

**CARBON
FORCE**

REINVENTING OD GRINDING

Precision Engineering Solutions



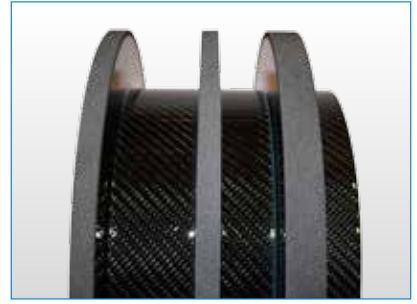
WINTER
SAINT-GOBAIN

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

- Low density/low weight
- High strength and rigidity
- Low thermal expansion
- Excellent dynamic behaviour/less vibrations
- Re-usable
- Simultaneous machining

Benefits

- Enables large parts to be ground
- Higher wheel speed
- Improves productivity
- Less deformation
- Less geometric errors
- Less tool vibration
- Better tool life
- Better surface finish
- Improved handling
- Less surface damage
- Reduced cost
- Environmentally friendly
- Increases spindle life time
- Faster manufacturing

Applications

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

Markets

- Automotive Manufacturers
- Gearbox Manufacturers

Case studies

CAM GRINDING

Machine:	Schautt
Component:	Cam, base circle diameter 30 mm Material: hardened steel 100Cr6 Hardness: 62 HRC Allowance: $z = 1,2$ mm (Diameter) Requirements: $2,5 \mu\text{m} \leq Rz \leq 4,0 \mu\text{m}$
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 $Q'_{w,max} = 44$ mm ³ /mms
Results:	$R_z = 3,0 - 3,6 \mu\text{m}$ 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: $Rz \leq 6,3 \mu\text{m}$
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 $Q'_{w,max} = 11,3$ mm ³ /mms
Results:	$R_z = 3 - 4 \mu\text{m}$ Parts per dress: 1800 Grinding cycle time: $t_c = 18$ s (floor to floor)



Saint-Gobain Diamantwerkzeuge
GmbH & Co. KG
Schützenwall 13-17
D-22844 Norderstedt,
Germany

Tel: +49 (0) 40 5258-0
Fax: +49 (0) 40 5258-383

www.winter-superabrasives.com

Winter is a registered trademark of Saint-Gobain Abrasives.
Form # 3165

