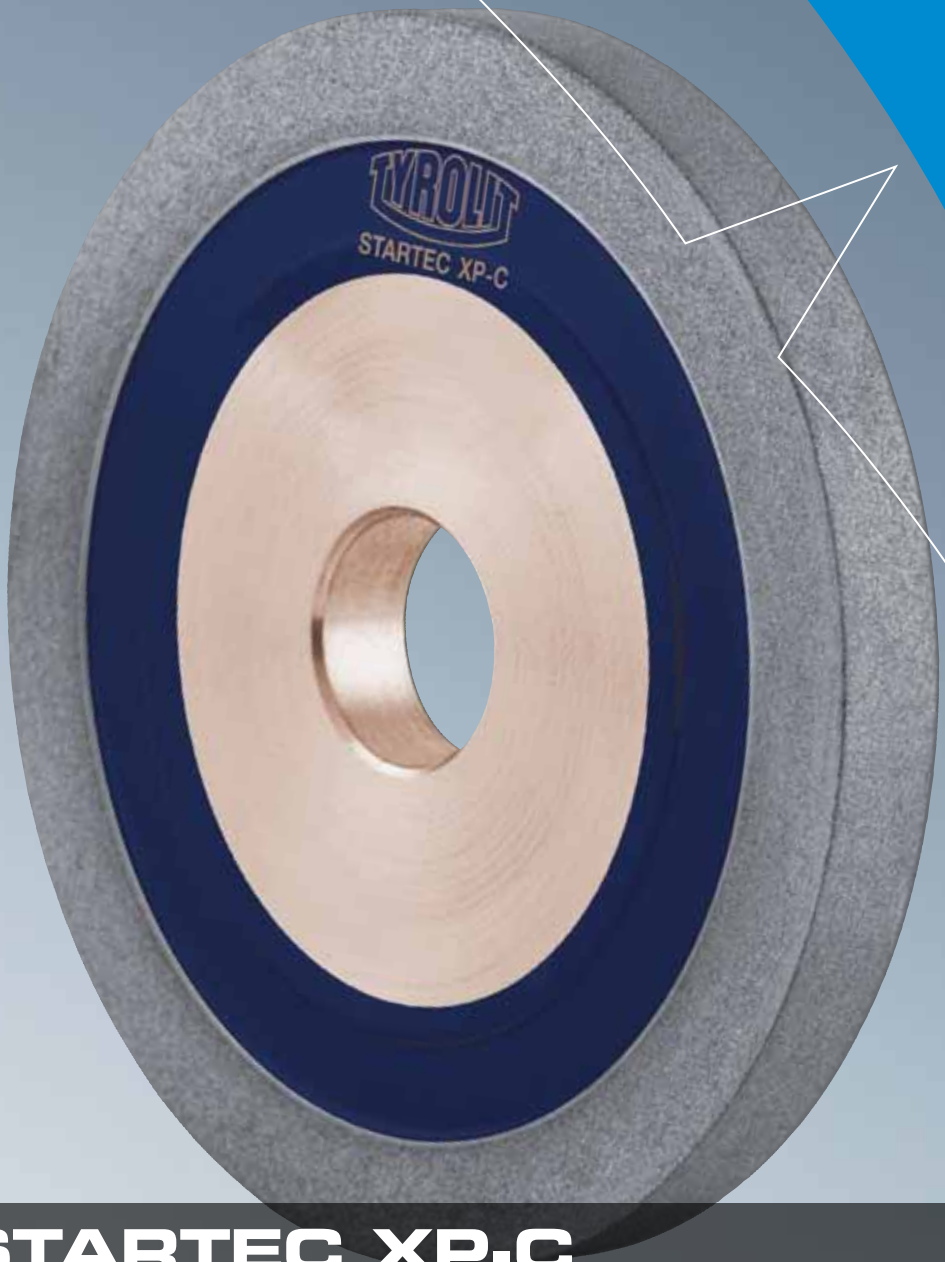


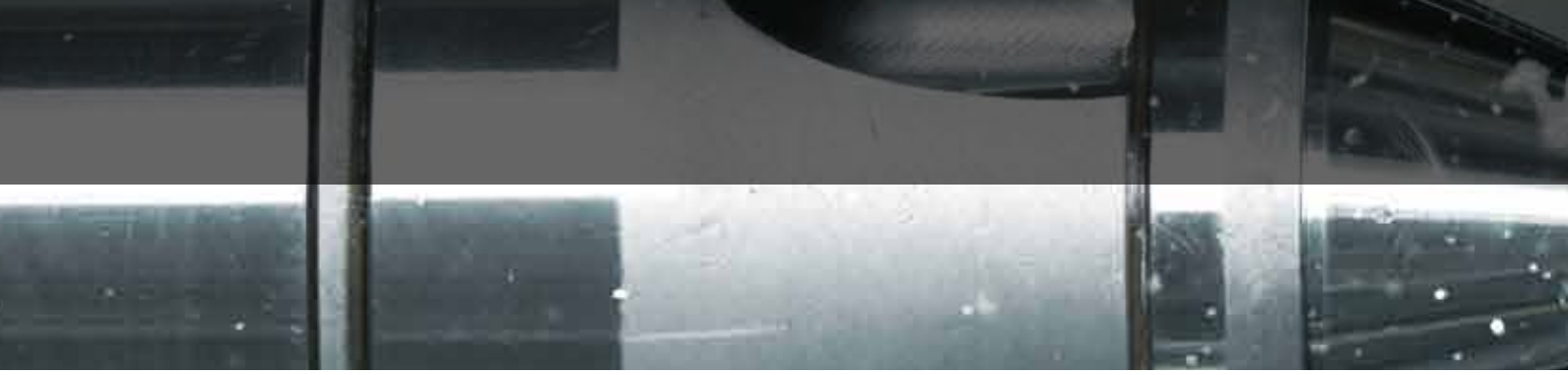
STARTEC XP-C

EXTREME CUTTING PERFORMANCE IN TOOL GRINDING

- Excellent cutting performance at the highest feed rates
- Increases productivity while lowering process costs
- Highest precision for your tools guaranteed

A Company of the SWAROVSKI Group

TYROLIT

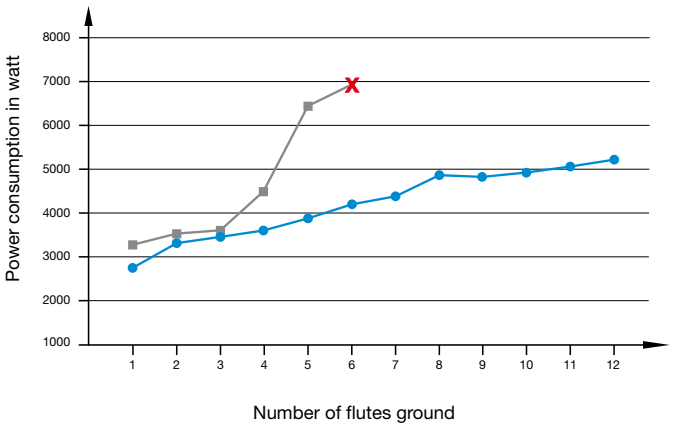


STARTEC XP-C
EXTREME CUTTING PERFORMANCE IN TOOL GRINDING

Flute grinding of solid carbide represents the greatest challenge in terms of stock removal of any tooling process. The cost efficiency of the process can only be improved by drastically reducing the grinding time. The STARTEC HP product line from TYROLIT is the new yardstick for high cutting performance and quality. The next generation of flute grinding wheels is now available with STARTEC XP-C.

STARTEC XP-C provides our customers with high stock removal rates and low cutting forces thanks to an innovative combination of raw material and manufacturing process. The resulting low levels of power consumption during the grinding process protect the machine and ensure the longest possible wheel life. Carefully selected grit sizes guarantee the best surface finish.

The STARTEC XP-C product line provides users with the highest precision and lowest process costs.



