

The CUMI logo is a blue circle with the word "CUMI" in white, bold, uppercase letters.

CUMI



murugappa

The background of the top half of the image shows a close-up of a gear grinding process. A metal gear is being ground by a large, light-colored grinding wheel. The gear has a red band around its circumference. The scene is set in a factory environment with various mechanical parts and tools visible. The image is framed by a white, stylized geometric pattern of overlapping shapes.

# GEAR GRINDING SOLUTIONS

The text "PRECISION TOOTH BY TOOTH" is enclosed in a white, stylized diamond-shaped frame with a blue outline. The text is in blue, bold, uppercase letters.

PRECISION  
TOOTH BY TOOTH



## About Murugappa

Founded in 1900, the 5.3 Billion USD Murugappa Group is one of India’s leading business conglomerate. The Group has 28 businesses including nine listed companies traded in NSE and BSE.

Headquartered in Chennai, the major Companies of the Group include Carborundum Universal Ltd., Cholamandalam Financial Holdings Ltd., Cholamandalam Investment and Finance Company Ltd., Cholamandalam MS General Insurance Company Ltd., Coromandel International Ltd., Coromandel Engineering Company Ltd., E.I.D. Parry (India) Ltd., Parry Agro Industries Ltd., Shanthi Gears Ltd., Tube Investments of India Ltd., and Wendt (India) Ltd.

## Companies



## Sectors



## In Numbers

118+ years	28 Businesses	9 Listed Companies	5.3 Billion USD
9.54 Billion USD Market Cap	50000+ Workforce	90+ Mfg. Locations	50+ Countries



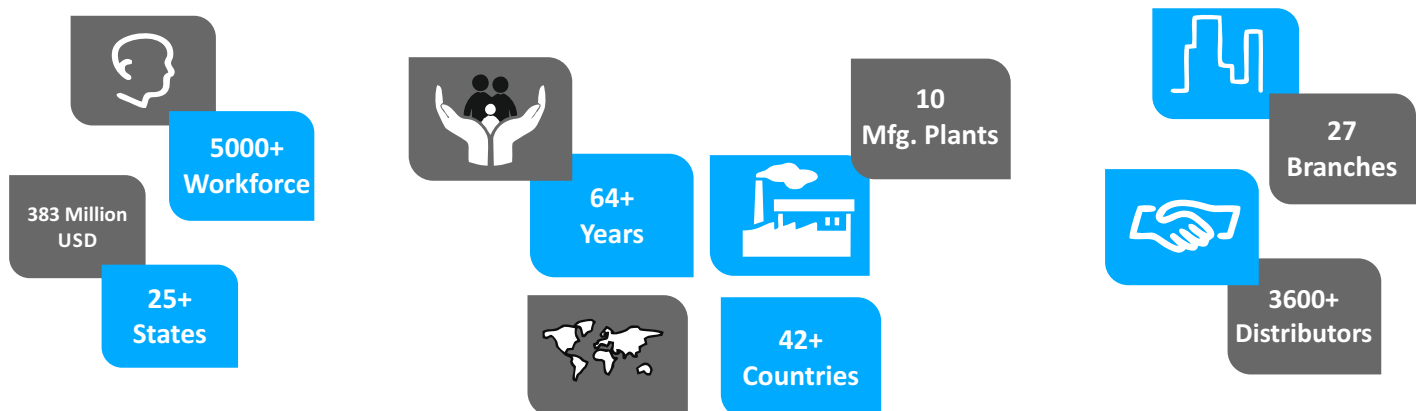
## About CUMI

Carborundum Universal Limited (CUMI), a 383 Million USD company was founded in 1954 as a tripartite venture between the Murugappa Group, Carborundum Inc, USA and the Universal Grinding Wheel Co Ltd, UK.

CUMI pioneered the manufacture of coated and bonded abrasives in India, besides super refractories, electro minerals, industrial ceramics and ceramic fibres. The widening product portfolio includes high technology products like Metallized Cylinders (among the top three producers in the World), Silicon Carbide grains (second largest producer in the world). The company manufactures over 20,000 varieties of products at 25 locations across India, Russia, South Africa, Australia, China and Thailand. CUMI exports to over 42 countries spread across the globe. About 47% of the consolidated revenue is generated outside India. All the manufacturing facilities of CUMI are ISO 9001:2008 and ISO 14001: 2004 certified for quality standards and environment friendly manufacturing practices.

