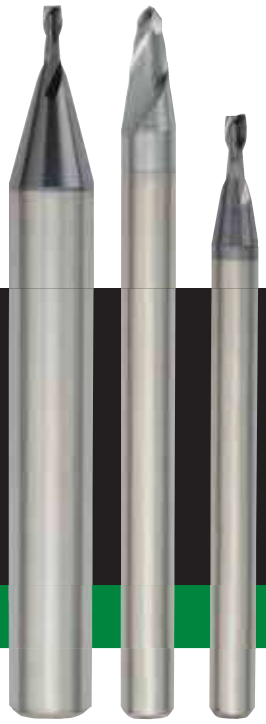
2017 Master Catalog

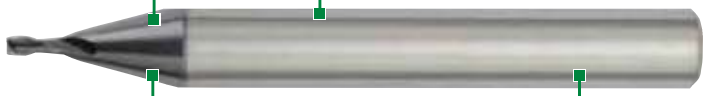
WIDIA™

Micro Solid Carbide End Mills



Micro solid carbide end mills offer plunging, slotting, profiling, and 3D milling for a wide range of materials and applications. They are designed to provide efficient machining in a wide range of steel, cast iron, copper and copper alloys, and aluminum materials. Micro square and ball nose tools, designed for the most demanding end users, offer exceptional tool life and precision at high operating parameters.

- 2-flute ball nose and 2–3 flute cutters with sharp corner.
- Micro tools for a wide range of materials.
- Roughing and finishing in one tool.
- Diameter range from 0.4–3mm.



Micro Solid Carbide End Mills

- Increases your manufacturing flexibility and cost efficiency.
- Suitable for roughing and finishing.
- Rigid shank gives extra toughness and strength.

4632 Series

- Wide range of diameters from 0.4–2mm.
- Medium steel, aluminum, copper, and cast iron.
- Center cut.
- Available coated and uncoated.

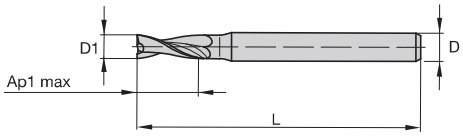
4633 Series

- Wide range of diameters from 0.4–3mm.
- Medium steel, aluminum, copper, and cast iron.
- Center cut.
- Available coated and uncoated.
- Rigid shank gives extra toughness and strength.

4651 Series

- Ball nose tool in range of diameter from 1–2mm with 3mm shank.
- Medium steel, aluminum, copper, and cast iron.
- Center cut ball nose.
- Available coated and uncoated.

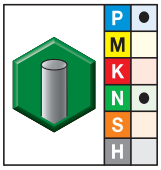
- Center cutting.
- Standard items listed. Additional styles and coatings made-to-order.

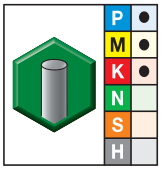


End Mill Tolerances

D1	tolerance e8	D	tolerance h6 + / -
≤ 3	-0,014/-0,028	≤ 3	0/0,006
> 3–6	-0,020/-0,038	> 3–6	0/0,008
> 6–10	-0,025/-0,047	> 6–10	0/0,009
> 10–18	-0,032/-0,059	> 10–18	0/0,011
> 18–30	-0,040/-0,073	> 18–30	0/0,013

Series 4632

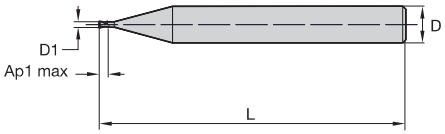




● first choice
○ alternate choice

grade UNCOATED		grade TiAlN-RT TiAlN					
order #	catalog #	order #	catalog #	D1	D	length of cut Ap1 max	length L
1656841	463200400..	1602266	463200400RT	0,4	3	1,50	38
1656844	463200500..	1602268	463200500RT	0,5	3	1,50	38
1656849	463200600..	1602270	463200600RT	0,6	3	1,50	38
1656853	463200800..	1602273	463200800RT	0,8	3	1,50	38
1656858	463201000..	1602274	463201000RT	1,0	3	2,00	38
1656863	463201500..	1602275	463201500RT	1,5	3	2,00	38
1656867	463202000..	–		2,0	3	8,00	38

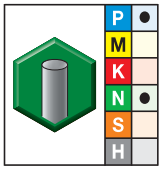
- Center cutting.
- Standard items listed. Additional styles and coatings made-to-order.

