oberfläche für besseren Spänefluß

04 **GEEIGNET FÜR DIE MATERIALIGRUPPEN H**

FRANÇAIS

01 **MEULAGE EXCENTRIQUE**
Meulage optimal diminuant le coeficient de friction tout en maintenant une bonne acuité de l'arête de coupe

02 **PRÉPARATION DES ARÊTES DE COUPES**
Améliore la durée de vie de l'outil
· Moins de matériau adhère à l'arête tranchante
· Pour un usinage stable

03 **REVÊTEMENT SUPÉRIEUR POUR RÉDUIRE LA FRICTION**
· Augmente la dureté et la résistance à l'abrasion
· Résistance thermique supérieure
· Évacuation des copeaux plus fluide

04 **ADAPTÉ AUX MATÉRIAUX H**

ITALIANO

01 **LEVIGATURA ORBITALE**
Levigatura orbitale ottimale per evitare sfregatura, garantendo la massima resistenza dello strumento di taglio

02 **PREPARAZIONE DELL'ANGOLO DI TAGLIO**
Migliora la durata dello strumento
· Meno materiale che aderisce sull'angolo di taglio
· Per una lavorazione stabile

03 **RIVESTIMENTO SUPERIORE PER RIDURRE LA FRIZIONE**
· Aumenta la durezza e una maggiore resistenza all'usura abrasiva
· Resistenza termica superiore
· Evacuazione dei trucioli più semplice

04 **ADATTO PER IL MATERIALE H**

中文

01 **偏心研磨**
最佳偏心研磨，可避免摩擦，同时保持最大切削刀具强度

02 **切削刃设置提高刀具寿命**
提高刀具寿命
· 较少的材料粘粘在切削刃上
· 用于稳定加工

03 **优异的涂层，减少摩擦**
· 增加硬度，提高材料耐磨性
· 更高的抗热性
· 更顺畅的排屑

04 **超合金和钛的材料 H**

BN 60 STANDARD BALLNOSE CUTTERS

≤ 1.600 N/mm² + B0909 ≤ 53 - 68 HRC

HPMT

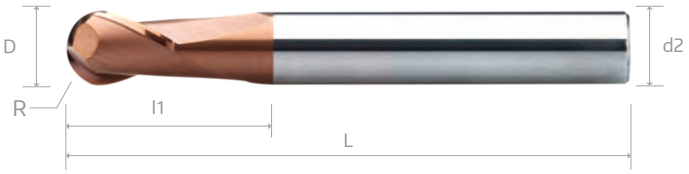
VHM Standard BN 60 Radiusschaftfräser, 2 Zähne

Fraises BN 60 Standard en carbure monobloc, à bout hémisphérique, 2 dents

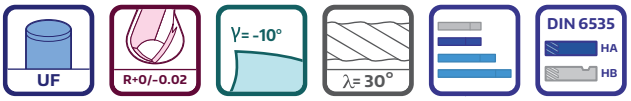
Frese cilindriche a raggio in metallo duro integrale, tipo BN 60 Standard, 2 taglienti

整体硬质合金 BN 60 系列 球头 立铣刀 2 刃 - 标准长度

A69*



Z2



HSC B0909 TISIN

EDP No. / EDV-Nr. / CODE usine / Codice EDP	Dimension (mm)						A69*
= * + Ø data	D	R	l 1	l 2	L	d2 (h6)	B0909
0050 050 04	0.5	0.25	1.2		50	4	•
0050 050 06	0.5	0.25	1.2		50	6	•
0060 050 04	0.6	0.3	1.4		50	4	•
0060 050 06	0.6	0.3	1.4		50	6	•
0080 050 04	0.8	0.4	1.8		50	4	•
0080 050 06	0.8	0.4	1.8		50	6	•
0100 050 04	1	0.5	3	4	50	4	•
0100 050 06	1	0.5	3	4	50	6	•
0150 050 04	1.5	0.75	3	6	50	4	•
0150 050 06	1.5	0.75	3	6	50	6	•
0200 050 04	2	1	4	8	50	4	•
0200 050 06	2	1	4	8	50	6	•
0250 050 04	2.5	1.25	4	10	50	4	•
0250 050 06	2.5	1.25	4	10	50	6	•
0300 050 03	3	1.5	5	14	50	3	•
0300 050 04	3	1.5	5	14	50	4	•
0300 050 06	3	1.5	5	14	50	6	•
0400	4	2	8	20	50	4	•
0400 050 06	4	2	8	20	50	6	•
0500	5	2.5	9	20	50	5	•
0500 050 06	5	2.5	9	20	50	6	•
0600 050	6	3	10	20	50	6	•
0600 060	6	3	10	30	60	6	•
0800	8	4	12	30	64	8	•
1000	10	5	14	32	70	10	•
1200	12	6	16	38	75	12	•

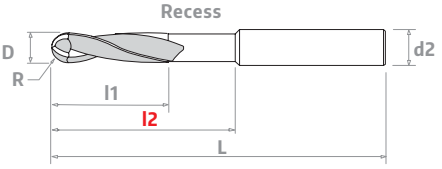
Tools with recess upon request

Fräser mit Freistellung auf Bestellung

Outils a vec dégagemen t sur demande

Utensilli con riduzione gambo su richiest a

密齿立铣刀带颈位特别要求



A70 *
cont'd ▶

Material Group | Material-Gruppe | Groupe Matiere | Gruppo Materiali | 材质主类

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
													•	•		

Cutting Parameter: 413

BN 60 STANDARD BALLNOSE CUTTERS

≤ 1.600 N/mm² + B0909 ≤ 53 - 68 HRC

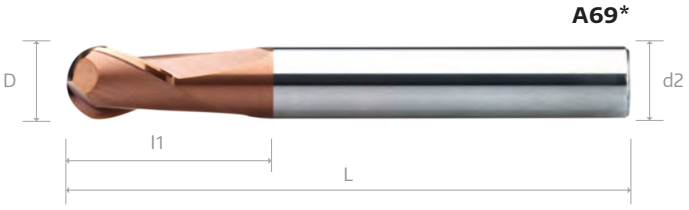
HPMT

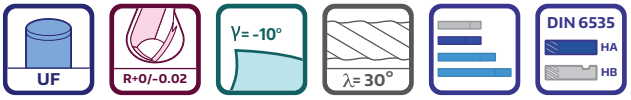
VHM Standard BN 60 Radiusschaftfräser, 2 Zähne

Fraises BN 60 Standard en carbure monobloc, à bout hémisphérique, 2 dents

Frese cilindriche a raggio in metallo duro integrale, tipo BN 60 Standard, 2 taglienti

整体硬质合金 BN 60 系列 球头 立铣刀 2 刃 - 标准长度

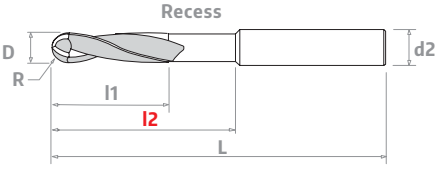




EDP No. / EDV-Nr. / CODE usine / Codice EDP	Dimension (mm)						A69*
= * + Ø data	D	R	l 1	l 2	L	d2 (h6)	B0909
1400	14	7	32	44	90	14	•
1600	16	8	32	46	90	16	•
1800	18	9	38	53	100	18	•
2000	20	10	38	58	100	20	•
2200	22	11	40	58	100	22	•
2500	25	12.85	40	58	100	25	•

