



Plastics Industry Pipe Association
of Australia Limited ACN 086 511 686

Field Butt Welding of Rural or Thin Wall Poly pipe

A Potentially Expensive Mistake

The Polyolefins Technical Committee of PIPA is very concerned about the potentially expensive mistake which can arise from the use of butt welders to join rural pipe.

Simple butt welders are now being offered to the farming market to weld rural or thin wall metric poly pipe and offer the promise of reducing the expenses associated with purchasing mechanical joiners/couplers.

These butt welders run the risk of producing welds which may fail prematurely. Polyethylene pipe appears to be a very forgiving material initially, however, any polyethylene system is only as good as the joints. If the joints are not made with the correct equipment and procedures the joints have a much higher chance of premature failure.

Standard Practice for Town Water or Gas Supply:

Poly pipes used in Town water or gas pipelines are often at least twice the wall thickness of rural poly pipe. The butt welders used to welding these pipe have controls to ensure the welding parameters are strictly adhered to. Parameters such as -

- Controlling heater plate temperature
- Controlling ovality and alignment
- Controlling interface pressure
- Controlling bead width
- Controlling heat soak time
- Controlling changeover time

These are necessary to ensure against premature failure of the weld.

Problems Associated with Welding Rural or Thin Wall Poly pipe:

Rural or thin walled poly is usually supplied in coils, often resulting in the pipes being neither round nor straight. It is very important to ensure correct alignment. For example - if a thick wall pipe is out of alignment by 1mm, this may result in a 10% reduction of joint strength. If a rural or thin wall pipe is out of alignment by 1mm, this will result in a very large reduction of joint strength.

The field conditions under which poly pipe is welded have a considerable effect on the strength of the joint. Any contamination of the weld, whether it be oxidised polyethylene, water, dust, oils etc can ruin joints.

In Summary:

In order to achieve an acceptable weld:

- **Cleanliness is essential.** Contamination will ruin joints.
- **Technique is essential.** Most owners of PE pipe systems require that people performing butt welding of PE pipes are qualified by completing a recognised training course (eg PARTEC).
- **Correctly designed Equipment with proper Maintenance is essential.** Correct welding temperatures, welding procedures and pipe facing tools must be maintained in tolerance and in good condition.

If any one of the above requirements is not met in full then the likely result is early failures of the welded joint. If pipeline owners choose to weld thin walled pipe, they should consider the consequences and costs involved with a pipeline failure which may result from incorrect procedures and equipment being used.

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