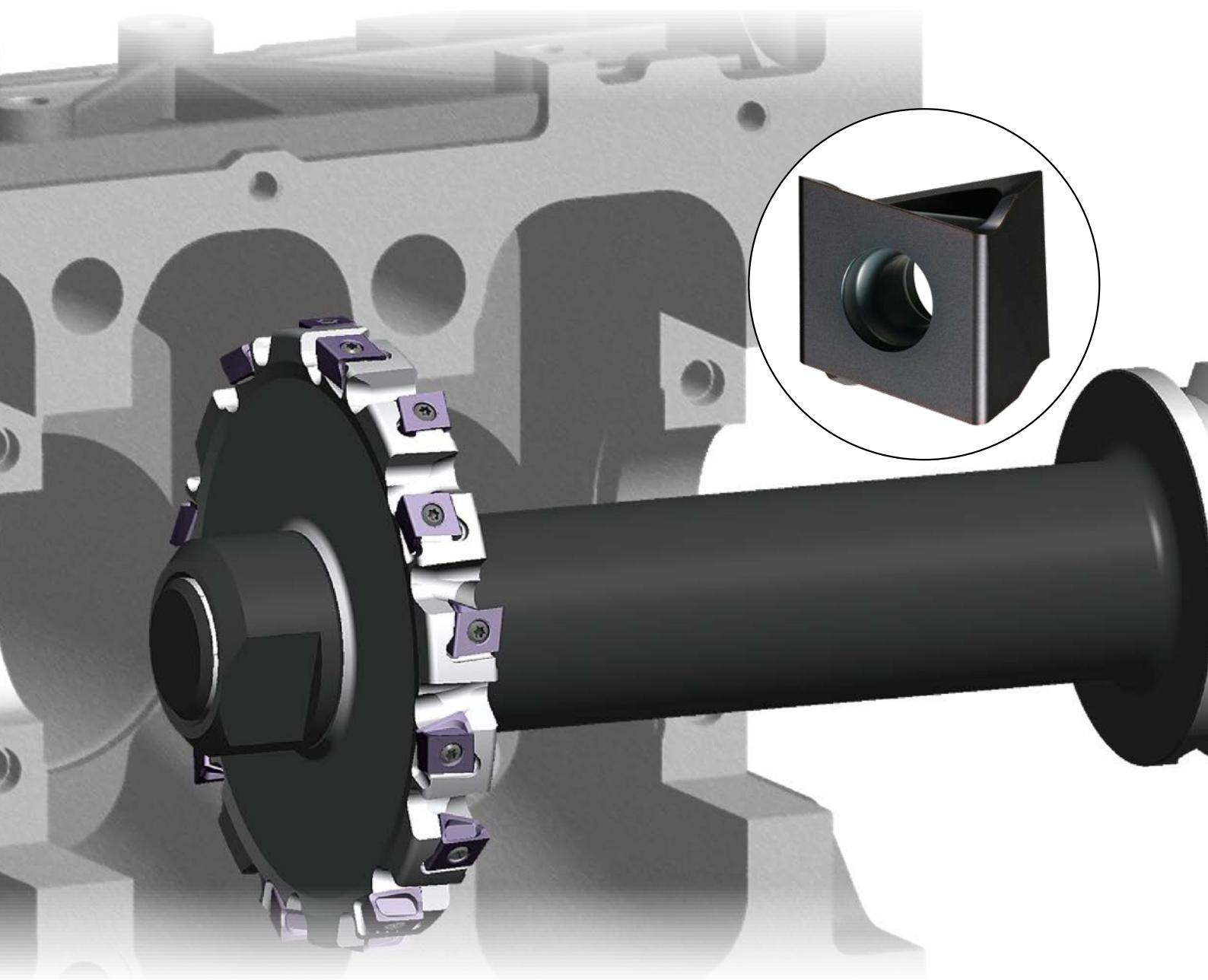


SERIE DI FRESE A DISCO

LAVORAZIONI LATERALI E FRONTALI
CON INSERTI TANGENZIALI A BASSA RESISTENZA
PER LA SERIE DCV DI FRESE A DISCO



Mplus...

DCV3 / DCV4 / DCV5

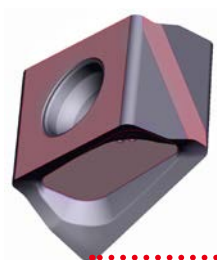
INSERTI INTERCAMBIABILI

DESIGN ECONOMICO DEGLI INSERTI

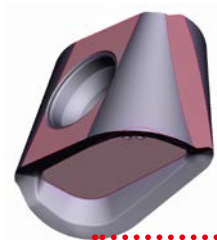
Inserto di tipo tangenziale con 4 taglienti.

BLOCCAGGIO SICURO

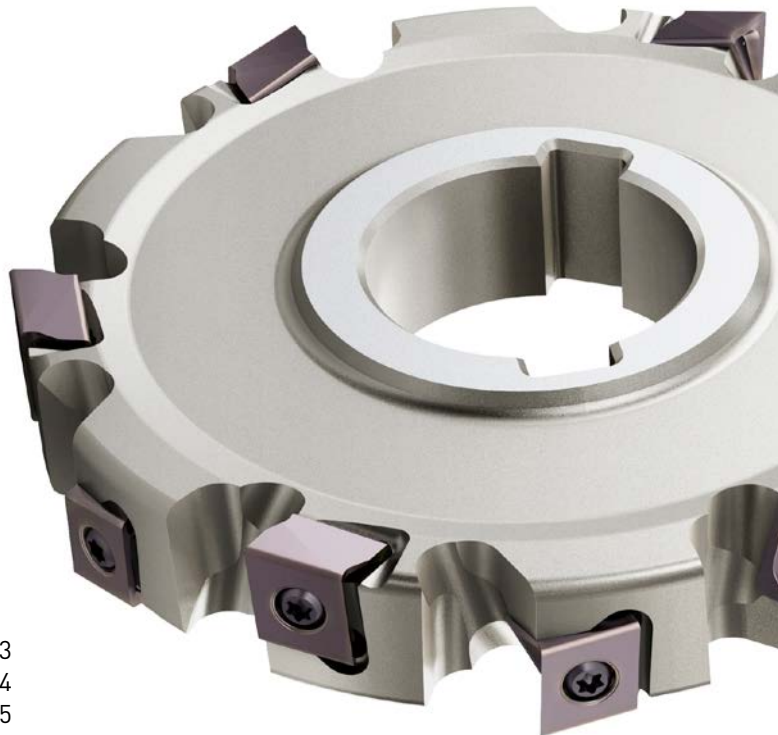
Grazie alle speciali superfici di alloggiamento, tutti gli inserti (con vari raggi) vengono fissati saldamente.



