



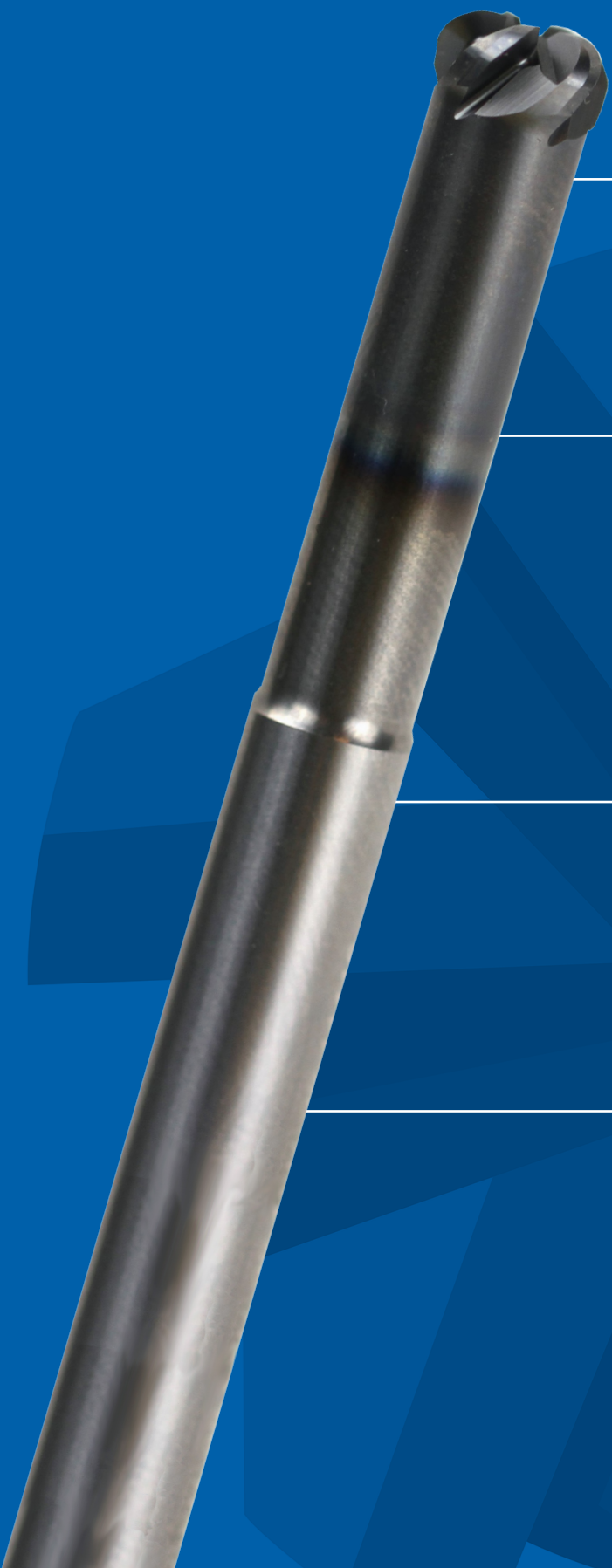
Corner radius end mills for a variety of work materials

CRE-SERIES

Volume 1



KEY FEATURES: WXS-(HS)-CRE / SX-(HS)-CRE



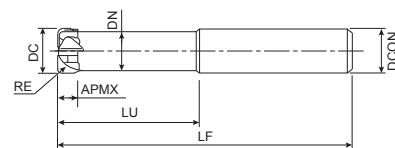
1 Multi flute with super radius

2 WXS coating

3 For hardened steels up to 65 HRC
and stainless steels

4 NEW: SX-(HS)-CRE with
EgiAs-coating for steel, stainless
steel and Titanium alloys

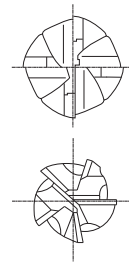
Milling | Solid carbide



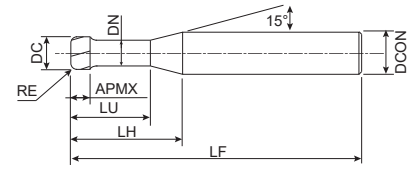
- | | | | | | |
|--|--|--|--|--|--|
| P  | P  | K  | S  | H  | H  |
| ~45 HRC | ~55 HRC | ~350 HB | | ~60 HRC | ~65 HRC |

