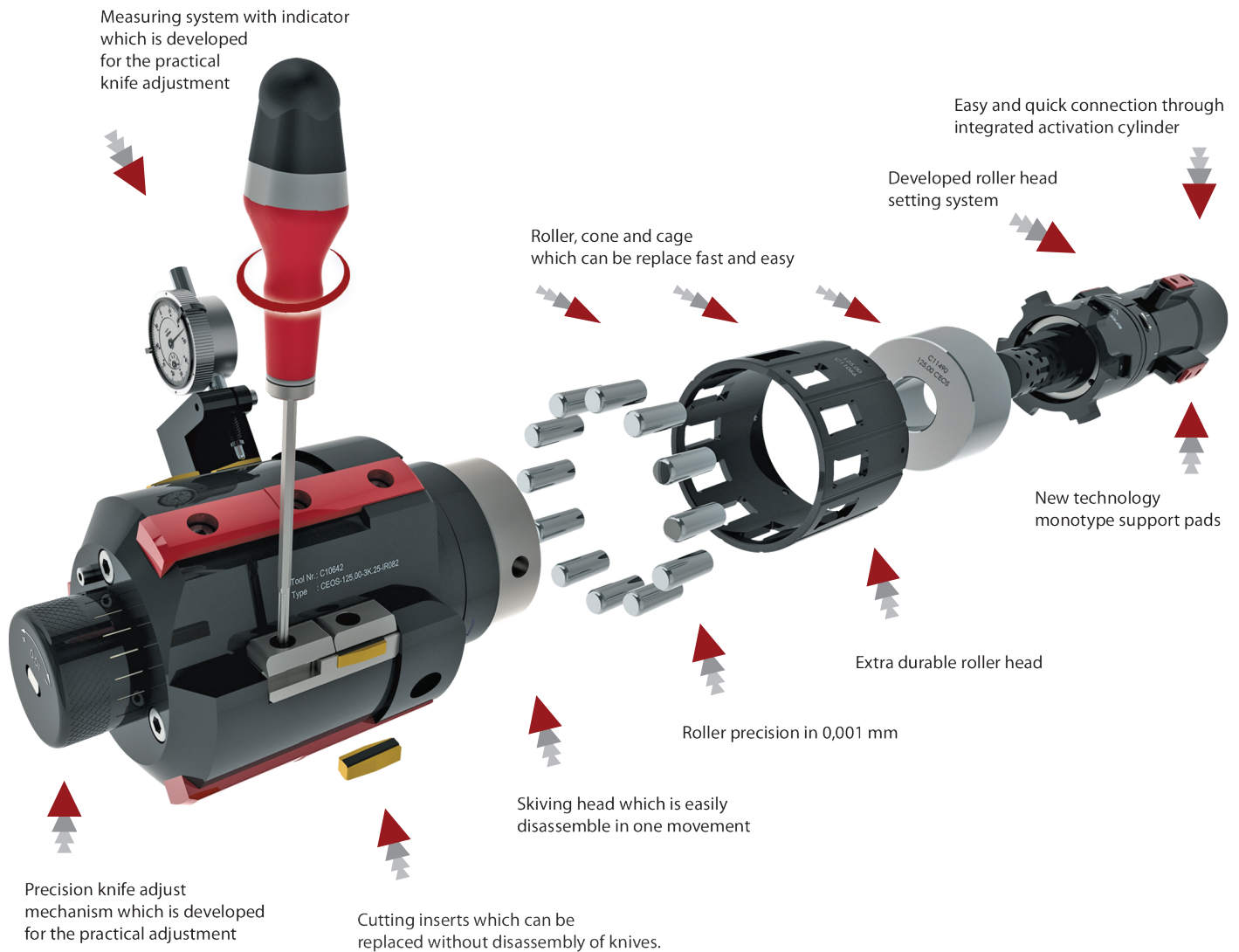


**Combined Skive-Burnishing Tools**

**Developed system**

YAMASA CEOS new generation combined skive-burnishing tools offer many innovations. These tool offers high performance and eliminate many problems experienced with the customary tools. YAMASA CEOS is a competitive tools which reduce the production costs extremely.

