



Tenacious Foamed Acrylic Bonding Tapes



Transportation

Construction

Electronics

*Metal & Plastic
Fabrication*

Sign & Graphics

Benefits of Foamed Acrylic Bonding Tapes

- Offer a flexible and conformable bond that is aesthetic and yet resilient to all weather conditions
- Quick and safe to apply without the need for extensive trade skills or equipment such as drills and rivet guns
- Immediate adhesion, unlike liquid glues (Bond strength does improve with time, as a guide: 20 minutes 50%, 1 Hour 75%, 1 Day 90%, 3 Days 100%)
- Since loads and stresses are spread uniformly across the entire bonded surfaces there are no stress points, as occur with mechanical based fastening systems
- The tape acts as a natural shock absorber, dampening and absorbing the loads generated by shock impact and differential expansion and contraction between dissimilar materials
- Where used to replace welding there is no distortion of the sheet metal and no need to grind-out the welding bead
- Assists in preventing galvanic corrosion where used for bonding dissimilar metals

Typical Applications

Products recommended are purely for guidance and the nature of each individual application will determine the most appropriate product based on type, gauge and colour.

Transportation (Car, Bus, Caravan, Coach, Truck & Marine)

- Badge & emblem mounting (T711BDX, T708GX)
- Fixing bodyside mouldings (T711BDX, T708GX)
- Fixing interior and exterior trim (T708GX, T716GX)
- Bonding roof & side panels (T711BDX, T716GX)
- Bonding reinforcing profiles to panels (T711WX, T711BDX, T716GX)
- Mounting skylights, mirrors, spoilers, tread plates, wheel arch mouldings, protective floor trims (T711WL, T708GX, T716GX, T711BDX)
- Bonding sub-assembly units (T708GX, T711BDX)



Bonding metal panels to chassis

Construction

- Bonding architectural cladding panels (T723GX, T720W Cold)
- Securing skylights (T711WX, T716GX, T720C)
- Securing interior partition panels (T708GX, T711WX, T716GX)
- Mounting architectural hardware - decorative trim, handles, kick plates (T711WX, T711WL, T711BDX, T710C)
- Bonding muntin plates internally and externally for colonial windows (T708GX, T710C, T711BDX)
- Mirror mounting (T711WL, T716GX)
- Bonding extrusions & weather strips to window frames (T7025C, T705C, T708GX, T711WL)



Electronics

- Bonding trim in electrical goods whitegoods, audio/visual equipment, gaming machines, switchboards (T7025C, T708GX, T711BDX, T716GX)
- Securing components - battery packs, circuit boards, ribbon cable (T708GX, T716GX)
- Sealing/Bonding of cabinets and machinery casings (T708GX, T711BDX, T716GX)
- Mounting alarms/security cameras, car aerials, E-Tag (T710C, T711WX, T711WL, T711BDX)



Mounting electronic equipment

Metal & Plastic Fabricators

- Bonding of all types of smooth profiles, powder coated metal & moulded plastics - office/shop fit-outs, acoustic screens, exhibition and P.O.S. display makers (T7025C, T705C, T710C, T706WL, T711WL, T711WX)
- Mounting magnetic extrusions to metal and plastic profiles (T7025C, T708GX)
- Mounting of P.O.S., Exhibition & Display (T608R)



Bonding metal trim to light diffuser

Sign & Graphics

- Bonding clear and translucent acrylics and polycarbonate for illuminated signage (T705C, T710C, T720C)
- Mounting of permanent signs and nameplates (T706WL, T710C, T711WL, T711BDX, T716GX)
- Fixing individual letters (T7025C, T705C, T710C, T706WL, T708GX, T711WL)
- Bonding stiffeners to metal panels - road signs (T711WX, T711BDX, T720W)
- Mounting of temporary signage (T608R)



Mounting laser cut acrylic letters

Tenacious Foamed Acrylic Bonding Tapes

The Tenacious Range of Foamed Acrylic Bonding Tapes are designed for the exacting needs of industry. The adhesive technology employed in their manufacture has many features that lend it to the structural bonding of smooth surfaced materials, with the capability of holding heavy weights in dynamic and static situations with excellent durability and long-term ageing characteristics. Our range is manufactured in an ISO 9001 certified production plant and has been engineered to meet the specific needs of users' applications.

