



OEMs *reduce costs* with crosslinked plastic tubing and molded parts:

Expensive engineered materials are being replaced with lower cost, e-beam crosslinked polymers which exhibit extraordinary thermal stability and stress cracking resistance.

Plastic tubing and molded parts are processed by E-BEAM Services, Inc. to create a permanently crosslinked molecular structure that exhibits outstanding performance reliability, long-wear, temperature and chemical resistant characteristics.

E-BEAM Services, Inc. treats plastic tubing, molded components and assemblies using an environmentally responsible high energy process that permanently alters the polymeric matrix by converting the material to a crosslinked polymeric structure. During the processing, high-energy electrons penetrate the product to form three-dimensional molecular "links" that deliver a wide variety of commercially desirable properties.

Automotive design engineers can use this crosslinking process on HDPE tubing and molded parts to provide in-service temperatures as high as 120° C. In comparison, untreated HDPE tubing normally withstands in-service temperatures of about 60° C.

In addition to improving performance temperatures, the process also provides increased thermal stability under load. When tested at 80° C, HDPE crosslinked tubing performed at 870 PSI, while un-treated HDPE tubing failed at 670 PSI.

Additional performance enhancements observed in crosslinked products include:

- increased tensile strength
- increased impact resistance
- improved resistance to slow crack growth (SCG)
- environmental stress crack resistance (ESCR)
- reduced rapid crack propagation (RCP)
- improved resistance to oils, petroleum, and solvents

This allows the manufacturer to use commodity resins in place of more expensive engineered materials in certain demanding automotive applications. The crosslinking process utilizes electron beam technology, which does not change product formulation or processing of the product. Unlike many thermo-chemical processing methods, which change the formulation, electron beam crosslinking is performed on the fully formed component or product.



Tubing and molded parts are crosslinked in a high energy process by E-BEAM Services, Inc., to create a permanently crosslinked molecular structure that exhibits outstanding performance reliability, long-wear, temperature and chemical resistant characteristics.



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