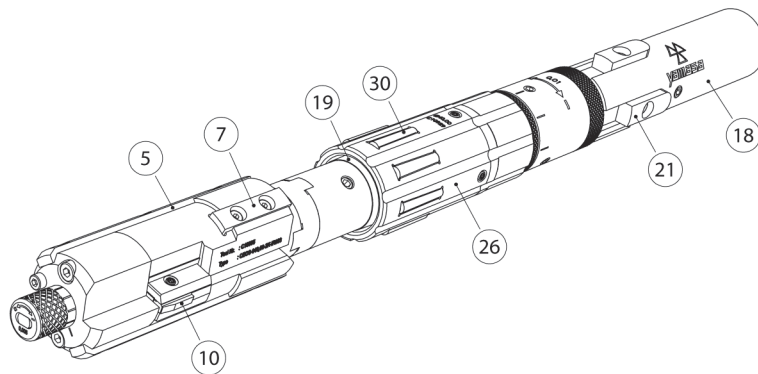
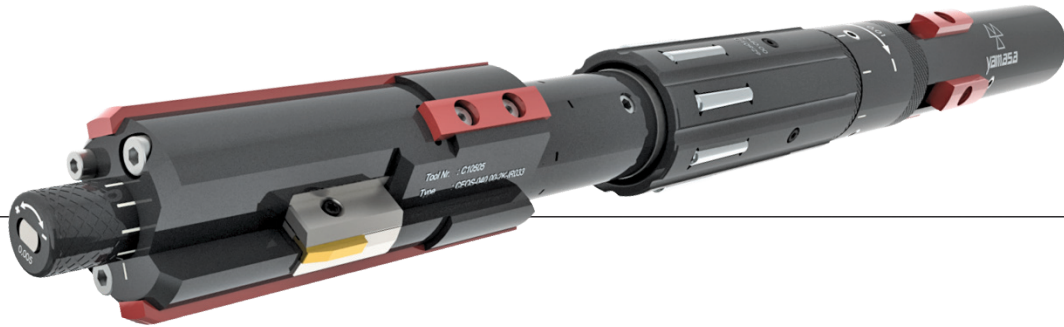


- Minimized process time (Vc=300 m/min, Feeding=up to 5mm/rev)
- Cutting depth up to 3 mm in diameter, high cutting performance
- Pneumatic and hydraulic control with integrated switch system
- Excellent oil flow design, maximum coolant
- Improved knife mechanism, eliminate the scratch problems after retract
- H7 tolerance, 0,01 mm circular shape and minimized longitudinal wavyness with improved skiving technology
- Avoidance or reduction of rippling
- Excellent knife system which machine irregular holes in one pass
- Simple and quick replacement of the spare parts! minimum waste of time!



✓ Achievable surface roughness Rz<1µm / Ra<0,16 µm

**Combined Skive-Burnishing Tools**



- 5- Guide pad (front)
- 7- Guide pad (back)
- 10- Cutting insert
- 18- Shank
- 19- Cone
- 21- Support pad
- 26- Cage
- 30- Roller

**Recommended machining parameters**

Dia.Range	Revolution	Feeding	Coolant flow	Cutting depth	Torque	Motor power	Attainability	
Ø-mm	rev/min	mm/rev	L/min	Ø-mm	Nm	kW	Tolerance	up to H7
38 - 40	1500	2	120 - 160	0,5 (max.1,5 opt.)	40	20	Circle regularity	up to 0,01 mm
41 - 49	1200	2	150 - 200	0,5 (max.1,5 opt.)	50		Roughness	Ra<0,1 / Rz<1µm