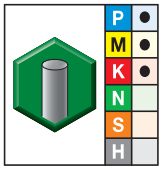


End Mill Tolerances

D1	tolerance e8	D	tolerance h6 + / -
≤ 3	-0,014/-0,028	≤ 3	0/0,006
> 3–6	-0,020/-0,038	> 3–6	0/0,008
> 6–10	-0,025/-0,047	> 6–10	0/0,009
> 10–18	-0,032/-0,059	> 10–18	0/0,011
> 18–30	-0,040/-0,073	> 18–30	0/0,013

Series 4633

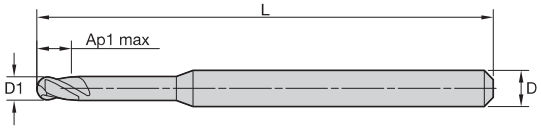




● first choice
○ alternate choice

grade UNCOATED		grade TiAlN-RT TiAlN					
order #	catalog #	order #	catalog #	D1	D	length of cut Ap1 max	length L
1656873	463300400..	1656875	463300400RT	0,4	3	1,50	38
1656878	463300500..	1656880	463300500RT	0,5	3	1,50	38
1656883	463300600..	1656885	463300600RT	0,6	3	1,50	38
1656888	463300800..	1656890	463300800RT	0,8	3	1,50	38
1656893	463301000..	1656895	463301000RT	1,0	3	2,00	38
1656898	463301200..	1656900	463301200RT	1,2	3	2,00	38
1656901	463301500..	1656903	463301500RT	1,5	3	2,00	38
1656906	463301800..	1656908	463301800RT	1,8	3	2,00	38
1656909	463302000..	1656910	463302000RT	2,0	3	8,00	38
	–	1656913	463302500RT	2,5	3	9,00	38
	–	1656916	463303000RT	3,0	3	12,00	38

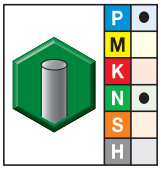
- Center cutting.
- Standard items listed. Additional styles and coatings made-to-order.

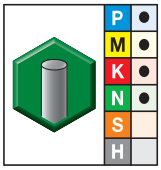


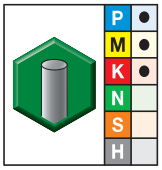
End Mill Tolerances

D1	tolerance e8	D	tolerance h6 + / -
≤ 3	-0,014/-0,028	≤ 3	0/0,006
> 3–6	-0,020/-0,038	> 3–6	0/0,008
> 6–10	-0,025/-0,047	> 6–10	0/0,009
> 10–18	-0,032/-0,059	> 10–18	0/0,011
> 18–30	-0,040/-0,073	> 18–30	0/0,013

Series 4651







● first choice
○ alternate choice

grade UNCOATED		grade TiCN-CT TiCN		grade TiAlN-RT TiAlN					
order #	catalog #	order #	catalog #	order #	catalog #	D1	D	length of cut Ap1 max	length L
1656950	465101000..	1656951	465101000CT	1611066	465101000RT	1,0	3	2,00	38
1656952	465101200..	1656953	465101200CT	1656954	465101200RT	1,2	3	2,00	38
1656955	465101500..	1656956	465101500CT	1656957	465101500RT	1,5	3	2,00	38
–		1656959	465101800CT	1656960	465101800RT	1,8	3	2,00	38
1656971	465102000..	1656972	465102000CT	1602538	465102000RT	2,0	3	2,00	38

