

Introduction to plastics

Physical characteristics of the material



The table below gives a brief guide to the look, feel and other key properties of the main thermoplastic piping materials. It is provided as a reference guide to the features of the material, although it also gives a general guide to the characteristics of the plastic pipe, fittings or valves.

- **Surface feel:** the feel of the material to the human touch
- **Colour:** the most common colour of the material used to manufacture piping products
- **Odour of smoke:** used to aid distinguishing between similar materials
- **Floats in water:** at normal ambient temperature conditions
- **Notch sensitivity:** the resistance a notched test specimen has to a sharp blow
- **Weather resistance:** against normal UV light conditions
- **Method of permanent jointing:** used for piping systems
- **Linear expansion:** the change in length of a specimen due to change in temperature
- **Thermal conductivity:** the time rate of transferring heat by combustion through material of a given thickness
- **Specific weight:** the ratio of density of a material to the density of water at ambient temperature

Physical data and aids to identification

Properties	PVC-U	PVC-C	PP	HDPE	PVDF	ABS	ECTFE
Surface feel	Smooth	Smooth	Waxy	Waxy	Smooth	Smooth	Smooth
Colour	Dark grey	Light Grey	Pale grey	Black	Opaque natural	Mid grey	Opaque natural
Flammability (UL94)	V-0	V-0	HB	HB	V-0	HB	V-0
Odour of smoke after flame is extinguished	Pungent (like hydrochloric acid)	Pungent (like hydrochloric acid)	Like resin	Like candles	Pungent	Acrid	Pungent
Floats in water	No	No	Yes	Yes	No	No	No
Notch sensitivity	Yes	Yes	Slight	No	Slight	No	Slight
Weather resistance	Stabilised good	Stabilised good	Stabilised good	Stabilised good	Unstabilised excellent	Stabilised good	Unstabilised excellent
Method of permanent jointing	Solvent cement	Solvent cement	Fusion welding	Fusion welding	Fusion welding	Solvent cement	Fusion welding
Linear expansion mm/m°C	0.08	0.07	0.16	0.18	0.12	0.10	0.08
Thermal conductivity W/m · K	0.140	0.066	0.22 - 0.24	0.40 - 0.43	0.130	0.170	0.150
Specific weight g/ml	1.38	1.55	0.91	0.95	1.78	1.03	1.68