Raggio angolare R 0.4 mm

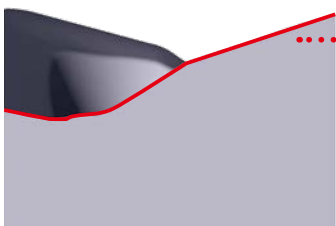


Raggio angolare R 4.0 mm per DCV3
Raggio angolare R 5.0 mm per DCV4
Raggio angolare R 7.0 mm per DCV5

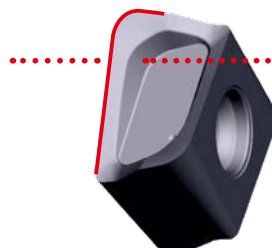


Corpo fresa con inserti: GAMF: + 8° GAMP: + 3°

INSERTO A BASSA RESISTENZA DI TAGLIO → AFFILATURA PREFERITA



Tagliente resistente
(curva convessa)

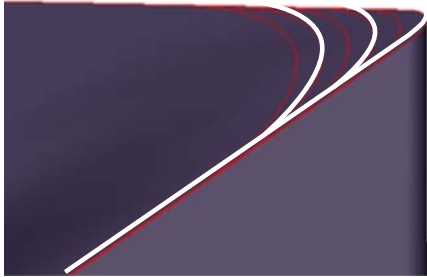


Angoli di spoglia
elicoidali a doppia fase

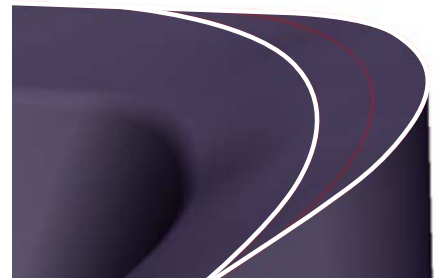
RAGGIO ANGOLARE AD ALTA PRECISIONE

INSERTI RETTIFICATI PER OTTENERE RAGGI ANGOLARI PRECISI NEL PARTICOLARI LAVORATI.

R 0.4 – R 3.0 mm

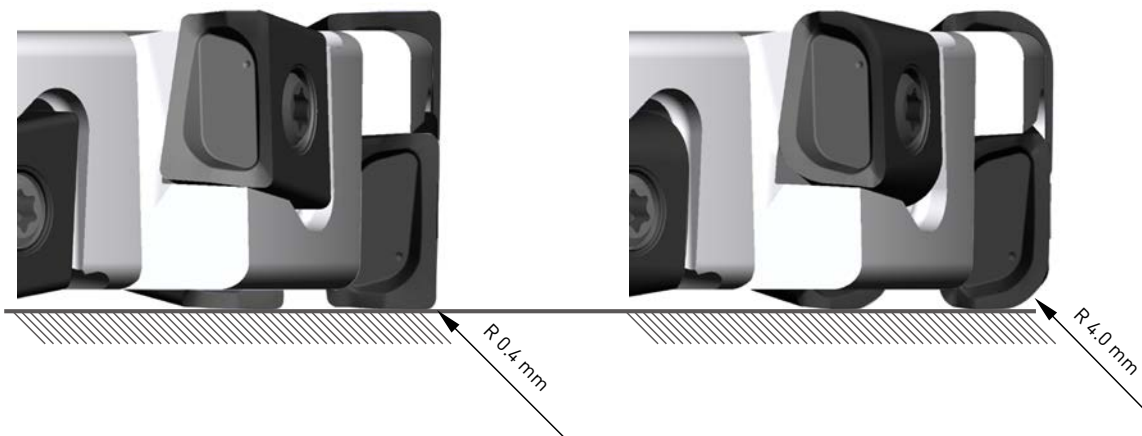


R 3.0 – R 7.0 mm



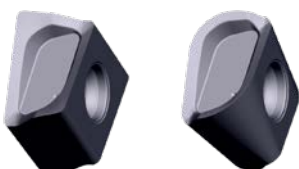
GEOMETRIA COSTANTE

La larghezza e il diametro di taglio non cambiano nemmeno quando si utilizzano inserti con raggio angolare diverso.