CUMI is equipped with a state-of-art Research and Development centre that works aggressively on product development and efficiency enhancement. Its in-house R&D and collaborative research with leading research institutions have ensured market leadership in India and abroad. CUMI has manufacturing practices like Lean and Six Sigma in place to improve its cost and operational competitiveness. Two of CUMI's plants have won the prestigious TPM Excellence Award by JIPM - Japan Institute of Plant Maintenance.

## In Numbers



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## EVOLVING NEEDS

From the skies to the seas, from the rails to the roads, from medical devices to material handling Equipments, Gears form an integral part of all the machines around us. They help in transmitting motion and help propel our lives forward. Gear manufacturing is a highly skilled and critical machining process. It requires application expertise and sophisticated tools & machines. Gear Grinding, a very precise finishing operation, helps in achieving the desired finish. The transmission industry now aims at increasing power density, reducing gear noise and improving energy efficiency levels in gear boxes. For gears, it translates into tighter tolerances, higher profile accuracy and improved surface finish.

### TRANSMISSION NEEDS

Lower NVH

Higher power density

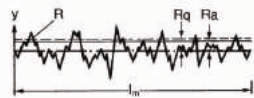
Longer service life

Precise tolerances

### GEAR NEEDS

Higher profile accuracy

Better surface finish



CUMI's advanced abrasive technologies help achieve the next level of manufacturing precision. The proven and time tested high performance EX, CN and MCA grains along with latest generation durable Krystal bond(V736, VCA2) help improve critical process parameters and provide an economically efficient solution.

Cost of benefit



Performance

## EX SERIES FOR PROFILE GRINDING (SINGLE RIB)



- Best suitable for single rib profile grinding of windmill and other industrial gears
- Nodular – High aspect ratio(8:1)
- Burn free finish
- Higher Q'w and V'w
- Lower dressing frequency and higher life

### BEST SUITED FOR



Windmill



Industry



Ships



Railways



Defence



Material handling

## CN SERIES FOR WORM GRINDING (MULTI RIB)



- Best suitable for multi rib worm grinding of automotive gears
- Bulky – Aspect ratio(2:1)
- Consistent profile and lead accuracy
- Suitable for twist and bias controlled topological grinding
- Lower dressing frequency and higher life
- Wheel speed upto 100 m/s

