

1) General

In common with most other organic polymers and materials used in manufacture and construction industries, Polybutene-1 is difficult to ignite and is defined as combustible but not highly inflammable.

When Polybutene-1 products used in piping applications are heated in air, melting will occur at ~ 127°C, and decomposition will commence at about 300°C with the release of volatile lower molecular weight hydrocarbons. A flame or radiant heat source can ignite these hydrocarbon emissions. Once ignition occurs, sufficient heat will be generated to continue the decomposition and provided enough oxygen is present, burning will continue even when the ignition source is removed. Burning is accompanied by the release of flaming molten droplets of polymer that could ignite other flammable material.

These comments can only be of a general nature, since the conditions in a real situation can never be fully predicted. They will depend on many factors, such as the location, the oxygen availability and the presence of other flammable materials. Like many other organic materials such as wood, paper and cellulose, when Polybutene-1 burns, it gives off carbon dioxide and water as the main decomposition products, together with carbon monoxide and carbon (soot), as well as a considerable number of other, often irritant, decomposition and oxidation products in very low concentrations. These can include small amounts of certain noxious aldehydes such as formaldehyde and acrolein. These aldehydes are irritant and lachrymatory and therefore can cause the fumes to be irritant.

Being a polyolefin, the flammability and burning characteristics of Polybutene-1 are similar to those of polyethylene and polypropylene materials.

2) Performance against fire protection standards

In an evaluation run by Springborn Laboratories Inc., a private testing group in Enfield, Connecticut, samples of Basell's Polybutene-1 resin were found to conform to the requirements of Underwriters Laboratories test UL94 HB classified material.

Polybutene-1 is classified according to Class IV.2 (normal flammability) in the recommendations of VKF (Association of Cantonal Fire Insurances in Switzerland).

According to DIN 4102-1, Polybutene-1 belongs to Fire Protection Class B2. If fire protection measures are required for pipes >DN 50 in wall and ceiling ducts, then only allowable fire protection insulation (e.g. DOYMA pipe duct technology, MISSE insulation systems etc.) may be used.

The limiting oxygen index, measured according to ASTM D 2863-77, for Polybutene-1 is 17.5.

Wherever Polybutene-1 pipe passes through a fire resistant wall, it must be sleeved in a suitable intumescent material.

The use of Polybutene-1 pipes and fittings in water pipe applications is approved by the building and construction codes in most countries.

Technical data are subject to alteration.