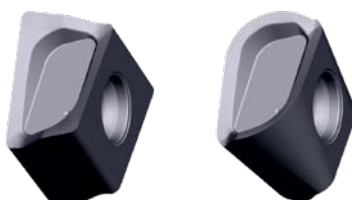


GRANDE VARIETÀ DI RAGGI ANGOLARI DISPONIBILE

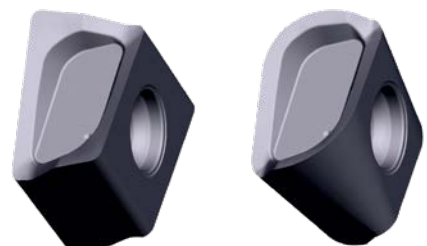
DCV3 = R 0.4 – R 4.0 mm



DCV4 = R 0.4 – R 5.0 mm



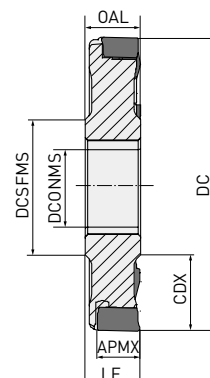
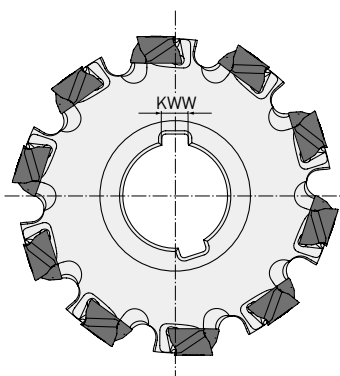
DCV5 = R 0.4 – R 7.0 mm



DCV3



P K



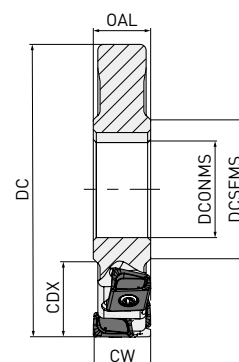
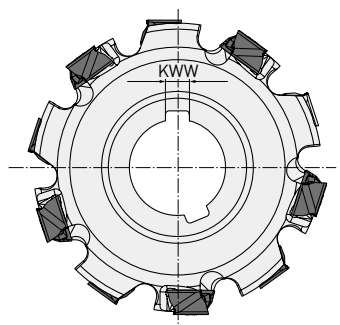
Max. APMX: 8.6 mm

TAGLIO FRONTALE

DC	ZNF	LF = OAL	CDX	DCONMS	DCSFMS	KWW		
80 - 99.9	8	≥12	20.0	27	40	7	—	LNGU09
100 - 124.9	10		27.0	32	46	8	—	
125 - 160.0	12		35.0	40	55	10	—	

1/1

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Ampiezza max. CW: 17.2 mm

TAGLIO COMPLETO

DC	ZNF	ZNP	LF = OAL	CW	CDX	DCONMS	DCSFMS	KWW		
80 - 99.9	4	8	≥12	12-17.2	20.0	27	40	7	—	LNGU09
100 - 124.9	5	10		12-17.2	27.0	32	46	8	—	
125 - 160.0	6	12		12-17.2	35.0	40	55	10	—	

1/1

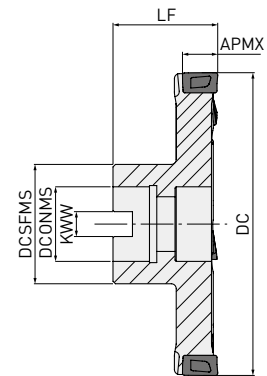
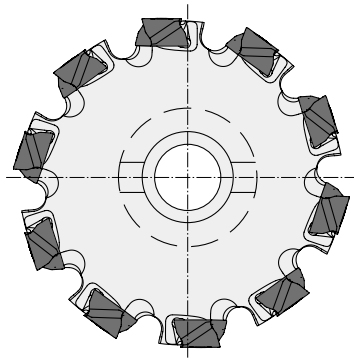
1. Per ogni misura sono disponibili design multilivello. Si prega di contattare l'ufficio tecnico di MMC Italia (info@mmc-italia.it) per i dettagli di qualsiasi geometria non indicata.

15

DCV3



P K



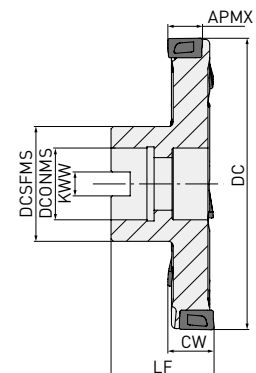
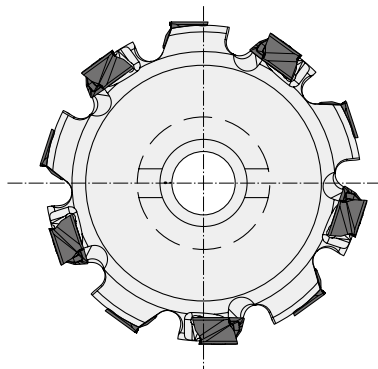
Max. APMX: 8.6 mm

TAGLIO FRONTALE

DC	ZEFP	LF	CDX	DCONMS	DCSFMS	KWW		
80 – 99.9	8	50	20.0	27	40	12.4	—	LNGU09
100 – 124.9	10	60	27.0	32	46	14.4	—	
125 – 160.0	12	60	35.0	40	55	16.4	—	

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TAGLIO COMPLETO

Ampiezza max. CW: 17.2 mm

DC	ZEFP	LF	CW	CDX	DCONMS	DCSFMS	KWW		
80 – 99.9	8	50	12-17.2	20.0	27	40	12.4	—	LNGU09
100 – 124.9	10	60	12-17.2	27.0	32	46	14.4	—	
125 – 160.0	12	60	12-17.2	35.0	40	55	16.4	—	

1/1

1. Per ogni misura sono disponibili design multilivello. Si prega di contattare l'ufficio tecnico di MMC Italia (info@mmc-italia.it) per i dettagli di qualsiasi geometria non indicata.