The White, Grey and Black Foamed Acrylic Bonding Tapes consist of a core of visco-elastic acrylic copolymers and monomers with microspheres of glass acting as the filler. The tapes are extruded in a liquid form and cured using ultra violet light and then coated with acrylic adhesive to improve their initial bond. There are different types of adhesive coating for different surfaces and applications (see Tips & Advice for further guidance). The clear varieties, **T7025C**, **T705C**, **T710C** and **T720C**, are however uncoated and do not contain the glass microspheres.

Code	Type and Density	Thickness mm	Temperature Resistance	180° Peel Adhesion after 24 Hrs @ 20°C
T7025C	Clear 950 Kg/m ³	0.25	-30° to 150°C	10.0 N/cm
T705C	Clear 950 Kg/m ³	0.50	-30° to 150°C	11.0 N/cm
T710C	Clear 950 Kg/m ³	1.00	-30° to 150°C	13.0 N/cm
T720C	Clear 950 Kg/m ³	2.00	-30° to 150°C	15.0 N/cm
T711WX	White 850 Kg/m ³	1.10	-30° to 130°C	21.1 N/cm
T720W*	White 850 Kg/m ³	2.00	-30° to 120°C	25.1 N/cm
T706WL	White with LSE Adhesive 800 Kg/m ³	0.60	-30° to 90°C	17.0 N/cm
T711WL	White with LSE Adhesive 850 Kg/m ³	1.10	-30° to 90°C	21.9 N/cm
T708GX	Grey 720 Kg/m ³	0.80	-30° to 120°C	19.5 N/cm
T716GX	Grey 720 Kg/m ³	1.60	-30° to 120°C	25.0 N/cm
T723GX	Grey 720 Kg/m ³	2.30	-30° to 120°C	28.0 N/cm
T711BDX	Black 720 Kg/m ³	1.10	-30° to 120°C	22.0 N/cm
T608R	Clear 950 Kg/m ³	0.80	-30° to 130°C Removable/Re-positionable	1.2 N/cm

* For cold weather application down to 0°C

Important Note: There is no substitute for full testing of a product. Whilst this may not always be practical, it remains the responsibility of the user to determine the suitability or otherwise of any product for their intended application. Trial samples are provided free of charge and without obligation. The information in this Guide is based upon our knowledge and practical experience. This data is intended only as a source of information, given without guarantee and does not constitute a warranty.

Tenacious Tapes are the exclusive Australian distributors for Bow Tapes International, the manufacturer of these high grade structural bonding tapes (www.bowtape.com)

Useful Tips and Advice *(continued)*

5. What gauge of tape do I need?

Whilst a wide range of factors will affect this, structural bonding tapes are only designed to be stuck to smooth or relatively smooth surfaces. Apart from the smoothness of surfaces their flatness and rigidity will need to be considered. If possible lay the two surfaces to be bonded on top of one another to see if they sit flat with no gaps, to ensure they are not warped or bent, since this will immediately put any formed bond under load and may result in subsequent failure. As a general rule though, the larger the two surface areas to be bonded the thicker the gauge required. It is recommended that for two rigid surfaces a minimum of 1.1mm gauge is used. If the two surfaces are of different materials then they will expand and contract at different rates. If the bond is to be subjected to a fluctuating temperature range then a thicker gauge will need to be considered. As a guide, these types of structural bonding tape can accommodate a movement of up to 3 times their gauge in the shear force direction. For the mounting of ACP (Aluminium Composite Panel) the 2.3mm Grey **T723GX** is recommended. Foamed acrylic tapes can be made in different densities but the lower the core density of the tape, the more readily it will wet-out and form a bond.

6. Where should I position the tape on the object to be mounted?

Generally tape should be evenly spaced across the entire surface to be bonded. Where tape can only be applied top and bottom it is suggested that 2/3 be applied along the top and 1/3 along the bottom so as to spread the load on the tape. If using **T608R** on rigid surfaces and require clean removal it is recommended to apply tape only along the top edge (thus a cleave force can be applied from the bottom when removing).

7. Is the tape available in a format other than rolls?

All foamed acrylics can be die-cut into complex shapes to exactly fit a given part to be mounted. Since these types of tape are visco-elastic they will tend to re-join or fuse after cutting so it is necessary to separate the pieces and there are various ways to achieve this. Contact your distributor for further details and advice on this service.

