

# KGS DIAMOND GROUP

## Precision Tools

**KGS Telum CH - Diamond Belt System  
Grinds and Polishes Hard Coatings Fast**

Specifically engineered to replace both metal bond  
diamond wheels and film super-finishing systems.

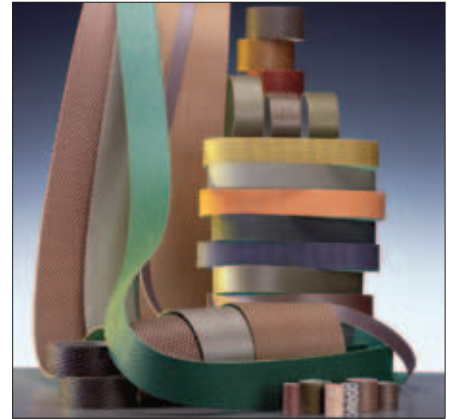
# KGS Precision Tools

## KGS Resin Bond Developments

**KGS brings a new range of Super-Abrasive Resin products to compliment and improve the existing Nickel bond range of belts.**

This range of KGS flexible diamond tools has been designed specifically for precision grinding & polishing of extremely hard materials, such as those used in the Thermal Spray Industry.

KGS manufactures both Diamond and CBN products, for both wet and dry applications, for heavy roll grinding, hydraulic rams, and also for finishing complex 3D shapes such as Turbine Blades and Prosthetics.



## Diamond Belt System - DBS

**KGS Telum CH - Diamond Belt System Grinds and Polishes Hard Coatings Fast**

**Engineered to replace both metal bond diamond wheels and super-finishing systems.**

Combines the accuracy of rigid tools (bonded wheels); with the speed, consistency & ease of use of a flexible Diamond Belt System. And for many applications, can replace the need for Diamond Film Finishing.



## Process Parameters - KGS Test Equipment

### R&D Test Centre Holland

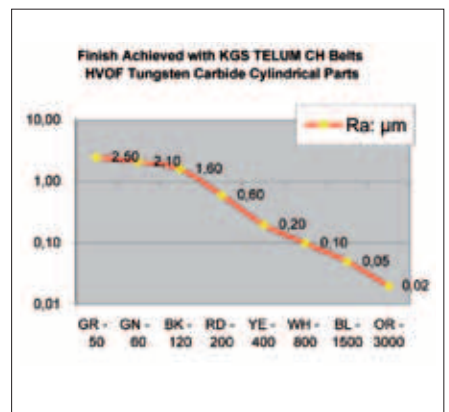
**Application Engineering Test Equipment  
Roll grinding with Flexible Diamond Belts - Thermal Spray Coatings**

LEH III/F:	Tool Post Grinder on variable speed lathe
Head:	Fixed for Hard Coating Removal & Grinding Floating for fine finishing and polishing
Belt:	Size - 2,000 x 50 mm ( 78¾x2 Inches )
Cutting Speed:	42 m/sec ( 8,200 SFPM )
Pulley:	Smooth & Incompressible - Hardness Shore 90
Coolant:	Water with 5% Shell Metalina D for belt grinding
HVOF Cylinders:	ø50 mm @ 600 rpm ( 2" Diameter @ 600 rpm )
Traverse Rate:	0.6 mm per rotation ( 360 mm/min or 1.2 SFPM )

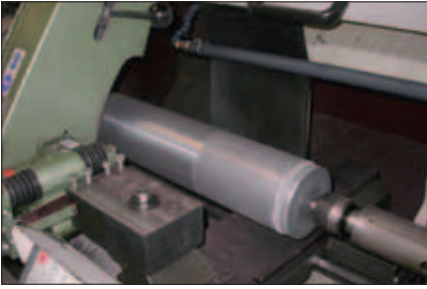


## Test Results - Tungsten Carbide (HVOF)

SURFACE FINISH RESULTS per Grit Mesh			Thickness of WC material removed per pass		
Colour -Mesh	Ra: µm	Ra: µin	Pulley	Micron	Thou
GR - 40	2.50	100.0	Fixed	72.0	2.83
GN - 60	2.10	84.0	Fixed	65.0	2.56
BK - 120	1.60	64.0	Fixed	41.0	1.61
RD - 200	0.60	24.0	Fixed	23.0	0.91
YE - 400	0.20	8.0	Floating	3.5	0.14
WH - 800	0.10	4.0	Floating	1.5	0.06
BL - 1500	0.05	2.0	Floating	0.6	0.02
OR - 3000	0.02	0.8	Floating	0.2	0.01



