How to Read a Coated Abrasive Specification

A coated abrasive product is made up of three basic raw materials: an *abrasive mineral*, the *backing* onto which the abrasive is applied, and an *adhesive bond*. The Carborundum Abrasives coated abrasive marking system includes both a generic and a technical marking.

The generic markings identify the abrasive type, backing, bond, and any special features and/or tradenames. An example would be: *Premier Red Aluminum Oxide Dri-Lube Resin Paper Open.*

The technical markings identify the actual components which make up the product. Technical markings consists of up to 10 parts. An example would be: *P400 B 0912 DO.* The following terminology explains the technical marking system.

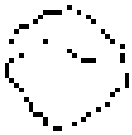
Coated Abrasive Terminology Key

P 60 Y C 09 8 6 A O

GRADING	GRIT SIZE	BACKING WEIGHT	CLOTH TYPE	BACKING FLEXIBILITY	MINERAL (ABRASIVE)	BACKING	BOND	PERFORMANCE	COATING
P FEPA	12	PAPER:	B POLY/ COTTON BLEND	F FLEXIBLE	02 EMERY	0 MESH	0 GLUE	A ANTI-STATIC	O OPEN COAT
_ ANSI/CAMI	↕	A		_ STANDARD	03 GARNET	1 PAPER	1 U/G	D DRI-LUBE OVERSIZE	_ CLOSED COAT
	2000	B	C COTTON	S STIFF	04 SILICON CARBIDE (S/C)	4 FIBRE	2 U/U	R REACTIVE OVERSIZE	
	CRS	C	P POLY-ESTER		07 LIGHT BROWN A/O (LBA)	CLOTH:	FULL RESIN:	W WASHABLE OR WATERPROOF	
	MED	D			08 ALUMINUM OXIDE (A/O)	5 MOST FLEXIBLE	4 LEAST DURABLE		
	FINE	E			09 HEAT-TREATED A/O	↕	↕		
		F			11 ZIRCONIA ALUMINA (Z/A)				
	MICRON	CLOTH:			12 PREMIUM ZIRCONIA ALUMINA (Z/A)	8 LEAST FLEXIBLE	7 MOST DURABLE		
		J			25 CERAMIC ALUMINA				
		X							
		Y							
		M MESH							
		V FIBRE							

Abrasive Types

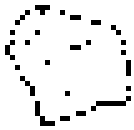
EMERY (02)



Emery is a dark gray, round-shaped grain which tends to polish rather than abrade a work surface.

- for polishing and cleaning metal only

GARNET (03)



Garnet is reddish brown in color. This natural abrasive is medium hard and relatively sharp, but not as durable as synthetic abrasives.

- for use on wood only
- particularly good for soft woods such as pine
- produces an excellent finish

SILICON CARBIDE (04)

Silicon carbide is the hardest and sharpest of the manufactured abrasives. Because of its extreme sharpness, this bluish-black abrasive grain permits fast stock removal and cool cut.

- cast iron
- non-ferrous metals, i.e. brass, aluminum and bronze
- non-metallics, i.e. glass, rubber, plastic and stone
- final finish on wood and stainless steel
- abrasive planing particleboard

LIGHT BROWN ALUMINUM OXIDE (07)

Light brown aluminum oxide is a tough, yet sharp, synthetic abrasive characterized by cool cut, long life and the ability to break down under pressure producing new cutting edges.

- production wood sanding
- non-ferrous metal finishing

BROWN ALUMINUM OXIDE (08)

Brown aluminum oxide is a tough, durable, synthetic abrasive characterized by the long life and wear resistance of its cutting edges. It offers enormous penetrating strength, even at high speeds.

- ferrous metals
- aluminum
- hardwood

HEAT-TREATED ALUMINUM OXIDE (09)

Heat-treated aluminum oxide is a tough but cool cutting abrasive which gives both long life and freeness of cut on a wide range of materials.

- ferrous metals
- Wood sanding

ZIRCONIA ALUMINA (11, 12)

Zirconia alumina is an ultra-tough, synthetic abrasive which provides a free, cool cut for high stock removal applications. It is tougher and sharper than aluminum oxide. It has a micro-crystalline structure which allows for controlled breakdown and self-sharpening.

- heavy duty snagging and grinding of all ferrous and non-ferrous metals
- abrasive planing of wood, plywood and particleboard
- grinding fiberglass, rubber and plastics

CERAMIC ALUMINA (25)

The sub-micron structure of ceramic alumina allows each grain to continually expose sharp cutting points, resulting in a cooler cutting action and an extended life.