A70 *

Tools with recess upon request



Fräser mit Freistellung auf Bestellung

Outils a vec dégagemen t sur demande

Utensilli con riduzione gambo su richiest a

密齿立铣刀带颈位特别要求

Material Group | Material-Gruppe | Groupe Matiere | Gruppo Materiali | 材质主类

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
													•	•		

Cutting Parameter: 413

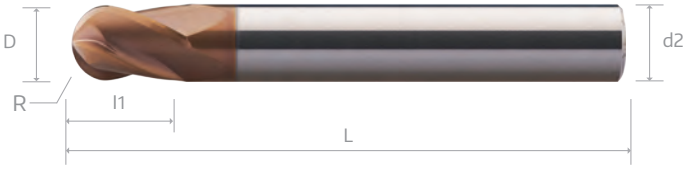
BN 60 STANDARD BALLNOSE CUTTERS

≤ 1.600 N/mm² + B0909 ≤ 53 - 68 HRC

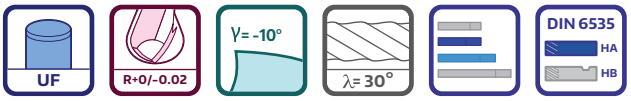
HPMT

VHM Standard BN 60 Radiusschaftfräser, 4 Zähne	Fraises BN 60 Standard en carbure monobloc, à bout hémisphérique, 4 dents
Frese cilindriche a raggio in metallo duro integrale, tipo BN 60 Standard, 4 taglienti	整体硬质合金 BN 60 系列 球头 立铣刀 4 刃 - 标准长度

A1L*



Z4



HSC B0909 TISIN

EDP No. / EDV-Nr. / CODE usine / Codice EDP	Dimension (mm)						A1L*
= * + Ø data	D	R	l 1	l 2	L	d2 (h6)	B0909
0300	3	1.5	5		40	3	•
0300 050 06	3	1.5	5		50	6	•
0400	4	2	8		50	4	•
0400 050 06	4	2	8		50	6	•
0500	5	2.5	9		50	5	•
0500 050 06	5	2.5	9		50	6	•
0600 050	6	3	10		50	6	•
0600 060	6	3	10		60	6	•
0800	8	4	12		64	8	•
1000	10	5	14		70	10	•
1200	12	6	16		75	12	•
1400	14	7	32		90	14	•
1600	16	8	32		90	16	•
1800	18	9	38		100	18	•
2000	20	10	38		100	20	•
2200	22	11	40		100	22	•
2500	25	12.5	40		100	25	•

BN 60

Material Group | Material-Gruppe | Groupe Matiere | Gruppo Materiali | 材质主类

Cutting Parameter

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
													•	•		

416

BN 60

BN 60 BALLNOSE CUTTERS – Long

≤ 1.600 N/mm² + B0909 ≤ 53 - 68 HRC

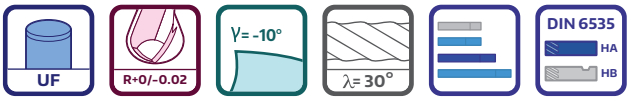
HPMT

VHM lange BN 60 Radiusschaftfräser, 2 Zähne

Fraises BN 60 longues en carbure monobloc, à bout hémisphérique, 2 dents

Frese cilindriche a raggio in metallo duro integrale, tipo BN 60 lunghe, 2 taglienti

整体硬质合金 BN 60 系列 球头 立铣刀 2 刃 - 中长



EDP No. / EDV-Nr. / CODE usine / Codice EDP	Dimension (mm)						A71*
= * + Ø data	D	R	l 1	l 2	L	d2 (h6)	B0909
0100 04	1	0.5	3	7	75	4	•
0100 075 06	1	0.5	3	7	75	6	•
0150 04	1.5	0.75	3	10	75	4	•
0150 075 06	1.5	0.75	3	10	75	6	•
0200 04	2	1	4	14	75	4	•
0200 075 06	2	1	4	14	75	6	•
0250 04	2.5	1.25	4	18	75	4	•
0250 075 06	2.5	1.25	4	18	75	6	•
0300	3	1.5	5	21	60	3	•
0300 075 06	3	1.5	5	21	75	6	•
0400	4	2	8	28	60	4	•
0400 075 06	4	2	8	28	75	6	•
0500	5	2.5	9	32	60	5	•
0500 075 06	5	2.5	9	32	75	6	•
0600	6	3	10	40	75	6	•
0800	8	4	12	40	75	8	•
1000 075	10	5	14	40	75	10	•
1000 100	10	5	14	60	100	10	•
1200	12	6	16	60	100	12	•
1400	14	7	32	80	125	14	•
1600	16	8	32	80	125	16	•
1800	18	9	38	80	125	18	•
2000	20	10	38	80	125	20	•

A72 *

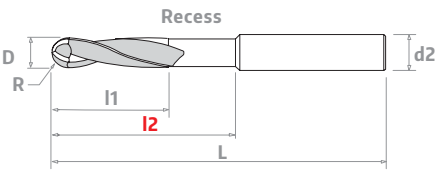
Tools with recess upon request

Fräser mit Freistellung auf Bestellung

Outils a vec dégagemen t sur demande

Utensilli con riduzione gambo su richiest a

密齿立铣刀带颈位特别要求



Material Group | Material-Gruppe | Groupe Matiere | Gruppo Materiali | 材质主类

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
													•	•		

Cutting Parameter: 414

BN 60 BALLNOSE CUTTERS - Extra-Long

≤ 1.600 N/mm² + B0909 ≤ 53 - 68 HRC

HPMT

VHM extra-lange BN 60 Radiusschaftfräser, 2 Zähne

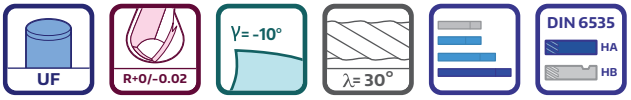
Fraises BN 60 extra-longues en carbure monobloc, à bout hémisphérique, 2 dents

Frese cilindriche a raggio in metallo duro integrale, tipo BN 60 extra-lunghe, 2 taglienti

整体硬质合金 BN 60 系列 球头 立铣刀 2 刃 - 加长

A74*

Z2



HSC B0909 TiSiN

EDP No. / EDV-Nr. / CODE usine / Codice EDP	Dimension (mm)						A73*
= * + Ø data	D	R	l 1	l 2	L	d2 (h6)	B0909
0100 04	1	0.5	3	10	100	4	•
0100 100 06	1	0.5	3	10	100	6	•
0150 04	1.5	0.75	3	15	100	4	•
0150 100 06	1.5	0.75	3	15	100	6	•
0200 04	2	1	4	20	100	4	•
0200 100 06	2	1	4	20	100	6	•
0250 04	2.5	1.25	4	25	100	4	•
0250 100 06	2.5	1.25	4	25	100	6	•
0300 04	3	1.5	5	30	100	4	•
0300 100 06	3	1.5	5	30	100	6	•
0400	4	2	8	40	100	4	•
0400 100 06	4	2	8	40	100	6	•
0500	5	2.5	9	50	100	5	•
0500 100 06	5	2.5	9	50	100	6	•
0600 100	6	3	10	60	100	6	•
0600 150	6	3	10	60	150	6	•
0800 100	8	4	12	60	100	8	•
0800 150	8	4	12	80	150	8	•
1000 125	10	5	14	85	125	10	•
1000 150	10	5	14	100	150	10	•
1200 125	12	6	16	85	125	12	•
1200 150	12	6	16	110	150	12	•
1400 150	14	7	32	110	150	14	•
1400 200	14	7	32	150	200	14	•
1600 150	16	8	32	110	150	16	•
1600 200	16	8	32	150	200	16	•