### BEST SUITED FOR



2 wheelers



3 wheelers



4 wheelers



Tractors

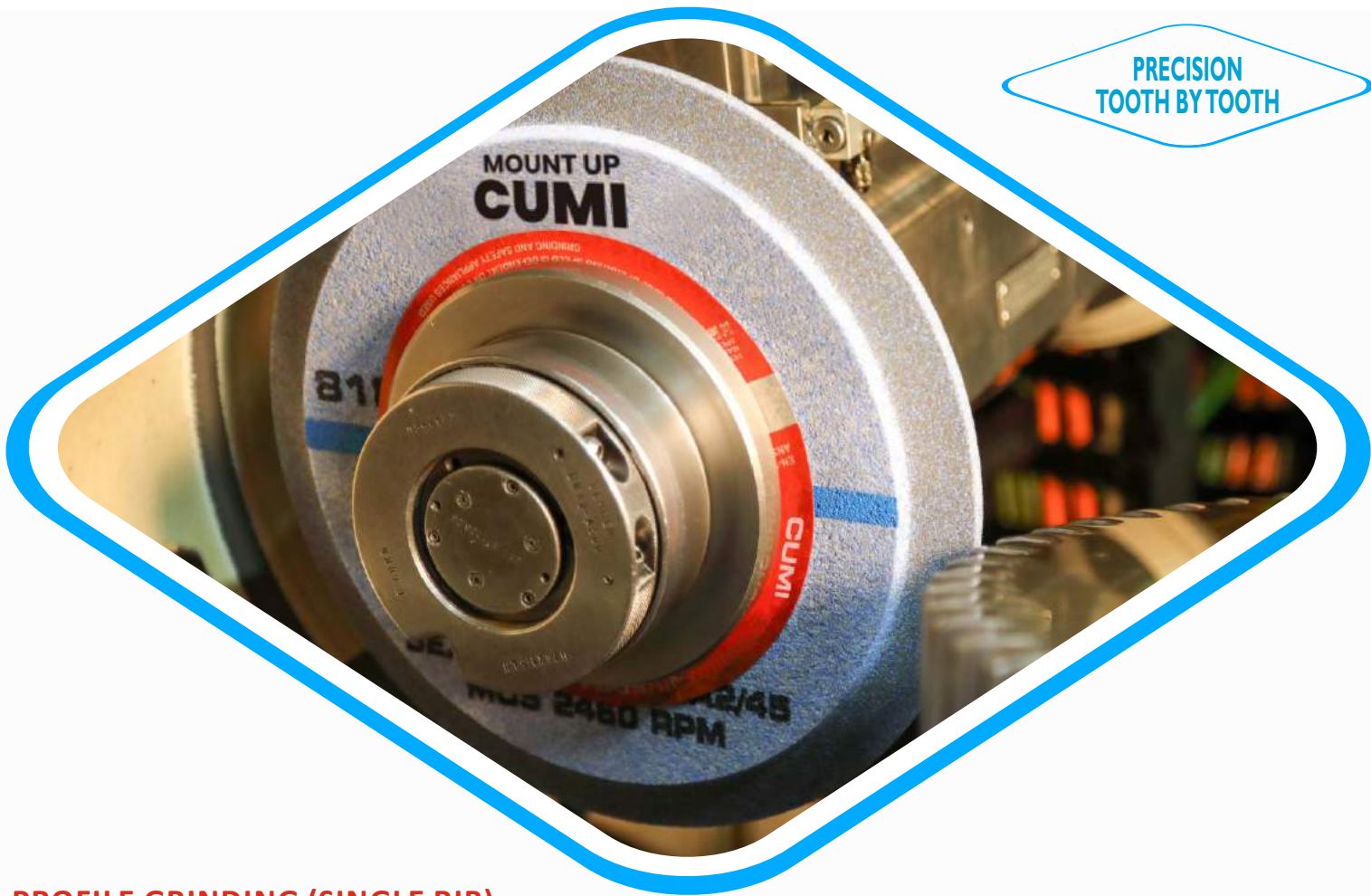


Trucks



Aerospace

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## PROFILE GRINDING (SINGLE RIB)

In Profile grinding or Single Rib grinding, each tooth flank is ground individually. This is used to manufacture windmill and other industrial gear boxes of higher modules in lower volumes.

Type of Process	Machine Model	Gear Module	GRADING RECOMMENDATION (As per Stock Removal)		
			Upto 5Q'W	6Q' to 8Q'W	Above 8Q'W
Conventional	-Niles, Hofler, Maag	upto 8 M	RAA60 H10 V736	1MCA601 G12 VCA2	1EX801 G12 VCA2
		Above 8 M	1MCA601 G12 VCA2	1MCA601 G15 VCA2	1EX801 G15 VCA2
CNC	-Gleason-Pfauter, Samputensili, Hofler, Niles	upto 10 M	1MCA601 G12 VCA2	3MCA601 G13 VCA2	3EX801 G15 VCA2
		Above 10 M	1MCA601 G12 VCA2	3MCA601 G15 VCA2	3EX801 G15 VCA2

WHEEL SIZES			
Machine Model	OD (mm)	Width (mm)	Bore (mm)
Gleason P600 800 G/P2400 G	350	25/30/32/45/50/70/82	127
Hofler Rapid 800, 900, 1250, 1800, 2500, 3000	400/450	32/45/60/90	127
Hofler Helix 400/700K	300	30	50.8
Hofler Viper series	350	20/30	160
Kapp Niles ZE400/WMW Niles	350	25/32	127
Samputensili	110	20	22
Samputensili RI370	150	15	32
Luren	400/405	12/16/20/25	160
SMS	500	25/30/40	203.2