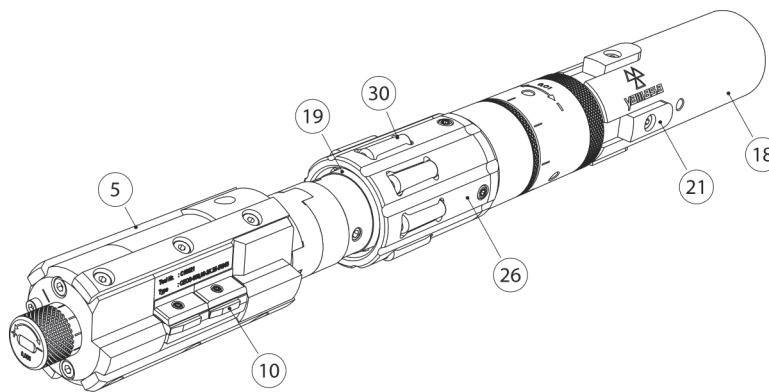
**Product selection**

CEOS tool selection				Spare part selection											
Complete tool		Connection system		Roller		Cutting insert		Guide pad		Support pad		Cone		Cage	
Ø-mm	Code	International	Europe	Code	Pc	Code	Pc	Code	Pc	Code	Pc	Code	Pc	Code	Pc
38,00	C10501	IR033 BTA Female	ER033 BTA Female	C11886	8	C11883	2	C11773 (5) C11774 (7)	2	4	1	C11781	C11349	C10925	1
39,00	C10503											C11783	C11351	C10927	
40,00	C10505											C11785	C11353	C10929	
41,00	C10506											C11786	C11354	C10930	
42,00	C10508											C11788	C11356	C10932	
43,00	C10510											C11790	C11358	C10934	
44,00	C10511											C11791	C11359	C10935	
45,00	C10513											C11793	C11361	C10937	
46,00	C10514											C11794	C11362	C10938	
47,00	C10516											C11796	C11364	C10940	
48,00	C10518											C11798	C11366	C10942	
49,00	C10519											C11799	C11367	C10943	

**How to order | Order samples**

It is enough to inform the code and quantities of the product you wish to order. For example C11883 x 8 pc. Please ask interval sizes which do not exist on the tables. On the choice of Europe connection system, letter "E" is added at the end of the complete tool code. Such as C10501E.

**Combined Skive-Burnishing Tools**



- 5- Guide pad
- 10- Cutting insert
- 18- Shank
- 19- Cone
- 21- Support pad
- 26- Cage
- 30- Roller

**Recommended machining parameters**

Dia.Range	Revolution	Feeding	Coolant flow	Cutting depth	Torque	Motor power	Attainability
Ø-mm	rev/min	mm/rev	L/min	Ø-mm	Nm	kW	
50 - 57	1100 (max.1700)	2 (max.4)	170 - 230	0,7 (max.2 opt.)	60	20 - 30	Tolerance   up to H7
58 - 64	1000 (max.1500)	2 (max.4)	190 - 260	0,7 (max.2 opt.)	65		Circle regularity   up to 0,01 mm
							Roughness   Ra<0,1 / Rz<1µm

**Product selection**

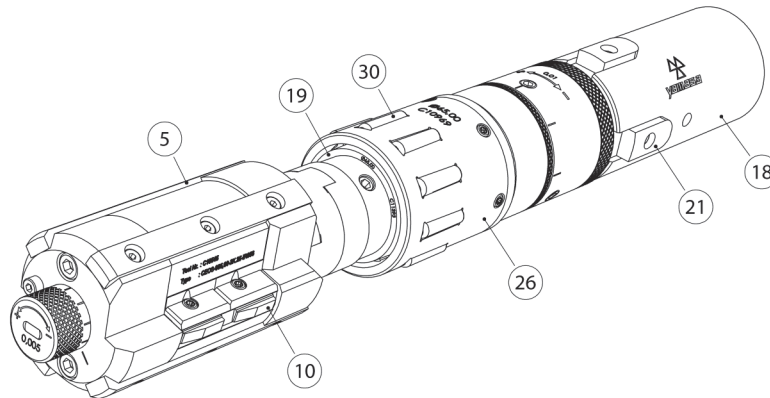
CEOS tool selection				Spare part selection											
Complete tool		Connection system		Roller		Cutting insert		Guide pad		Support pad		Cone		Cage	
Ø-mm	Code	International	Europe	Code	Pc	Code	Pc	Code	Pc	Code	Pc	Code	Pc	Code	Pc
50,00	C10521	IR043 BTA Female	ER043 BTA Female	C11887	8	C11883	4	C11775	4	C11801	4	C11369	1	C10945	1
51,00	C10523									C11803		C11371		C10947	
52,00	C10524									C11804		C11372		C10948	
53,00	C10526									C11806		C11374		C10950	
54,00	C10528									C11808		C11376		C10952	
55,00	C10529									C11809		C11377		C10953	
56,00	C10531									C11811		C11379		C10955	
57,00	C10532									C11812		C11380		C10956	
58,00	C10534									C11814		C11382		C10958	
59,00	C10536									C11816		C11384		C10960	
60,00	C10537									C11817		C11385		C10961	
61,00	C10539									C11819		C11387		C10963	
62,00	C10541									C11821		C11389		C10965	
63,00	C10542									C11822		C11390		C10966	
64,00	C10544									C11824		C11392		C10968	