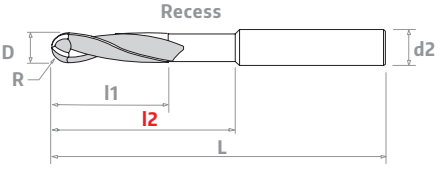
Tools with recess upon request

Fräser mit Freistellung auf Bestellung

Outils a vec dégagemen t sur demande

Utensilli con riduzione gambo su richiest a

密齿立铣刀带颈位特别要求



A74 *
cont'd ▶

Material Group | Material-Gruppe | Groupe Matiere | Gruppo Materiali | 材质主类

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
													•	•		

Cutting Parameter

415

BN 60 BALLNOSE CUTTERS - Extra-Long

≤ 1.600 N/mm² + B0909 ≤ 53 - 68 HRC

HPMT

VHM extra-lange BN 60 Radiusschaftfräser, 2 Zähne

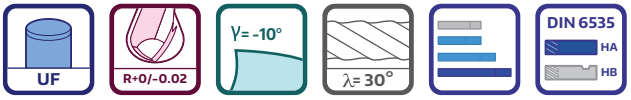
Fraises BN 60 extra-longues en carbure monobloc, à bout hémisphérique, 2 dents

Frese cilindriche a raggio in metallo duro integrale, tipo BN 60 extra-lunghe, 2 taglienti

整体硬质合金 BN 60 系列 球头 立铣刀 2 刃 - 加长

A74*

Z2



HSC B0909 TISIN

EDP No. / EDV-Nr. / CODE usine / Codice EDP	Dimension (mm)						A73*
= * + Ø data	D	R	l 1	l 2	L	d2 (h6)	B0909
1800 150	18	9	38	110	150	18	•
1800 200	18	9	38	150	200	18	•
2000 150	20	10	38	110	150	20	•
2000 200	20	10	38	150	200	20	•

A74 *

BN 60

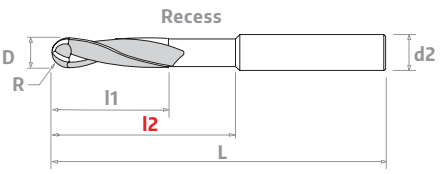
Tools with recess upon request

Fräser mit Freistellung auf Bestellung

Outils a vec dégagemen t sur demande

Utensilli con riduzione gambo su richiest a

密齿立铣刀带颈位特别要求



Material Group | Material-Gruppe | Groupe Matiere | Gruppo Materiali | 材质主类

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
													•	•		

Cutting Parameter

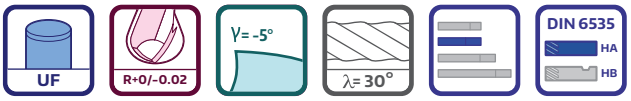
415

BN 60 MINIATURE BALLNOSE CUTTERS

≤ 1.600 N/mm² + B0909 ≤ 53 - 63 HRC

HPMT

VHM Radiuskleinstschaftfräser BN 60, 2 Zähne	Micro-fraises BN 60 en carbure monobloc à bout hémisphérique, 2 dents
Micro-frese cilindriche a raggio in metallo duro integrale, tipo BN 60, 2 taglienti	整体硬质合金 BN 60 系列 微型球头 立铣刀 2 刃 - 标准长度



EDP No. / EDV-Nr. / CODE usine / Codice EDP	Dimension (mm)						A75*
= * + Ø data	D	R	l 1	l 2	L	d2 (h6)	B0909
0020 03	0.2	0.1	0.4		40	3	•
0020 04	0.2	0.1	0.4		40	4	•
0030 03	0.3	0.15	0.6		40	3	•
0030 04	0.3	0.15	0.6		40	4	•
0040 03	0.4	0.2	0.8		40	3	•
0040 04	0.4	0.2	0.8		40	4	•
0050 03	0.5	0.25	1.2		40	3	•
0050 04	0.5	0.25	1.2		40	4	•
0060 03	0.6	0.3	1.4		40	3	•
0060 04	0.6	0.3	1.4		40	4	•
0070 03	0.7	0.35	1.6		40	3	•
0070 04	0.7	0.35	1.6		40	4	•
0080 03	0.8	0.4	1.8		40	3	•
0080 04	0.8	0.4	1.8		40	4	•
0090 03	0.9	0.45	2		40	3	•
0090 04	0.9	0.45	2		40	4	•

D*

D mm	Tol. µm
0.1 ~ 0.7	0 / - 12
0.7 ~ 4.0	0 / - 20

Material Group | Material-Gruppe | Groupe Matiere | Gruppo Materiali | 材质主类

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
													•	•		

Cutting Parameter: 418

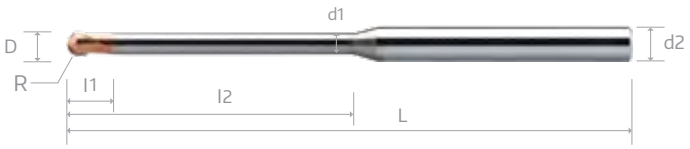
BN 60 MINIATURE BALLNOSE CUTTERS – with Long Neck

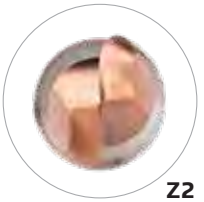
≤ 1.600 N/mm² + B0909 ≤ 53 - 68 HRC

HPMT

VHM BN 60 Kleinstradiusfräser mit langem Hals, 2 Zähne	Micro-fraises BN 60 à bout hémisphérique en carbure monobloc avec cou long, 2 dents
Micro-frese cilindriche BN 60 a raggio con collo lungo in metallo duro integrale, 2 taglienti	整体硬质合金 BN 60 系列 长颈短刃 球头 立铣刀 2 刃