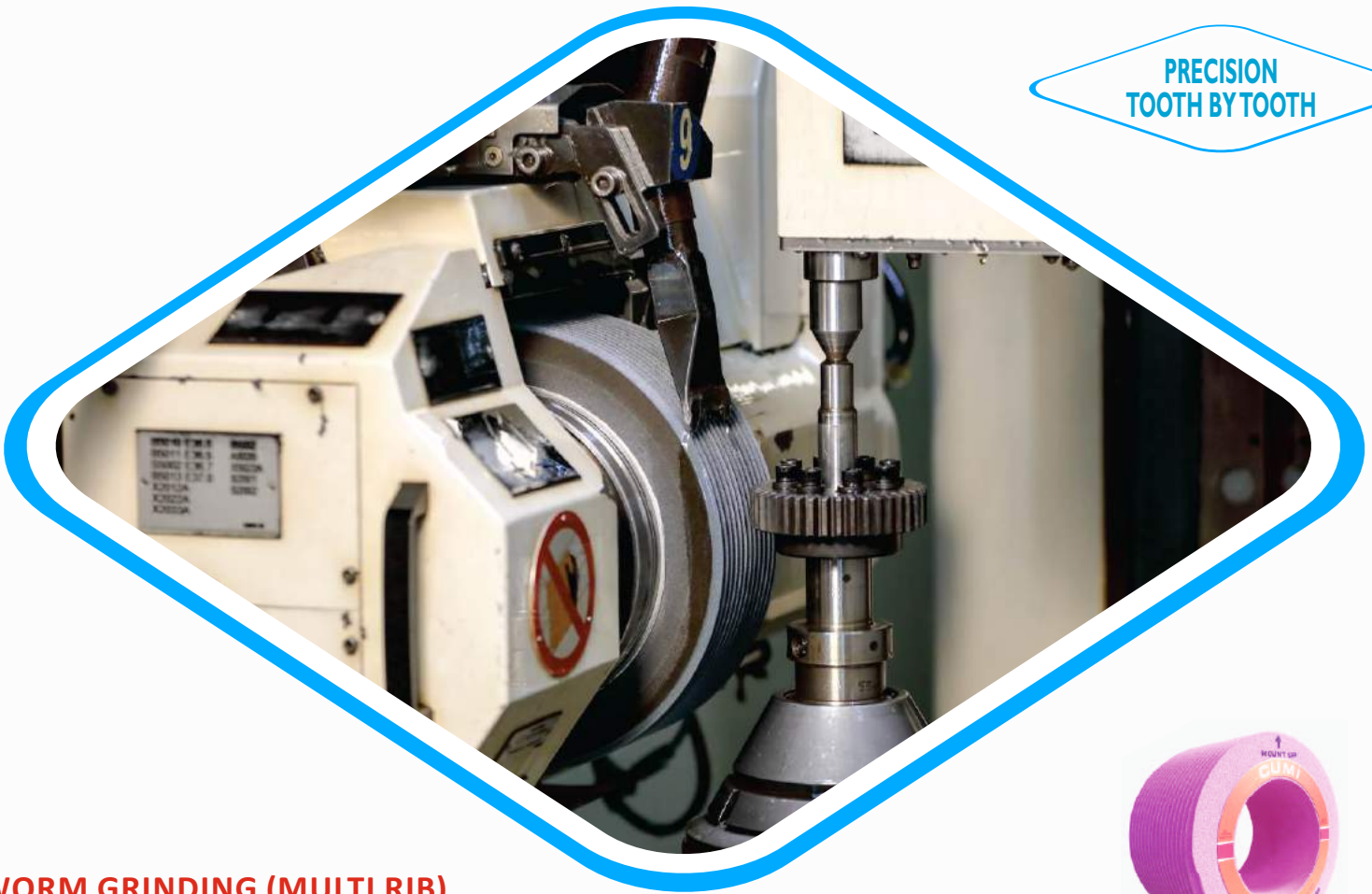


Single Rib Wheel



Dresser Wheel

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## WORM GRINDING (MULTI RIB)

In Worm grinding or Multi-Rib grinding, there is a Synchronous rotation of the Gear with the profiled Grinding wheel. This is used primarily in the automotive industry for lower module gears with high volumes.

Type of Process	Machine Model	Gear Module	Grading Recommendation		
			Good	Better	Best
Conventional	- Reishauer (ZB/OZA/AZA/NZA) - Csepel	upto 1.5 M	SA120 I7 V677G	24 R120 I12 V736	
		1.5 M - 2.5 M	SA100 J7 V677G	24R100 J12 V736	3MCA100 J12 V736
		2.5 M and Above	SA 80 K7 V677G	24R80 J12 V736	3MCA80 J12 V736
CNC - 45 mps	- Reishauer Rz301S, Rz362A - Gleason TAG 400	upto 1.5 M	24R120 I12 V736	3MCA120 I12 V736	2CN120 I12 V736
		1.5 M - 2.5 M	24R100 J12 V736	3MCA100 J12 V736	2CN100 J12 V736
		2.5 M and Above	24R80 J12 V 736	3MCA80 J12 V736	2CN80 J12 V736
CNC -50 to 100 mps	- Reishauer Rz260, Rz400, Rz410, Rz150,Rz1000 - Liebherr - Kapp Niles - Samputensili - Burri - Hofler viper	upto 1.5 M	24R120 I12 V736	3MCA120 I12 V736	2CN120 I12 V736
		1.5 M - 2.5 M	24R100 J12 V736	3MCA100 J12 V736	2CN100 J12 V736
		2.5 M and Above	24R80 J12 V736	3MCA80 J12 V736	2CN80 J12 V736