**How to order | Order samples**

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✓ Achievable surface roughness Rz<1µm / Ra<0,16 µm



- 5- Guide pad
- 10- Cutting insert
- 18- Shank
- 19- Cone
- 21- Support pad
- 26- Cage
- 30- Roller

**Recommended machining parameters**

Dia.Range	Revolution	Feeding	Coolant flow	Cutting depth	Torque	Motor power	Attainability	
Ø-mm	rev/min	mm/rev	L/min	Ø-mm	Nm	kW	Tolerance	up to H7
65 - 72	900 (max.1400)	2,5(max.4)	210 - 290	1 (max.3 opt.)	75	30 - 40	Circle regularity	up to 0,01 mm
73 - 79	800 (max.1200)	2,5(max.4)	240 - 320	1 (max.3 opt.)	80		Roughness	Ra<0,1 / Rz<1µm

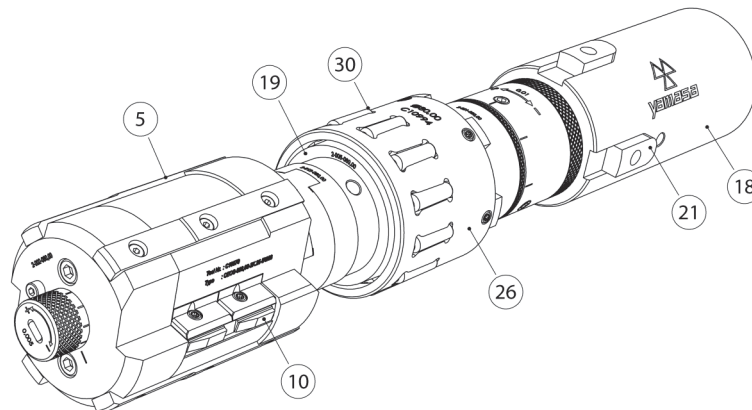
**Product selection**

CEOS tool selection				Spare part selection											
Complete tool		Connection system		Roller		Cutting insert		Guide pad		Support pad		Cone		Cage	
Ø-mm	Code	International	Europe	Code	Pc	Code	Pc	Code	Pc	Code	Pc	Code	Pc	Code	Pc
65,00	C10545	IR056 BTA Female	ER056 BTA Female	C11887	10	C11884	4	C11776	4	C11825	4	C11393	1	C10969	1
66,00	C10547									C11827		C11395		C10971	
67,00	C10549									C11829		C11397		C10973	
68,00	C10550									C11830		C11398		C10974	
69,00	C10552									C11832		C11400		C10976	
70,00	C10554									C11834		C11402		C10978	
71,00	C10555									C11835		C11403		C10979	
72,00	C10557									C11837		C11405		C10981	
73,00	C10558									C11838		C11406		C10982	
74,00	C10560									C11840		C11408		C10984	
75,00	C10562									C11842		C11410		C10986	
76,00	C10563									C11843		C11411		C10987	
77,00	C10565									C11845		C11413		C10989	
78,00	C10567									C11847		C11415		C10991	
79,00	C10568									C11848		C11416		C10992	

**How to order | Order samples**

It is enough to inform the code and quantities of the product you wish to order. For example C11883 x 8 pc. Please ask interval sizes which do not exist on the tables. On the choice of Europe connection system, letter "E" is added at the end of the complete tool code. Such as C10501E.