A76*





Z2

EDP No. / EDV-Nr. / CODE usine / Codice EDP	Dimension (mm)							A76*
= * + Ø data	D	R	l1	l2	L	d1	d2 (h6)	B0909
0020 050 0400	0.2	0.10	0.2	-	50	-	4	•
0020 050 0400 005	0.2	0.10	0.2	0.5	50	0.17	4	•
0020 050 0400 010	0.2	0.10	0.2	1.0	50	0.17	4	•
0020 050 0400 015	0.2	0.10	0.2	1.5	50	0.17	4	•
0030 050 0400	0.3	0.15	0.3	-	50	-	4	•
0030 050 0400 010	0.3	0.15	0.3	1.0	50	0.27	4	•
0030 050 0400 020	0.3	0.15	0.3	2.0	50	0.27	4	•
0030 050 0400 030	0.3	0.15	0.3	3.0	50	0.27	4	•
0040 050 0400	0.4	0.20	0.4	-	50	-	4	•
0040 050 0400 010	0.4	0.20	0.4	1.0	50	0.37	4	•
0040 050 0400 020	0.4	0.20	0.4	2.0	50	0.37	4	•
0040 050 0400 030	0.4	0.20	0.4	3.0	50	0.37	4	•
0040 050 0400 040	0.4	0.20	0.4	4.0	50	0.37	4	•
0040 050 0400 050	0.4	0.20	0.4	5.0	50	0.37	4	•
0050 050 0400	0.5	0.25	0.4	-	50	-	4	•
0050 050 0400 020	0.5	0.25	0.4	2.0	50	0.45	4	•
0050 050 0400 030	0.5	0.25	0.4	3.0	50	0.45	4	•
0050 050 0400 040	0.5	0.25	0.4	4.0	50	0.45	4	•
0050 050 0400 050	0.5	0.25	0.4	5.0	50	0.45	4	•
0050 050 0400 060	0.5	0.25	0.4	6.0	50	0.45	4	•
0050 050 0400 080	0.5	0.25	0.4	8.0	50	0.45	4	•
0060 050 0400	0.6	0.30	0.5	-	50	-	4	•
0060 050 0400 020	0.6	0.30	0.5	2.0	50	0.55	4	•
0060 050 0400 030	0.6	0.30	0.5	3.0	50	0.55	4	•
0060 050 0400 040	0.6	0.30	0.5	4.0	50	0.55	4	•
0060 050 0400 050	0.6	0.30	0.5	5.0	50	0.55	4	•

cont'd ▶

Material Group | Material-Gruppe | Groupe Matiere | Gruppo Materiali | 材质主类

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
													•	•		

Cutting Parameter: 418

BN 60 MINIATURE BALLNOSE CUTTERS – with Long Neck

≤ 1.600 N/mm² + B0909 ≤ 53 - 65 HRC

HPMT

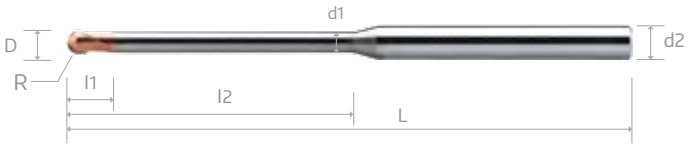
VHM BN 60 Kleinstradiusfräser mit langem Hals, 2 Zähne

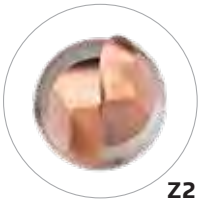
Micro-fraises BN 60 à bout hémisphérique en carbure monobloc avec cou long, 2 dents

Micro-frese cilindriche BN 60 a raggio con collo lungo in metallo duro integrale, 2 taglienti

整体硬质合金 BN 60 系列 长颈短刃 球头 立铣刀 2 刃

A76*





Z2

EDP No. / EDV-Nr. / CODE usine / Codice EDP	Dimension (mm)							A76*
= * + Ø data	D	R	l1	l2	L	d1	d2 (h6)	B0909
0060 050 0400 060	0.6	0.30	0.5	6.0	50	0.55	4	•
0060 050 0400 080	0.6	0.30	0.5	8.0	50	0.55	4	•
0080 050 0400	0.8	0.40	0.6	-	50	-	4	•
0080 050 0400 020	0.8	0.40	0.6	2.0	50	0.75	4	•
0080 050 0400 040	0.8	0.40	0.6	4.0	50	0.75	4	•
0080 050 0400 050	0.8	0.40	0.6	5.0	50	0.75	4	•
0080 050 0400 060	0.8	0.40	0.6	6.0	50	0.75	4	•
0080 050 0400 070	0.8	0.40	0.6	7.0	50	0.75	4	•
0080 050 0400 080	0.8	0.40	0.6	8.0	50	0.75	4	•
0080 050 0400 100	0.8	0.40	0.6	10.0	50	0.75	4	•
0100 050 0400	1.0	0.50	0.8	-	50	-	4	•
0100 050 0400 030	1.0	0.50	0.8	3.0	50	0.9	4	•
0100 050 0400 040	1.0	0.50	0.8	4.0	50	0.9	4	•
0100 050 0400 050	1.0	0.50	0.8	5.0	50	0.9	4	•
0100 050 0400 060	1.0	0.50	0.8	6.0	50	0.9	4	•
0100 050 0400 070	1.0	0.50	0.8	7.0	50	0.9	4	•
0100 050 0400 080	1.0	0.50	0.8	8.0	50	0.9	4	•
0100 050 0400 090	1.0	0.50	0.8	9.0	50	0.9	4	•
0100 050 0400 100	1.0	0.50	0.8	10.0	50	0.9	4	•
0100 050 0400 120	1.0	0.50	0.8	12.0	50	0.9	4	•
0100 050 0400 140	1.0	0.50	0.8	14.0	50	0.9	4	•
0100 050 0400 160	1.0	0.50	0.8	16	50	0.9	4	•
0100 060 0400	1.0	0.50	0.8	-	60	-	4	•
0100 060 0400 200	1.0	0.50	0.8	20.0	60	0.9	4	•
0120 050 0400	1.2	0.60	1.0	-	50	-	4	•
0120 050 0400 060	1.2	0.60	1.0	6.0	50	1.1	4	•

cont'd ▶

Material Group | Material-Gruppe | Groupe Matiere | Gruppo Materiali | 材质主类

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
													•	•		

Cutting Parameter

418

BN 60 MINIATURE BALLNOSE CUTTERS – with Long Neck

≤ 1.600 N/mm² + B0909 ≤ 53 - 65 HRC

HPMT

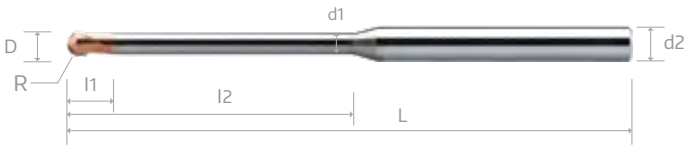
VHM BN 60 Kleinstradiusfräser mit langem Hals, 2 Zähne

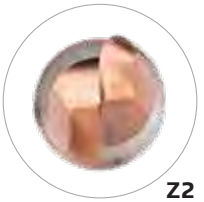
Micro-fraises BN 60 à bout hémisphérique en carbure monobloc avec cou long, 2 dents

Micro-frese cilindriche BN 60 a raggio con collo lungo in metallo duro integrale, 2 taglienti