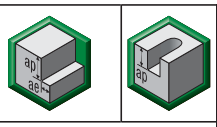
Series 4632

Material Group		Side Milling (A) and Slotting (B)			uncoated			TiAlN			Recommended feed per tooth (IPT = inch/th) for side milling (A). For slotting (B), reduce IPT by 20%.							
		A		B	Cutting Speed — vc SFM			Cutting Speed — vc SFM				D1 — Diameter						
		ap	ae	ap	min		max	min		max	mm	0.4	0.5	0.6	0.8	1.0	1.5	2.0
P	0	1 x D	0.1 x D	0.25 x D	246	–	328	492	–	656	IPT	.0001	.0001	.0002	.0002	.0003	.0004	.0006
	1	1 x D	0.1 x D	0.25 x D	246	–	328	492	–	656	IPT	.0001	.0001	.0002	.0002	.0003	.0004	.0006
	2	1 x D	0.1 x D	0.25 x D	–	–	–	459	–	623	IPT	.0001	.0001	.0002	.0002	.0003	.0004	.0006
	3	1 x D	0.1 x D	0.25 x D	–	–	–	394	–	525	IPT	.0001	.0001	.0001	.0002	.0002	.0004	.0005
	4	1 x D	0.1 x D	0.25 x D	–	–	–	295	–	492	IPT	.0001	.0001	.0001	.0002	.0002	.0003	.0005
M	1	1 x D	0.1 x D	0.25 x D	–	–	–	295	–	377	IPT	.0001	.0001	.0001	.0002	.0002	.0004	.0005
	2	1 x D	0.1 x D	0.25 x D	–	–	–	197	–	262	IPT	.0001	.0001	.0001	.0002	.0002	.0003	.0004
K	1	1 x D	0.1 x D	0.25 x D	–	–	–	394	–	492	IPT	.0001	.0001	.0002	.0002	.0003	.0004	.0006
	2	1 x D	0.1 x D	0.25 x D	–	–	–	361	–	459	IPT	.0001	.0001	.0001	.0002	.0002	.0004	.0005
N	1	1 x D	0.1 x D	0.25 x D	820	–	3280	1640	–	6560	IPT	.0002	.0002	.0003	.0003	.0004	.0006	.0009
	2	1 x D	0.1 x D	0.25 x D	820	–	2460	1640	–	4920	IPT	.0002	.0002	.0002	.0003	.0004	.0006	.0008
	5	1 x D	0.1 x D	0.25 x D	410	–	1312	820	–	3280	IPT	.0002	.0002	.0002	.0003	.0004	.0006	.0008