Pink Alumina Wheel



Ceramic Wheel



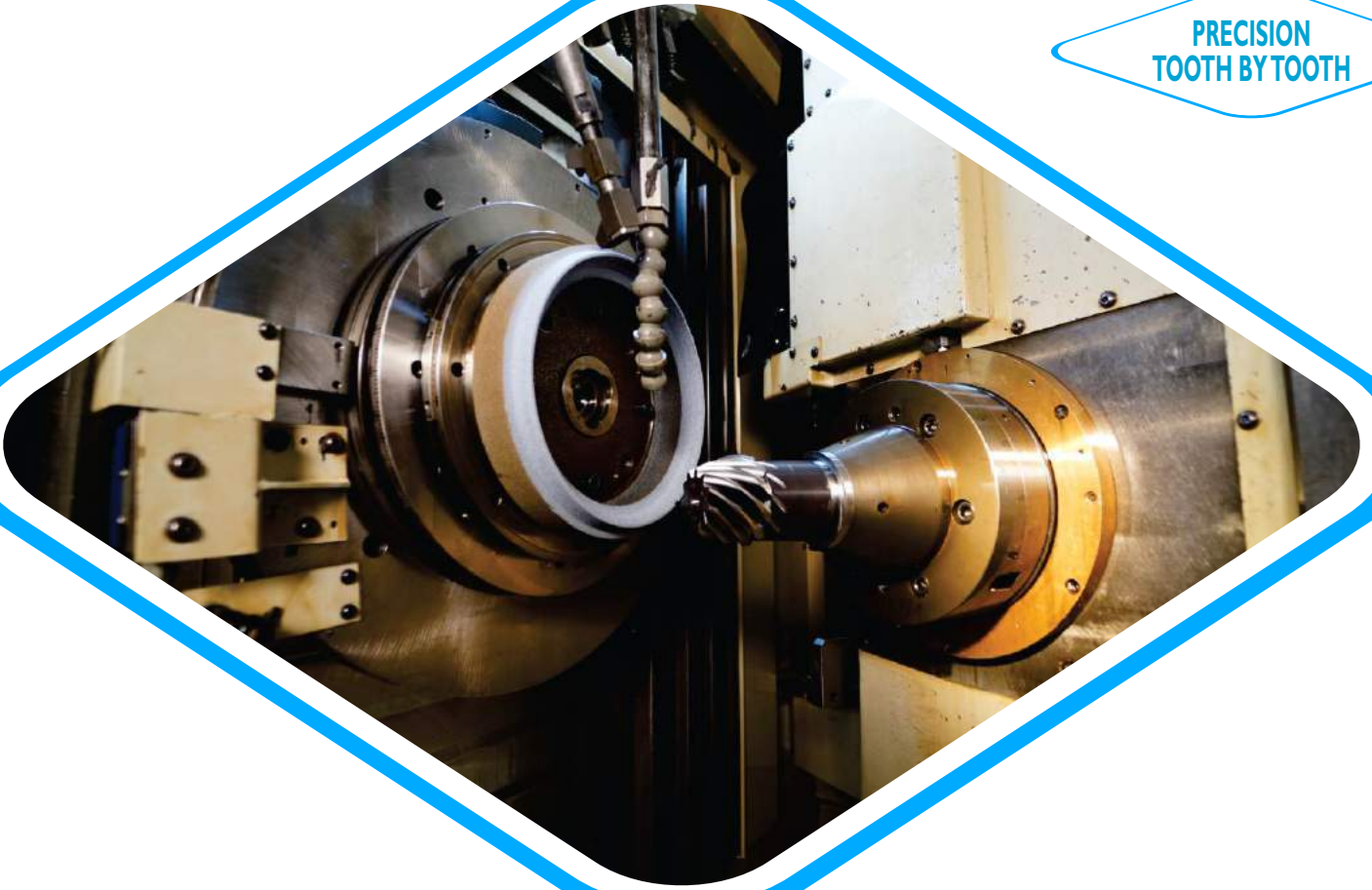
Polishing Wheel

WHEEL SIZES			
Machine Model	OD (mm)	Width (mm)	Bore (mm)
Reishauer OZA/AZA/NZA/ RZ 301S/ RZ362 Burri 331/220 Gleason TAG 400	350	84/104	160
Reishauer RZ150, RZ60, RZ160, RZ 260, RZ 360, RZ 400/RZ 410	275/300	125/160	160
Csepel, Reishauer RZ800	400/450	84/104	160
Liebherr LCS200/LCS 300/LCS 380	195/240	200/230	90/110
Gleason TWG 160	240	125	120
Kapp Niles KX300	280	160	115
Samputensili GS 400	200/220	84/104/150	90/120/76.2
Samputensili GS 250	250	180	120
Hofler Viper series	350	150	160



Dressing Rolls

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## BEVEL GEAR GRINDING

In Bevel Gear grinding, the Bevel gears and pinions are ground using cup or cylinder shaped grinding wheel in a special profile grinding