整体硬质合金 BN 60 系列 长颈短刃 球头 立铣刀 2 刃

A76*





Z2

EDP No. / EDV-Nr. / CODE usine / Codice EDP	Dimension (mm)							A76*
= * + Ø data	D	R	l1	l2	L	d1	d2 (h6)	B0909
0120 050 0400 080	1.2	0.60	1.0	8.0	50	1.1	4	•
0120 050 0400 100	1.2	0.60	1.0	10.0	50	1.1	4	•
0120 050 0400 120	1.2	0.60	1.0	12.0	50	1.1	4	•
0140 050 0400	1.4	0.70	1.1	-	50	-	4	•
0140 050 0400 080	1.4	0.70	1.1	8.0	50	1.3	4	•
0140 050 0400 120	1.4	0.70	1.1	12.0	50	1.3	4	•
0140 050 0400 160	1.4	0.70	1.1	16.0	50	1.3	4	•
0150 050 0400	1.5	0.75	1.2	-	50	-	4	•
0150 050 0400 080	1.5	0.75	1.2	8.0	50	1.4	4	•
0150 050 0400 120	1.5	0.75	1.2	12.0	50	1.4	4	•
0150 050 0400 160	1.5	0.75	1.2	16.0	50	1.4	4	•
0150 060 0400	1.5	0.75	1.2	-	60	-	4	•
0150 060 0400 180	1.5	0.75	1.2	18.0	60	1.4	4	•
0160 050 0400	1.6	0.80	1.3	-	50	-	4	•
0160 050 0400 080	1.6	0.80	1.3	8.0	50	1.5	4	•
0160 050 0400 120	1.6	0.80	1.3	12.0	50	1.5	4	•
0160 050 0400 160	1.6	0.80	1.3	16.0	50	1.5	4	•
0160 060 0400	1.6	0.08	1. 3	-	60	-	4	•
0160 060 0400 200	1.6	0.80	1.3	20.0	60	1.5	4	•
0180 050 0400	1.8	0.90	1.4	-	50	-	4	•
0180 050 0400 080	1.8	0.90	1.4	8.0	50	1.7	4	•
0180 050 0400 120	1.8	0.90	1.4	12.0	50	1.7	4	•
0180 050 0400 160	1.8	0.90	1.4	16.0	50	1.7	4	•
0180 060 0400	1.8	0.90	1.4	-	60	-	4	•
0180 060 0400 200	1.8	0.90	1.4	20	60	1.7	4	•
0200 050 0400	2	1	1.6	-	50	-	4	•
0200 050 0400 040	2	1	1.6	4	50	1.9	4	•
0200 050 0400 060	2	1	1.6	6	50	1.9	4	•

cont'd ▶

Material Group | Material-Gruppe | Groupe Matiere | Gruppo Materiali | 材质主类

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
													•	•		

Cutting Parameter

418

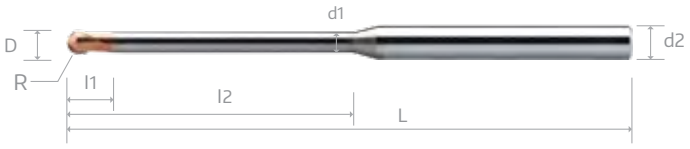
BN 60 MINIATURE BALLNOSE CUTTERS – with Long Neck

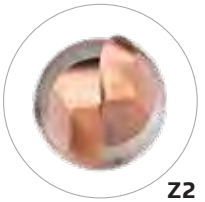
≤ 1.600 N/mm² + B0909 ≤ 53 - 68 HRC

HPMT

VHM BN 60 Kleinstradiusfräser mit langem Hals, 2 Zähne	Micro-fraises BN 60 à bout hémisphérique en carbure monobloc avec cou long, 2 dents
Micro-frese cilindriche BN 60 a raggio con collo lungo in metallo duro integrale, 2 taglienti	整体硬质合金 BN 60 系列 长颈短刃 球头 立铣刀 2 刃

A76*





Z2

EDP No. / EDV-Nr. / CODE usine / Codice EDP	Dimension (mm)							A76*
= * + Ø data	D	R	l1	l2	L	d1	d2 (h6)	B0909
0200 050 0400 080	2	1	1.6	8	50	1.9	4	•
0200 050 0400 100	2	1	1.6	10	50	1.9	4	•
0200 050 0400 120	2	1	1.6	12	50	1.9	4	•
0200 050 0400 140	2	1	1.6	14	50	1.9	4	•
0200 050 0400 160	2	1	1.6	16	50	1.9	4	•
0200 060 0400	2	1	1.6	-	60	-	4	•
0200 060 0400 180	2	1	1.6	18	60	1.9	4	•
0200 060 0400 200	2	1	1.6	20	60	1.9	4	•
0200 060 0400 220	2	1	1.6	22	60	1.9	4	•
0200 075 0400	2	1	1.6	-	75	-	4	•
0200 075 0400 250	2	1	1.6	25	75	1.9	4	•
0200 075 0400 300	2	1	1.6	30	75	1.9	4	•
0300 050 0600	3	1.5	2.4	-	50	-	6	•
0300 050 0600 080	3	1.5	2.4	8	50	2.8	6	•
0300 050 0600 100	3	1.5	2.4	10	50	2.8	6	•
0300 060 0600	3	1.5	2.4	-	60	-	6	•
0300 060 0600 160	3	1.5	2.4	16	60	2.8	6	•
0300 060 0600 200	3	1.5	2.4	20	60	2.8	6	•
0300 075 0600	3	1.5	2.4	-	75	-	6	•
0300 075 0600 250	3	1.5	2.4	25	75	2.8	6	•
0300 075 0600 300	3	1.5	2.4	30	75	2.8	6	•
0300 075 0600 350	3	1.5	2.4	35	75	2.8	6	•
0400 050 0600	4	2	3.2	-	50	-	6	•
0400 050 0600 100	4	2	3.2	10	50	3.7	6	•
0400 060 0600	4	2	3.2	-	60	-	6	•
0400 060 0600 160	4	2	3.2	16	60	3.7	6	•

cont'd ▶

Material Group | Material-Gruppe | Groupe Matiere | Gruppo Materiali | 材质主类

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
													•	•		

Cutting Parameter

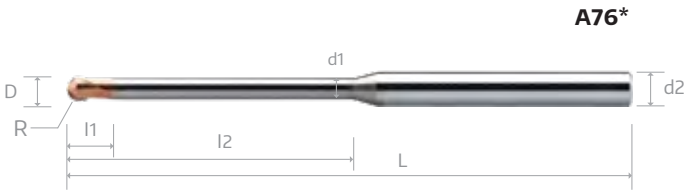
418

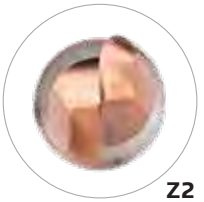
BN 60 MINIATURE BALLNOSE CUTTERS – with Long Neck

≤ 1.600 N/mm² + B0909 ≤ 53 - 68 HRC

HPMT

VHM BN 60 Kleinstradiusfräser mit langem Hals, 2 Zähne	Micro-fraises BN 60 à bout hémisphérique en carbure monobloc avec cou long, 2 dents
Micro-frese cilindriche BN 60 a raggio con collo lungo in metallo duro integrale, 2 taglienti	整体硬质合金 BN 60 系列 长颈短刃 球头 立铣刀 2 刃





EDP No. / EDV-Nr. / CODE usine / Codice EDP	Dimension (mm)							A76*
= * + Ø data	D	R	l1	l2	L	d1	d2 (h6)	B0909
0400 060 0600 200	4	2	3.2	20	60	3.7	6	•
0400 075 0600	4	2	3.2	-	75	-	6	•
0400 075 0600 250	4	2	3.2	25	75	3.7	6	•
0400 075 0600 300	4	2	3.2	30	75	3.7	6	•
0400 075 0600 350	4	2	3.2	35	75	3.7	6	•
0400 100 0600	4	2	3.2	-	100	-	6	•
0400 100 0600 400	4	2	3.2	40	100	3.7	6	•
0400 100 0600 450	4	2	3.2	45	100	3.7	6	•
0400 100 0600 500	4	2	3.2	50	100	3.7	6	•