## Test Results - Conclusions



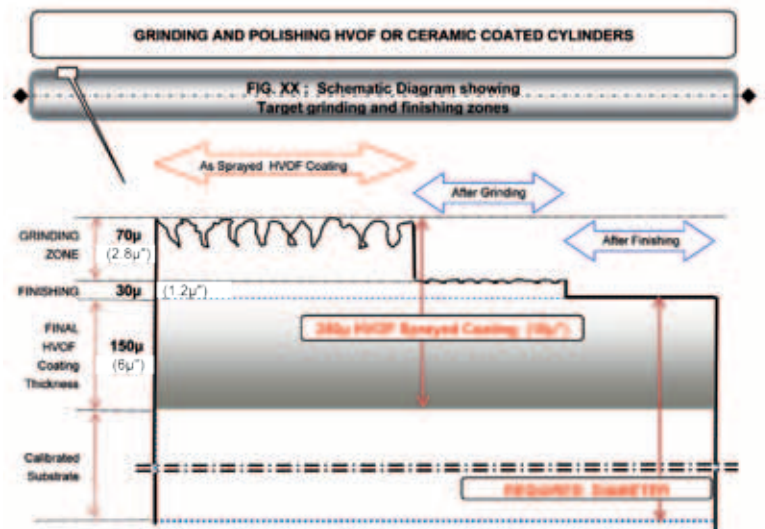
- ❖ Same results every time
- ❖ Not only grinds fast - can polish too
- ❖ Hard pulley gives high calibration
- ❖ A straight forward, low cost solution
- ❖ Lower grinding force needed than wheels
- ❖ Much lower capital investment needed

## Process Recommendations

The process benefits from very precise equipment. Generally - with an accurately calibrated metal roll - and as sprayed with 250 micron of coating. Depending on the quality of the sprayed powder, the type of gun and whether the application is by hand or by robot.

This coating could have an Ra of around 8 micron and an Rt of around 70 micron. So at least 80 micron is removed to ensure they reach below to the continuous closed layer. The target is to remove around 100 micron to end up with accurately sized and polished roll. (in this example with a 150 micron layer)  
The initial grind is normally required to remove the coarse finish from spraying –say 75 micron – this is done with the red 200 grit, or coarser grit if needed. (this initial grind is more often done by Wheels today)

The next 25 micron will normally be done with Yellow 400 grit and finer - with multiple passes - ending with the final required diameter and a specific coating thickness & Ra. (often done by Diamond Film Superfinishing today)



## DBS Successful Sales - KGS Telum CH

### WC Roll for Sheet Metal Industry

#### Large Rolls for Steel Mills

Customers often require coarse Ra values as rough as 3.0 or even 4.2 Ra. This roll, which is slightly tapered, normally takes over 8 hours to finish with a diamond wheel. KGS Telum CH Diamond Belt System took less than one hour, including set-up, to achieve the required finish.

#### KEY POINT

KGS can massively shorten cycle times compared to diamond wheel grinding.



### Hydraulic Rams - Chrome Replacement

#### Dynabrade Belt Finishing Machine

Grinding and calibration is done with the coarse belts on an incompressible pulley. Finishing with the finer belts can be supported by the "Free Running" attachment from Dynabrade.

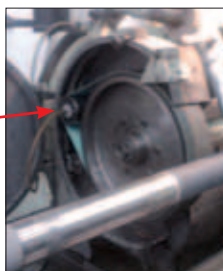


### Retro-fit DBS on Wheel Grinder

Customers with large diamond wheel grinders can normally benefit from the Diamond Belt System at a very low cost, without the investment in a Tool Post Grinder - by replacing the diamond wheel with an incompressible pulley - and adding an EXTRA smaller pulley behind it.