process. CUMI's range of bevel gear grinding wheels are well suited and established in machines namely Klingelnberg-Oerlikon and Gleason-Phoenix.

### Grading Recommendation

Good	Better	Best
1MCA 601 K7 VC500	3MCA 601 J6 VC500	5MCA 601 I7 VC500

### Range of Grinding Wheel

OD (mm)	Width (mm)	Bore (mm)
80-500	50 - 150	50.8-203.2



## HOB RE-SHARPENING CUMI Product Specification

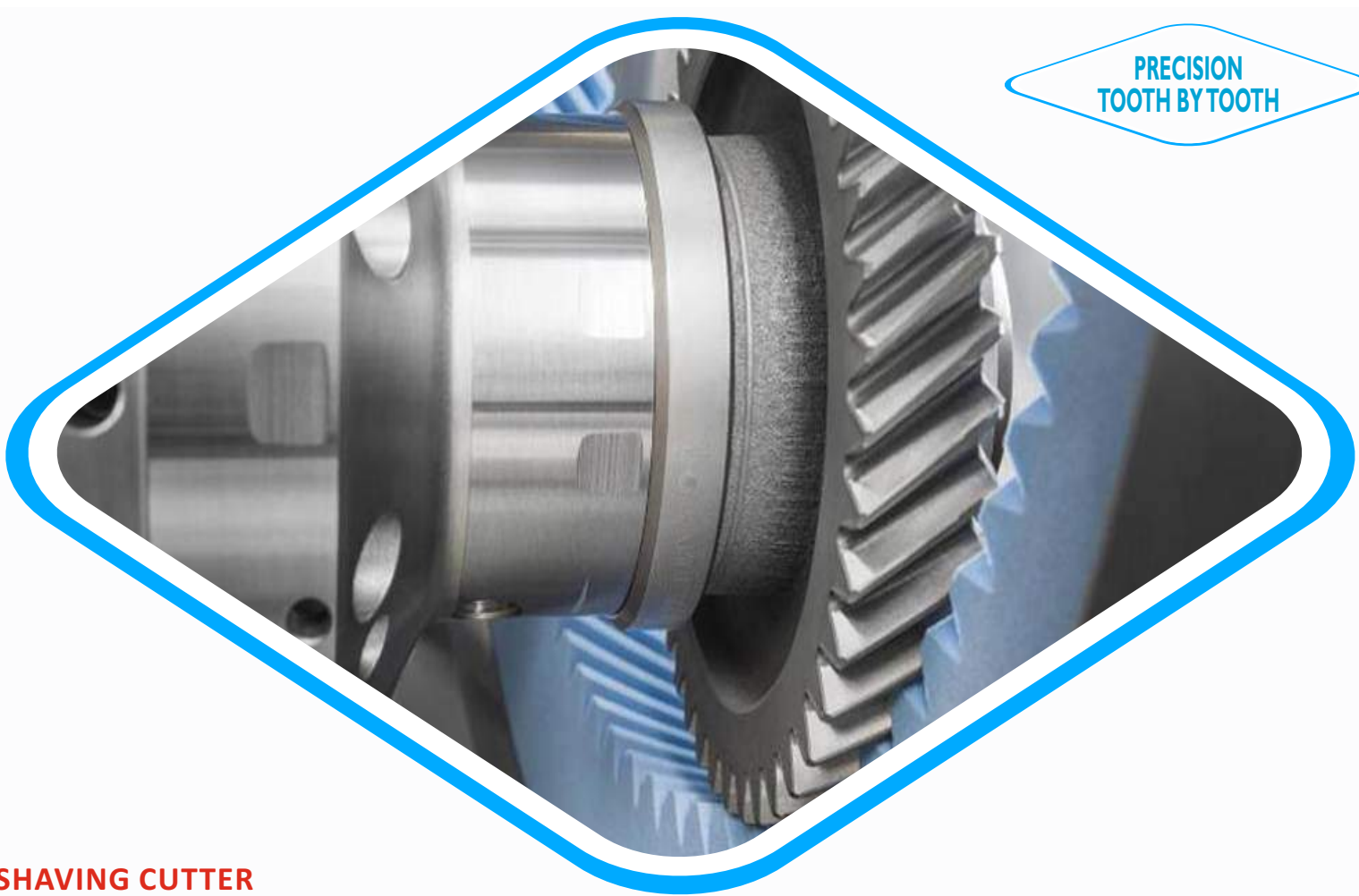
Gear hobbing is the most common manufacturing process of Gears. Being the initial operation, it plays a significant role in achieving consistent quality in subsequent finishing processes like Gear shaving or Gear grinding. Hobs wear out after certain number of gears and require re-sharpening and recoating. CUMI's range of re-sharpening wheels help achieve good finish to prepare the surface for re-coating.

