

### Roughing Ball Nose Cutters Cover a Wide Range of Applications

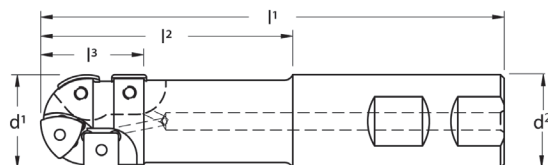
#### Performance and Versatility

The TBNR copy-milling cutter works equally well on conventional milling machines, copy milling machines and NC machines.

Mainly employed in the production of molds and dies, this universal tool is also proven in volume production, e.g. in housing manufacture. It not only performs all kinds of copy-milling operations, but can also plunge-cut at an angle. Its capabilities even include drilling from the solid. The key to this exemplary versatility lies in the cutter design and in the special arrangement of the indexable inserts.

The TBNR can also be fitted with precision-ground inserts if required. The inserts are held in place by countersunk screws, ensuring optimum chip flow since there are no interfering top clamping elements.

The TBNR ball nose copy-milling cutter is supplied in diameters ranging from 5/8" to 2".



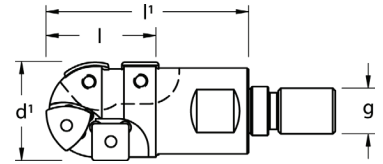
#### End Mills with Coolant Through

Designation	d	d <sup>1</sup>	d <sup>2</sup>	l <sup>2</sup>	l <sup>3</sup>	Insert		Insert Screw	Screw Driver Type Wrench
						Radius (QTY.)	Square (QTY.)		
<b>Regular Length</b>									
TBNR-0625R	.625	.750	3.50	1.47	.71	222.67.102 (2)	SPNX-21.51 (2)	214.80.061(Rad.) 214.80.687(Sq.)	214.80.059 214.80.866
TBNR-0750R	.750	.750	4.00	1.97	.75	222.67.104 (2)	SPNX-21.51 (2)	214.80.687	214.80.866
TBNR-1000R	1.000	1.000	4.00	1.72	1.11	222.67.106 (2)	SDNT-322 (2)	214.80.951	214.80.824
TBNR-1250R	1.250	1.250	5.00	2.72	1.22	222.67.108 (2)	SDNT-322 (2)	214.80.388	214.80.824
TBNR-1500R	1.500	1.250	5.00	2.72	1.37	222.67.112 (2)	SDNT-322 (2)	214.80.388	214.80.824
TBNR-2000R	2.000	2.000	6.25	3.00	1.81	222.67.114 (3)	SPNT-432 (2)	214.80.072	214.80.994
<b>Extended Length</b>									
TBNR-0625	.625	.750	4.00	1.97	.71	222.67.102 (2)	SPNX-21.51 (2)	214.80.061(Rad.) 214.80.687(Sq.)	214.80.059 214.80.866
TBNR-0750	.750	.750	5.00	2.97	.75	222.67.104 (2)	SPNX-21.51 (2)	214.80.687	214.80.866
TBNR-1000	1.000	1.000	5.00	2.72	1.11	222.67.106 (2)	SDNT-322 (2)	214.80.951	214.80.824
TBNR-1250	1.250	1.250	6.00	3.72	1.22	222.67.108 (2)	SDNT-322 (2)	214.80.388	214.80.824
TBNR-1500	1.500	1.250	6.00	3.72	1.38	222.67.112 (2)	SDNT-322 (2)	214.80.388	214.80.824
TBNR-2000	2.000	2.000	7.25	4.00	1.81	222.67.114 (3)	SPNT-432 (2)	214.80.072	214.80.994
<b>Extra Long Length</b>									
TBNR-2000LX	2.000	2.000	10.00	6.75	1.81	222.67.114 (3)	SPNT-432 (3)	214.80.072	214.80.994
TBNR-2000L	2.000	2.000	10.00	6.75	3.00	222.67.114 (3)	SPNT-432 (5)	214.80.072	214.80.994

Remember to use COPASLIP® anti-seize compound on all insert screws

# TBNR

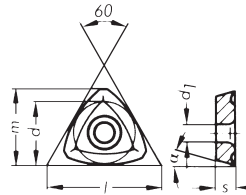
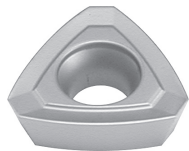
## Roughing Ball Nose Milling Cutters



### Screw-On Milling Cutters

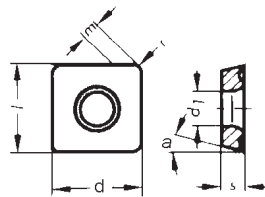
Designation	d <sup>1</sup>	g	l <sup>1</sup>	l	flutes	Insert		Insert Screw	Screw Driver Type Wrench
						Radius (QTY.)	Square (QTY.)		
TBNR-0625-TS	.625	M8	1.50	.71	1	222.67.102 (2)	SPNX-21.51 (2)	214.80.061(Rad.) 214.80.687(Sq.)	214.80.059 214.80.866
TBNR-0750-TS	.750	M10	1.50	.75	1	222.67.104 (2)	SPNX-21.51 (2)	214.80.687	214.80.866
TBNR-1000-TS	1.000	M12	2.00	1.10	1	222.67.106 (2)	SDNT-322 (2)	214.80.951	214.80.824
TBNR-1250-TS	1.250	M16	1.75	1.22	1	222.67.108 (2)	SDNT-322 (2)	214.80.388	214.80.824

Remember to use COPASLIP® anti-seize compound on all insert screws



### TBNR Radius Inserts

Designation	l	s	r	d	d <sup>1</sup>	m	a	Material												
								Coated					Uncoated			Cermet				
222.67.102 (5/8")	---	3/32	---	7/32	.100	.263	11°	●	●	●	●	●	●	●	●	●	●	●	●	●
222.67.104 (3/4")	---	7/64	---	1/4	.110	.303	11°	●	●	●	●	●	●	●	●	●	●	●	●	●
222.67.106 (1")	---	1/8	---	3/8	.173	.446	15°	●	●	●	●	●	●	●	●	●	●	●	●	●
222.67.108 (1 1/4")	---	3/16	---	13/32	.173	.500	15°	●	●	●	●	●	●	●	●	●	●	●	●	●
222.67.112 (1 1/2")	---	3/16	---	1/2	.173	.611	11°	●	●	●	●	●	●	●	●	●	●	●	●	●
222.67.114 (2")	---	3/16	---	1/2	.217	.593	11°	●	●	●	●	●	●	●	●	●	●	●	●	●



### TBNR Square Inserts

Designation	l	s	r	d	d <sup>1</sup>	m	a	Material												
								Coated					Uncoated			Cermet				
SDNT-322	.375	1/8	1/32	3/8	.173	.065	15°	●	●	●	●	●	●	●	●	●	●	●	●	●
SPNT-432	.500	3/16	1/32	1/2	.217	.091	11°	●	●	●	●	●	●	●	●	●	●	●	●	●
SPNX-21.51	.250	7/64	1/64	1/4	.110	.045	11°	●	●	●	●	●	●	●	●	●	●	●	●	●