

## **Knowledge about Abrasive Products**

Abrasive products are used to remove surface materials such as metal, ceramics, glass, plastics, and paint. Abrasive products include discs, belts, blast machines and sandblasters, as well as sheets, rolls, and hand pads. Some abrasive products are designed for use on bench or back stand grinders, while others are designed for use on portable or handheld grinders or sanders. Bonded abrasives, which include grinding wheels, use abrasive grains held together in a matrix of glass, resin, rubber, or other binders. Coated abrasives consist of an abrasive grain layer adhesively bonded to the surface of a cloth belt, fiber disc, plastic film, paper sheet, or other backing.

Grit size measures the abrasive grains in a matrix or bonded to a surface. Typically, grit sizes are based on ANSI (U.S.), FEPA (European), JIS (Japanese), or Micron graded standards. Typically, bonded abrasives and grinding wheels use ANSI - Bonded and FEPA - F grit size standards. Coated abrasives, grinding belts, and sanding discs use ANSI - CAMI and FEPA - P standards. Coarse grains, or grits, are used to remove large amounts of material, while medium grains are used to remove intermediate amounts. Fine grits are used in finishing and debarring applications, while very fine grits are suitable for debarring.

Abrasive products use several different types of abrasive grains. Aluminum oxide, the most common industrial mineral in use today, is used either individually or with other materials to form ceramic grains. Aluminum oxide is also combined with emery and crocus to produce abrasives suitable for finishing applications. Other types of abrasive grains include garnet, tungsten carbide, silicon carbide, and alumina-zirconia. Super-abrasive diamond pastes are useful in ferrous polishing or lapping applications where heat and reactivity are not factors. Cubic boron nitride (CBN), a super-abrasive grain with hardness second to diamond and a cubic crystal structure provides superior grinding performance on carbon and alloy steel.

There are several different backing types for abrasive products. Cloth backing is used with abrasive products designed for aggressive applications such as abrasive planning. Fiber backing is denser than cloth and contains vulcanized or chemically treated cotton or cellulose fibers; however, fiber may curl under humid conditions. Film backing uses abrasive grains on plastic film, while foam and sponge backing uses abrasive grains bonded onto a foam layer, sponge, felt or other soft, resilient materials. Similarly, metal backing uses abrasive grains bonded onto a metal backing such as aluminum or brass. Other types of backing include paper, screen, non-woven, or aggregate materials.

Abrasives products are used in wet and dry grinding, sanding, cleaning, polishing, lapping, and surface preparation in a variety of industries, including metalworking, woodworking, ceramics, and semiconductors. Abrasives products are also used to sharpen tools, cut optical components, and finish concrete.