8. How do I remove the tape once a bond is formed?

With difficulty is the short answer. Consequently it is very important to ensure that the item to be mounted is correctly positioned before applying firm pressure. Initially apply light pressure to one end of the item being mounted and then move into position (marking plumb lines can aid the location of items) before applying firm pressure. One common technique is to only partially remove the release liner at either end and crease it through 90°, so that the release liner protrudes from behind the surface. Then, when the item is correctly located, strip the release liner from the side by pulling gently (this is one of the key reasons that filmic rather than paper liners are used on these types of tape, since they will not tear when being stripped from an entrapped space). Another tip when applying sheets and panels is to apply pressure at the top first, then, if you need to remove, you can apply a cleave force from the bottom – gently applying force and lifting the panel away from mounting surface from the bottom. A gentle, gradually increasing force will give better results than any shock load. If this is not possible then a saw wire may be effective or applying extreme heat and force. Where the tape only needs to be removed from one surface, this is normally somewhat simpler. Try and gently peel from one end - a popular method is to take a pen or pencil and then gently pull and wind the tape up onto the pen or pencil by rotating it. This stretching of the tape helps break the bond and exhibits the visco-elastic nature of the adhesive. Note: **T608R** is a clear tape specially designed for temporary mounting applications.

Acrylic Foam Tape Adhesive

All the acrylic foam tapes have a solid core of visco-elastic adhesive and this provides stress relaxation properties to these products. This allows the tapes to elongate and relax under stress loads and spreads these loads throughout the tape, rather than concentrating them at the bond surface. This characteristic of the adhesive allows it to stretch up to 3 times its thickness to accommodate the forces generated by the differential expansion and contraction of varying substrates.

The core of the tape can then be coated with extra adhesive to create different bond characteristics. It is important to understand with adhesives that there is always a compromise between the adhesive and the cohesive strength of a particular product.

High **adhesive** strength means that the adhesive will be soft and tacky, so that it can wet-out easily to form a bond.

High **cohesive** strength means that the adhesive will be hard and dry to the touch, so that they can support a stress without stretching and failing.

Inevitably it becomes a compromise and the industrial chemists add tackifiers to soften the adhesive and modify their performance. The Tenacious range is designed to give you some options and choices:

Tenacious Foamed Acrylic Adhesives	
T7025C, T705C, T710C, T720C	An uncoated clear acrylic polymer
T711WX, T708GX, T716GX, T723GX, T711BDX	A solventless, glass bead filled acrylic core coated on both sides with a high tack/high shear modified acrylic adhesive
T706WL, T711WL	A solventless, glass bead filled acrylic core coated on both sides with a softer, low surface energy adhesive
T720W	A solventless, glass bead filled acrylic core coated on both sides with a solvent acrylic adhesive modified for cold weather application down to 0° C
T608R	A clear acrylic polymer core coated on both sides with a low tack, clean peel solventless acrylic adhesive

Useful Tips and Advice

1. What factors do I need to consider when selecting a tape?

When selecting a product for a particular application a range of criteria will need to be considered:

1. The nature of the two surfaces being bonded:
 - a) The type of material (surface energy)
 - b) The size
 - c) The stiffness or rigidity of the two surfaces
 - d) Their differential expansion & contraction coefficients
 - e) The need for clarity/transparency
2. The ambient conditions under which the tape will be applied?
3. Aesthetics: Will the tape be seen side on or through the substrate it is stuck to?
4. Will the tape be the only product used for bonding or joining the two surfaces or are other systems also being employed as part of the bond/join?

Different substrates / Relative Surface Energy Guide

High Energy	Medium Energy	Low Energy
Stainless Steel	Acrylic	Polyethylene
Aluminium	PVC	Polypropylene
Glass	Polycarbonate	Silicone
Anodized Aluminium	Epoxy Paint Ethyl Vinyl	Acetate
Zinc	ABS	Teflon™
Copper	Polyester	Tedlar™
Lead	Nylon	
	Kapton™	

2. How quickly is a bond formed?

Although a range of factors will affect this as a rough guide, expressed as a % of final maximum bond strength, one could expect:

50% within 20 Minutes **90%** within 24 Hours **100%** within 72 Hours

Due to this build strength of the bond over time it is important to not put the bond under immediate load but give the tape an opportunity for the bond to “cure”. Where this is not possible (e.g. applying signs in situ) consider the use of mechanical clamps temporarily or use a greater amount of tape than would normally be recommended for the given weight.

