

3M™ Cubitron™ II Vitrified grinding wheels for bevel gear grinding

Gearings on bevel gears are subject to special requirements: efficient and reproducible production processes, smooth running, and low-maintenance operation – while meeting highest operating safety requirements – these are important properties to be mentioned.

3M™ Cubitron™ II vitrified grinding wheels are designed for bevel gear pinions and ring gears and meet highest tolerance requirements of only a few micrometers while achieving the required surface finish and minimal wear – and all that almost free of grinding abuse.

3M™ Cubitron™ II vitrified grinding wheels are suited both for grinding hardened components and for preliminary gearing (creep-feed grinding) of soft materials.

Application examples:

Various sizes of bevel gear pinions and ring gears in:

- Drive systems (e.g. vehicles and helicopters)
- Steering systems (e.g. shipbuilding)
- Agricultural and industrial machines



The advantages at a glance:

- Reduced grinding time by approx. 20 – 30 %
- Doubled service life through reduced dressing amounts or longer intervals between dressing cycles
- Very low wear
- The risk of grinding abuse is virtually zero
- Significant increase of dressing roll service life



Application recommendation

Cutting speed (v_c)	20 – 23 m/s	Dressing	Infeed: 0.04 mm
Feed rate (v_f)	Immersion: 120-150 mm/min Generation grinding: 24-30 °/s		Feed rate concave: 155 mm/min
			Feed rate convex: 155 mm/min
			Feed rate tip: 185 mm/min
		Dressing after every 1st to 3rd component	

Specification recommendation

Product Code	Specification	PSG	v_c max.	Structure	Comment
92VC	93DA80/80 H12VP601	30 %	32 m/s	porous	Universal < 12
93VE	99DA80/80 H12VP901	100 %	32 m/s	porous	Universal >= 12"
	99DA80/80 K11VP901	100 %	32 m/s	narrow	

Service life and cost calculation bevel gear grinding

Gearing Data		
Specification	93A80 H12VP601	93DA80/80 H12VP601
Dimensions grinding wheel	225 × 95 W = 20	225 × 95 W = 20
Normal module (mm)	4 mm	4 mm
Number of teeth (z)	51	51
Pressure angle (alpha)	20°	20°
Helix angle (β_{m1})	24°	24°
Pitch circle (d_{e2})	246.70 mm	246.70 mm
Tooth width (z_b)	43 mm	43 mm
Tooth height (z_h)	11.10 mm	11.10 mm
Cutting speed (v_c)	25 m/s	22 m/s
Unclamping width (b_{s2})	22 mm	22 mm
Original price grinding wheel	€ 200	€ 280
Machine-hour rate	€ 100	€ 100

Operating Parameters		
Total radial infeed ($a_{e\text{ges.}}$)	0.42 mm	0.42 mm
Total flank infeed ($a_{e\text{ges.}}$)	0.14 mm	0.14 mm

Dressing		
Dressing infeed (a_d)	0.12 mm	0.04 mm
Number of parts between dressing cycles	1 x	1 x

Evaluation	93A80 H12VP601	93DA80/80 L7901
Total material removal	0.42 mm	0.42 mm
Total running time	00:02:27 h:m:s	00:01:52 h:m:s
Total wheel wear per part	0.12 mm	0.04 mm
Cost share wheel	0.320 €/workpiece	0.149 €/workpiece
Number of workpieces per wheel	625 pcs.	1,875 pcs.
Total costs machine-hour rate	4.08 €/workpiece	3.11 €/workpiece
Total overall costs	4.40 €/workpiece	3.26 €/workpiece

For more information, or to make an appointment, please contact us at the address or telephone number below.



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