

## PE welding temperatures

The temperature range at which polyethylene pipe should be welded is 220° +/-15°C. This should be the temperature between the interface of the heater surface and the pipe material.

Temperatures greater than 240°C when coupled with long heat soak times may result in diminution of the anti-oxidants in the pipe.

Cold joints will result if the weld temperature is too low, or the heat soak time is too short, or the time between removal of the heater and butting the pipes together is too long.

*Either situation will eventually lead to joint failure*

## Heater plate temperature

Heater plate temperature displays usually indicate the internal temperature of the plate. However the actual surface temperature may vary from that displayed for a number of reasons.

- 1) The rate of heat lost from the heater surface will depend on the design of the heater plate and the type of temperature controller used. The surface temperature could be up to 25°C cooler than the thermometer indication. This variation will be greatest on cold, windy days - which is one reason for using a shelter when welding.
- 2) The temperature will change as power is being pumped into the heater. The temperature will be highest just after the power cycles off, and lowest just as it cycles back on.
- 3) The temperature is unlikely to be exactly the same at every point on the surface, and there may also be small variations from side to side, due to manufacturing tolerances.
- 4) As heat is transferred into the pipe during heat soak, the heater temperature initially falls but eventually returns to the set point. As it is the welding temperature that is important, it is recommended to check the heater surface temperature during the heat soak phase.

## Measuring surface temperature

- To ensure the temperature of the heater plate has stabilised, wait 5 minutes after the heater has reached set temperature before recording measurements.
- Take readings at several points (North, South, East, West) on both sides of the heater, at the diameter of the pipe being welded .
- If a contact probe is used it should be held in position for 3-5 seconds before the reading is taken.
- With **FUSIONMASTER®** heater plates using non-stick cloth, it is essential to use a contact probe which forces the cloth into contact with the plate. (Incorrect readings may result if the cloth system traps an insulating air layer between the cloth and the heater surface.)
- If an infra red pyrometer is used, care must be taken to ensure its emissivity is correctly calibrated for use on the non-stick cloth, AND care must be taken to ensure no air is trapped between the plate and the cloth or an incorrect reading is likely to result (see suggestion below).
- Never use an infra-red pyrometer to take a reading from a shiny aluminium surface (such as a **FUSIONMASTER®** heater without cloths, or the outer edge of a heater plate) or a gross error will result.

## Suggestion

Infra-red pyrometers are good tools for reading heater plate temperatures, but should always be used with a "spot control adapter" (Dixon part number AF000104).

The "spot control adapter" clips to the end of a Thermotwin pyrometer. When pressed square against the heater surface this correctly focuses the infra-red beam every time, and when used on **FUSIONMASTER®** heaters, it expels trapped air from beneath the non-stick cloth, ensuring consistently accurate measurements.