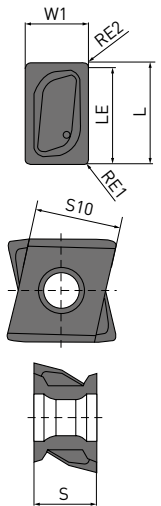
15 

DCV3

RICAMBI

Tipo portautensili		TQ (Nm)		
	Vite di serraggio	Coppia di serraggio	Chiave	Lubrificante anti-grippaggio
DCV3 L [●] NGU0906 [○] PN [○] E [○] M	TS304	1.5	TKY08W	MK1KS

INSERTI

Codice ordinazione	VP15TF	Direzione	Classe	Onatura	L	LE	S	S10	RE1	W1	Forma	Geometria
												Inserto destro raffigurato
LNGU090604PNER-M	●	R	G	E	9	8.6	6	8.5	0.4	6		
LNGU090608PNER-M	●	R	G	E	9	8.6	6	8.5	0.8	6		
LNGU090612PNER-M	●	R	G	E	9	8.6	6	8.5	1.2	6		
LNGU090616PNER-M	●	R	G	E	9	8.6	6	8.5	1.6	6		
LNGU090620PNER-M	●	R	G	E	9	8.6	6	8.5	2	6		
LNGU090624PNER-M	●	R	G	E	9	8.6	6	8.5	2.4	6		
LNGU090630PNER-M	●	R	G	E	9	8.6	6	8.5	3	6		
LNGU090640PNER-M	●	R	G	E	9	8.6	6	8.5	4	6		
LNGU090604PNEL-M	●	L	G	E	9	8.6	6	8.5	0.4	6		
LNGU090608PNEL-M	●	L	G	E	9	8.6	6	8.5	0.8	6		
LNGU090612PNEL-M	●	L	G	E	9	8.6	6	8.5	1.2	6		
LNGU090616PNEL-M	●	L	G	E	9	8.6	6	8.5	1.6	6		
LNGU090620PNEL-M	●	L	G	E	9	8.6	6	8.5	2	6		
LNGU090624PNEL-M	●	L	G	E	9	8.6	6	8.5	2.4	6		
LNGU090630PNEL-M	●	L	G	E	9	8.6	6	8.5	3	6		
LNGU090640PNEL-M	●	L	G	E	9	8.6	6	8.5	4	6		

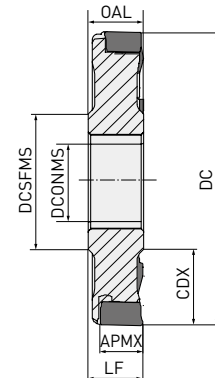
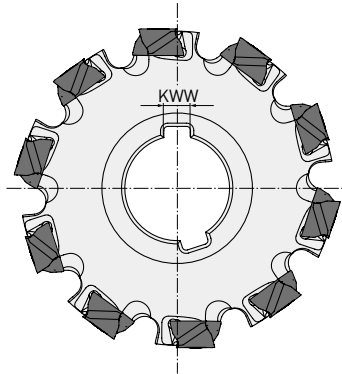
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[10 inserti in un astuccio]

DCV4



P K



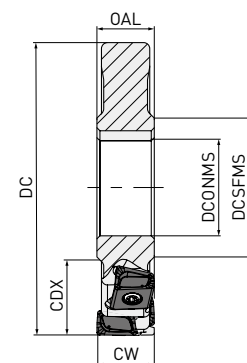
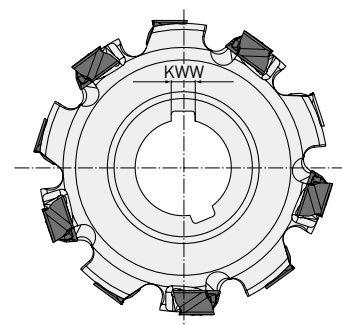
Max. APMX: RE1 < 3.0 mm 12.2 mm
RE1 > 3.0 mm 11.4 mm

TAGLIO FRONTALE

DC	ZEFP	LF = OAL	CDX	DCONMS	DCSFMS	KWW		
80 – 99.9	8	18	20.0	27	40	7	—	LNGU13
100 – 124.9	10		27.0	32	46	8	—	
125 – 159.9	12		35.0	40	55	10	—	
160 – 200	14		52.5	40	55	10	—	

1/1

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Ampiezza max. CW: 24 mm

TAGLIO COMPLETO

DC	ZEFP	CW	CDX	DCONMS	DCSFMS	KWW		
80 – 99.9	4	18–24	20.0	27	40	7	—	LNGU13
100 – 124.9	5	18–24	27.0	32	46	8	—	
125 – 159.9	6	18–24	35.0	40	55	10	—	
160 – 200	7	18–24	52.5	40	55	10	—	

1/1

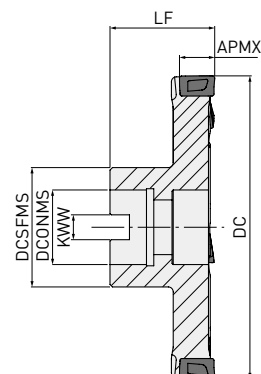
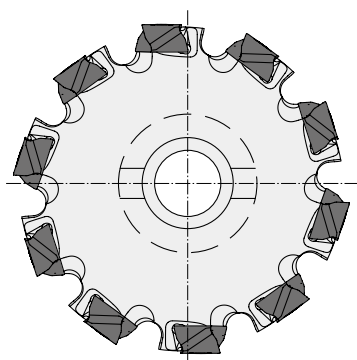
1. Per ogni misura sono disponibili design multilivello. Si prega di contattare l'ufficio tecnico di MMC Italia (info@mmc-italia.it) per i dettagli di qualsiasi geometria non indicata.