- 5- Guide pad
- 10- Cutting insert
- 18- Shank
- 19- Cone
- 21- Support pad
- 26- Cage
- 30- Roller

**Recommended machining parameters**

Dia.Range	Revolution	Feeding	Coolant flow	Cutting depth	Torque	Motor power	Attainability
Ø-mm	rev/min	mm/rev	L/min	Ø-mm	Nm	kW	
80 - 89	700 (max.1100)	3 (max.4)	270 - 360	1 (max.3 opt.)	90	30 - 40	Tolerance   up to H7
90 - 99	640 (max.1000)	3 (max.4)	300 - 400	1 (max.3 opt.)	100		Circle regularity   up to 0,01 mm
							Roughness   Ra<0,1 / Rz<1µm

**Product selection**

CEOS tool selection				Spare part selection											
Complete tool		Connection system		Roller		Cutting insert		Guide pad		Support pad		Cone		Cage	
Ø-mm	Code	International	Europe	Code	Pc	Code	Pc	Code	Pc	Code	Pc	Code	Pc	Code	Pc
80,00	C10570	IR068 BTA Female	ER068 BTA Female	C11887	12	C11884	4	C11776	4	C11850	4	C11418	1	C10994	1
81,00	C10572									C11852		C11420		C10996	
82,00	C10573									C11853		C11421		C10997	
83,00	C10575									C11855		C11423		C10999	
84,00	C10576									C11856		C11424		C11000	
85,00	C10578									C11858		C11426		C11002	
86,00	C10580									C11860		C11428		C11004	
87,00	C10581									C11861		C11429		C11005	
88,00	C10583									C11863		C11431		C11007	
89,00	C10585									C11865		C11433		C11009	
90,00	C10586									C11866		C11434		C11010	
91,00	C10588									C11868		C11436		C11012	
92,00	C10589									C11869		C11437		C11013	
95,00	C10594									C11874		C11442		C11018	
99,00	C10601									C11881		C11449		C11025	

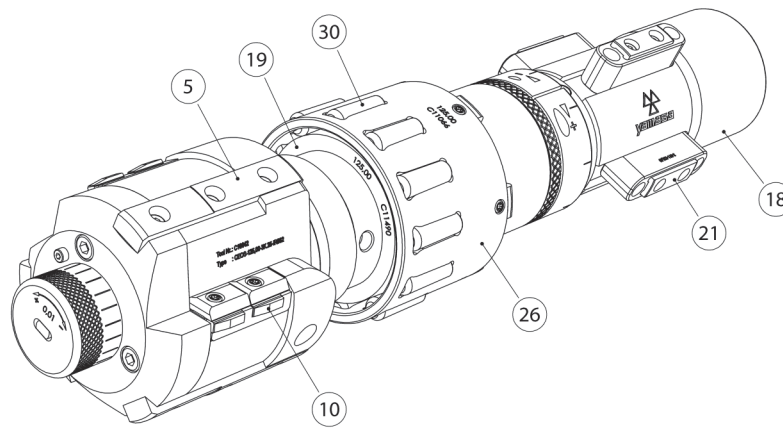
**How to order | Order samples**

It is enough to inform the code and quantities of the product you wish to order. For example C11883 x 8 pc. Please ask interval sizes which do not exist on the tables. On the choice of Europe connection system, letter "E" is added at the end of the complete tool code. Such as C10501E.



✓ Achievable surface roughness Rz<1µm / Ra<0,16 µm

## Combined Skive-Burnishing Tools



- 5- Guide pad
- 10- Cutting insert
- 18- Shank
- 19- Cone
- 21- Support pad
- 26- Cage
- 30- Roller

