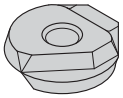
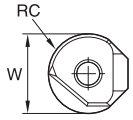




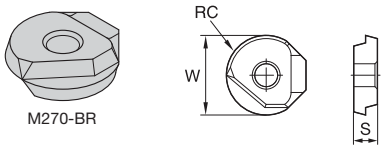
- -BF geometry is the first choice for all finishing and light operations.

● first choice
○ alternate choice

P	○	○	●	●	●	●
M			○	●	○	○
K	●	●	○	○		○
N						
S				●		
H	●	●				

M270 BF

catalogue number	W	S	RC	hm	TN2505	TN2510	TN6525	TN6540	TN7525	TN7535
M270BF10	10,00	2,38	5,00	0,08	2012698	2012700	●	●	●	●
M270BF12	12,00	3,18	6,00	0,08	2012718	2012720	2957538	●	●	●
M270BF16	16,00	4,76	8,00	0,08	2012728	2012730	2957541	●	●	●
M270BF20	20,00	4,76	10,00	0,10	2012748	2012750	2957542	●	●	●
M270BF25	25,00	4,76	12,50	0,10	2012758	2012760	●	●	●	●
M270BF32	32,00	4,76	16,00	0,10	2012778	2012780	●	●	●	●



- -BR geometry is the first choice for all semi-finishing and medium-duty applications.

● first choice
○ alternate choice

P	○	○	●	●	●	●
M			○	●	○	○
K	●	●	○	○		○
N						
S				●		
H	●	●				

M270 BR

catalogue number	W	S	RC	hm	TN2505	TN2510	TN6525	TN6540	TN7525	TN7535
M270BR10	10,00	2,38	5,00	0,08	-	2012610	-	-	2012612	2012624
M270BR12	12,00	3,18	6,00	0,08	-	2012630	-	2957539	2012632	2012634
M270BR16	16,00	4,76	8,00	0,08	-	2012640	-	2957540	2012642	2113506
M270BR20	20,00	4,76	10,00	0,10	-	2012658	-	2957543	2012660	2012662
M270BR25	25,00	4,76	12,50	0,10	-	2012668	-	-	2012670	2012672
M270BR32	32,00	4,76	16,00	0,10	-	2012688	-	-	2012690	2012692

Recommended Starting Speeds [m/min]

Material Group		TN2505			TN2510			TN6525			TN6540		
P	1	550	**420**	360	660	**580**	540	410	**320**	280	360	**280**	240
	2	320	**240**	205	410	**370**	330	320	**250**	215	250	**190**	170
	3	320	**240**	205	370	**330**	305	280	**215**	185	215	**170**	140
	4	–	**–**	–	275	**260**	230	235	**170**	145	180	**130**	110
	5	–	**–**	–	330	**300**	275	310	**235**	200	240	**180**	150
	6	–	**–**	–	230	**205**	175	205	**160**	130	160	**120**	100
M	1	–	**–**	–	270	**240**	210	190	**120**	80	130	**80**	60
	2	–	**–**	–	245	**210**	190	120	**80**	50	80	**50**	40
	3	–	**–**	–	190	**175**	150	125	**80**	55	85	**50**	40
K	1	400	**300**	250	420	**360**	300	275	**245**	220	220	**205**	180
	2	540	**365**	280	360	**300**	250	215	**190**	180	175	**155**	140
	3	310	**190**	155	300	**250**	200	180	**160**	145	155	**145**	125
N	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	–	**–**	–	50	**35**	30
	2	–	**–**	–	–	**–**	–	–	**–**	–	25	**20**	10
	3	–	**–**	–	–	**–**	–	–	**–**	–	70	**40**	30
	4	–	**–**	–	–	**–**	–	–	**–**	–	60	**30**	25
H	1	175	**140**	95	145	**110**	70	–	**–**	–	–	**–**	–
	2	175	**140**	95	145	**110**	70	–	**–**	–	–	**–**	–
	3	140	**115**	80	115	**80**	45	–	**–**	–	–	**–**	–

Material Group		TN7525			TN7535			TTI25		
P	1	410	**310**	280	545	**475**	445	430	**360**	300
	2	310	**250**	215	335	**305**	275	310	**250**	215
	3	280	**215**	185	305	**275**	245	310	**250**	215
	4	235	**170**	145	230	**210**	190	265	**215**	180
	5	310	**235**	200	310	**275**	250	320	**235**	200
	6	205	**160**	130	190	**160**	130	145	**110**	90
M	1	245	**220**	185	245	**220**	185	480	**310**	215
	2	220	**190**	170	220	**190**	170	325	**205**	145
	3	175	**155**	140	175	**155**	140	320	**210**	145
K	1	380	**280**	240	355	**320**	290	220	**185**	155
	2	325	**240**	200	280	**250**	230	180	**145**	125
	3	240	**200**	170	235	**210**	190	145	**125**	100
N	1	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–
	4	–	**–**	–	–	**–**	–	–	**–**	–
H	1	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

