

SUPERABRASIVES – GRINDING HINTS AND FAULT-FINDING

Adhering to the following suggestions will help ensure the most efficient and cost-effective performance from superabrasive products.

AVOID STEEL WHEN USING DIAMOND WHEELS

When using a diamond wheel try to keep the amount of steel ground to an absolute minimum. On brazed tools, use an ALUNDUM wheel, and back off the steel shank. A high lubricity grinding fluid should be used. For some tool steels, armoured (AMD) diamond wheel may prove most economical.

USE RIGID WORK SUPPORT

All workpieces should be supported firmly during the grinding process. Any amount of vibration will cause wheel wear and produce chatter or wave marks on the ground surface. On work ground between centres, be sure the centreholds are properly prepared. Minimize work overhang. If the ground edge is supported by a work finger, ensure the finger is strong enough to provide vibration-free support.

GRIND WET

If at all possible, diamond wheels should be used with a full flood of coolant properly directed into the grinding zone. (Vitrified bond diamond wheels should be used only with a flood coolant.) Water with a rust inhibitor is recommended.

When a flood application cannot be used, try a mist or spray application. These systems used compressed air to “atomize” water or soluble oil. The spray is directed at the grinding zone and helps dissipate heat in the workpiece and wheel. Although not as effective as the flood procedure, it does increase wheel life and helps prevent heat damage to the work.

AVOID EXCESSIVE FEEDS

Every grinding operation is different. What is an excessive removal rate on one operation may be entirely acceptable on another. Excessive feeds on a given operation will always cause premature wheel wear. If you smell resin, reduce infeed because you are burning up the bond. Excessively high feed rates are characterized by :

- ◆ A harsh grinding sound
- ◆ Chatter
- ◆ Burn
- ◆ Vibration
- ◆ Smell
- ◆ High wheel wear rate

DRESS CORE

As the abrasive section of a cup wheel wears, the core material (that part of the superabrasive wheel which holds and supports the abrasive bearing section) may become exposed. The core materials should not contact the workpieces during grinding as they cause heat build up. However, some core materials as in some 11V9's are self dressing.

A single point carbide or steel tool is the best way to dress a resalloy core. The tool is clamped in vise with its cutting edge directed accurately to remove enough core material to leave a 1/16" of abrasive section exposed.

FAULT-FINDING AND CORRECTION GUIDE

DIAMOND WHEELS - DRY GRINDING

Problem	Possible Causes	Suggested Correction
Burning (excessive heat)	Wheel loaded or glazed	Dress wheel with a dressing stick
	Excessive feed rate	Reduce infeed to wheel or workpiece
	Wheel too durable	Use freer cutting specification or slow down wheel speed
Poor Finish	Grit size too coarse	Select a finer grit size
	Excessive feed rate	Reduce infeed to wheel or workpiece
Chatter	Wheel out of trueness	True wheel (see Truing and Dressing Section)

DIAMOND WHEELS - WET GRINDING

Problem	Possible Causes	Suggested Correction
Poor Finish	Excessive dressing	Use lighter dressing pressure. Stop dressing as soon as wheel starts to consume stick rapidly
	Grit size too coarse	Select finer grit size
	Poor coolant flow or location	Apply heavy flood of coolant so it reaches wheel/work interface
Chatter	Wheel out of trueness	True wheel, ensure it is not slipping on mounting
Wheel won't grind	Glazed by truing	Dress lightly until wheel opens up
	Wheel loaded	Dress lightly until wheel opens up, increase coolant flow to keep wheel surface clean, never run wheel with coolant turned off
Slow cutting	Low feeds and speeds	Increase coolant to flood wheel work surface
	Low wheel speed	Increase wheel speed
	Excessive dressing	Use lighter dressing pressure
	Wheel too soft or too hard	Change grit or grade, use higher concentration
Burning (excessive heat)	Wheel glazed or loaded	Redress wheel
	Poor placement of coolant	Apply coolant directly to wheel/workpiece
	Excessive material removal	Reduce downfeed and/or crossfeed

For optimal design of the best super abrasive product a complete understanding of the grinding system is required. For choosing the right wheel and optimising your requirement, please send us the enclosed chart filled up.