### Attainability

Tolerance	up to H7
Circle regularity	up to 0,01 mm
Roughness	Ra<0,1 / Rz<1µm

### Recommended machining parameters

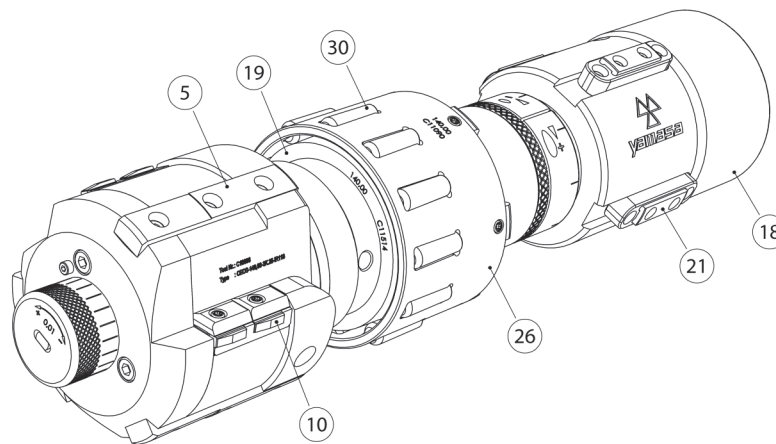
Dia.Range	Revolution	Coolant flow	Torque	Dia.Range	Revolution	Coolant flow	Torque	Feeding (mm/rev)	3,5 (max.4)
Ø-mm	rev/min	L/min	Nm	Ø-mm	rev/min	L/min	Nm	Cutting depth (Ø-mm)	1 (max.3 opt.)
100 - 109	580 (max.900)	330 - 440	180	120 - 129	500 (max.750)	390 - 520	220	Motor power (kW)	40 - 50
110 - 119	530 (max.800)	360 - 480	200	130 - 139	450 (max.700)	420 - 560	230		

### Product selection

CEOS tool selection				Spare part selection											
Complete tool		Connection system		Roller		Cutting insert		Guide pad		Support pad		Cone		Cage	
Ø-mm	Code	International	Europe	Code	Pc	Code	Pc	Code	Pc	Code	Pc	Code	Pc	Code	Pc
100,00	C10602	IR082 BTA Female	ER082 BTA Female	C11888	10	C11884	6	C11777	3	C11882	4	C11450	1	C11026	1
105,00	C10610											C11458		C11034	
109,00	C10616											C11464		C11040	
110,00	C10618											C11466		C11042	
115,00	C10626											C11474		C11050	
120,00	C10634											C11482		C11058	
125,00	C10642											C11490		C11066	
130,00	C10649											C11497		C11073	
135,00	C10658											C11506		C11082	
139,00	C10664											C11512		C11088	

### How to order | Order samples

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- 5- Guide pad
- 10- Cutting insert
- 18- Shank
- 19- Cone
- 21- Support pad
- 26- Cage
- 30- Roller

**Attainability**

Tolerance	up to H7
Circle regularity	up to 0,01 mm
Roughness	Ra<0,1 / Rz<1µm

**Recommended machining parameters**

Dia.Range	Revolution	Coolant flow	Torque	Dia.Range	Revolution	Coolant flow	Torque	Feeding (mm/rev)	Cutting depth (Ø-mm)	Motor power (kW)
Ø-mm	rev/min	L/min	Nm	Ø-mm	rev/min	L/min	Nm			
140 - 149	430 (max.650)	450 - 600	250	160 - 169	380 (max.570)	510 - 680	285	3,5 (max.4)	1 (max.3 opt.)	
150 - 159	400 (max.600)	480 - 640	270	170 - 179	360 (max.540)	540 - 720	300	40 - 50		

**Product selection**

CEOS tool selection				Spare part selection											
Complete tool		Connection system		Roller		Cutting insert		Guide pad		Support pad		Cone		Cage	
Ø-mm	Code	International	Europe	Code	Pc	Code	Pc	Code	Pc	Code	Pc	Code	Pc	Code	Pc
140,00	C10666	IR118 BTA Female	ER118 BTA Female	C11888	14	C11884	6	C11778	3	C11882	4	C11514	1	C11090	1
145,00	C10674											C11522		C11198	
149,00	C10680											C11528		C11104	
150,00	C10682											C11530		C11106	
155,00	C10690											C11538		C11114	
160,00	C10698											C11546		C11122	
165,00	C10706											C11554		C11130	
169,00	C10713											C11561		C11137	
170,00	C10715											C11563		C11139	
175,00	C10723											C11571		C11147	
179,00	C10729	C11577	C11553												