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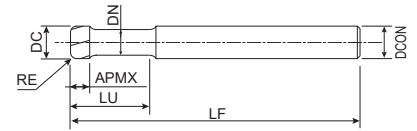
Milling | Solid carbide



Type 1



Type 2

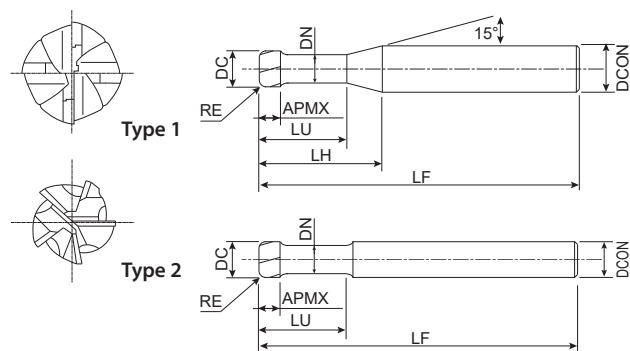


- Carbide end mill with WXS coating
- For hardened steels up to 65 HRC
- Multi flute with super radius

[illegible]

Milling | Solid carbide

NEW



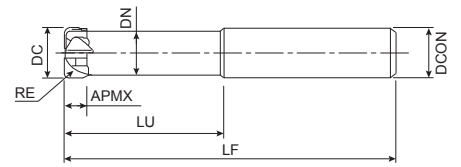
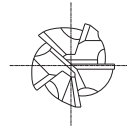
- Carbide end mill with Egias coating
- For steels, stainless steel and Titanium alloys
- Multi flute with super radius

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Milling | Solid carbide



Milling | Solid carbide

NEW

- Carbide end mill with Egias coating
- For steels, stainless steel and Titanium alloys
- Shorter overall length, super radius

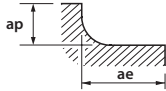
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CUTTING CONDITIONS

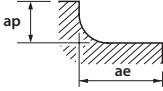
Milling | Endmills | Cutting conditions

WXS-CRE / WXS-HS-CRE

Regular milling

	GG		30~38 HRC NAK55 • HPM1 • SKT • SKD		38~45 HRC SUS304 • SKD • HPM50 NAK80		45~55 HRC		55~60 HRC		60~ HRC																														
	Ø	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)																												
2 x R0,5	16.000	5.250	12.500	3.800	11.000	3.350	7.950	2.150	4.750	860	4.270	615																													
3 x R0,75	10.500	6.250	8.500	4.500	7.450	3.900	5.300	2.600	3.200	995	2.850	715																													
4 x R1	7.950	6.600	6.350	4.800	5.550	4.200	4.000	2.750	2.400	1.050	2.150	755																													
6 x R1,5	5.300	7.000	4.250	5.100	3.700	4.450	2.650	2.850	1.600	1.150	1.400	825																													
8 x R2	4.000	7.000	3.200	5.100	2.800	4.450	2.000	2.850	1.200	1.150	1.050	825																													
10 x R2	3.200	7.000	2.550	5.100	2.250	4.450	1.600	2.850	955	1.150	860	825																													
12 x R3	2.650	7.000	2.100	5.100	1.850	4.450	1.350	2.850	795	1.150	715	825																													
Max cutting depth						<table><tr><td>ap</td><td></td><td>ae</td></tr><tr><td>RE≤2</td><td>0,2xRE</td><td>0,5D</td></tr><tr><td>2<RE</td><td>0,5mm</td><td>0,5D</td></tr></table>			ap		ae	RE≤2	0,2xRE	0,5D	2<RE	0,5mm	0,5D	<table><tr><td>ap</td><td></td><td>ae</td></tr><tr><td>RE≤2</td><td>0,2xRE</td><td>0,5D</td></tr><tr><td>2<RE</td><td>0,4mm</td><td>0,5D</td></tr></table>			ap		ae	RE≤2	0,2xRE	0,5D	2<RE	0,4mm	0,5D	<table><tr><td>ap</td><td></td><td>ae</td></tr><tr><td>RE≤2</td><td>0,1xRE</td><td>0,5D</td></tr><tr><td>2<RE</td><td>0,2mm</td><td>0,5D</td></tr></table>			ap		ae	RE≤2	0,1xRE	0,5D	2<RE	0,2mm	0,5D
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High speed side milling