15 

DCV4



P K



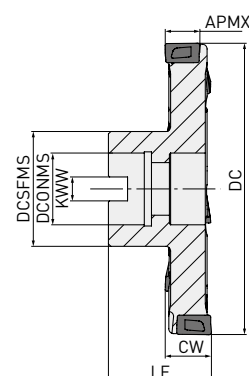
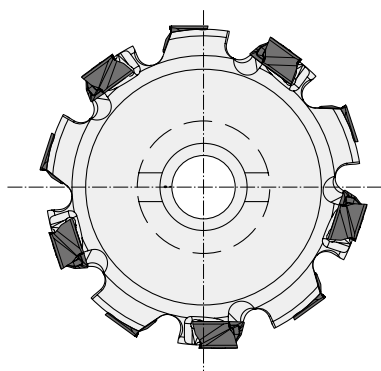
TAGLIO FRONTALE

Max. APMX: RE1 < 3.0 mm 12.2 mm
RE1 > 3.0 mm 11.4 mm

DC	ZEFP	LF	CDX	DCONMS	DCSFMS	KWW		
80 - 99.9	8 - 10	50	20	27	40	12.4	—	LNGU13
100 - 124.9	10 - 12	60	27	32	46	14.4	—	
125 - 159.9	12 - 14	60	35	40	55	16.4	—	
160 - 200	14 - 20	70	52.5	40	55	16.4	—	

1/1

15



Ampiezza max. CW: 24 mm

TAGLIO COMPLETO

DC	ZEFP	LF	CW	CDX	DCONMS	DCSFMS	KWW		
80 - 99.9	8 - 10	50	18-24	20	27	40	12.4	—	LNGU13
100 - 124.9	10 - 12	60	18-24	27	32	46	14.4	—	
125 - 159.9	12 - 14	60	18-24	35	40	55	16.4	—	
160 - 200	14 - 20	70	18-24	52.5	40	55	16.4	—	

1/1

1. Per ogni misura sono disponibili design multilivello. Si prega di contattare l'ufficio tecnico di MMC Italia (info@mmc-italia.it) per i dettagli di qualsiasi geometria non indicata.

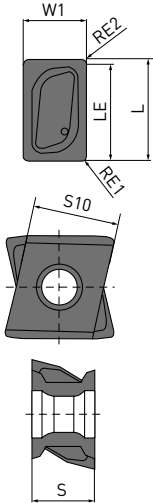
15

DCV4

RICAMBI

Tipo portautensili		TQ (Nm)		
	Vite di serraggio	Coppia di serraggio	Chiave	Lubrificante anti-grippaggio
DCV4 LNGU13080PNE	TS406	3.5	TKY15T	MK1KS

INSERTI

Codice ordinazione	MP6120 VP15TF	Direzione	Classe	Onatura	L	LE	S	S10	RE1	RE2	W1	Forma	Geometria Inserto destro raffigurato
LNGU130804PNER-M	●	R	G	E	13.0	12.2	8.0	11.0	0.4	0.8	8.0		
LNGU130804PNEL-M	●	L	G	E	13.0	12.2	8.0	11.0	0.4	0.8	8.0		
LNGU130808PNER-M	●	R	G	E	13.0	12.2	8.0	11.0	0.8	0.8	8.0		
LNGU130808PNEL-M	●	L	G	E	13.0	12.2	8.0	11.0	0.8	0.8	8.0		
LNGU130812PNER-M	●	R	G	E	13.0	12.2	8.0	11.0	1.2	0.8	8.0		
LNGU130812PNEL-M	●	L	G	E	13.0	12.2	8.0	11.0	1.2	0.8	8.0		
LNGU130816PNER-M	●	R	G	E	13.0	12.2	8.0	11.0	1.6	0.8	8.0		
LNGU130816PNEL-M	●	L	G	E	13.0	12.2	8.0	11.0	1.6	0.8	8.0		
LNGU130820PNER-M	●	R	G	E	13.0	12.2	8.0	11.0	2.0	0.8	8.0		
LNGU130820PNEL-M	●	L	G	E	13.0	12.2	8.0	11.0	2.0	0.8	8.0		
LNGU130824PNER-M	●	R	G	E	13.0	12.2	8.0	11.0	2.4	0.8	8.0		
LNGU130824PNEL-M	●	L	G	E	13.0	12.2	8.0	11.0	2.4	0.8	8.0		
LNGU130830PNER-M	●	R	G	E	13.0	11.4	8.0	11.0	3.0	1.6	8.0		
LNGU130830PNEL-M	●	L	G	E	13.0	11.4	8.0	11.0	3.0	1.6	8.0		
LNGU130840PNER-M	●	R	G	E	13.0	11.4	8.0	11.0	4.0	1.6	8.0		
LNGU130840PNEL-M	●	L	G	E	13.0	11.4	8.0	11.0	4.0	1.6	8.0		
LNGU130850PNER-M	●	R	G	E	13.0	11.4	8.0	11.0	5.0	1.6	8.0		
LNGU130850PNEL-M	●	L	G	E	13.0	11.4	8.0	11.0	5.0	1.6	8.0		
LNGU130804PNER-R	●	R	G	E	13.0	12.2	8.0	11.0	0.4	0.8	8.0		
LNGU130804PNEL-R	●	L	G	E	13.0	12.2	8.0	11.0	0.4	0.8	8.0		
LNGU130808PNER-R	●	R	G	E	13.0	12.2	8.0	11.0	0.8	0.8	8.0		
LNGU130808PNEL-R	●	L	G	E	13.0	12.2	8.0	11.0	0.8	0.8	8.0		
LNGU130812PNER-R	●	R	G	E	13.0	12.2	8.0	11.0	1.2	0.8	8.0		
LNGU130812PNEL-R	●	L	G	E	13.0	12.2	8.0	11.0	1.2	0.8	8.0		
LNGU130816PNER-R	●	R	G	E	13.0	12.2	8.0	11.0	1.6	0.8	8.0		
LNGU130816PNEL-R	●	L	G	E	13.0	12.2	8.0	11.0	1.6	0.8	8.0		
LNGU130820PNER-R	●	R	G	E	13.0	12.2	8.0	11.0	2.0	0.8	8.0		
LNGU130820PNEL-R	●	L	G	E	13.0	12.2	8.0	11.0	2.0	0.8	8.0		
LNGU130824PNER-R	●	R	G	E	13.0	12.2	8.0	11.0	2.4	0.8	8.0		
LNGU130824PNEL-R	●	L	G	E	13.0	12.2	8.0	11.0	2.4	0.8	8.0		
LNGU130830PNER-R	●	R	G	E	13.0	11.4	8.0	11.0	3.0	1.6	8.0		
LNGU130830PNEL-R	●	L	G	E	13.0	11.4	8.0	11.0	3.0	1.6	8.0		
LNGU130840PNER-R	●	R	G	E	13.0	11.4	8.0	11.0	4.0	1.6	8.0		
LNGU130840PNEL-R	●	L	G	E	13.0	11.4	8.0	11.0	4.0	1.6	8.0		
LNGU130850PNER-R	●	R	G	E	13.0	11.4	8.0	11.0	5.0	1.6	8.0		
LNGU130850PNEL-R	●	L	G	E	13.0	11.4	8.0	11.0	5.0	1.6	8.0		

