General Abrasive Information

There are many factors involved in matching an abrasive to an application. The information contained herein relates to typical conditions, however, there are endless combinations of these factors. GRIER's experience will be an important ingredient to assist in matching abrasive to application. Listed below are some of the important ingredients to proper selection.

To make bonded abrasives, you need (1) abrasive grain and (2) bond. To get specific properties, GRIER selects the appropriate (3) grade, (4) structure and (5) treatment.

(1) ABRASIVE GRAIN

Aluminum Oxide consists of blunt shaped grains and is very tough in its lowest refined form. It is produced in a variety of refinements and by its versatility can be used from very hard to soft applications; making it the most commonly used abrasive.

Silicon Carbide is hard and sharp with exceptional strength, but due to its brittleness it breaks down faster than aluminum oxide under heavy loads.

Ceramic Grain abrasive is non-fused ceramic aluminum oxide that is extremely tough in all grades. It provides exceptional durability and cut rates. This grain is more costly, so its merits need to be evaluated against the other abrasives.

PROPERTIES

Friability – the degree to which a grain is easily fractured. A **friable abrasive** grain is easily fractured by impact, therefore, constantly exposing fresh cutting crystals to the work piece making it the fastest cutting abrasive. A **semi-friable abrasive** grain does not fracture as readily as friable grain, therefore, gives longer life but does not cut quite as freely.

Grain Size – abrasives are classified into grit sizes ranging from very-coarse to super-fine. Coarser grits are used for heavy stock removal while fine grits are used to improve a surface finish or meet dimensional tolerances.

Very-Coarse =	8 to 16 grit
Coarse =	20 to 46 grit
Medium =	54 to 120 grit
Fine =	150 to 220 grit
Very-Fine =	240 to 320 grit
Super-Fine =	400 to 600 grit

CATEGORIES

Aluminum Oxides
23A — Aluminum oxide is an off-white friable, very aggressive grain, used in larger mounted point and wheel applications where a tougher application is indicated.

27A — Aluminum oxide is semi-friable and of average hardness. It is the most widely used medium density, fused aluminum oxide. It has a complete range of grit sizes for use in general purpose vitrified applications.

28A — Premium aluminum oxide is friable white grain which has an aggressive, cool, fast cutting action while holding form well. It is used in grinding heat sensitive alloys, taking advantage of its friability and cool cutting. This grain is also widely used in grinding of heal treated tool steels, high speed steels, and internal wheels.

29A — Aluminum oxide is a pure fused abrasive, alloyed with chrome oxide making it pink in color. Although friable and cool cutting, it exhibits marked form-holding characteristics. Applications will be found in precision, broad surface and tool room grinding on hard alloy steels.

36A — Aluminum oxide is a high chromium ruby-colored fused abrasive, free of titania. It is made by fusing high purity calcined alumina and chromium oxide. It is a friable abrasive, somewhat tougher than white, with corner-holding characteristics, which is needed for precision grinding. It is a premium priced grain as compared to 28A-white and 29A-pink, so the merits as compared to these types should be weighed.

AMA — Aluminum oxide is a friable, very aggressive grain for a tough compositions.

Silicon Carbides
C — Silicon carbide is a black, semi-friable medium density abrasive. It is produced in both resin and vitrified points and wheels for grinding hard or brittle materials, such as cast iron, ceramics, and glass: as well as low tensile strength, ductile non-ferrous metals.

GC — Silicon carbide is a green in color, friable, highly pure, medium density abrasive used in vitrified bonded points and wheels. It is most commonly used for grinding hard, brittle materials, such as cemented carbides, where fast cool cutting is desirable.

Ceramic Grains
11A (CG) — Aluminum oxide is non-fused ceramic grain that is very tough, pure, and of uniform quality. Applications are in resin and vitrified points and wheels for high stock removal rates and long life. It performs especially well in precision grinding and fine finish applications, without excess heat generation. Since it is a premium priced grain, its merits need to be weighed in comparison to the more common specifications, and is most commonly used in combination with other grains for best results.

COMBINATIONS

Used in various proportions to obtain desired results:

17A = 11A + 27A aluminum oxide
18A = 11A + 28A aluminum oxide
19A = 11A + 29A aluminum oxide
68A = 36A + 28A aluminum oxide
69A = 36A + 29A aluminum oxide
73A = 27A + 23A aluminum oxide
78A = 27A + 28A aluminum oxide
79A = 27A + 29A aluminum oxide
7MA= 27A +AMA aluminum oxide
89A = 28A + 29A aluminum oxide
BG = C + GC silicon carbide
CA = C silicon carbide + 27A aluminum oxide (resin products only)

Grier Abrasive Co., Inc.