3. At what temperature can I safely apply the tape?

The ambient temperature will affect the “quick-stick” or tack of the tape. It is generally recommended that our standard range are applied between 15° - 35°C. It should still be possible to form an adequate bond between 10° - 15°C however, since the adhesive will be firmer, greater pressure will be required to achieve the bond and the build-strength of the bond will be slower. It should always be remembered that these tapes are **pressure sensitive** and so the greater the force applied the better, when trying to achieve maximum bond strength. For a situation where the temperature is between 0° - 10°C it is recommended to trial the **T720W**, this variant is coated with a softer adhesive system that can more readily form a bond at these cold temperatures. Be very wary of dew or condensation on surfaces in cool, calm conditions.

4. How much tape do I need to use for a given weight of material to be mounted?

Provided one can achieve good wet-out of the adhesive with the two underlying substrates to which the tape is being bonded, then 50 cm² per Kg of weight is recommended as a safe margin. It may well be possible to significantly reduce this amount after testing and evaluation of results. Note that, due to their nature, structural bonding tapes are good at withstanding and absorbing shock loads but may be prone to “creep” under significant static loads, hence the need for the large safety margin provided in the above figure.

Other parameters will also affect the amount of tape required:

- a) The nature of the two surfaces to be bonded
- b) The smoothness and cleanliness of the surfaces being bonded
- c) The ambient conditions at time of application (if not optimal then more tape will be required for a given weight)
- d) The force that can be applied to achieve wet-out of the tape and form a bond
- e) If the bond will be subjected to immediate load/shear force. If the bond can be created without it being placed under load for at least 24 hours this will substantially reduce the amount of tape for a given weight

Recommended amount of tape in Metres to support a given weight: Weight in Kgs

	1	2	5	10	15	20	25	30	40	50
12	0.46	0.92	2.3	4.6	6.9	9.2	11.5	13.8	18.4	23.0
15	0.37	0.74	1.85	3.7	5.6	7.4	9.3	11.2	14.8	18.6
18	0.31	0.62	1.55	3.1	4.7	6.2	7.8	9.4	12.4	15.6
24	0.23	0.46	1.15	2.3	3.5	4.6	5.8	7.0	9.2	11.6
36	0.15	0.31	0.78	1.6	2.4	3.1	3.9	4.8	6.2	7.8

Application Advice

To obtain optimal results from your selected Tenacious Foamed Acrylic Bonding Tape the following points should be considered:

Surface Preparation

The importance of ensuring that the bonding surfaces are properly prepared cannot be over-stated. The two surfaces to be bonded should be smooth, clean, dry and free from all loose particles and surface contaminants. To achieve this, a number of steps may be required:

- 1) For smooth surfaces, that are not contaminated, spray a small amount of **X250** IPA Surface Prep. onto the surface(s) and wipe off with a lint-free cloth.
- 2) However, to prepare surfaces such as bare metals, those that are not smooth or are heavily contaminated, there is a need to abrade the surfaces first. We recommend the Tenacious Abrading Disc **X950**, used on an angle grinder, in conjunction with an extension arm and rubber backing plate (**X960**). This is a very quick and effective method of preparing surfaces. For small jobs the abrasive hand pads **X995**, or similar, are an alternative option. This process will remove any surface contaminants such as oxides, rust, solder or hardened residues like old paint. Loose particles should then be wiped off before the surfaces are cleaned. We recommend the Tenacious Surface Cleaner, available in a 1 Litre Tin (**X400**) or 350g Aerosol Can (**X440**), for more heavily soiled surfaces, this is a specially made blend of hydrocarbons that will remove virtually any processing oils, greases, mould releasing agents from surfaces and provide a stable keying surface for the tape. Like the **X250** IPA Surface Prep. this will evaporate without leaving a surface residue.
- 3) A final wipe-down with a clean, solvent moistened cloth is then recommended.

