

History of HDPE and HDPE pipe products

History of HDPE

At the very close of the 19th century, German chemist Hans von Pechmann noted a precipitate while working with a form of methane in ether. In 1900, German chemists Eugen Bamberger and Friedrich Tschirner identified this compound as polymethylene, a very close cousin to polyethylene. Thirty years later, a high density residue was created by an American chemist at E.I. du Pont de Nemours & Company, Inc., Carl Shipp Marvel by subjecting ethylene to a large amount of pressure.

Working with ethylene at high pressures, British chemists Eric Fawcett and Reginald Gibson created a solid form of polyethylene in 1935. Its first commercial application came during World War II, when the British used it to insulate radar cables. In 1953, Karl Ziegler of the Kaiser Wilhelm Institute (renamed the Max-Planck Institute) and Erhard Holzkamp invented High-Density Polyethylene (HDPE). The process included the use of catalysts and low pressure, which is the basis for the formulation of many varieties of polyethylene compounds. Two years later, in 1955, HDPE was produced in pipe-shape. For his successful invention of HDPE, Ziegler was awarded the 1963 Nobel Prize in Chemistry.

History of HDPE Pipe Production

First continuous pipe production started in 1959 (material quality PE 63) in pipe sizes 16 mm to 250 mm for water, sewage and chemical fluids. Due to recent excellent experiences and developments regarding the chemical properties as corrosion resistance and chemical resistance, the mechanical properties as creep strength and flexibility, the fast installation and perfect weldability, the material improvement to PE 80 quality and pipe sizes up to 1000 mm went fast (1977).

PE 80 material quality was further improved to bi-modular polyethylene in 1995 as well as in the late 1980's the third generation called PE 100 was introduced to the market with advantages of higher pressure resistance at the same pipe wall thickness, improved stress crack resistance at higher rigidity. These materials are still used, mainly for pressure pipes in gas and potable water applications.

PE 125 materials are in development now.

Classification

Classification is ISO 12162 for HDPE material based on the results of efficiency of Long Term Hydrostatic Strength (LTHS).

Material generations:

Generation	Since	LTHS results expressed in MRS
1	1950's	PE 50
2	1960's	PE 63
3	1980's	PE 80
4	1990's	PE 100
5	2002	PE 125

PE 80 is the common name for MRS 80 material.

MRS = Minimum Required Strength value related to the LTHS Test Results.

Today PE 80 and PE 100 materials are available in the market.