CARBON FORCE

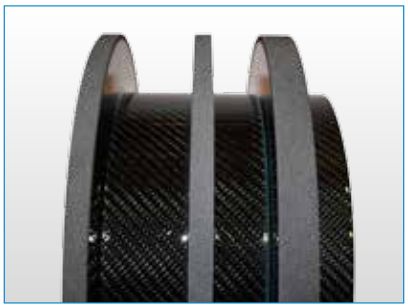
REINVENTING OD GRINDING

Precision Engineering Solutions

WINTER
SAINT-GOBAIN

CarbonForce vitrified CBN wheels

Through Winter's research and development programme comes a new innovative technology for large dimension grinding wheels - CarbonForce.



CarbonForce is a light weight proprietary carbon fibre reinforced polymer core used in large diameter vitrified cBN wheels, offering higher strength than steel at a lower weight than aluminium providing a massive weight reduction of 75% compared to steel-hubbed Superabrasive wheels.

Thanks to the lightweight structure, CarbonForce wheels facilitate easy operator handling and with their robust, form-holding carbon fibre core, reduce cycle times due to less wheel changeover facilitating a reduction in production costs. A superior finish is also achieved on component parts and machine life can be extended due to reduced grinding forces on the machine and work piece.

Features	Benefits
• Low density/low weight	• Enables large parts to be ground • Higher wheel speed • Improves productivity
• High strength and rigidity	• Less deformation • Less geometric errors
• Low thermal expansion	• Less tool vibration • Better tool life • Better surface finish
• Excellent dynamic behaviour/less vibrations	• Improved handling • Less surface damage
• Re-usable	• Reduced cost • Environmentally friendly • Increases spindle life time
• Simultaneous machining	• Faster manufacturing

Applications

- Outer diameter grinding
- Centerless grinding
- Camshaft grinding
- Gear grinding

Markets

- Automotive Manufacturers
- Gearbox Manufacturers

Case studies

CAM GRINDING

Machine:	Schaudt
Component:	Cam, base circle diameter 30 mm Material: hardened steel 100Cr6 Hardness: 62 HRc Allowance: z = 1,2 mm (Diameter) Requirements: 2,5 µm ≤ Rz ≤ 4,0 µm
Wheel:	3A1 140-38-8-2S 50 B126 SGC FT1 V40
Parameters:	Wheel speed: v_c = 70 m/s Tangential feed rate: v_{ft} = 10,8 m/min $Q'_{w,max}$ = 44 mm³/mms
Results:	R_z = 3,0 – 3,6 µm Parts per dress: 120 cams

CAM SHAFT TUBE GRINDING

Machine:	EMAG
Component:	Camshaft tube Material: soft steel Allowance: z = 0,4 to 0,5 mm (Diameter) Requirements: Rz ≤ 6,3 µm
Wheel:	1A1-545-210-13 104 B126 VSS 1327 I8SW V360
Parameters:	Wheel speed: v_c = 105 m/s Radial feed rate: v_{ft} = 9 m/min $Q'_{w,max}$ = 11.3 mm³/mms
Results:	R_z = 3 – 4 µm Parts per dress: 1800 Grinding cycle time: t_c = 18 s (floor to floor)

CarbonForce

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