# BONDED ABRASIVE WHEELS

## HOW THEY WORK

Abrasive wheels are actually thousands of cutting edges (abrasive grains) boned together to form a single cutting tool. The first abrasive wheels were made from natural grains of carborundrum and were bonded together with a clay bond.

## MATERIALS

**SILICON CARBIDE** A jagged glasslike material that fractures easily. This exposes new cutting particles constantly. Generally used in masonry cutting blades.

**ALUMINUM OXIDE** A harder, stronger grain that releases itself from the bond as it becomes dull, exposing the next grain behind it. Generally used in metal cutting blades.

**ALUMINUM ZIRCONIUM** Harder than Silicon Carbide and more jagged than Aluminum Oxide. It has both the performance properties of both and can be used to cut both masonry and metal.

**S.G. (SEEDED GEL)** A ceramic aluminum oxide that performs like a "superabrasive".

## BONDS

**SHELLAC BOND** For light duty work and very smooth finishes.

**RUBBER BOND** For high quality, smooth finishes such as autobody work.

**VITRIFIED BOND** For fast stock removal or precisiongrinding. Unaffected by water, oils, acids or ordinary tempertature changes.

**RESNOID BOND** A compound of synthetic phenolic resins which is for

## GRIT SIZE

Determined by a screening process on the number of holes per square inch in the screen. The higher the number,the finer the grain. (Ex.100 grit last passed through a screen with 100 holes per square inch.)

## REINFORCING

For added strength wheels are reinforced with one, two or three fiberglass matts which allows the blade a limited amount of flexibility without breaking. The more reinforcing, the more expensive the blade.

## CLASSIFICATION AND IDENTIFICATION

A quick look at any bonded abrasive code number will reveal it's composition,grit size,hardness and size.

EXAMPLE

**A - 24 - N 7 x 1/4 x 5/8-11**

- **A** — Material: A=Aluminum Oxide, C=Silicon Carbide, Z=Aluminum Zirconium
- **24** — Grit Size: 16 - 600
- **N** — Hardness: A=Softest, Z= Hardest
- **7** — Outside Diameter
- **1/4** — Thickness
- **5/8-11** — Arbor Size

## TYPES

**Type 1** Cut off wheels used on circular, masonry, chop, high speed cutoff saws. These tools are available in gas, electric and pneumatic power. Wheels are used to cut metal, masonry, and ductile iron

**Type 11** A Cup type grinding wheel with a built-in 5/8-11 threaded hub. Used on right angle grinders for heavier grinding applications.

**Type 27** A depressed center wheel used on a right angle grinder for either cutting or grinding of metal pipe and masonry materials. The depressed center enables the operator to cut or grind without interfering with the mounting of the wheel. These wheels are available with an arbor hole or a preassembled spin on style hub.

**Type 28** A depressed center wheel with a saucer shaped grinding rim. This wheel is designed for corner and side grinding. This wheel should not be used for cutting or notching applications.

**Type 29** A conical ( convex) shaped, surface grinding wheel. It's shape allows it to reach more contoured areas.

**Type 16,17,17R,18 & 18R** Cones and plugs for horizontal and straight grinders.

## WHEEL HARDNESS

Hardness is the term that refers to how tightly the resin material holds on to the grain particles.

**HARD WHEELS** Last longer, but may not cut as fast or as cleanly. Used on soft materials.

**SOFT WHEELS** Cut fast and smooth, but do not last as long. Generally used on hard materials.

## SAFETY

**Always wear eye protection.**
**Do not exceed maximum RPM marked on every wheel.**
**Use safety guards.**
**Check flanges and mounting procedures.**
**Always clamp material being worked on securely.**
**Inspect wheel before mounting on equipment .**
**Never use a damaged wheel.**
**O.S.H.A. requires compliance with A.N.S.I B7.1 for use, care and protection of abrasive wheels.**

# ABRASIVE TROUBLE SHOOTING GUIDE

| PROBLEM | POSSIBLE CAUSES | RECOMMENDATIONS |
|---|---|---|
| "Loading"<br>Metal lodged on grains or in wheel pores | Incorrect wheel spec. | Use a coarser grit size or more open structure to provide chip clearance. Use more coolant |
| | Faulty operation | Manipulate operation to soften effect of wheel<br>Use less pressure. |
| "Glazing"<br>Wheel has shiny appearance and feels slick | Wrong Spec. | Use a coarser grit size , softer grade.<br>Manipulate operation to minimize effect. |
| | Faulty operation | Use greater feed pressure |
| "Radial breakage"<br>Wheel breaks into three or more pieces<br><br>"Chordal breakage"<br><br>"Irregular breakage" | Wheel speed too high<br>Improper mounting<br>Wheel jams on work<br>Excessive wheel pressure on work<br>Too much side strain<br>Wheel is jamming; it has been hit hard or damaged in handling | **CAUTION:** Stop all grinding using this product. Investigate wheel breakage to determine and correct the cause. If unable to determine cause, contact manufacturer for immediate assistance. |
| Poor quality cut | Wheel is too coarse | Try a finer grit |
| | Wheel is too hard | Try a softer wheel |
| Non-square cuts | Work isn't properly clamped | Check the clamp: clean cuts to remove residue |
| | Inadequate coolant distribution | Apply an equal volume of water to each side |
| | Misaligned spindle bearings | Check for bearing runout and alignment |
| | Wheel is too hard | Try a softer acting wheel |
| Poor cutting rate | Insufficient power | Increase feed pressure |
| | Wheel is too hard | Try a softer thinner wheel |
| | Contact area is too big | Try reducing contact area to a minimum |
| | Wheel is too coarse | Try a finer grit wheel |
| | Wheel not running true | Check the spindle and wheel runout |
| Work is burned | Feed rate is insufficient | Work the machine at maximum power |
| | Wheel is too coarse | Try a finer grit wheel |
| | Wheel is too hard | Try a softer grit wheel |
| | Wheel not running true | Check the machine spindle and wheel runout |
| Poor finish | Wheel speed is too slow | Check for wheel slippage. Use maximum recommended speed |
| | Too many burs | Try a finer grit or softer wheel |
| | Wheel is too coarse | Try a finer grit wheel |