Material Group | Material-Gruppe | Groupe Matiere | Gruppo Materiali | 材质主类

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
													•	•		

Cutting Parameter: 418

BN 60

BALLNOSE CUTTERS– with Taper Neck

≤ 1.600 N/mm² + B0909 ≤ 43 - 68 HRC

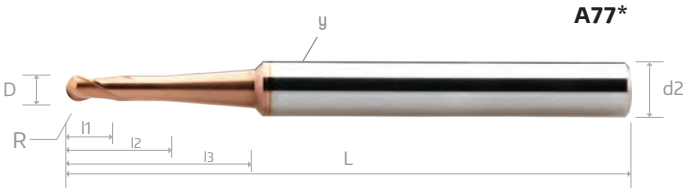
HPMT

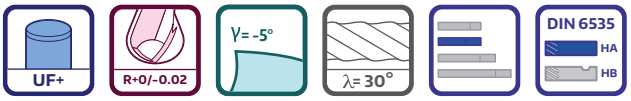
VHM Torusfräser, - Standard, 2 Zähne

Fraises 2 tailles toriques en carbure monobloc - Standard, 2dents

Frese in metallo duro integrale - Standard, 2 taglienti

整体硬质合金 BN 60 系列 圆鼻 立铣刀 2 刃 - 标准长度





HSC B0909 TiSiN

EDP No. / EDV-Nr. / CODE usine / Codice EDP	Dimension (mm)								A77*
= * + Ø data	D	R	l 1	l 2	l 3	L	d2 (h6)	y	B0909
0100 020 06 080	1.0	0.5	1.5	4.0	20	60	6	8°	•
0100 040 06 040	1.0	0.5	1.5	4.0	40	75	6	4°	•
0150 020 06 070	1.5	0.8	2.3	7.5	20	60	6	7°	•
0150 040 06 035	1.5	0.8	2.3	7.5	40	75	6	3.5°	•
0200 020 06 067	2.0	1.0	3.0	8.0	20	60	6	6.7°	•
0200 040 06 029	2.0	1.0	3.0	8.0	40	75	6	2.9°	•
0200 040 06 010	2.0	1.0	3.0	8.0	40	75	6	1°	•
0300 020 06 043	3.0	1.5	3.5	10.0	20	60	6	4.3°	•
0300 040 06 022	3.0	1.5	3.5	12.0	40	75	6	2.2°	•
0300 045 06 010	3.0	1.5	3.5	12.0	45	75	6	1°	•
0400 020 06 029	4.0	2.0	4.0	12.0	20	60	6	2.9°	•
0400 040 06 014	4.0	2.0	4.0	20.0	40	75	6	1.4°	•
0400 060 06 010	4.0	2.0	4.0	20.0	60	100	6	1°	•
0500 040 06 007	5.0	2.5	6.0	25.0	40	75	6	0.7°	•
0600 020 06 000	6.0	3.0	6.0	20.0	20	60	6	-	•
0600 040 06 000	6.0	3.0	6.0	40.0	40	75	6	-	•
0600 060 08 010	6.0	3.0	6.0	25.0	60	100	8	1°	•
0600 080 08 010	6.0	3.0	6.0	25.0	80	125	8	1°	•
0800 025 08 000	8.0	4.0	7.0	25.0	25	64	8	-	•
0800 060 08 000	8.0	4.0	7.0	60.0	60	100	8	-	•
0800 075 10 008	8.0	4.0	7.0	30.0	75	125	10	0.8°	•
0800 105 10 006	8.0	4.0	7.0	20.0	105	150	10	0.6°	•
1000 030 10 000	10.0	5.0	8.0	30.0	30	75	10	-	•
1000 075 10 000	10.0	5.0	8.0	75.0	75	125	10	-	•
1000 070 10 008	10.0	5.0	8.0	30.0	70	125	12	0.8°	•
1000 070 12 008	12.0	6.0	10.0	35.0	35	100	12	-	•
1200 070 12 000	12.0	6.0	10.0	70.0	70	125	12	-	•
1200 090 16 013	12.0	6.0	10.0	35.0	90	150	16	1.3°	•

Material Group | Material-Gruppe | Groupe Matiere | Gruppo Materiali | 材质主类

Cutting Parameter

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
													•	•		

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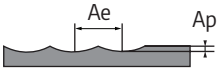
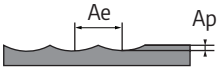
Standard Ballnose Cutters 2 Flutes



Roughing	H			
Working Material	Hardened Steel			
Properties	45 ≤ HRC < 52		52 ≤ HRC ≤ 68	
Cutting Depth, Ap (mm)	0.10 × D		0.07 × D	
Cutting Width, Ae (mm)	0.30 × D		0.21 × D	
D (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)
1	100	0.029	80	0.024
2		0.041		0.034
3		0.053		0.043
4		0.059		0.048
5		0.082		0.067
6		0.094		0.077
8		0.105		0.086
10		0.117		0.096
12		0.129		0.106
14		0.134		0.110
16		0.140		0.115
18		0.147		0.120
20		0.151		0.124
22		0.152		0.125
25		0.152		0.125

Standard Ballnose Cutters 2 Flutes

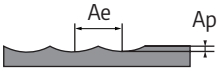


Finishing	H			
Working Material	Hardened Steel			
Properties	45 ≤ HRC < 52		53 ≤ HRC ≤ 68	
Cutting Depth, Ap (mm)	0.05 × D		0.05 × D	
Cutting Width, Ae (mm)	0.02 × D		0.02 × D	
D (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)
1	100	0.029	80	0.024
2		0.041		0.034
3		0.053		0.043
4		0.059		0.048
5		0.082		0.067
6		0.094		0.077
8		0.105		0.086
10		0.117		0.096
12		0.129		0.106
14		0.134		0.110
16		0.140		0.115
18		0.147		0.120
20		0.151		0.124
22		0.152		0.125
25		0.152		0.125

H

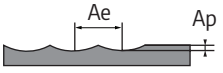
Recommended Cutting Data
Note: These recommended cutting conditions indicate just references. It should be adjusted due to different cutting conditions.

Long Ballnose Cutters 2 Flutes



Roughing	H			
Working Material	Hardened Steel			
Properties	45 ≤ HRC < 52		53 ≤ HRC ≤ 68	
Cutting Depth, Ap (mm)	0.10 × D		0.07 × D	
Cutting Width, Ae (mm)	0.30 × D		0.21 × D	
D (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)
1	100	0.023	80	0.019
2		0.033		0.027
3		0.042		0.035
4		0.047		0.038
5		0.066		0.054
6		0.075		0.061
8		0.084		0.069
10		0.094		0.077
12		0.103		0.084
14		0.107		0.088
16		0.112		0.092
18		0.117		0.096
20		0.121		0.099
22		0.122		0.100
25		0.122		0.100

Long Ballnose Cutters 2 Flutes

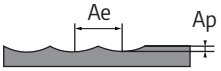


Finishing	H			
Working Material	Hardened Steel			
Properties	45 ≤ HRC < 52		53 ≤ HRC ≤ 68	
Cutting Depth, Ap (mm)	0.05 × D		0.05 × D	
Cutting Width, Ae (mm)	0.02 × D		0.02 × D	
D (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)
1	100	0.023	80	0.019
2		0.033		0.027
3		0.042		0.035
4		0.047		0.038
5		0.066		0.054
6		0.075		0.061
8		0.084		0.069
10		0.094		0.077
12		0.103		0.084
14		0.107		0.088
16		0.112		0.092
18		0.117		0.096
20		0.121		0.099
22		0.122		0.100
25		0.122		0.100

H

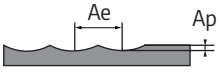
Recommended Cutting Data
Note: These recommended cutting conditions indicate just references. It should be adjusted due to different cutting conditions.