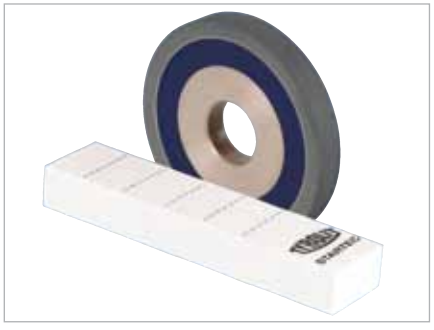
- Competition (Benchmark)
- STARTEC XP-C
- Stop due to over load

Q'w = 10 mm³/s · mm
Cooling lubricant = Oil
Material = HM K30F

Product and user benefits

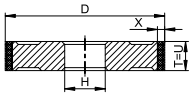
- Extremely high stock removal rates
- Maximum cutting ability
- Easy dressing
- Higher productivity
- Shorter process time during flute grinding
- Low grinding forces
- High process stability
- Quiet and even grinding process
- Best tool quality

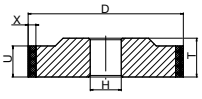
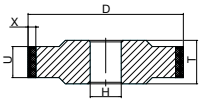
The STARTEC XP-C grinding tools are delivered unsharpened. Prior to grinding the wheel has to be sharpened with the enclosed sharpening stick. Only a perfect sharpening procedure will ensure an optimum cutting ability of the grinding tool.
Sharpening instructions and an overview of the STARTEC range comes together with each grinding wheel.
High availability of the grinding tools, reduced processing costs and the perfect quality of your tool are the major advantages by applying the new STARTEC XP-C line.



STARTEC XP-C
PRODUCTION PROGRAM

PRODUCTION PROGRAM SHAPE A1

Shape		D	T = U	X	H
1A1		75	6 - 16	6, 10	According to customer specifications
		100, 125	6 - 20	6, 10	
		150, 175	6 - 20	6, 10	
		200	10 - 20	6, 10	

Shape		D	U	X	Tmax	H
3A1		75	4	6	Shape 3: T=U+3 Shape 14: T=U+6	According to customer specifications
			5 - 16	6, 10		
		100, 125	6 - 16	6, 10		
14A1		150, 175	6 - 16			
		200	6 - 16			

STANDARD GRINDING TOOLS SHAPE 1A1

D	T	H	U	X	Specification	TN
75	6	20	6	6	**STARTEC XP-C D54MXPC**	614714
75	10	20	10	6	**STARTEC XP-C D54MXPC**	614722
100	6	20	6	6	**STARTEC XP-C D54MXPC**	614723
100	6	31,75	6	6	**STARTEC XP-C D54MXPC**	614721
100	10	20	10	6	**STARTEC XP-C D54MXPC**	614725
100	10	31,75	10	6	**STARTEC XP-C D54MXPC**	614720
100	12	20	12	6	**STARTEC XP-C D54MXPC**	614726
100	15	20	15	6	**STARTEC XP-C D54MXPC**	619105
100	15	31,75	15	6	**STARTEC XP-C D54MXPC**	614687
125	6	20	6	6	**STARTEC XP-C D54MXPC**	619106
125	10	20	10	6	**STARTEC XP-C D54MXPC**	614707
125	15	20	15	6	**STARTEC XP-C D54MXPC**	619107
125	15	31,75	15	6	**STARTEC XP-C D54MXPC**	614701
150	6	20	6	6	**STARTEC XP-C D54MXPC**	614684
150	6	20	6	10	**STARTEC XP-C D54MXPC**	614694
150	10	20	10	6	**STARTEC XP-C D54MXPC**	614704
150	10	20	10	10	**STARTEC XP-C D54MXPC**	614711
150	12	20	12	10	**STARTEC XP-C D54MXPC**	614698
150	15	20	15	10	**STARTEC XP-C D54MXPC**	673281

On request, we also manufacture customised grinding tools.

STARTEC XP-C
RECOMMENDED PROCESS PARAMETERS

The values in this table provide an insight into performance during the Q'_w grinding process. You can find the perfect infeed (profile depth) a_e and feed v_t combination for use with the STARTEC XP-C. The feed values depend on the workpiece diameter, the twisting angle of the flutes, the coolant used and the machine power that can be utilised.