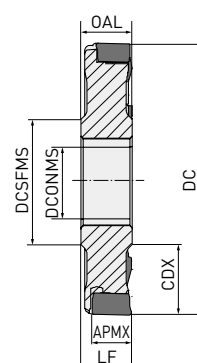
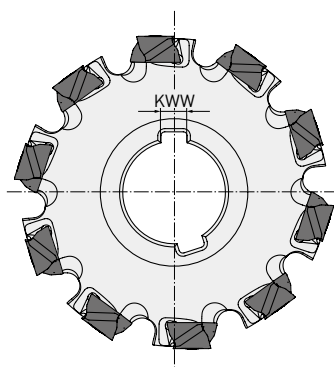
[10 inserti in un astuccio]

● : Materiale disponibile. □ : Non a magazzino, prodotto solo su ordinazione.

DCV5



P K



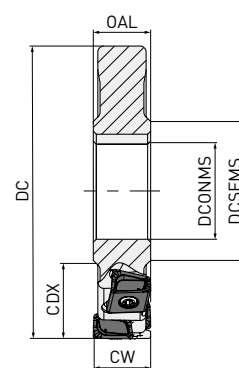
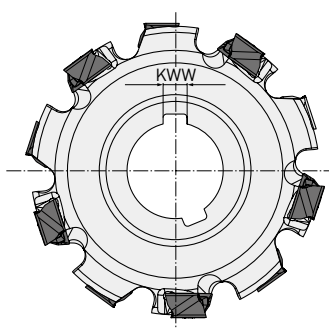
Max. APMX: RE1 < 3.0 mm 16.2 mm
RE1 > 3.0 mm 15.4 mm

TAGLIO FRONTALE

DC	ZEFP	LF = OAL	CDX	DCONMS	DCSFMS	KWW		
100 – 124.9	8	23	27.0	32	46	8	—	LNGU17
125 – 159.9	10		35.0	40	55	10	—	
160 – 199.9	12		52.5	40	55	10	—	
200 – 250	16		65.0	50	70	12	—	

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Ampiezza max. CW: 32 mm

TAGLIO COMPLETO

DC	ZEFP	CW	CDX	DCONMS	DCSFMS	KWW		
100 – 124.9	8	23 – 32	27.0	32	46	8	—	LNGU17
125 – 159.9	10		35.0	40	55	10	—	
160 – 199.9	12		52.5	40	55	10	—	
200 – 250	16		65.0	50	70	12	—	

1/1

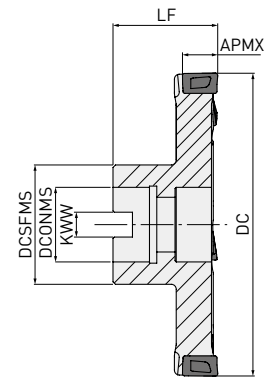
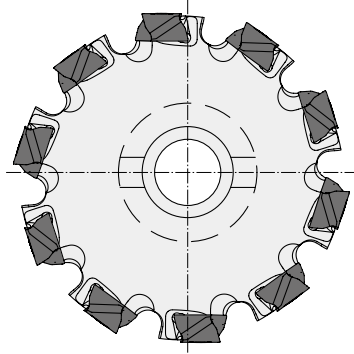
1. Per ogni misura sono disponibili design multilivello. Si prega di contattare l'ufficio tecnico di MMC Italia (info@mmc-italia.it) per i dettagli di qualsiasi geometria non indicata.

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DCV5



P K

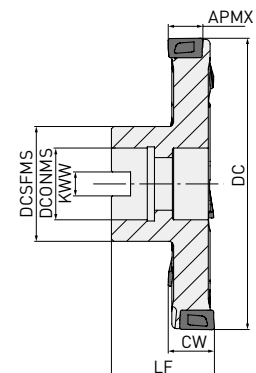
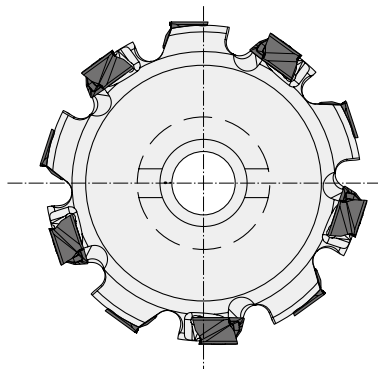


Max. APMX: RE1 < 3.0 mm 16.2 mm
RE1 > 3.0 mm 15.4 mm

TAGLIO FRONTALE

DC	ZEFP	LF	CDX	DCONMS	DCSFMS	KWW		
100 – 124.9	8 – 10	50	27	32	46	14.4	—	LNGU17
125 – 159.9	10 – 12	60	35	40	55	16.4	—	
160 – 199.9	12 – 14	60	52.5	40	55	16.4	—	
200 – 250.0	14 – 20	70	65	40	70	16.4	—	