	GG		30~38 HRC NAK55 • HPM1 • SKT • SKD		38~45 HRC SUS304 • SKD • HPM50 NAK80		45~55 HRC		55~60 HRC		60~ HRC																										
	Ø	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)																								
2 x R0,5	31.850	10.500	32.000	9.550	24.000	7.150	24000	6.450	16.000	2.850	14.400	2.050																									
3 x R0,75	21.000	12.500	21.000	12.000	16.000	8.400	16.000	7.850	10.500	3.300	9.450	2.370																									
4 x R1	16.000	13.000	16.000	12.000	12.000	9.000	12.000	8.200	7.950	3.550	7.150	2.550																									
6 x R1,5	10.600	14.000	10.600	12.700	7.950	9.550	7.950	8.600	5.300	3.800	5.300	3.800																									
8 x R2	7.950	14.000	7.950	12.700	5.950	9.550	5.950	8.600	4.000	3.800	4.000	3.800																									
10 x R2	6.350	14.000	6.350	12.700	4.750	9.550	4.750	8.600	3.200	3.800	3.200	3.800																									
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	<table border="1"><tr><td>ap</td><td>ae</td></tr><tr><td>0,1xR</td><td>0,3D</td></tr></table>						ap	ae	0,1xR	0,3D			<table border="1"><tr><td></td><td>ap</td><td>ae</td></tr><tr><td>R<2</td><td>0,1xR</td><td>0,3D</td></tr><tr><td>2<R</td><td>0,2mm</td><td>0,3D</td></tr></table>			ap	ae	R<2	0,1xR	0,3D	2<R	0,2mm	0,3D			<table border="1"><tr><td></td><td>ap</td><td>ae</td></tr><tr><td>R<2</td><td>0,05xR</td><td>0,3D</td></tr><tr><td>2<R</td><td>0,1mm</td><td>0,3D</td></tr></table>			ap	ae	R<2	0,05xR	0,3D	2<R	0,1mm	0,3D	
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R<2	0,05xR	0,3D																																			
2<R	0,1mm	0,3D																																			

1. Use a rigid and precise machine and holder.
2. These milling conditions are based on milling with circular interpolation at corners. For milling without circular interpolation (such as right angle corners), reduce the speed to 50-70% and the cutting depth to 50-80% of the above conditions.
3. We suggest using air blow or MQL (mist).
4. Please adjust the speed, feed and cutting depth according to actual cutting conditions.
5. When WXS(CRE) enters in Z axis, reduce the feed speed to 30-60% of the above conditions with machining incline angle $\beta < 2^\circ$.
6. These milling conditions are for a tool extension length: less than $4 \times D$. For a longer tool extension, reduce the speed, feed rate, and the cutting depth in accordance with the respective coefficients, to prevent chattering.

CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

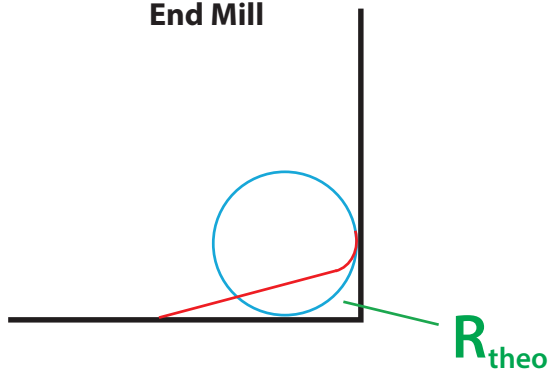
SX-(HS)-CRE

Regular milling

			Low carbon steel • Cast iron St-37 / GG-25 ~750N/mm2		Alloyed steel • Tool steel 42CrMo4 1.2379~30HRC		Tempered steel • Hardened steel 1.2379 / 1.2344 30~45HRC		Stainless steel 1.4301 ≤200HB		Stainless steel, tempered '1.4542		Titanium alloys Ti-6Al-4V		Ni-alloys Inconel 718																																
Vc			120 (80-140) [m/min]		100 (70-120) [m/min]		80 (60-100) [m/min]		70 (50-80) [m/min]		70 (60-80) [m/min]		60 (50-70) [m/min]		25 (20-30) [m/min]																																
Nr. flutes	Ø	R	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)																															
4	2	0,5	19.000	6.100	16.000	3.800	12.800	3.000	11.200	2.300	11.000	2.200	9.500	2.300	4.000	950																															
5	3	0,75	12.700	7.600	10.700	4.800	8.500	3.800	7.500	2.600	7.400	2.600	6.400	2.600	2.700	1.000																															
5	4	1	9.500	7.800	8.000	5.200	6.400	4.200	5.600	2.800	5.600	2.700	4.800	2.400	2.000	1.000																															
5	6	1,5	6.300	8.300	5.300	5.800	4.300	4.700	3.800	2.800	3.700	2.700	3.200	2.400	1.300	1.000																															
5	8	2	4.800	8.300	4.000	5.600	3.200	4.500	2.800	2.800	2.800	2.700	2.400	2.100	1.000	890																															
5	10	2	3.800	7.600	3.200	5.600	2.600	4.500	2.300	2.800	2.200	2.650	1.900	1.900	800	800																															
5	12	3	3.200	7.200	2.700	5.600	2.200	4.600	1.900	2.800	1.850	2.600	1.600	1.800	650	760																															
Max. cutting depth			<table><tr><td></td><td>ap</td><td>ae</td></tr><tr><td>RE≤2</td><td>0,3xRE</td><td>0,5D</td></tr><tr><td>2<RE</td><td>0,5mm</td><td>0,5D</td></tr></table>							ap	ae	RE≤2	0,3xRE	0,5D	2<RE	0,5mm	0,5D	<table><tr><td></td><td>ap</td><td>ae</td></tr><tr><td>RE≤2</td><td>0,2xRE</td><td>0,5D</td></tr><tr><td>2<RE</td><td>0,4mm</td><td>0,5D</td></tr></table>							ap	ae	RE≤2	0,2xRE	0,5D	2<RE	0,4mm	0,5D	<table><tr><td></td><td>ap</td><td>ae</td></tr><tr><td>RE≤2</td><td>0,1xRE</td><td>0,5D</td></tr><tr><td>2<RE</td><td>0,2mm</td><td>0,5D</td></tr></table>							ap	ae	RE≤2	0,1xRE	0,5D	2<RE	0,2mm	0,5D
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TECHNICAL FEATURES