Calculation Formular

$$Q'_w = \frac{a_e \cdot v_t}{60}$$

$$v_t = \frac{Q'_w \cdot 60}{a_e}$$

Guideline

V_c	
STARTEC XP-C	16 – 20 m/s

Q'_w	
Standard range	3 – 6 mm³/s · mm
TOP PERFORMANCE range	7 – 10 mm³/s · mm

Q'_w Table [mm³/s · mm]

	Feed v_t [mm/min]									
Profile depth a_e [mm]	50	60	70	80	100	120	140	160	180	200
2,6						5,2	6,1	6,9	7,8	8,7
2,8						5,6	6,5	7,5	8,4	9,3
3,0						6,0	7,0	8,0	9,0	10,0
3,2						6,4	7,5	8,5	9,6	10,7
3,4					5,7	6,8	7,9	9,1	10,2	11,3
3,6					6,0	7,2	8,4	9,6	10,8	12,0
3,8				5,1	6,3	7,6	8,9	10,1	11,4	
4,0				5,3	6,7	8,0	9,3	10,7	12,0	
4,2				5,6	7,0	8,4	9,8	11,2	12,6	
4,4				5,9	7,3	8,8	10,3	11,7	13,2	
4,6			5,4	6,1	7,7	9,2	10,7	12,3		
4,8			5,6	6,4	8,0	9,6	11,2	12,8		
5,0		5,0	5,8	6,7	8,3	10,0	11,7	13,3		
5,5	4,6	5,5	6,4	7,3	9,2	11,0	12,8			
6,0	5,0	6,0	7,0	8,0	10,0	12,0	14,0			
6,5	5,4	6,5	7,6	8,7	10,8	13,0				
7,0	5,8	7,0	8,2	9,3	11,7	14,0				

v_t Starting value

v_t Optimisation potential

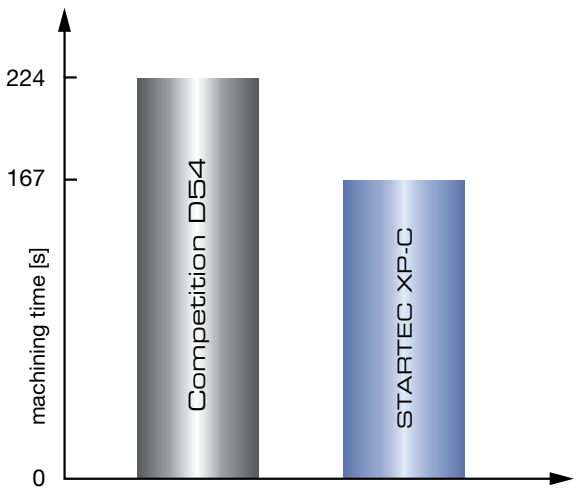
Reading direction

STARTEC XP-C
EXAMPLE OF APPLICATIONS

Grinding task	
Workpiece	Drill, 2 flutes, 30° twisting angle
Dimensions	Diameter d = 8,25 mm, Flute length l = 40 mm, Core diameter dk = 2,05 mm
Material	K40
Machine	WALTER VISION
Coolant	Oil 80 l/min, 6 bar

Initial situation	
Grinding wheel	Competition D54
Parameters	v_c = 20 m/s, a_e = 3,1 mm, v_t = 50 mm/min Q'_w = 2,59 $mm^3/s \cdot mm$
Sharpen	after 15 pieces

Optimized situation	
New grinding wheel	TYROLIT STARTEC XP-C 1A1 125x6x20 6-6 D54MXPC TN 619106
New parameters	v_c = 18 m/s, a_e = 3,1 mm, v_t = 120 mm/min Q'_w = 6,2 $mm^3/s \cdot mm$
Sharpen	not necessary
Summary	Feed increased by 140% No sharpening required during the batch Silent grinding process
Total machining time reduced by 25%	



Reduction in machining time by 25%

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