Extra Long Ballnose Cutters 2 Flutes



Roughing	H			
Working Material	Hardened Steel			
Properties	45 ≤ HRC < 52		53 ≤ HRC ≤ 68	
Cutting Depth, Ap (mm)	0.10 × D		0.07 × D	
Cutting Width, Ae (mm)	0.30 × D		0.21 × D	
D (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)
1	100	0.021	80	0.017
2		0.029		0.024
3		0.037		0.030
4		0.041		0.034
5		0.057		0.047
6		0.066		0.054
8		0.073		0.060
10		0.082		0.067
12		0.090		0.074
14		0.093		0.077
16		0.098		0.080
18		0.103		0.084
20		0.106		0.087
22		0.106		0.087
25		0.107		0.088

Extra Long Ballnose Cutters 2 Flutes

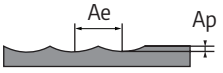


Finishing	H			
Working Material	Hardened Steel			
Properties	45 ≤ HRC < 52		53 ≤ HRC ≤ 68	
Cutting Depth, Ap (mm)	0.05 × D		0.05 × D	
Cutting Width, Ae (mm)	0.02 × D		0.02 × D	
D (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)
1	100	0.021	80	0.017
2		0.029		0.024
3		0.037		0.030
4		0.041		0.034
5		0.057		0.047
6		0.066		0.054
8		0.073		0.060
10		0.082		0.067
12		0.090		0.074
14		0.093		0.077
16		0.098		0.080
18		0.103		0.084
20		0.106		0.087
22		0.106		0.087
25		0.107		0.088

 **H**

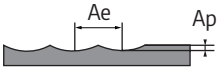
Recommended Cutting Data
Note: These recommended cutting conditions indicate just references. It should be adjusted due to different cutting conditions.

Standard Ballnose Cutters 4 Flutes



Roughing	H			
Working Material	Hardened Steel			
Properties	45 ≤ HRC < 52		53 ≤ HRC ≤ 68	
Cutting Depth, Ap (mm)	0.10 × D		0.07 × D	
Cutting Width, Ae (mm)	0.30 × D		0.21 × D	
D (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)
1	-	-	-	-
2	-	-	-	-
3	100	0.105	80	0.086
4		0.117		0.096
5		0.164		0.135
6		0.187		0.154
8		0.210		0.172
10		0.234		0.192
12		0.257		0.211
14		0.267		0.219
16		0.280		0.230
18		0.293		0.241
20		0.303		0.248
22		0.304		0.249
25		0.305		0.250

Standard Ballnose Cutters 4 Flutes

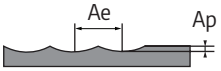


Finishing	H			
Working Material	Hardened Steel			
Properties	45 ≤ HRC < 52		53 ≤ HRC ≤ 68	
Cutting Depth, Ap (mm)	0.05 × D		0.05 × D	
Cutting Width, Ae (mm)	0.02 × D		0.02 × D	
D (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)
1	-	-	-	-
2	-	-	-	-
3	100	0.105	80	0.086
4		0.117		0.096
5		0.164		0.135
6		0.187		0.154
8		0.210		0.172
10		0.234		0.192
12		0.257		0.211
14		0.267		0.219
16		0.280		0.230
18		0.293		0.241
20		0.303		0.249
22		0.304		0.249
25		0.304		0.250

H

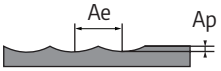
Recommended Cutting Data
Note: These recommended cutting conditions indicate just references. It should be adjusted due to different cutting conditions.

Long Ballnose Cutters 4 Flutes



Roughing	H			
Working Material	Hardened Steel			
Properties	45 ≤ HRC < 52		53 ≤ HRC ≤ 68	
Cutting Depth, Ap (mm)	0.10 × D		0.07 × D	
Cutting Width, Ae (mm)	0.30 × D		0.21 × D	
D (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)
1	-	-	-	-
2	-	-	-	-
3	100	0.084	80	0.069
4		0.094		0.077
5		0.131		0.108
6		0.150		0.123
8		0.168		0.137
10		0.187		0.154
12		0.206		0.169
14		0.214		0.175
16		0.224		0.184
18		0.235		0.193
20		0.242		0.199
22		0.243		0.200
25		0.244		0.200

Long Ballnose Cutters 4 Flutes

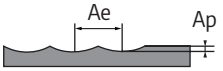


Finishing	H			
Working Material	Hardened Steel			
Properties	45 ≤ HRC < 52		53 ≤ HRC ≤ 68	
Cutting Depth, Ap (mm)	0.05 × D		0.05 × D	
Cutting Width, Ae (mm)	0.02 × D		0.02 × D	
D (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)
1	-	-	-	-
2	-	-	-	-
3	100	0.084	80	0.069
4		0.094		0.077
5		0.131		0.108
6		0.150		0.123
8		0.168		0.137
10		0.187		0.154
12		0.206		0.169
14		0.214		0.175
16		0.224		0.184
18		0.235		0.193
20		0.242		0.199
22		0.243		0.200
25		0.244		0.200

H

Recommended Cutting Data
Note: These recommended cutting conditions indicate just references. It should be adjusted due to different cutting conditions.

Miniature Ballnose Cutter – Long Neck 2 Flutes



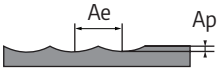
Profiling		H					
Working material		Hardened Steels			Hardened Steels		
Properties		45 ≤ HRC < 52			52 ≤ HRC ≤ 68		
D (mm)	Effective length	Ap (mm)	Vc (m/min)	Fz (mm)	Ap (mm)	Vc (m/min)	Fz (mm)
0.2	0.5	0.013	25	0.003	0.012	25	0.003
	1.0	0.009	25	0.003	0.008	25	0.003
	1.5	0.005	25	0.003	0.005	24	0.002
0.3	1.0	0.014	38	0.005	0.013	38	0.004
	2.0	0.008	38	0.004	0.007	36	0.004
	3.0	0.005	38	0.004	0.005	36	0.004
0.4	1.0	0.026	45	0.005	0.024	42	0.005
	2.0	0.018	45	0.005	0.017	42	0.005
	3.0	0.010	41	0.004	0.010	38	0.004
	4.0	0.007	41	0.004	0.006	38	0.004
	5.0	0.003	36	0.004	0.002	38	0.004
0.5	2.0	0.023	47	0.009	0.021	44	0.009
	3.0	0.020	42	0.008	0.018	40	0.008
	4.0	0.013	42	0.008	0.012	40	0.008
	5.0	0.012	42	0.008	0.011	40	0.008
	6.0	0.008	38	0.008	0.008	35	0.007
	8.0	0.005	38	0.008	0.005	35	0.007
0.6	2.0	0.027	57	0.012	0.025	53	0.010
	3.0	0.022	57	0.012	0.020	53	0.010
	4.0	0.016	51	0.011	0.014	48	0.010
	5.0	0.013	51	0.011	0.012	48	0.005
	6.0	0.010	51	0.011	0.009	48	0.009
	8.0	0.010	45	0.010	0.009	42	0.008
0.8	2.0	0.052	75	0.015	0.048	70	0.014
	4.0	0.036	75	0.015	0.034	70	0.014
	5.0	0.029	68	0.014	0.027	63	0.013
	6.0	0.021	68	0.014	0.019	63	0.013
	7.0	0.017	64	0.014	0.016	60	0.013
	8.0	0.013	60	0.014	0.012	56	0.013
	10.0	0.013	60	0.013	0.012	56	0.012

cont' d ▶

H

Recommended Cutting Data
Note: These recommended cutting conditions indicate just references. It should be adjusted due to different cutting conditions.