### Grading Recommendation

Good	Better	Best
AA46/54 J5 V8	1MCA601G12 VCA2	3EX801 G12 VCA2



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## SHAVING CUTTER

### CUMI Product Specification

Timely sharpening is key in getting optimum productivity and consistent quality of Gears. CUMI's range of shaving cutter grinding wheels give optimum stock removal rates to achieve cutting edges like-new cutters.

Grading Recommendation		
Good	Better	Best
AA 100 I18 VMPA	RA 120 G6 V155	53A 120 G12 VCA2



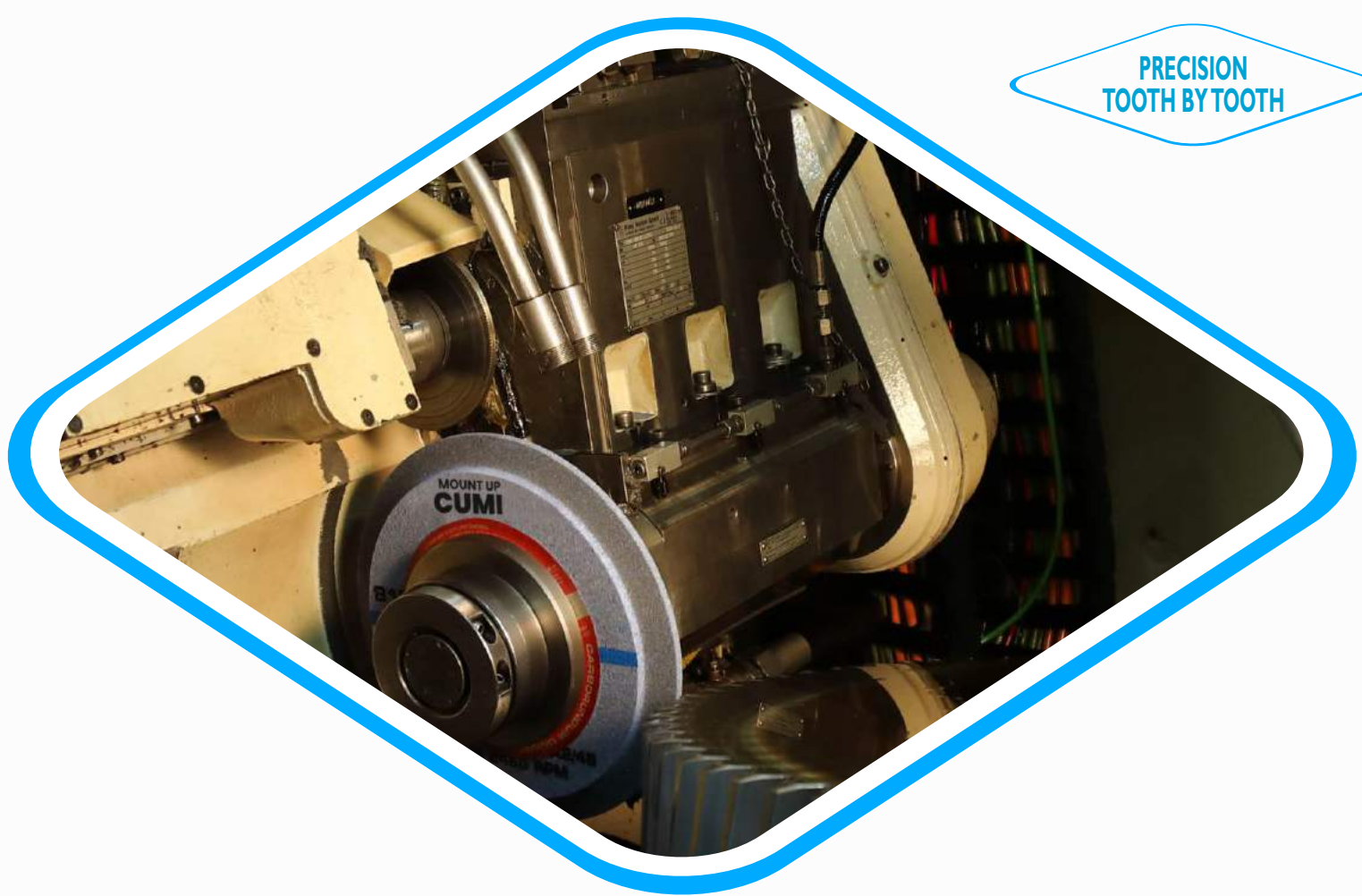
## GEAR HONING(Vitrified Bond)