Recommended Starting Feeds [mm] • .B..10

Light Machining	General Purpose	Heavy Machining

At 4,76 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,12	**0,23**	0,42	0,08	**0,16**	0,29	0,06	**0,12**	0,21	0,05	**0,10**	0,18	0,05	**0,10**	0,17	BF
BR	0,19	**0,29**	0,51	0,14	**0,20**	0,35	0,10	**0,15**	0,25	0,09	**0,13**	0,22	0,08	**0,12**	0,20	BR

At 2,38 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,14	**0,27**	0,49	0,10	**0,19**	0,34	0,07	**0,14**	0,25	0,06	**0,12**	0,21	0,06	**0,11**	0,19	BF
BR	0,22	**0,34**	0,61	0,16	**0,24**	0,40	0,12	**0,17**	0,29	0,10	**0,15**	0,25	0,09	**0,14**	0,23	BR

At 1,19 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,18	**0,36**	0,68	0,13	**0,25**	0,45	0,09	**0,18**	0,32	0,08	**0,16**	0,28	0,08	**0,15**	0,25	BF
BR	0,29	**0,46**	0,84	0,21	**0,31**	0,54	0,15	**0,23**	0,39	0,13	**0,20**	0,33	0,12	**0,18**	0,30	BR

At 0,60 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,25	**0,51**	1,02	0,18	**0,34**	0,63	0,13	**0,25**	0,44	0,11	**0,22**	0,38	0,10	**0,20**	0,35	BF
BR	0,41	**0,66**	1,34	0,28	**0,44**	0,76	0,21	**0,31**	0,53	0,18	**0,27**	0,45	0,17	**0,25**	0,41	BR

NOTE: Use "Light Machining" value as starting feed rate.

Recommended Starting Feeds [mm] • .B..12

Light Machining	General Purpose	Heavy Machining

At 5,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BR	0,13	**0,29**	0,43	0,09	**0,20**	0,30	0,07	**0,15**	0,22	0,06	**0,13**	0,19	0,06	**0,12**	0,18	BR
BF	0,21	**0,39**	0,58	0,15	**0,27**	0,40	0,11	**0,20**	0,29	0,10	**0,18**	0,25	0,09	**0,16**	0,23	BF

At 2,50 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BR	0,15	**0,33**	0,50	0,11	**0,24**	0,35	0,08	**0,17**	0,26	0,07	**0,15**	0,22	0,06	**0,14**	0,20	BR
BF	0,24	**0,46**	0,69	0,17	**0,32**	0,47	0,13	**0,23**	0,34	0,11	**0,20**	0,29	0,10	**0,18**	0,27	BF

At 1,25 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BR	0,20	**0,45**	0,68	0,14	**0,31**	0,46	0,11	**0,23**	0,34	0,09	**0,20**	0,29	0,08	**0,18**	0,27	BR
BF	0,32	**0,61**	0,94	0,23	**0,42**	0,62	0,17	**0,31**	0,45	0,15	**0,26**	0,38	0,13	**0,24**	0,35	BF

At 0,63 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BR	0,28	**0,63**	0,99	0,20	**0,43**	0,64	0,15	**0,31**	0,46	0,13	**0,27**	0,40	0,12	**0,25**	0,36	BR
BF	0,45	**0,89**	1,42	0,31	**0,58**	0,87	0,23	**0,42**	0,61	0,20	**0,36**	0,53	0,18	**0,33**	0,48	BF

NOTE: Use "Light Machining" value as starting feed rate.

Recommended Starting Feeds [mm] • .B..16

Light Machining	General Purpose	Heavy Machining

At 8,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,14	**0,28**	0,45	0,10	**0,20**	0,31	0,08	**0,15**	0,23	0,07	**0,13**	0,20	0,06	**0,12**	0,18	BF
BR	0,21	**0,38**	0,59	0,15	**0,27**	0,41	0,11	**0,20**	0,30	0,10	**0,17**	0,26	0,09	**0,16**	0,24	BR

At 4,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,16	**0,33**	0,52	0,12	**0,23**	0,36	0,09	**0,17**	0,27	0,08	**0,15**	0,23	0,07	**0,14**	0,21	BF
BR	0,24	**0,45**	0,69	0,17	**0,31**	0,48	0,13	**0,23**	0,35	0,11	**0,20**	0,30	0,10	**0,18**	0,28	BR

At 2,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,21	**0,44**	0,70	0,15	**0,31**	0,48	0,11	**0,23**	0,35	0,10	**0,20**	0,30	0,09	**0,18**	0,28	BF
BR	0,32	**0,60**	0,94	0,23	**0,42**	0,63	0,17	**0,31**	0,46	0,15	**0,26**	0,40	0,13	**0,24**	0,36	BR

At 1,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,29	**0,61**	0,99	0,21	**0,43**	0,66	0,16	**0,31**	0,48	0,14	**0,27**	0,42	0,12	**0,25**	0,38	BF
BR	0,44	**0,85**	1,38	0,31	**0,57**	0,88	0,23	**0,42**	0,63	0,20	**0,36**	0,54	0,18	**0,33**	0,50	BR

NOTE: Use "Light Machining" value as starting feed rate.

