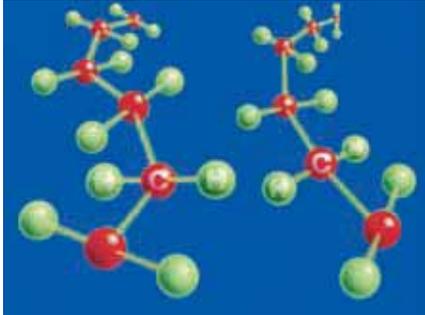
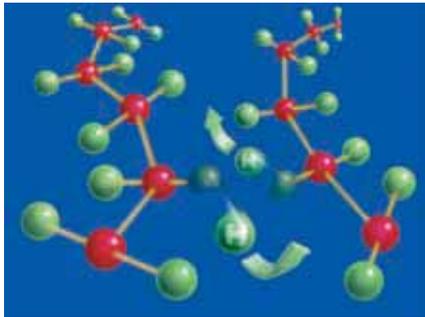

The principle of heat-shrinking, a technical explanation

Thermoplastic materials are composed of extremely long molecular chains in a random arrangement. Their strength depends upon the distance between the molecules and the crystalline nature of the molecular structure. In fact, it is the crystals that contribute most of the strength.

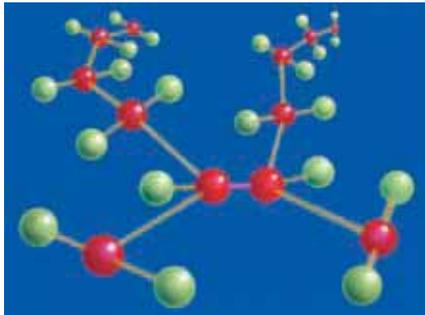


As the thermoplastic is heated to above its crystalline melting point (120°C) (248°F), the crystals disappear. The molecules can then easily slip past each other, so the material flows.

During the investigation of atomic energy, the important discovery was made that exposure of some plastic materials to high-energy penetrating radiation can cause permanent crosslinking (intermolecular joining) of adjacent molecules.



This linking results in the chemical bonding of the plastic structure into a new three-dimensional matrix. Once a material has been crosslinked, it will not melt or flow at any temperature. When heated, the crystals disappear as before, but no flow or shape change occurs because the crosslinks act as ties between the molecules. However, the structure remains elastic – when the crystals are melted, the material behaves like a rubber.



Products that have been radiation crosslinked exhibit perfect elastic memory. They can be supplied in a deformed or expanded condition. When heated, they shrink – for example, to tightly enclose an object over which they have been placed. This makes them ideal for covering a variety of pipes and pipe fittings, as well as wires lugs, terminals, connectors and other electrical and electronic components.

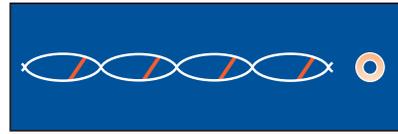
Berry Plastics fabricates its Covalence compounds into their final form and then subjects them to high energy radiation, thus permanently 'freezing' them into the desired shape. The following illustrations demonstrate what happens to the molecular structure of crosslinked tubing during subsequent stages of manufacture and during application.

Next to each illustration is an end view of a piece of heat-shrinkable tubing.



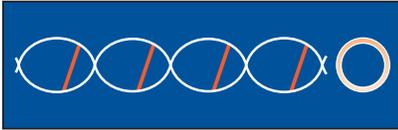
Figure 1 is an enlarged schematic view of a very small crosslinked section of extremely long molecules.

1



Once the tubing has been crosslinked, the next step in imparting elastic memory is to heat the compound above its crystalline melting point. The molecules are then tied together only by the crosslinks.

2



While hot, the tubing is deformed by applying internal pressure, thus stretching the crosslinked molecule

3



While in this deformed shape, the tubing is cooled. The crystals then reappear, thereby locking the structure together indefinitely in the expanded form. This is the form in which the material is supplied to customers.

4



A user reheats the product, melting the crystals. The crosslinks allow the material to return to its original shape. This is the perfect elastic memory of crosslinked material.

5



After cooling, the crystals reform and the tubing is locked in its recovered form. Upon subsequent reheating, no further change in shape will take place, unless mechanical force is applied.

6

Legend

-  cross-section of a tubing
-  crystals
-  crosslinks

Berry Plastics warrants that the product conforms to its chemical and physical description and is appropriate for the use stated on the technical data sheet when used in compliance with Berry Plastics written instructions. Since many installation factors are beyond the control of Berry Plastics, the user shall determine the suitability of the products for the intended use and assume all risks and liabilities in connection herewith. Berry Plastics liability is stated in the standard terms and conditions of sale. Berry Plastics makes no other warranty either expressed or implied. All information contained in this technical data sheet is to be used as a guide and is subject to change without notice. This technical data sheet supersedes all previous data sheets on this product.

BERRY
PLASTICS
CORPORATION
 AND SUBSIDIARIES
CORROSION PROTECTION GROUP
www.berrycpg.com

Local Distributor / Representative:

For contact details of local Distributors / Representatives
 Please visit www.berrycpg.com.

Headquarters : Berry Plastics Tapes & Coatings Division, Franklin MA, USA

Franklin, MA, USA
 Tel: +1 508 918 1714
 US Toll Free: +1 800 248 0149
 Fax: +1 508 918 1910
 CPG@berryplastics.com

Houston, TX, USA
 Tel: +1 713 676 0085
 US Toll Free: 01 888 676 7202
 Fax: +1 713 676 0086
 CPGH@berryplastics.com

Tijuana, Mexico
 Tel USA +1 858 633 9797
 Fax US: +1 858 633 9740
 Tel Mexico: +52 664 647 4397
 Fax Mexico: +52 664 647 4370
 CPGTJ@berryplastics.com

Aarschot, Belgium
 Tel: +32 16 55 36 00
 Fax: +32 16 55 36 74
 CPGE@berryplastics.com

Baroda, India
 Tel: +91 2667 264721
 Fax: +91 2667 264724
 CPGIN@berryplastics.com