

Silicon Carbide Abrasives - Explained



What is a coated abrasive?

It consists of a single layer of abrasive grain on a flexible backing. An adhesive layer is deposited on the backing. Before the glue has a chance to set, the grain is electrostatically drawn upward and implanted in the adhesive. This orients the grain so the elongated particles are perpendicular to the backing. Then a second adhesive layer is deposited over the grain to lock it in place.

With the ability to adhere abrasive grain to paper backing, coated abrasives for simple hand sanding were developed. The first mechanized use of coated abrasives was probably achieved by adhering pieces of abrasive paper onto rotating drums. Drum sanding is still popular today in the woodworking industry. It was not long before portable and stationary floor and bench sanders employing abrasive discs and belts became popular.

Slitting coated abrasives into specific lengths, splicing the ends together forming an endless belt gave us a tool we could run under power over two or more pulleys to provide quick stock removal and quality finishes. Coated abrasive belts are made today in widths as narrow as 1/4" and as wide as 75" and wider. For example, narrow belts are popular in the metalworking industry and very wide belts are very popular in the particle board and woodworking industries.

Why silicon carbide?

Silicon carbide was developed in an effort to produce a man made diamond. The effort was anything but a failure, and we now enjoy one of the sharpest cutting grains in use today. The bondings have greatly improved. Phenolic resins along with modifications now anchor the grain securely to the backing. Application of the grain to the backing by electrostatic coating methods affixes the grain with the sharp edges protruding. This gives the sharpness and durability to perform glass sanding operations.

Improvement in the cloth backing has assured a real tool for glass work. Cotton, "X" weight backing, when properly finished, provides excellent dry sanding belts for the tempering and other glass industries. The ability to properly treat the cotton has produced excellent abrasive belts for wet sanding, and the introduction of polyester backing has added further waterproof backings.

Most abrasive belts made for the industry are confined to 3" or 4" widths and are used on stationary or portable sanders. Unfortunately the portable belt sander manufacturers have not standardized on specific belt lengths; so we find our-

selves with a dozen or so different sizes. 3"x 24" and 3"x 21" are just two examples of the more popular sizes. Since these standards have been developed for dry sanding, they should be used in that manner. While a waterproof belt can be run wet or dry, a phenolic resin bond "X" wt. cloth dry sanding belt (our Powerkut belt) will abrade as well as and better than a waterproof cloth belt on dry sanding operations and at a lower initial cost.

Portable belt sanders employ a steel platen. The platen holds and contacts the belt splice on each rotation of the belt. Since portable belts are quite short, there is very little cooling time for the splice before it once again meets the platen. Besides subjecting the splice to heat, the platen also supplies a hard steel surface. A strong splice that is too thick provides a bump on each rotation, so the splice must be made thinner without sacrificing strength. Since the splice is the weakest part of the belt, it must be made stronger than ever before since the coated abrasive manufacturers are producing abrasive cloth that lasts longer.

There are a number of different splices. In addition to the variations in the splice angle, there are variations in the type of lap at the splice. Overlap splices are very popular and have been for decades. This type of splice is available in two types, "skived" or "unskived". The unskived splice retains a full coat of mineral on the top of the lap. Of the two, the skived splice is preferred on platen applications. Overlap splices should be run in one direction only in accordance with the directional arrow stamped on the back of the belt. Butt splices have the two ends of the belt cut at an angle, butted together and anchored with a piece of cloth or plastic film material pressed onto the backside of the belt. These belts can be run in either direction. Some operators felt they get added service from the belts by running them in the opposite direction after they are partially used. Butt splices must have a smooth joint with high tensile strength and proper flexibility for the intended use. Splices are factory made by the coated abrasive manufacturers. All our portable belts have factory made butt splices.