Recommended Starting Feeds [mm] • .B..20

Light Machining	General Purpose	Heavy Machining

At 10,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,19	**0,24**	0,40	0,13	**0,17**	0,28	0,10	**0,13**	0,21	0,09	**0,11**	0,18	0,08	**0,10**	0,17	BF
BR	0,24	**0,38**	0,65	0,17	**0,27**	0,46	0,13	**0,20**	0,34	0,11	**0,17**	0,30	0,10	**0,16**	0,27	BR

At 5,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,22	**0,28**	0,46	0,15	**0,20**	0,33	0,12	**0,15**	0,24	0,10	**0,13**	0,21	0,09	**0,12**	0,19	BF
BR	0,27	**0,44**	0,76	0,20	**0,31**	0,53	0,15	**0,23**	0,39	0,13	**0,20**	0,34	0,12	**0,18**	0,31	BR

At 2,50 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,28	**0,37**	0,61	0,20	**0,27**	0,43	0,15	**0,20**	0,32	0,13	**0,17**	0,28	0,12	**0,16**	0,25	BF
BR	0,36	**0,58**	1,01	0,26	**0,41**	0,70	0,19	**0,30**	0,52	0,17	**0,26**	0,45	0,15	**0,24**	0,41	BR

At 1,25 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,39	**0,51**	0,85	0,28	**0,36**	0,59	0,21	**0,27**	0,44	0,18	**0,23**	0,38	0,17	**0,21**	0,35	BF
BR	0,50	**0,81**	1,44	0,36	**0,56**	0,97	0,26	**0,42**	0,71	0,23	**0,36**	0,61	0,21	**0,33**	0,56	BR

NOTE: Use "Light Machining" value as starting feed rate.

Recommended Starting Feeds [mm] • .B..25

Light Machining	General Purpose	Heavy Machining

At 12,50 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,17	**0,31**	0,50	0,13	**0,22**	0,36	0,09	**0,16**	0,26	0,08	**0,14**	0,23	0,08	**0,13**	0,21	BF
BR	0,24	**0,38**	0,65	0,17	**0,27**	0,46	0,13	**0,20**	0,34	0,11	**0,17**	0,30	0,10	**0,16**	0,27	BR

At 6,25 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,20	**0,35**	0,58	0,15	**0,25**	0,41	0,11	**0,19**	0,30	0,09	**0,16**	0,27	0,09	**0,15**	0,24	BF
BR	0,27	**0,44**	0,76	0,20	**0,31**	0,53	0,15	**0,23**	0,39	0,13	**0,20**	0,34	0,12	**0,18**	0,31	BR

At 3,13 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,27	**0,47**	0,77	0,19	**0,33**	0,54	0,14	**0,25**	0,40	0,12	**0,21**	0,35	0,11	**0,20**	0,32	BF
BR	0,36	**0,58**	1,02	0,26	**0,41**	0,70	0,19	**0,30**	0,52	0,17	**0,26**	0,45	0,15	**0,24**	0,41	BR

At 1,56 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,37	**0,65**	1,09	0,26	**0,46**	0,75	0,19	**0,34**	0,55	0,17	**0,29**	0,47	0,15	**0,27**	0,43	BF
BR	0,50	**0,81**	1,44	0,36	**0,56**	0,97	0,26	**0,42**	0,71	0,23	**0,36**	0,61	0,21	**0,33**	0,56	BR

NOTE: Use "Light Machining" value as starting feed rate.

Recommended Starting Feeds [mm] • .B..32

Light Machining	General Purpose	Heavy Machining

At 16,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,17	**0,30**	0,47	0,13	**0,22**	0,34	0,09	**0,16**	0,25	0,08	**0,14**	0,22	0,08	**0,13**	0,20	BF
BR	0,23	**0,38**	0,59	0,17	**0,27**	0,42	0,13	**0,20**	0,31	0,11	**0,17**	0,27	0,10	**0,16**	0,25	BR

At 8,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,20	**0,35**	0,55	0,15	**0,25**	0,39	0,11	**0,19**	0,29	0,09	**0,16**	0,25	0,09	**0,15**	0,23	BF
BR	0,27	**0,43**	0,69	0,19	**0,31**	0,49	0,14	**0,23**	0,36	0,13	**0,20**	0,32	0,12	**0,18**	0,29	BR