Miniature Ballnose Cutter – Long Neck 2 Flutes



Profiling		H					
Working material		Hardened Steels			Hardened Steels		
Properties		45 ≤ HRC < 52			52 ≤ HRC ≤ 68		
D (mm)	Effective length	Ap (mm)	Vc (m/min)	Fz (mm)	Ap (mm)	Vc (m/min)	Fz (mm)
1.0	3.0	0.065	85	0.021	0.060	79	0.020
	4.0	0.046	85	0.021	0.042	79	0.020
	5.0	0.039	85	0.021	0.036	79	0.020
	6.0	0.026	76	0.019	0.024	81	0.016
	7.0	0.026	76	0.019	0.024	71	0.018
	8.0	0.026	76	0.019	0.024	71	0.018
	9.0	0.020	76	0.019	0.018	71	0.018
	10.0	0.016	76	0.019	0.015	71	0.018
	12.0	0.016	68	0.018	0.015	63	0.017
	14.0	0.013	68	0.017	0.012	63	0.017
	20.0	0.007	51	0.017	0.006	47	0.016
1.2	6.0	0.029	81	0.022	0.027	76	0.020
	8.0	0.026	81	0.022	0.024	76	0.020
	10.0	0.023	81	0.021	0.021	76	0.019
	12.0	0.020	81	0.020	0.018	76	0.018
1.4	8.0	0.033	83	0.026	0.033	77	0.025
	12.0	0.023	83	0.024	0.021	77	0.022
	16.0	0.023	74	0.022	0.021	69	0.021
1.5	8.0	0.039	89	0.024	0.036	83	0.022
	12.0	0.039	89	0.024	0.036	83	0.022
	16.0	0.025	79	0.023	0.023	74	0.021
	18.0	0.018	79	0.023	0.016	74	0.021
1.6	8.0	0.072	98	0.030	0.066	91	0.028
	12.0	0.042	88	0.027	0.039	82	0.025
	16.0	0.026	88	0.027	0.024	82	0.025
	20.0	0.026	78	0.026	0.024	73	0.024
1.8	8.0	0.085	110	0.033	0.078	103	0.030
	12.0	0.046	100	0.030	0.042	93	0.027
	16.0	0.029	100	0.030	0.027	93	0.027
	20.0	0.029	88	0.028	0.027	83	0.025

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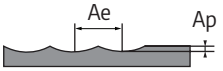
Recommended Cutting Data
Note: These recommended cutting conditions indicate just references. It should be adjusted due to different cutting conditions.

Miniature Ballnose Cutter – Long Neck 2 Flutes



Profiling		H					
Working material		Hardened Steels			Hardened Steels		
Properties		45 ≤ HRC < 52			52 ≤ HRC ≤ 68		
D (mm)	Effective length	Ap (mm)	Vc (m/min)	Fz (mm)	Ap (mm)	Vc (m/min)	Fz (mm)
2.0	4.0	0.130	99	0.043	0.120	92	0.040
	6.0	0.130	99	0.038	0.120	92	0.036
	8.0	0.091	99	0.038	0.084	92	0.036
	10.0	0.091	99	0.034	0.084	92	0.032
	12.0	0.052	89	0.034	0.000	83	0.032
	14.0	0.052	89	0.034	0.048	83	0.032
	16.0	0.052	89	0.031	0.048	83	0.029
	18.0	0.039	89	0.031	0.036	83	0.029
	20.0	0.033	89	0.031	0.030	83	0.029
	22.0	0.033	84	0.029	0.030	79	0.027
	25.0	0.033	79	0.029	0.030	74	0.027
	30.0	1.950	79	0.029	0.180	74	0.027
3.0	8.0	0.195	113	0.063	0.180	106	0.060
	10.0	0.137	113	0.063	0.126	106	0.060
	16.0	0.137	113	0.057	0.126	106	0.054
	20.0	0.078	102	0.057	0.072	95	0.054
	25.0	0.052	102	0.057	0.048	102	0.050
	30.0	0.052	102	0.057	0.048	95	0.054
	35.0	0.052	90	0.054	0.048	85	0.051
4.0	10.0	0.260	108	0.085	0.240	102	0.080
	16.0	0.182	108	0.085	0.168	102	0.080
	20.0	0.182	108	0.085	0.168	102	0.080
	25.0	0.104	98	0.076	0.096	90	0.072
	30.0	0.104	98	0.076	0.096	90	0.072
	35.0	0.065	98	0.076	0.060	90	0.072
	40.0	0.065	98	0.076	0.060	90	0.072
	45.0	0.065	87	0.072	0.060	80	0.069
	50.0	0.065	87	0.072	0.060	80	0.069

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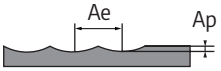
Recommended Cutting Data
Note: These recommended cutting conditions indicate just references. It should be adjusted due to different cutting conditions.

Miniature Ballnose Cutter – Taper Neck 2 Flutes



Profiling		H					
Working material		Hardened Steels			Hardened Steels		
Properties		45 ≤ HRC < 52s			53 ≤ HRC ≤ 68		
D (mm)	Effective length	Ap (mm)	Vc (m/min)	Fz (mm)	Ap (mm)	Vc (m/min)	Fz (mm)
1.0	4.0	0.036	52	0.040	0.033	52	0.035
1.5	7.5	0.046	52	0.060	0.042	52	0.053
2.0	8.0	0.098	62	0.080	0.090	62	0.070
3.0	10.0	0.176	78	0.119	0.162	78	0.105
	12.0	0.176	78	0.119	0.162	78	0.105
4.0	12.0	0.208	98	0.108	0.192	98	0.102
	20.0	0.208	98	0.108	0.192	98	0.102
5.0	25.0	0.221	97	0.102	0.204	97	0.096
6.0	20.0	0.293	98	0.113	0.270	98	0.107
	25.0	0.293	98	0.113	0.270	98	0.107
	40.0	0.260	98	0.101	0.240	98	0.095
8.0	20.0	0.325	98	0.109	0.300	98	0.104
	25.0	0.325	98	0.109	0.300	98	0.104
	30.0	0.325	98	0.109	0.300	98	0.104
	60.0	0.280	98	0.109	0.258	98	0.104
10.0	30.0	0.325	97	0.121	0.300	97	0.115
	75.0	0.325	97	0.121	0.300	97	0.115
12.0	35.0	0.325	98	0.135	0.300	98	0.129
	70.0	0.325	98	0.135	0.300	98	0.129

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Recommended Cutting Data
Note: These recommended cutting conditions indicate just references. It should be adjusted due to different cutting conditions.