1/1



Ampiezza max. CW: 32 mm

TAGLIO COMPLETO

DC	ZEFP	LF	CW	CDX	DCONMS	DCSFMS	KWW		
100 – 124.9	8 – 10	60	23 – 32	27	32	46	14.4	—	LNGU17
125 – 159.9	10 – 12	60		35	40	55	16.4	—	
160 – 199.9	12 – 14	70		52.5	40	55	16.4	—	
200 – 250.0	14 – 20	70		65	40	70	16.4	—	

1/1

1. Per ogni misura sono disponibili design multilivello. Si prega di contattare l'ufficio tecnico di MMC Italia (info@mmc-italia.it) per i dettagli di qualsiasi geometria non indicata.

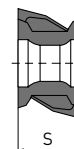
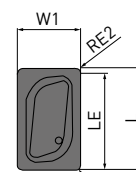
DCV5

RICAMBI

Tipo portautensili		TQ (Nm)		
	Vite di serraggio	Coppia di serraggio	Chiave	Lubrificante anti-grippaggio
DCV5 LNGU17100PNEOR	TS53	7.5	TKY25T	MK1KS

INSERTI

Codice ordinazione	MP6120	VP15TF	Direzione	Classe	Onatura	L	LE	S	S10	RE1	RE2	W1	D1	Forma	Geometria <i>Inserto destro raffigurato</i>
LNGU171004PNER-R	●	●	R	G	E	17.0	16.2	10.0	13.0	0.4	0.8	10.0	5.5		
LNGU171004PNEL-R	●	●	L	G	E	17.0	16.2	10.0	13.0	0.4	0.8	10.0	5.5		
LNGU171008PNER-R	●	●	R	G	E	17.0	16.2	10.0	13.0	0.8	0.8	10.0	5.5		
LNGU171008PNEL-R	●	●	L	G	E	17.0	16.2	10.0	13.0	0.8	0.8	10.0	5.5		
LNGU171012PNER-R	●	●	R	G	E	17.0	16.2	10.0	13.0	1.2	0.8	10.0	5.5		
LNGU171012PNEL-R	●	●	L	G	E	17.0	16.2	10.0	13.0	1.2	0.8	10.0	5.5		
LNGU171016PNER-R	●	●	R	G	E	17.0	16.2	10.0	13.0	1.6	0.8	10.0	5.5		
LNGU171016PNEL-R	●	●	L	G	E	17.0	16.2	10.0	13.0	1.6	0.8	10.0	5.5		
LNGU171020PNER-R	●	●	R	G	E	17.0	16.2	10.0	13.0	2.0	0.8	10.0	5.5		
LNGU171020PNEL-R	●	●	L	G	E	17.0	16.2	10.0	13.0	2.0	0.8	10.0	5.5		
LNGU171024PNER-R	●	●	R	G	E	17.0	16.2	10.0	13.0	2.4	0.8	10.0	5.5		
LNGU171024PNEL-R	●	●	L	G	E	17.0	16.2	10.0	13.0	2.4	0.8	10.0	5.5		
LNGU171030PNER-R	●	●	R	G	E	17.0	15.4	10.0	13.0	3.0	1.6	10.0	5.5		
LNGU171030PNEL-R	●	●	L	G	E	17.0	15.4	10.0	13.0	3.0	1.6	10.0	5.5		
LNGU171040PNER-R	●	●	R	G	E	17.0	15.4	10.0	13.0	4.0	1.6	10.0	5.5		
LNGU171040PNEL-R	●	●	L	G	E	17.0	15.4	10.0	13.0	4.0	1.6	10.0	5.5		
LNGU171050PNER-R	●	●	R	G	E	17.0	15.4	10.0	13.0	5.0	1.6	10.0	5.5		
LNGU171050PNEL-R	●	●	L	G	E	17.0	15.4	10.0	13.0	5.0	1.6	10.0	5.5		
LNGU171060PNER-R	●	●	R	G	E	17.0	15.4	10.0	13.0	6.0	1.6	10.0	5.5		
LNGU171060PNEL-R	●	●	L	G	E	17.0	15.4	10.0	13.0	6.0	1.6	10.0	5.5		
LNGU171070PNER-R	●	●	R	G	E	17.0	15.4	10.0	13.0	7.0	1.6	10.0	5.5		
LNGU171070PNEL-R	●	●	L	G	E	17.0	15.4	10.0	13.0	7.0	1.6	10.0	5.5		



1/1

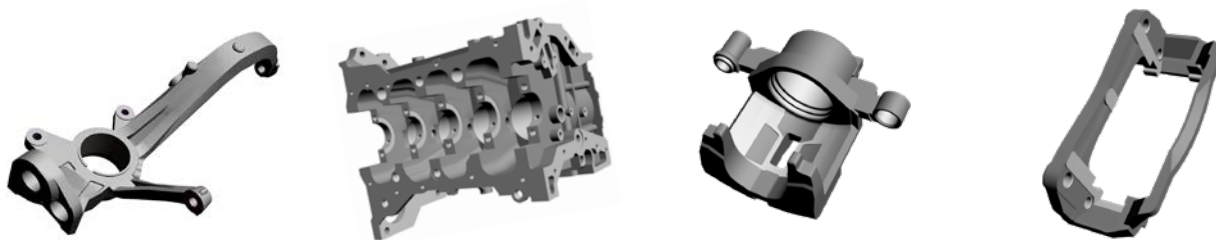
[10 inserti in un astuccio]

ESEMPI DI APPLICAZIONE

Utensile	DCV4 Ø 300 mm	DCV4 Ø 160 mm
Inserto (grado)	LNGU130804PNER-M (VP15TF)	LNGU130804PNER-M (VP15TF)
	Pinza freno (DIN GGG40.3)	Monoblocco (DIN GG25)
Pezzo da lavorare		
n (min ⁻¹)	120	500
Vc (m/min.)	113	201
fz (mm/dente)	0.09 – 0.24	0.14
Vf (mm/min.)	150 – 400	500
ap (mm)	1.0 – 2.0	1.0
Modalità di taglio	Taglio a secco	Taglio a secco
Macchina	Centro di lavoro	Orizzontale
Risultati	Durata dell'utensile all'incirca 2 volte maggiore rispetto ai prodotti convenzionali. Eccellente precisione dimensionale e straordinaria finitura superficiale. Una maggiore efficienza di lavorazione ha determinato una riduzione del 30% dei costi di lavorazione. Efficienza di lavorazione 1.5 volte superiore rispetto ai prodotti convenzionali. Durata dell'utensile all'incirca doppia. Taglio stabile con rumorosità minima e buona finitura superficiale. Maggiore efficienza di lavorazione e maggiore durata dell'utensile.	

1. Gli esempi che precedono sono applicazioni di clienti reali e dunque possono non rispettare le condizioni raccomandate.

SERIE DI FRESE A DISCO UNICA NEL SUO GENERE



Vantaggi offerti dalle ultime novità in fatto di tecnologie, materiali e geometrie delle frese.

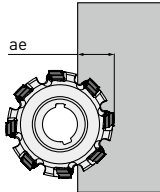
SPECIFICHE

	DCV3	DCV4	DCV5
Materiale	P K	P K	P K
Bassa resistenza di taglio	◎	◎	◎
Robustezza	◎	◎	◎
Forma inserto		Tangenziale	Tangenziale
ZNF		Inserto bilaterale	Inserto bilaterale
ZNP	4	4	4
Taglio frontale Profondità di taglio max. APMX	RE < 4.0 mm 8.6 mm	RE < 3.0 mm 12.2 mm	RE < 3.0 mm 16.2 mm
	RE ≥ 3.0mm 11.4 mm	RE ≥ 3.0mm 11.4 mm	RE ≥ 3.0 mm 15.4 mm
Taglio completo Max. DC	Ø 300 mm	Ø 400 mm	Ø 660 mm

DCV3 / DCV4 / DCV5

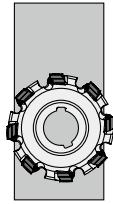
CONDIZIONI DI TAGLIO RACCOMANDATE

FRESATURA IN SPALLAMENTO

Materiale	Durezza	Grado	Vc	ap	ae	fz	Modalità di taglio
P	Acciaio ≤180HB	MP6120 VP15TF	150 (130 – 180)	≤APMX	<10%	0.10 (0.08 – 0.15)	
					<30%		
					≤50%		
					≤2.0	0.12 (0.08 – 0.20)	
					≤4.0	0.12 (0.08 – 0.20)	
K	Acciaio al carbonio/ acciaio legato	MP6120 VP15TF	150 (130 – 180)	≤4.0	<10%	0.12 (0.08 – 0.20)	
				≤4.0	≤50%	0.10 (0.08 – 0.15)	
				≤APMX	<10%	0.10 (0.08 – 0.15)	
				≤APMX	≤50%	0.10 (0.08 – 0.12)	
	Ghisa	VP15TF	150 (130 – 180)	≤2.0	≤50%	0.12 (0.08 – 0.20)	
				≤4.0	<10%	0.12 (0.08 – 0.20)	
				≤4.0	≤50%	0.10 (0.08 – 0.15)	
				≤APMX	<10%	0.10 (0.08 – 0.15)	
	Ghisa grigia	VP15TF	130 (110 – 160)	≤2.0	≤50%	0.12 (0.08 – 0.20)	
				≤4.0	<10%	0.12 (0.08 – 0.20)	
				≤4.0	≤50%	0.10 (0.08 – 0.15)	
				≤APMX	<10%	0.10 (0.08 – 0.15)	
	Ghisa sferoidale	VP15TF	130 (110 – 160)	≤2.0	≤50%	0.12 (0.08 – 0.20)	
				≤4.0	<10%	0.12 (0.08 – 0.20)	
				≤4.0	≤50%	0.10 (0.08 – 0.15)	
				≤APMX	<10%	0.10 (0.08 – 0.15)	
				≤APMX	≤50%	0.10 (0.08 – 0.12)	

1/1

FRESATURA FRONTALE

Materiale	Durezza	Grado	Vc	ap	fz	Modalità di taglio
P	Acciaio ≤180HB	MP6120 VP15TF	150 (130 – 180)	≤APMX	0.10 (0.08 – 0.15)	
K	Acciaio al carbonio/ acciaio legato	MP6120 VP15TF	150 (130 – 180)	≤2.0	0.12 (0.08 – 0.20)	
				≤4.0	0.10 (0.08 – 0.15)	
				≤APMX	0.10 (0.08 – 0.12)	
	Ghisa	VP15TF	150 (130 – 180)	≤2.0	0.12 (0.08 – 0.20)	
				≤4.0	0.10 (0.08 – 0.15)	
				≤APMX	0.10 (0.08 – 0.12)	
	Ghisa grigia	VP15TF	150 (130 – 180)	≤2.0	0.12 (0.08 – 0.20)	
				≤4.0	0.10 (0.08 – 0.15)	
				≤APMX	0.10 (0.08 – 0.12)	
	Ghisa sferoidale	VP15TF	130 (110 – 160)	≤2.0	0.12 (0.08 – 0.20)	
				≤4.0	0.10 (0.08 – 0.15)	
				≤APMX	0.10 (0.08 – 0.12)	

1/1



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