Procedures
Be sure to follow manufacturer’s safety recommendations for equipment and materials used with ACRYLITE® sheet.

Type of Finish

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Preparation
The amount of finishing required to produce a smooth, transparent edge is dependent on the quality of the machined edge. A sharp and properly designed cutting tool will reduce the amount of the finishing work needed. Finishing work is also reduced when spray coolant is used with the cutting tool to prevent excessive heat build-up.

Polishing Edges
Polishing creates the best finished edge but requires the most preparation. A well machined (milled) edge can be polished without prior sanding. However, a saw-cut must either be sanded, run through a jointer, shaper, router, edge finishing machine, or be hand-scraped before it can be polished. Edge polishing is best done on a stationary polishing head. Use 8” to 14” (200–300 mm) diameter bleached muslin wheels designed with bias strips which give the buffing wheel a pleated appearance. This design will do a faster job.

Edge finish quality depends on the selection of the polishing compounds. The use of a medium cutting compound will give a fairly good finish in one operation. For a high luster finish, it is best to first use a fast cutting compound to remove all sanding marks, and then a high luster compound for the final buffering operation.

Be careful to avoid excessive heat buildup when buffing edges. Too much heat can induce stress into the sheet and eventually cause crazing. To
reduce to a minimum the amount of stress, anneal the part, if possible, after all fabrication steps are complete (inducing polishing). See Tech Brief #12 on Annealing for the proper procedures.

**Polishing Surfaces**
If the scratches or machining marks are not too deep, the surface can be polished without prior sanding. Wheels used for surface polishing can be from 6” to 12” (150–300 mm) in diameter, built up to a width of 1 ½” to 2” (38–51 mm). They are made of soft, bleached muslin for initial polishing operation and of soft flannel for the final finishing.

For the first buffing operation use a medium–coarse polishing compound depending on the depth of the scratches.

When polishing the surface of the sheet, the piece must be kept in motion at all times. Do not use excessive pressure, as softening from over–heating can result.

**Sanding Edges**
Sanding Edges is desired for finishing acrylics. Normally 180–320 grit “wet–or dry” paper is used along with plenty of water. If done by hand, use a sanding block to keep edges even. Only light pressure should be applied when grinding with power sanders to minimize frictional heat which can cause gumming from over–heating of the acrylic. Follow “Polishing Edges” procedure for a higher finish.

**Sanding Surfaces**
A scratched surface should not be sanded unless the imperfections are too deep to be removed by polishing alone. If sanding is required, it is recommended that wet sanding be used. The application of water makes it possible to produce a smoother finish because a fine–grit sandpaper can be used. Without water, the same fine–grit paper would fill up and over–heat the acrylic.

For very deep scratches, a 240–grit or 320–grit paper will be coarse enough to start the sanding process. The first step should be followed, after rinsing, by a 400–grit, and then by a 600–grit paper. Be sure to use plenty of water and rinse the sandpaper frequently to keep it from clogging. With power sanders, only light pressure should be applied to reduce friction. Follow “Polishing Surfaces” procedure for a higher finish.

**Scraping Edges**
Scraping is the easiest finishing technique. A scraper can be almost any piece of metal with a sharp, flat edge. Special acrylic scraping tools are available from your ACRYLITE® sheet distributor. Whatever tool you use, it must have a sharp square edge.

Hand scraping is an alternative to sanding for preparing the edges for polishing. Used in conjunction with flame polishing, high luster edges are achieved, but without the smoothness of sanded and polished edges.

Clamp the work vertically. Start at the rear of the edge with the scraper tilted 45° and draw with uniform speed and pressure to the front. A uniform strip should be removed. Follow an edge polishing procedure for a higher finish.

**Flame Polishing Edges**
Flame polishing should be done with an oxygen–hydrogen welding torch. The flame should be bluish, nearly invisible, approximately 3” (75 mm) long and narrow. Hold the torch at the angle shown and draw the flame along the edge of the sheet. Practice will help you to estimate the speed and distance. If the first pass does not produce a completely polished edge, allow the piece to cool, and then try a second pass. The sudden heating of the sheet when flame polishing induces a high degree of stress into it.
After flame polishing, be sure to anneal the part. This will decrease the amount of stress and reduce or prevent the chance of crazing over time. See Tech Brief #12 on Annealing for more information.

**Edge Finishing Machines**

Commercially available edge finishing machines offer a fast method of obtaining smooth edges without sanding or scraping. Finishes range from smooth edges with slight machining marks to smooth, almost polish edges, depending on design of the machine and cutting tools used. Machine finished edges are ideal for cementing of flame polishing, but are sharp and require some additional fabrication to make them safe for handling.

Care should be taken to adjust the feed rate to eliminate chipping and melting. Feed rates that are too fast will result in chipping, while a slow feed rate will result in melting. Edge finishing machine will vary in cutter diameter and rotation speed. In general, machines with larger cutter and rotation speeds will permit faster feed rates without chipping.