Cryogenic Supports

Carpenter & Paterson are suppliers of Cryogenic Pipe Supports in three main categories:

1) High Density Polyurethane Foam (HD PUF)
2) Glass Reinforced Polyester Composite
3) Hardwood. Densified Wood Blocks

The selection of one of the above forms of Pipe Support is dependant on many factors, which include: load carrying capacity, ease of installation, piping contractors requirements etc.

This section includes typical details of all three types of Cryogenic Supports, however due to the numerous individual requirements in the marketplace, we welcome all enquiries in connection with the supporting of Cryogenic piping and our experienced engineers can offer guidance as to the benefits of all three systems.
Cryogenic Insulated Pipe Supports

Carpenter & Paterson are suppliers of Cold Insulated Pipe Supports consisting of a steel cradle containing High Density Polyurathane Foam inserts

“Thermafoam” is specifically formulated and moulded in single or multi layer 180° segments with high density skins. The design make-up of the insulated pipe support can be categorised as follows:-

i) "HD PUF monolithically moulded, or cut from bun stock, segments either single or multilayer.

ii) Aluminium foil vapour barrier to prevent ingress of moisture.

iii) Aluminised metal thin gauge protective jacket, to prevent damage to the vapour barrier.

iv) Mechanically strong carbon steel support cradle which contains the insulation element and allows pipe loading to be transferred safely to supporting structures. (see page 146 for typical details)

The two essential design parameters for Cryogenic Pipe Supports are compressive strength and thermal conductivity. Polyurethane Foam has superior insulation properties to prevent heat loss and maintain temperatures in cold process pipelines to prevent freezing. Polyurethane Foams can be efficient over an extremely wide range of temperatures typically -196°C to +120°C. The density of the foam which determines the compressive strength is generally between 160 kg/m3 and 320 kg/m3 and with these load bearing properties it is evident why PUF is such a suitable insulation material for Cryogenic Support Applications.

Polyurethane Foam is produced by mixing two liquids along with a blowing agent and Carpenter & Paterson using the latest in moulding machine technology utilise CFC free blowing agents in producing monolithically moulded components with a very low isocyanurate index. Steps are machined to ensure alignment with the parent pipe insulation system.

With the manufacture of the steelwork and the PUF insulation undertaken side by side in our works, we ensure complete control of production progress throughout.
Our Engineering Department is staffed by experienced designers who are able to give practical advice and assistance in the design of Cryogenic Pipe Supports.

Our Engineers upon receipt of all relevant information can calculate and design the cryogenic supports needed for each project from simple shoes to complex anchors. Fully dimensioned detail drawings for each individual support are produced for customer approval before manufacture commences.

The moulding tools are designed on a project specific basis and they can be produced in pipe sizes ranging up to 900NB and above with insulation thickness of upto 250mm.

Independent testing is carried out to determine the thermal conductivity, the density and compressive strength of the HD PUF materials.

Our testing, calculation and design criteria are all based on:

i) Shell DEP No 30.46.00.31 - Gen document

ii) ASTM D-1621: Compressive strengths of HD PUF

iii) ASTM C-177: Thermal conductivity testing

Our Quality Systems are regularly audited by third parties and have been fully endorsed by achieving certification in accordance with BS EN ISO 9001.
Cryogenic Insulated Pipe Supports

Typical Rest & Guide Type Support

Typical Rest, Guide & Line Stop Type Support
We are able to offer cryogenic supports manufactured from a Resin Based compound capable of withstanding greater loads than that of polyurethane foam. This material has a proven track record in Oil, Gas and Process Industries and offers an excellent combination of Mechanical Thermal and Fire Resistant properties. A compressive strength of 140 mpa is typical for these types of supports together with a standard working temperature range of between -190˚C to +160˚C. As this material will accept inserts, individual blocks can be machined, bored or tapped and it is particularly suited for use in supports which incorporate steel sections. Typical supports incorporating this moulded material are illustrated below.
Close-grained hardwood such as oak, iroko or obeche are often used as load bearing insulators on low temperature services.

The woods are kiln dried to ensure an acceptable moisture content and then machined in segments according to pipe diameters.

An alternative to hardwood blocks is a unique material manufactured from selected beech vaneers, which are impregnated under vacuum with thermosetting synthetic resin and then densified under heat and pressure.

The main benefit of both the above products is their high compressive strengths coupled with their obvious machining versatility.

There are numerous applications for both wood block designs and enquiries are welcome.