**How to order | Order samples**

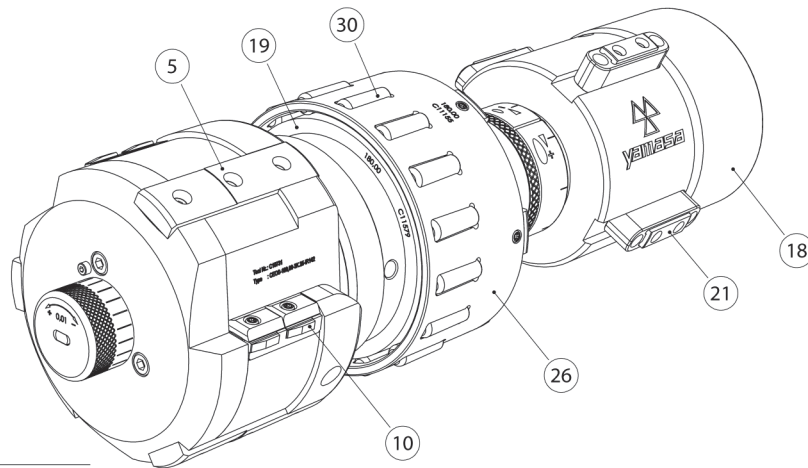
It is enough to inform the code and quantities of the product you wish to order. For example C11883 x 8 pc. Please ask interval sizes which do not exist on the tables. On the choice of Europe connection system, letter "E" is added at the end of the complete tool code. Such as C10501E.



✓ Achievable surface roughness Rz < 1 μm / Ra < 0,16 μm

# CEOS Type | Between Ø180 - 209 mm

## Combined Skive-Burnishing Tools



- 5- Guide pad
- 10- Cutting insert
- 18- Shank
- 19- Cone
- 21- Support pad
- 26- Cage
- 30- Roller

### Attainability

Tolerance	up to H7
Circle regularity	up to 0,01 mm
Roughness	Ra < 0,1 / Rz < 1 μm

### Recommended machining parameters

Dia.Range	Revolution	Coolant flow	Torque	Dia.Range	Revolution	Coolant flow	Torque	Feeding (mm/rev)	Cutting depth (Ø-mm)	Motor power (kW)
Ø-mm	rev/min	L/min	Nm	Ø-mm	rev/min	L/min	Nm	4 (max.5)	1 (max.3 opt.)	40 - 50
180 - 184	350 (max.520)	550 - 740	310	190 - 199	320 (max.480)	600 - 800	335			
185 - 189	340 (max.510)	570 - 760	320	200 - 209	310 (max.460)	630 - 840	350			

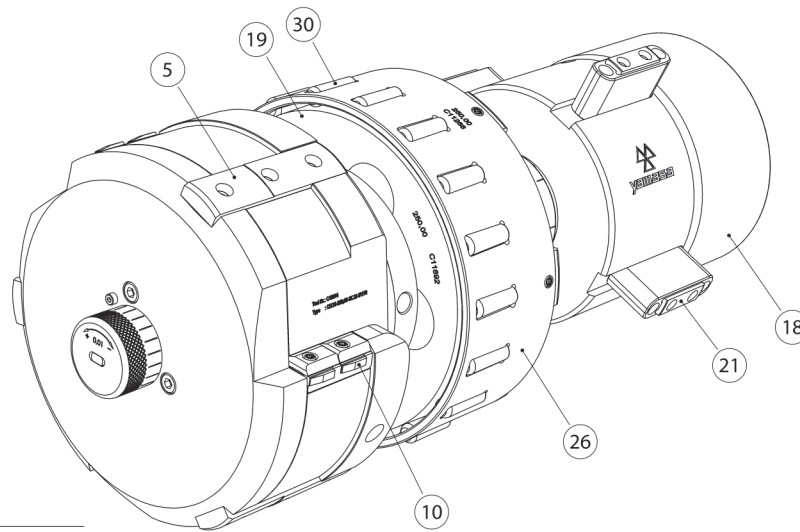
### Product selection

CEOS tool selection				Spare part selection											
Complete tool		Connection system		Roller		Cutting insert		Guide pad		Support pad		Cone		Cage	
Ø-mm	Code	International	Europe	Code	Pc	Code	Pc	Code	Pc	Code	Pc	Code	Pc	Code	Pc
180,00	C10731	IR142 BTA Female	ER142 BTA Female	C11888	16	C11884	6	C11779	3	C11882	4	C11579	1	C11155	1
185,00	C10739											C11587		C11163	
190,00	C10747											C11595		C11171	
195,00	C10755											C11603		C11179	
199,00	C10762											C11610		C11186	
200,00	C10763											C11611		C11187	
205,00	C10772											C11620		C11196	
209,00	C10778											C11626		C11202	