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

WIDIA HANITA

Series 4633



Material Group		Side Milling (A) and Slotting (B)			uncoated			TiAlN			Recommended feed per tooth (IPT = inch/th) for side milling (A). For slotting (B), reduce IPT by 20%.											
		A		B	Cutting Speed — vc SFM			Cutting Speed — vc SFM				D1 — Diameter											
		ap	ae	ap	min		max	min		max	mm	0.4	0.5	0.6	0.8	1.0	1.2	1.5	1.8	2.0	2.5	3.0
P	0	1 x D	0.1 x D	0.25 x D	246	–	328	492	–	656	IPT	.0001	.0001	.0002	.0002	.0003	.0004	.0004	.0005	.0006	.0008	.0009
	1	1 x D	0.1 x D	0.25 x D	246	–	328	492	–	656	IPT	.0001	.0001	.0002	.0002	.0003	.0004	.0004	.0005	.0006	.0008	.0009
	2	1 x D	0.1 x D	0.25 x D	–	–	–	459	–	623	IPT	.0001	.0001	.0002	.0002	.0003	.0004	.0004	.0005	.0006	.0008	.0009
	3	1 x D	0.1 x D	0.25 x D	–	–	–	394	–	525	IPT	.0001	.0001	.0001	.0002	.0002	.0003	.0004	.0004	.0005	.0006	.0007
	4	1 x D	0.1 x D	0.25 x D	–	–	–	295	–	492	IPT	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0005	.0006	.0007
M	1	1 x D	0.1 x D	0.25 x D	–	–	–	295	–	377	IPT	.0001	.0001	.0001	.0002	.0002	.0003	.0004	.0004	.0005	.0006	.0007
	2	1 x D	0.1 x D	0.25 x D	–	–	–	197	–	262	IPT	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0004	.0004	.0005	.0006
K	1	1 x D	0.1 x D	0.25 x D	–	–	–	394	–	492	IPT	.0001	.0001	.0002	.0002	.0003	.0004	.0004	.0005	.0006	.0008	.0009
	2	1 x D	0.1 x D	0.25 x D	–	–	–	361	–	459	IPT	.0001	.0001	.0001	.0002	.0002	.0003	.0004	.0004	.0005	.0006	.0007
N	1	1 x D	0.1 x D	0.25 x D	820	–	3280	1640	–	6560	IPT	.0002	.0002	.0003	.0003	.0004	.0005	.0006	.0008	.0009	.0011	.0013
	2	1 x D	0.1 x D	0.25 x D	820	–	2460	1640	–	4920	IPT	.0002	.0002	.0002	.0003	.0004	.0005	.0006	.0007	.0008	.0010	.0012
	5	1 x D	0.1 x D	0.25 x D	410	–	1312	820	–	3280	IPT	.0002	.0002	.0002	.0003	.0004	.0005	.0006	.0007	.0008	.0010	.0012

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Series 4651

Material Group		Side Milling (A) and Slotting (B)			uncoated			TiAlN			TiCN			Recommended feed per tooth (IPT = inch/th) for side milling (A). For slotting (B), reduce IPT by 20%.					
		A		B	Cutting Speed — vc SFM			Cutting Speed — vc SFM			Cutting Speed — vc SFM				D1 — Diameter				
		ap	ae	ap	min		max	min		max	min		max	mm	1.0	1.2	1.5	1.8	2.0
P	0	0.5 x D	0.5 x D	0.5 x D	246	–	328	492	–	656	394	–	525	IPT	.0003	.0004	.0004	.0005	.0006
	1	0.5 x D	0.5 x D	0.5 x D	246	–	328	492	–	656	394	–	525	IPT	.0003	.0004	.0004	.0005	.0006
	2	0.5 x D	0.5 x D	0.5 x D	–	–	–	459	–	623	367	–	499	IPT	.0003	.0004	.0004	.0005	.0006
	3	0.3 x D	0.3 x D	0.3 x D	–	–	–	394	–	525	315	–	420	IPT	.0002	.0003	.0004	.0004	.0005
	4	0.3 x D	0.3 x D	0.3 x D	–	–	–	295	–	492	236	–	394	IPT	.0002	.0003	.0003	.0004	.0005
M	1	0.3 x D	0.3 x D	0.3 x D	–	–	–	295	–	377	236	–	302	IPT	.0002	.0003	.0004	.0004	.0005
	2	0.3 x D	0.3 x D	0.3 x D	–	–	–	197	–	262	157	–	210	IPT	.0002	.0002	.0003	.0004	.0004
K	1	0.5 x D	0.5 x D	0.5 x D	–	–	–	394	–	492	315	–	394	IPT	.0003	.0004	.0004	.0005	.0006
	2	0.5 x D	0.5 x D	0.5 x D	–	–	–	361	–	459	289	–	367	IPT	.0002	.0003	.0004	.0004	.0005
N	1	0.5 x D	0.5 x D	0.5 x D	820	–	3280	1640	–	6560	1312	–	5248	IPT	.0004	.0005	.0006	.0008	.0009
	2	0.5 x D	0.5 x D	0.5 x D	820	–	2460	1640	–	4920	1312	–	3936	IPT	.0004	.0005	.0006	.0007	.0008
	5	0.5 x D	0.5 x D	0.5 x D	410	–	1312	820	–	3280	656	–	2624	IPT	.0004	.0005	.0006	.0007	.0008

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.