Gear honing is a precision finishing process in which the honing wheel and the work piece roll on one another. With increasing demands for lower noise and high power density, Gear honing is becoming a critical operation in gear manufacturing. It lowers the NVH, improves pitting resistance and helps achieve surface finish of 0.15 Ra.

CUMI's High Performance vitrified bonds achieve controlled stock removal rate upto 0.1 mm



Specification	Grain	Machine Type
5MCA 220 M8V500	Microcrystalline	Prawema, Fassler



### DRESSING ROLLS FOR GENERATIVE GRINDING (MULTI RIB)

- Compatible with Reishauer, Liebherr, Fassler, Gleason, Samputensili and other Dressing Systems
- Module range 0.5 to 8.0 mm, conforms to DSA/SPA and Rp2 attachment
- Pressure Angle: 15° to 30°
- HBR: Standard (200 to 3000) / Customer Specific
- Tip Relief: Standard (0.02 to 0.05) / Customer Specific
- Tip Chamfer: Customer Specific



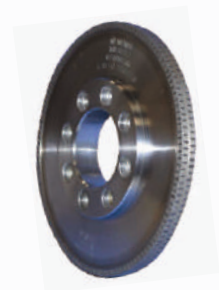
### CBN FINISHING DISC

- Compatible with Kapp, Liebherr, Samputensili
- H19A - 140-30-B76-PN2000
- Vs: 66 m/s
- Vf: 3.600 mm/min



### FORM ROLLS FOR PROFILE GRINDING (SINGLE RIB)

- Compatible with Hofler, Liebherr, Kapp, Gleason, Samputensili, Niles
- Offered with Natural Diamonds, CVD/PCD and MCD for all Dressing Systems





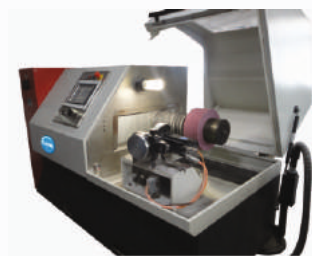
## OUR CAPABILITIES

We have the expertise and technology to manufacture grinding wheels to maximum precision. At our IoT enabled manufacturing facility at Chennai, we have the capability to pre profile the wheels to custom requirement.

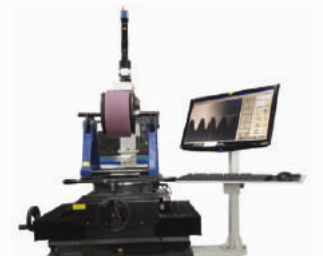
- Fully integrated from grains to end product
- Profile grooving machine
- Profile inspection machine
- Speed testing machine
- Scada controlled continuous temperature kilns
- H8 tolerance for bore
- Module up to 14
- Pressure angle up to 25
- No of starts up to 09



**SEM Grain Analysis**



**Profile Grooving Machine**



**Profile Inspection Machine**



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