### How to order | Order samples

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- 5- Guide pad
- 10- Cutting insert
- 18- Shank
- 19- Cone
- 21- Support pad
- 26- Cage
- 30- Roller

**Attainability**

Tolerance	up to H7
Circle regularity	up to 0,01 mm
Roughness	Ra<0,1 / Rz<1µm

**Recommended machining parameters**

Dia.Range	Revolution	Coolant flow	Torque	Dia.Range	Revolution	Coolant flow	Torque
Ø-mm	rev/min	L/min	Nm	Ø-mm	rev/min	L/min	Nm
210 - 229	280 (max.420)	690 - 920	380	250 - 269	240 (max.360)	810 - 1080	445
230 - 249	260 (max.390)	750 - 1000	410	270 - 300	210 (max.320)	900 - 1200	490

<b>Feeding (mm/rev)</b>	4 (max.5)
<b>Cutting depth (Ø-mm)</b>	1 (max.3 opt.)
<b>Motor power (kW)</b>	40 - 50

**Product selection**

CEOS tool selection				Spare part selection											
Complete tool		Connection system		Roller		Cutting insert		Guide pad		Support pad		Cone		Cage	
Ø-mm	Code	International	Europe	Code	Pc	Code	Pc	Code	Pc	Code	Pc	Code	Pc	Code	Pc
210,00	C10780	IR178 BTA Female	ER178 BTA Female	C11888	18	C11884	6	C11779	3	C11882	4	C11628	1	C11204	1
215,00	C10788											C11636		C11212	
220,00	C10796											C11644		C11220	
225,00	C10804											C11652		C11228	
230,00	C10811											C11659		C11235	
235,00	C10820											C11668		C11244	
240,00	C10828											C11676		C11252	
245,00	C10836											C11684		C11260	
250,00	C10844											C11692		C11268	
260,00	C10859											C11707		C11283	
270,00	C10876											C11724		C11300	
280,00	C10892											C11740		C11316	
290,00	C10908											C11756		C11332	
300,00	C10924											C11772		C11348	

**How to order | Order samples**

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**Skive & Roller Burnishing Tools**

**Application**

CX type skiving tools machine the hydraulic cylinders in two different operation with CX-D type roller burnishing tools. In first operation, CX skiving tool skive the cylinder; in the second operation, CX-D tool roller burnish the surface.

The tools are retracted after process and rapidly pullback without damaging the surface.

Depending upon cylinder, process result H7 - H8 diameter allowance and also the surface quality of  $Rz < 1 \mu m$  ( $Ra < 0,16 \mu m$ ) are obtained. Short process time provides time savings.

Tools have precise diameter adjustment. Spare parts can be changed easily. The skiving tool's inserts can be changed without disassemble the knives. The tools can be connected and removed quickly.



*CX-R Skiving tool  
For short and long cylinders*



*CX-CS Skiving tool - internal coolant  
For used lathe machines and short cylinders*



*CX-D Roller burnishing tool  
For short and long cylinders  
internal or external coolant*

**CX-R Processing properties and parameters**

Used machines	Deep hole drilling machines
Processing length	≤ 20 m
Circumferential speed	150 - 300 m/min.
Feed rate	1 - 5 mm/rev.
Attainability tolerance	up to H7
Attainability circle regularity	up to 0,01 mm
Attainability roughness	$Rz = 5 - 30 \mu m$
Coolant	Oil or emulsion

**CX-CS Processing properties and parameters**

Used machines	CNC-universal lathe, machining centers
Processing length	$L/\varnothing \leq 15$
Circumferential speed	150 - 300 m/min.
Feed rate	1 - 5 mm/rev.
Attainability tolerance	up to H7
Attainability circle regularity	up to 0,01 mm
Attainability roughness	$Rz = 5 - 30 \mu m$
Coolant	Oil or emulsion

**CX-D Processing properties and parameters**

Used machines	Deep hole drilling, CNC-universal lathe, machining centers
Processing length	≤ 20 m
Circumferential speed	max. 250 m/min.
Feed rate (per roller)	0,05 - 0,3 mm/rev.
Attainability tolerance	up to H6
Attainability circle regularity	up to 0,001 mm
Attainability roughness	$Rz < 1 / Ra < 0,16 \mu m$
Coolant	Oil or emulsion