For most applications of fusion welded joints, it is unnecessary to go to the trouble and expense of ensuring fully continuous transition of metal between parent materials. The fillet weld and the partial or full penetrating butt weld usually are adequate; employed intelligently, they can meet many structural requirements. For this reason, they are in widespread use throughout the manufacturing industry.

For some demanding applications, however, maximum joint strength is mandatory. Products subjected to mechanical fatigue, corrosion, or thermal cycling in end-user industries such as nuclear engineering, aerospace, and power generation need joints of optimum quality to provide an acceptable level of insuramce against service failure. For those critical applications, a fully penetrating butt weld is essential.

The penetrating capability of the arc process determines whether or not a square edge preparation is adequate. With the manual metal arc (MMA) and gas tungsten arc welding (GTAW) techniques, the maximum material thickness that can be welded from one side usually is about 3 millimeters. Using a high-current gas metal arc welding (GMAW) technique allows this thickness to be increased to about 6 millimeters.

For thicker materials, the edges must be cut back to provide access for the torch. The simplest preparation of this type is the single V, and the joint is filled using a multiple run, with each pass fusing into the previous one and into the adjacent side wall. The first pass is referred to as the root run, and the quality of this deposit ultimately determines the overall quality of the finished joint. It provides continuous fusion between the two materials along their length, and this can be achieved in a number of ways.

The most direct technique is for the welder to exercise total control over the deposit, producing an ac-
EXAMPLES OF BACKING TAPE BEING USED IN WELDING
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The Article refers to Weld Backing Tape which is manufactured by Huntingdon Fusion Techniques HFT® under the trade name of Argweld® Weld Backing Tape® and some introductory information is on the reverse of this reprint. More comprehensive technical and commercial information is available from the company at:

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MORE EXAMPLES OF BACKING TAPE BEING USED IN WELDING
Extending the Argweld® range of purging products, Huntingdon Fusion Techniques HFT® are providing an economical non metallic weld backing system for the backing of welds, where purging is required but not easily achieved, for quality and for supporting weld roots to improve weld bead profiles.

The latest addition to the Weld Backing Tape® range is the 600 Amps tape to support very high welding currents.

Typically for the welding of thin wall stainless steel sheet and vessels from one side only, the backing tape can be attached to the backside of the weld, to support the weld pool, keep the argon from the weld torch surrounding the weld pool and eliminate the need to back purge, while giving a consistent high quality underbead profile.

For purging large vessels the tremendous savings of purge gas and waiting time, pays for the use of the backing tape® many times over.

The high temperature heat resistant adhesive aluminium backing foil is 75 mm (3 inch) wide and in the centre is a heat resistant band of woven glass fibre cloth 25 mm (1") wide.

The glass fibre cloth has a weight of 1000 grams per square metre.

The 80 Ampere tape comes in rolls of 25 m (80") length and the 160, 240 and 600 Amps tape rolls are 12.5m (40") long.

With the thickest cloth Argweld® Backing Tape® will support single pass welding at weld currents up to 600 Amps, without change to the chemistry or metallurgy of the weld.

**FEATURES:**

- Speeds up production.
- Provides back purge facility.
- Ideal for stainless steel and alloyed metals.
- Saves cleaning costs.
- Massive purge gas savings.
- Eliminates weld defects.
- Suitable for sheet, plate, pipes, vessels.
- For horizontal or vertical welding.
- No gouging or grinding.
- No re-welding or rework.