At 4,00 Axial Depth of Cut (ap)

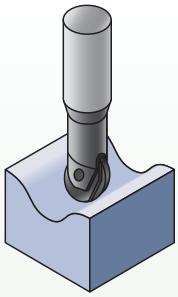
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,26	**0,46**	0,72	0,19	**0,33**	0,51	0,14	**0,25**	0,38	0,12	**0,21**	0,33	0,11	**0,20**	0,30	BF
BR	0,35	**0,57**	0,92	0,25	**0,41**	0,64	0,19	**0,30**	0,48	0,17	**0,26**	0,41	0,15	**0,24**	0,38	BR

At 2,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,36	**0,64**	1,01	0,26	**0,45**	0,71	0,19	**0,34**	0,52	0,17	**0,29**	0,45	0,15	**0,27**	0,41	BF
BR	0,49	**0,80**	1,28	0,35	**0,56**	0,89	0,26	**0,42**	0,65	0,23	**0,36**	0,57	0,21	**0,33**	0,52	BR

NOTE: Use "Light Machining" value as starting feed rate.

Selecting the Correct Insert and Cutting Conditions for Your Application

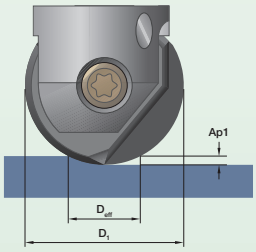


1. Insert Style: Considerations for Selecting the Correct Insert

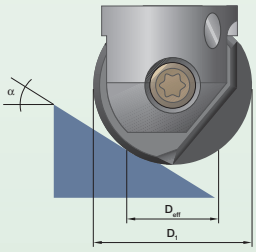
Best Choices for Insert and Grade Selection ● First choice ○ Alternate choice	BR Geometry		BF Geometry
Grade	**TN7535**	**TN2510**	**TN2505**
Roughing Operation	●	○	
Finishing Operation		○	●
Low RPM Machine	●	○	
Flat Areas or Face Milling (≤10° inclination)	●	○	
Hard Machining		○	●
Unstable and/or Long Overhangs	●	○	
HSM or 5-Axis Machining (smaller ap/ae values)	●	○	

2. Calculating effective diameter and resulting surface speed

It is important to consider the effective diameter (Deff) when using light depths of cut in order to properly calculate RPM values. Use the following formula when machining flat surfaces or inclinations of 10° or less to find the Deff value, and then use this for RPM calculations as opposed to using the overall insert diameter (D1).



When machining inclinations between 11° and 55°, further modification of vc is required. Apply factor "k" from the given formula to calculate the correct vc (vceff). This corrected value is then used to calculate the proper RPM for the tool.



$$Deff = \sqrt{D1^2-(D1-2Ap1)^2}$$

$$k = \frac{1}{\sin\left[\alpha + \arccos\left(1-(2\,(Ap1/D1))\right)\right]}$$

$$v_c eff = v_c \times k$$

Starting Values for Semi-Finishing in Common Material Types (L/D ratio <3 x D1)

M270 is usually applied for semi-finishing and finishing operations; Ap1/ae conditions depend on the operation. As a general rule: Ap1/ae ≤0,05D.

Material	Tool Diameter																	
	Ø10			Ø12			Ø16			Ø20			Ø25			Ø32		
	max rec. (mm)		fz (mm/ tooth)	max rec. (mm)		fz (mm/ tooth)	max rec. (mm)		fz (mm/ tooth)	max rec. (mm)		fz (mm/ tooth)	max rec. (mm)		fz (mm/ tooth)	max rec. (mm)		fz (mm/ tooth)
	Ap1	ae		Ap1	ae		Ap1	ae		Ap1	ae		Ap1	ae		Ap1	ae	
Soft Steel <250 HB	0,7	0,7	0,2	0,8	0,8	0,2	1,1	1,1	0,27	1,3	1,3	0,27	1,7	1,7	0,3	2,1	2,1	0,3
High-Strength Steel 33–44 HRC	0,5	0,5	0,15	0,6	0,6	0,2	0,8	0,8	0,25	1	1	0,25	1,3	1,3	0,25	1,6	1,6	0,25
Hardened Steel 44–55 HRC	0,3	0,3	0,15	0,4	0,4	0,2	0,5	0,5	0,22	0,7	0,7	0,22	0,8	0,8	0,25	1,1	1,1	0,25
Grey Cast Iron GG25…	1	1	0,2	1,2	1,2	0,25	1,6	1,6	0,25	2	2	0,25	2,5	2,5	0,3	3,2	3,2	0,3
Nodular Cast Iron GGG60…	0,7	0,7	0,2	0,8	0,8	0,25	1,1	1,1	0,25	1,3	1,3	0,25	1,7	1,7	0,3	2,1	2,1	0,3