



Infrared Heat welds Pressure Tanks

Infrared welding, employing high power, short wave infrared emitters from Excelitas Noblelight, is helping to produce cylindrical pressure tanks with a glass-filled polypropylene cylinder body. The cylindrical housing is produced in two mouldings, which are joined together in such a fashion that the complete assembly is able to withstand internal operating pressures of around 10 bar.

Typical hot plate welding methods would be unsuitable in this application, as the melt temperatures involved (210°C to 250°C) would expose the short glass fibres in the polypropylene, which would then abrade the PTFE coating of the hot plates, causing accelerated wear and hence frequent and costly replacement.

The heart of the new machine is an arrangement of four banks of six, high-power short-wave infrared on either side of a movable platten. In operation, two bottom cylinder halves, each of 140mm diameter, are loaded into the machine and then two matching top cylinder halves are located in position directly above the bottom halves. The movable platten is advanced to its working position between the butt ends of the opposing cylinders and the power is switched on. The melt temperature is achieved in around 40 seconds, the platten is withdrawn, the power is switched off, and the butt ends are brought together under pressure to effect the weld. Under bursting tests at pressures of around 28 bar, it has been found the cylinder body has been destroyed well before the welded joint.

Infrared welding can be used with most polymeric materials and is increasingly being accepted as being complementary to conventional plastics welding techniques. Being a non-contact method, it does not promote plastic adhesion to the heating surface, which can necessitate frequent tool cleaning. It is also very energy-efficient, as power is used only during the short times that the system is working. Typically, the installed power is drawn, on average, for only one-tenth of the operating cycle. Infrared is also capable of handling large surface area components, as it is a simple operation to add more emitters to a heating bank.



Features

- short wave emitters are heating plastic halves
- contact free heating
- avoids frequent tool cleaning
- very energy efficient, the heaters need only to be switched on, when the heat is needed

Technical Data

- six short wave emitters of 1.6kW per module
- four movable plattens
- melting achieved in around 40s

Excelitas Noblelight
Infrared Process Technology
hng-infrared@excelitas.com
www.noblelight.com