

Tyro Tool of the Month - Sandpaper

This month's tyro tool is "Sandpaper". Its so commonplace, I have long taken it for granted. Yet, its usefulness in the art of woodcarving, to shape wood and to smooth a wood surface for woodburning and finishing, has brought to light many things about sandpaper that this tyro did not appreciate.

"Sandpaper" usage dates back many centuries, at least as early as 13th century China when parchment was coated with ground seashells, seeds and sand using natural gum as a binder. By the 1830s, crushed glass adhered to paper was being mass produced and sold as "glass paper." Today, sandpaper may be provided in various shapes such as sheets, discs, belts. Its abrasive particles, instead of being sand, are chosen from a variety of materials having different degrees of hardness and crystal structure such as garnet, flint, emery, aluminum oxide, silicon oxide, alumina-zirconia, chromium oxide, diamond, and ceramic aluminum oxide. Abrasive particle size is called "grit" (see the October, 2016 Tyro Tool Tip). These abrasive particles are bonded to a backing that is typically paper, woven cloth, or polyester film (mylar). The "weight" of the paper or cloth backing may vary and is graded according to a letter scale. Different types of adhesives may be used to bond the abrasive particles to the backing e.g. water soluble, hide glue or water resistant resins.

The amount of the surface area of the "paper" covered by particles is also varied to make different sandpapers. When 100% of one surface of the backing is covered it is said to have a "closed coat." The many particles of closed coat sandpaper cut aggressively. Closed coat sandpaper works well for hard woods like oak or hickory. "Open coated" sandpaper has less than 100% surface coverage. Typically, 50% coverage is called "open," and 70% coverage is called "semi-open". The fewer number of abrasive particles reduces the aggressiveness and speed of the material removal, and also reduces clogging. Open coated papers work well on materials such as soft woods like pine or basswood, as well as aluminum, brass and copper.

Another way to reduce clogging is by coating the sandpaper with a metal wax such as zinc or calcium stearate to make a "no load" stearated paper. Stearated papers use their waxy coatings as a soap-like lubricant to prevent clogging, and also to cool the surface heat generated by friction. Stearated papers are used dry. Surfaces that have been sanded by stearated papers must be cleaned to remove any wax transfer that might contaminate a finish. For that matter, after sanding the wood should always be cleaned of any remaining abrasive particles. This helps prevent dulling the edge of carving tools when additional carving is performed. Since sandpaper and sanding belts are often used to shape and sharpen tools, clearly the abrasive grit particles can scratch away metal.

3M

Formed in 1902 3M began making sandpapers several years later using imported garnet. In 1929 3M used a waterproof adhesive to bond silicon carbide to a cloth

backing to invent a sandpaper that could be used wet. The advantages of wet sanding are: (1) the abraded material may be washed away to reduce clogging; and (2) the sanded surface may be cooled by the water to reduce the heat generated by friction. These two advantages led to extensive use for metal sanding. This type of sandpaper is sold as "wet or dry."

http://www.3m.com/3M/en_US/company-us/

Swiss Sandpaper

There are some great long lasting, flexible, heavyweight cotton cloth backed, closed coated, semi-friable aluminum oxide sandpapers made in Switzerland by sia Abrasives (for some reason they always use a lower case "s" for their company name). One sia sandpaper (trade designation 2951 siatur h) is sold by several carving suppliers as "Swiss Sandpaper". Four inch wide by one yard rolls are available for \$4.95 per roll in grit sizes 80, 150, 220, and 400, from Christian Hummel.

<http://hummul.com/wood-carving-supplies/sanding-supplies/sandpaper-discs/>

Sia, founded in 1867, is older than 3M. Sia has been making coated abrasives since 1875, and emery paper and cloth since 1875. One sia emery cloth is sold as 2915 siarol. It has aluminum oxide in a closed coat on a highly flexible J weight cloth. It is available in 1 inch by 30 yard rolls (sizes range from 60-400 grit) for about \$20 per roll. Today sia is owned by Bosch and has over 60,000 abrasive products.

<https://www.siaabrasives.com/us/en/home/>

Finnish Sanding Mesh - Mirka Abranet

Even better than the cloth backed "Swiss" sandpapers is the Finnish Mirka Abranet Sanding Mesh. Founded in 1943, Mirka is now part of KWH Group.

This does open coated sandpaper one better by using a porous mesh backing having thousands of small holes. According to Mirka it possible to vacuum away particles without clogging the disc surface producing a very uniform sanding pattern and a perfectly smooth surface with a minimum of airborne dust. These meshes are also long wearing, but may tear or rip if caught on a sharp corner.

Abranet sanding mesh is available as sheets, discs, rolls and strips. It has an aluminum oxide abrasive resin bonded to a polyamide net. While Mirka advertises that it has a closed coating (which provides aggressive sanding), the use of a mesh net structure backing equates to a better than open coat performance regarding clogging. The grit range is P80-P180, P240, P320-P1000.

<https://www.mirka.com/en-US/us/productview/#/540/ABRANET>

If you opt to use Abranet Sanding Mesh Discs on your rotary sander, please heed the advice of others and use a special Abranet Pad Protector adapter pad to attach the sanding mesh to your hook and loop fastener disc. Without this adapter pad interface, the hooks on your Dewalt, Makita or Bosch, etc sander will quickly abrade rendering the hook and loop disc attachment useless, requiring you to get another disc for your sander. Apparently, the hooks stick through the Abranet mesh leading to the disc's

early demise. The Abranet adapter pad sticks to both the mesh and the sander disc to prevent this from happening. A pad may be included with a set of Abranet discs.

The accolades for these sanding discs on Amazon are almost universally exceptional.
https://www.amazon.com/Mirka-9A-232-APRP-5-Inch-Abranet-Assortment/dp/B001BL1R2C/ref=sr_1_2?ie=UTF8&qid=1489376675&sr=8-2&keywords=abranet

Abranet sanding mesh sheets are available from Christian Hummel in 80, 120, 240 and 400 grit sizes. \$3.45 list price for a 4 1/2 inch by 12 inch sheet. The Woodcraft Shop in Bettendorf has the same product in 24 inch lengths for \$5.29.

So as you work to complete refinishing that old Philco radio cabinet, embellished now with a pair of freshly carved acanthus leaves and a custom bluebird tweeter, it is time once again for the Lone Tyro to return to his thrilling days in the old woodshop with a new fiery sanding mesh, no cloud of dust, and a hearty Hi-Yo Abranet!

