

PE-Xb for Injection Moulding

PE-X b Injection Moulding compounds are able to satisfy the demands of applications historically reserved for other 'Engineering Plastics'. PE-X b performance characteristics of high & low end use temperature, excellent chemical & abrasion resistance, good dimensional & hydrolytic stability, good creep & environmental stress cracking resistance & high strength & toughness have conferred a broad property attractiveness to the Hot and Cold water. The PE-X pipe and fittings system standard for applications was finally published in 2004, EN ISO 15875 (1). This European and International standard is the result of harmonisation of standards from several European countries and other countries worldwide. It is now being implemented as a replacement for national standards when applicable.

In Europe, manufacturers usually use voluntary third party certification against product standards to gain a quality mark to promote their products and satisfy customer requirements. The CE mark is used to indicate that the product is produced to a relevant performance specification related to the application. For the purpose of CE marking, harmonised Euronormes referred to as hENs are to be used in parallel with product standards following a decision made by CEN TC 155 Plastics Pipes and Fittings. The hEN for plastics products for Hot and Cold water applications specifying the relevant 'performance requirements' will be EN 15015 (2). Following a negative vote in the first UAP unique acceptance procedure, the document will go out for a second 3 month UAP vote later this year. It is expected to be published early in 2006 and will allow conforming products to be CE marked from that date. Most European countries have a legal obligation for products to be CE marked. In accordance with Guidance Paper D (3), it is stated that 'the CE marking indicates that the product complies with the relevant national standards transposing the harmonised standards, or a European technical approval, or one of the national technical specifications referred to in Article 4 (2.c) and that the system of attestation of conformity laid down in the Commission Decision relating to the product has been applied.' It categorically states that 'The CE marking is neither a mark of origin, indicating made in the "EEA", nor a quality mark'. 'Once all obligations arising from EC law (directives, Treaty provisions etc) have been respected, a producer may also affix different marks to a product, such as a voluntary quality mark or a voluntary standardisation mark, on condition that the visibility and legibility of the CE marking are not reduced, and provided that such marks are not likely to deceive third parties as to the meaning and form of the CE marking. A producer remains entitled, on a voluntary basis, to go beyond the strictly legal requirements, for commercial or marketing reasons, allowing a product to be positioned on the market in the normal way.' (1) EN ISO 15875 Plastics piping systems for hot and cold water installations – Cross linked polyethylene (PE-X) Parts 1/2/3/5/7 (2) EN 15015 Plastics piping systems - Systems for hot and cold water not intended for human consumption - Performance characteristics for pipes, fittings and their joints (3) Guidance Paper D: CE marking under the Construction Products Directive (version May 2004) CEN TC 155 document N2785. compounds market. Expensive 'Engineering Plastics' are frequently over specified & in such cases PE-X b compounds can provide a more cost effective solution. The excellent processability of the PE-X b products is similar to that for standard thermoplastic PE compounds, giving a wide process window & high productivity. PE-X b compounds, require a post moulding treatment to complete crosslinking ,not unlike other post treatments, annealing etc, required for some engineering materials. PE-X compounds have competed successfully with polysulphone , polyketone, polyacetal & metal for injection moulded pipe pressure hot & cold water systems, fully satisfying all performance requirements . Considerable cost benefits can be achieved by factors of up to 8 times. PE-X pipe fittings are compatible for use with other pipe materials such as polyethylene, polybutylene & copper. The table below compares the properties & cost relationship for engineering materials used for pipe fittings.

	PE-Xb	A	B	C	D
Tensile strength MPa	26	36	55	60	70
Elongation at break %	450	340	300	30	75
Density	0.95	0.94	1.24	1.42	1.24
Heat Deflection Temp °C (0.45 MPa)	116	na	210	160	1.74 (1.84 MPa)
Vicat Softening Point °C	131	120	210	157	188
Flexural Modulus MPa	900	450	1400	2700	2700
Mould shrinkage %	3	2.5	2.5	2	0.7
Relative Material cost	1	1.5	4	1.5	8