

## Technical Bulletin - Adhesive Joining and Thermal Attachment Guidelines for ARPRO® Expanded Polypropylene (EPP) Foam and ARPAK® Expanded Polyethylene (EPE)

There are numerous joining and attachment method that can be readily employed for ARPRO EPP. The guidelines below illustrate several attachment methods, including those using adhesives, as well as those utilizing thermal bonding techniques.

| Adhesive Type  | Description   | Advantages  | Processing  | Tradename & Supplier   |
|----------------|---|---|---|--|
| Hot Melt       | Includes 'hot-'melt' and 'cool-melt types. EVA, Acrylic, and PO based. Available in sprayable form (with spray-melt gun). | Easy to apply. Available in various tack times. Only clean surface required. Waterproof.              | Requires glue gun. Can be sprayed or deposited. Performance depends on technique used.  | Hysol (Henkel/Loctite) 0420/0430 (Cool Melt Series). Jet-Melt (3M) 3600/3800 Series.         |
| Spray Adhesive | Generally PU based in aerosol form.   | Easy to apply. Readily Available. Minimum surface cleanliness required.                               | Self contained. Strength depends on application technique and amount used. Contains VOC's.                                    | Spray 90 (3M). Super 77 (3M).  |
| Epoxy          | Two component (resin & hardener).   | Very strong bond. Waterproof  | Requires mixing. Time dependent.  | Plastic Weld Epoxy Series (Devcon). Scotch-Weld Series (3M).                                 |
| Cyanoacrylate  | Single component, instant set.  | Quick setting, with minimum set and curing time. Easy to apply.                                       | Requires clean surface and surface treatment (primer). Bond strength depends on technique used.                               | Zip-Grip GPE (Devcon). Hysol 3440/5570 (Henkel/Loctite).                                     |
| Tape/Film      | Adhesive and tape combination. Used with film or foam tape.   | Bond is instant with pressure sensitive adhesive. Quick and easy installation. Can be reapplied.      | Minimum surface cleaning required. For low strength or temporary applications. Application technique effects bond quality.    | 5790 /5605 Acrylic PSA Foam Tape (3M). FT1126/ft8217 Acrylic PSA Foam Tape (Avery Dennison). |
| Butyl Rubber   | Butyl rubber tacky adhesive strip or film.  | Bond is instant (PSA-like). Quick and easy installation. Can be reapplied multiple times. Waterproof. | Minimum surface cleaning required. For low strength or temporary applications. Forms to part contour. Very flexible/formable. | 3023-5 Butyl Rubber (Bostik).  |

| Joining Method    | Description   | Advantages  | Processing   | Equipment   |
|-------------------|---|---|--|---|
| Hot Plate Welding | Hot surface plate or profile used to heat surface of foam to it's melt point, causing the surface to soften and become tacky allowing for material bonding. | Repeatable process. Can be repeated on same surface. Can be automated. Relatively fast and provides permanent thermal bond.                 | Requires specialized equipment and good temperature control. Density dependent. Performance depends on technique used. | Specialized equipment available (Plasticworking; Abbeon Cal, Inc.) or use of modified commercial hot plate systems.   |
| Hot Air Welding   | Hot air system or heat gun used to heat surface of foam to it's melt point, causing the surface to soften and become tacky allowing for material bonding.   | Low investment. Repeatable process. Can be repeated on same surface. Can be automated. Relatively fast and provides permanent thermal bond. | Operator or process dependent. Density Dependent. Performance depends on technique used. Requires operator skill.      | Several industrial hot air guns available. Can be use with or without welding rods for filler. Systems and supplies avaiable (Plasticworking; Abbeon Cal, Inc.) |

Note: Surface treatment preparation for adhesives includes; cleaning and degreasing with solvent (such as acetone or alcohols). ARPRO EPP Foam surface can also be 'roughed' by using sandpaper, which improves the surface bond. Care should be exercised when working with any of the adhesives or equipment listed above. Manufacturers recommendations should be strictly adhered too, and all recommended safety precautions followed.