**High Feed
End Mill**

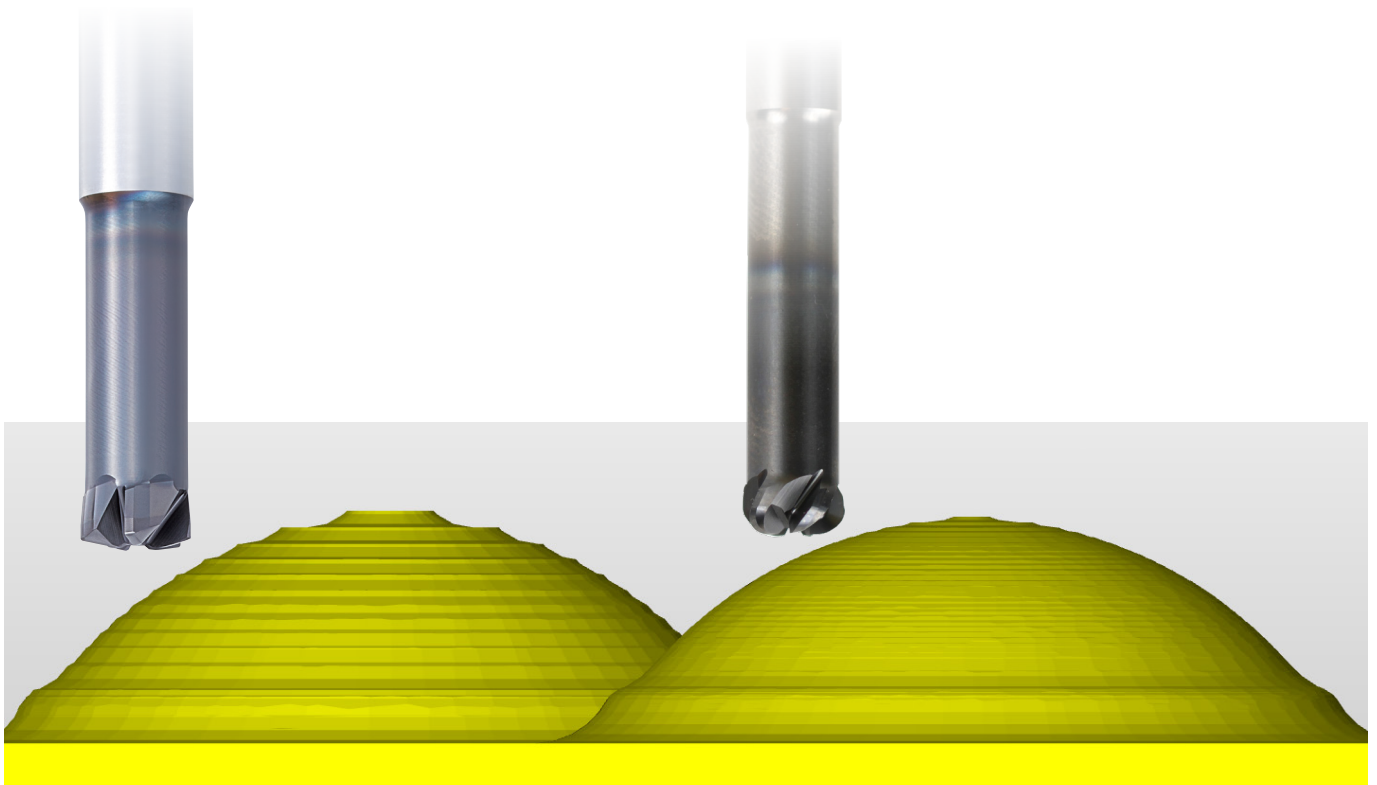


Due to its point geometry a high feed end mill does not produce a clearly defined corner radius on the work piece.

WXS-CRE

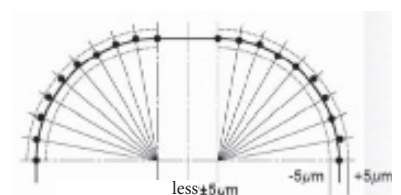


The WXS-CRE features a clearly defined corner radius.



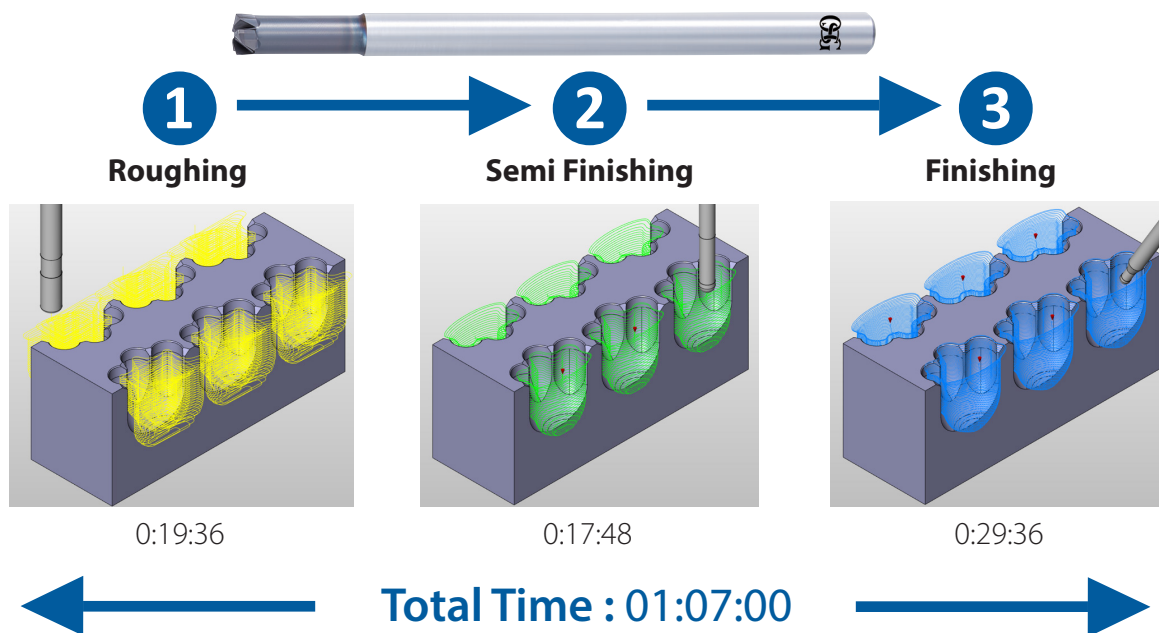
The WXS-CRE features a clearly defined corner radius and a tolerance like ball nose end mills used for finishing. OSG puts greatest emphasis on manufacturing the radii as precisely as possible over the entire contour to ensure maximum dimensional accuracy on the work piece, even in work environments where changing the tool working angle is not possible (e.g. 3-axis machines).