#### KEY POINT -

This set up gave the same Ra values as the KGS R&D team, and took a fraction of the time to grind and polish both WC & CrC sprayed coatings.



### Free Running DBS - Dry

KGS Telum CH belts are used dry on special hard coatings with a free running set-up.

For one customer with Silicon Aluminium Oxide coating the advantage of KGS Telum CH over SiC belts is huge.

Not only has the grinding time been decreased from 6 hours to less than 1 hour, there has also been a high cost saving in Silicon Carbide abrasive belts.



# KGS Precision Tools

## KGS Established Patterns    New KGS Patterns



KGS Telum  
H  
Nickel



KGS Flexis  
21  
Nickel



KGS Telum CH  
Hard resin  
GR - OR



KGS Telum  
T1  
Nickel



KGS Flexis  
18  
Nickel



KGS Swiflex SDA  
Structured  
Diamond Abrasive  
Hard resin  
GN - OR



KGS Telum  
CP1  
Soft resin



KGS Flexis  
CP1  
soft resin



KGS Telum  
R55  
Hard resin



KGS Flexis  
R55  
Hard resin

### KGS NEW RESIN GRITS

Colour	Mesh	Micron
GR - Grey	40	602µm
GN - Green	60	250µm
BK - Black	120	125µm
RD - Red	200	74µm
YE - Yellow	400	40µm
WH - White	800	20µm
BL - Blue	1500	9µm
OR - Orange	3000	3µm

## CBN Versions now available

### KGS Telum CH CBN - KGS Swiflex SCBA

#### New version available in Cubic Boron Nitride - GN/60, BK/120 & RD/200 Grits

To avoid the GLAZING issues found with Diamond Belts on base metals.

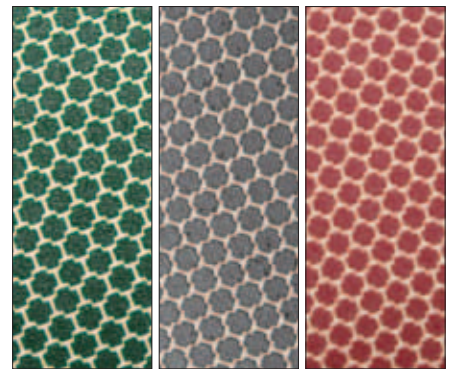
Customers can now benefit from using CBN versions.

CBN belts are suitable for either –

Removing existing Hard Coatings and calibrating the metal surface below the coating.

Or – Removing existing Chrome plated coatings as preparation for replacement HVOF coating or re-chroming.

Currently supplied with a hard backer - suitable for dry use.



## Super-Finishing Strips

### Surface Conditioning - Long Strips

Although some rolls require a high reflective finish and low Ra values – others require a specific surface roughness for friction grip &/or ink or water retention.

During the constant use of these rolls, they tend to lose this surface roughness and become "Polished" during use. Depending on the coating thickness, some rolls can be "Re-furbished" many times before needing stripping and re-coating. This can be done by diamond belts or long strips on a Super-finishing machine.

KGS now supplies these long strips with circa 3 feet (1 m) + "TAILS" on BYW3 (Similar to a conventional SiC belt backer) backer on a 3" keyed plastic core. KGS also has a new Resin product KGS Swiflex® SDA.

SDA is a new Structured Diamond Abrasive - available in CBN version also.



## Local Distributor

## Technical Support and Sales Information



KGS DIAMOND INTERNATIONAL  
Precision Tools

### SOLUTIONS

Contact our Application Engineers for advise on technical applications and Customer Services for local Suppliers in your area.

The Netherlands

### Customer Services

Tel +31 525 683300

Fax +31 525 683530

Email [sales@kgsdiamond.com](mailto:sales@kgsdiamond.com)

Internet [www.kgsdiamond.com](http://www.kgsdiamond.com)