- all ferrous/non-ferrous metals, carbon steel and exotic alloys

Grit Comparison Chart

AVERAGE PARTICLE SIZE IN MICRONS	GRADING SYSTEMS (OTHER THAN EMERY) CAMI	FEPA	JIS	EMERY PRODUCTS
5.0	-	-	-	-
6.0	-	-	3000	-
6.5	1200	-	2500	4/0
8.4		P2500	-	-
8.5	-	-	2000	-
9.2	1000	-	-	3/0
10.3	-	P2000	-	-
10.5	-	-	1500	-
12.2	800	-	1200	-
12.6	-	P1500	-	-
15.0	-	-	-	-
15.3	-	P1200	1000	-
16.0	600	-	-	2/0
18.3	-	P1000	800	-
19.7	500	-	-	0
20.0	-	-	-	-
21.8	-	P800	-	-
23.6	400	-	600	-
25.0	-	-	-	-
25.75	-	P600	-	-
28.8	360	-	500	-
30.0	-	P500	-	-
35.0	-	P400	400	-
36.0	320	-	-	-
40.0	-	-	360	-
40.5	-	P360	-	-
44.0	280	-	-	1
45.0	-	-	-	-
46.2	-	P320	320	-
50.0	-	-	-	-
52.5	-	P280	280	-
53.5	240	-	-	-
55.0	-	-	-	-
58.5	-	P240	-	-
60.0	-	-	240	-
64.0	-	-		2
65.0	-	P220	220	-
66.0	220	-	-	-
78.0	180	P180	180	-
79.0		-	-	3
93.0	150	-	150	
95.0	-	-	-	FINE
97.0	-	P150	-	-
116.0	120	-	120	-
127.0	-	P120	100	-
136.0	-	-	-	MEDIUM
141.0	100	-	-	-
156.0	-	P100	-	-
189.0	-	-	-	COARSE
192.0	80	-	80	-
197.0	-	P80	-	-
260.0	-	P60	-	-
268.0	60	-	60	-
326.0	-	P50	50	-
341.0	-	-	-	EX. COARSE
351.0	50	-	-	-
412.0	-	P40	40	-
428.0	40	-	-	-
524.0	-	P36	-	-
535.0	36	-	36	-
622.0	-	P30	-	-
638.0	30	-	30	-
715.0	24	-	-	-
740.0	-	P24	24	-
905.0	20	-	-	-
984.0	-	P20	20	-
1320.0	16	-	16	-
1324.0	-	P16	-	-
1764.0	-	P12	-	-
1842.0	12	-	-	-

Backing Types

Backings are the base for the abrasive minerals and, combined with the adhesive bond, support and anchor the abrasive mineral. The backings used in the manufacture of coated abrasives are:

PAPER

Paper is used for a variety of operations from hand sanding to mechanical sanding. It is the least expensive backing. Due to the fine surface of paper, a consistent finish is produced. Paper weights include *A, B, C, D, E* and *F* weights with *A* being the lightest and most flexible and *F* being the heaviest and least flexible. *A, B, C* and *D* weight papers are used for hand sanding and light mechanical operations in the form of sheets, *Grip-On* and *Stick-On* discs and Stick-On rolls. *E* and *F* weight papers are primarily used for more aggressive mechanical operations in the form of belts and discs.

CLOTH

Cloth backings used for coated abrasives are identified by weight. Cloth backings are filled or "finished" with a variety of materials, glues or resins, to create various backing characteristics, most notably flexibility.

There are three basic weights of cloth: *J-weight* or "jeans" is the lightest and most flexible. *X-weight* or "drills" is a heavier cloth that ranges in flexibility, strength and durability and is used on the broadest range of applications. *Y-weight* is a heavyweight drills cloth used on heavy-duty, high stock removal operations. Several cloth types are used: cotton, polyester, and polyester/cotton blends.

FIBRE

Vulcanized fibre (cotton fibers which are chemically treated and then pressed under temperature and pressure to form a very durable backing) is used exclusively as the backing for resin fibre discs.

Bond Types

An adhesive bond system is required to secure the abrasive mineral to the backing. All coated abrasive products are made with a two stage bonding process. The first layer of bond applied to the backing is called the *make coat.* The make coat provides the adhesive base between the abrasive mineral and the backing.

The second coat is the *size coat,* which is applied over the abrasive mineral and make coat to anchor the abrasive mineral and provide the desired physical strength of the finished product.

Glue, urea resin and *phenolic resin* are the three basic bonding agents most commonly used. There are many size coat and make coat combinations, such as *glue over glue, urea over glue, and resin over resin. Glue over glue* is the most flexible bond while *resin over resin bond* is moisture resistant, harder, less flexible, heat-resistant and has superior grain retention.

Coating Types

There are two types of abrasive coatings used in the manufacturing of coated abrasives: *open coat* and *closed coat.*

OPEN COAT

With an open coat, 50% to 75% of the coated abrasive surface is covered by abrasive grain. There are evenly spaced voids between particles of grain, helping reduce the effect of loading caused by wood dust or metal particles.

OPEN COAT
(1/3 LESS GRAIN THAN CLOSED COAT)

CLOSED COAT

With a closed coat, the entire coated abrasive surface is covered with abrasive grain, with no voids between the particles. This is the most typical coating, permitting the greatest degree of stock removal and longest product life.

CLOSED COAT