This results in an extremely precise surface even after the first roughing operation leaving very even residual material thus facilitating the follow up process. This eliminates the process of semi-roughing which results in enormous time saving!



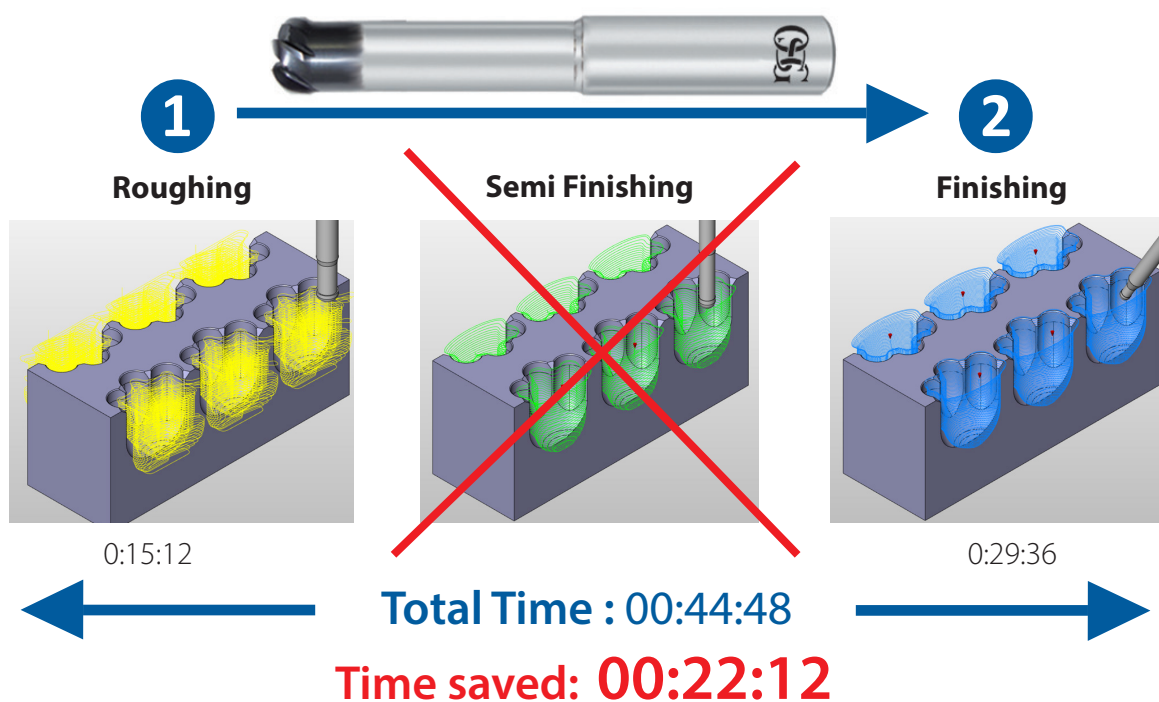
Work with: **HFC**

Conventional machining strategies require three steps to produce the finished contour.



Work with: **WXS-CRE**

The WXS-CRE produces a very high surface quality and smooth residual material even after roughing which eliminates semi-processes.



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shaping your dreams

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