Note: Whenever cleaning surfaces use an unsoiled, lint-free cloth and only wipe in one direction, with a fresh section each time, to prevent cross-contamination.

Tape Application

Pressure sensitive tapes ideally require around 15psi (100kPa) to achieve good "wet out", however this will be affected by the smoothness of the two surfaces and the ambient temperature. To apply tape to a surface:

- 1) Unwind the tape and smooth down with one's hand, avoiding any wrinkles, the focus being on getting the tape correctly located.
- 2) Apply firm, even pressure across the surface of release liner of the tape being bonded, the use of a Hand Pressure Roller, such as our **XL50**, is recommended since this transfers the pressure evenly across the entire surface of the bond and assists in expelling all air.
- 3) The release liner should be left in situ until the second surface to be bonded has been fully prepared.
- 4) When ready to mount the item expose the second surface by removing the release liner, taking care not to touch the surface of the tape. Where positioning is critical it is recommended that the liner is peeled back at 90° just to expose a small amount of the tape surface at both ends. Then move the object into position making light contact at one end. Once alignment looks correct, apply firm pressure at both ends and then pull the entrapped release liner at the 90° angle to expose the rest of the tape. Once liner fully removed, apply maximum pressure and clamp surfaces if practical to allow the bond strength to build.

Factors Affecting Performance

The air temperature, when the tape is applied, should ideally be between 15° and 35°C. Do not attempt forming a bond below 10°C (for applications where the tape may be applied at low ambient temperature, consider using the **T720W** see Tips & Advice). Similarly high humidity can affect the quality of the bond, as can conditions close to the Dew Point, where condensation can form on surfaces (cool, still mornings are renowned for causing problems)

Where practical, the bond should not be put under load for at least 24 hours. Special care should be taken with the following surfaces:

- **Untreated bare metals** will have oxides present and surfaces such as zinc, copper, bronze or lead will need to be sealed with a primer prior to applying the tape (seek further guidance from your distributor)
- **Glass surfaces** may require to be sealed, contact your distributor for further details on specialist glass primers.
- **Porous surfaces** such as wood, concrete, plaster and fabrics will require a sealer to be applied to form a moisture barrier, so that a bond can be formed. Ensure any sealers used are fully cured prior to applying the tape.
- **Plastic components** and profiles are prone to having mould release agents present on the surface. These should be able to be removed with the **X400** or **X440** Surface Cleaner applied with a cloth or lightly abraded using a scouring pad.
- **Low Surface Energy** materials such as polypropylene, polyethylene, thermoplastic rubbers may require some form of chemical primer to be used to make the surface receptive to the tape, however, such products have significant Health & Safety implications. Often, simply by cleaning with the **X400** or **X440** Surface Cleaner this will sufficiently improve the surface to permit adequate keying of the tape. However, lightly abrading the surface can significantly enhance the quality of the bond that can be obtained.

Should this still not prove satisfactory contact your local distributor for more information.

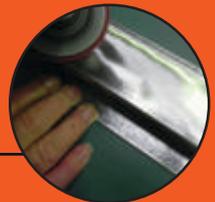
Where practical always test products to ensure their suitability for your intended application. Care should also be exercised to ensure that cleaning products are compatible with surfaces to be bonded since certain painted and plastic finishes may be affected. Consult your local distributor for a full range of accessories to support the use and installation of the Tenacious Foamed Acrylic Tape range.

Application Process



1. Use cleaning agents to prepare the surfaces according to guidelines opposite.

2. Use appropriate abrading materials for bare metals, heavily contaminated or rough surfaces.



3. Ensure surfaces have fully dried following final clean down before applying the tape to the first surface ensuring correct positioning.

4. Use pressure roller to ensure good wet-out of adhesive



5. When ready to mount the item, expose the second surface by removing the release liner, taking care not to touch the surface of the tape. Where positioning is critical it is recommended that the liner is peeled back at 90° just to expose a small amount of the tape surface at both ends.



6. Move the object into position making light contact at one end. Once alignment looks correct, apply firm pressure at both ends and then pull the entrapped release liner at the 90° angle to expose the rest of the tape. Once liner fully removed, apply maximum pressure and clamp surfaces if practical to allow the bond strength to build.

Helpful Hint

..excellent preparation gives excellent results..

Contact for further details: