



UNIVAR



## DYNAPAK POLY™

UNIVAR POLYISOBUTENES

# Introduction

## Dynapak Poly™

As the world's largest chemical distributor Univar is always looking for additional products to improve our service to customers. One of those products is Dynapak Poly. This is the Univar brand name for a range of high-quality polyisobutenes (PIB), based on BASF technology.

High quality PIB has specific properties making them suitable ingredients for a wide variety of products and applications.

## Physical Properties

Dynapak Poly is a series of non-toxic, permanently tacky and viscous liquids. Whilst each type of Dynapak Poly differs in viscosity and molecular weight all grades are water white, tasteless and odorless.

## Chemical Properties

Name

Polyisobutylene

Chemical

Formula(C<sub>4</sub>H<sub>8</sub>)<sub>n</sub>

The molecular structure of PIB, consisting of straight chain macromolecules with chain/end olefinic bonds, leads to chemical inertness and resistance to:

- oxidation by light or moderate heat
- Mineral, sulphuric and phosphoric acid
- Alkalis
- Aqueous inorganic salt

Dynapak Poly products are hydrophobic and have low moisture transmission rates which make them impermeable to water, vapor or gas. The higher the molecular weight the lower the moisture transmission rate.

## Grades

Dynapak Poly is available in various grades. The grades differ in molecular weight, tackiness and viscosity. The low molecular weight grades are a viscous liquid at room temperature where as the high molecular weight grades are more of a semi-solid.

Dynapak*	5	15	20
Dynapak Poly	55	190	230
	500	640	700
	1500	3150	4250
	12050	40050	

\*Based on oligomers

All products are available in bulk and drums.

## Specific features Dynapak Poly\*

Dynapak Poly shows specific features compared to conventional polybutene (pb). The use of a new and innovative production process makes Dynapak Poly a more stable and pure product. One of the most important differences to the conventional pb production is the use of pure isobutylene as a feed stock, leading to the absence of n-butylene as an impurity.

Characteristics of Dynapak Poly resulting from the new production method are:

- Narrower molecular weight distribution
- Low chlorine content (typical < 1 ppm)
- Low water content (usually < 20 ppm)

These characteristics create both application specific benefits and result in end products having a higher and more consistent quality than those containing conventional pb.

\* Especially applicable to products with a viscosity of 190 cSt up to 1500 cSt

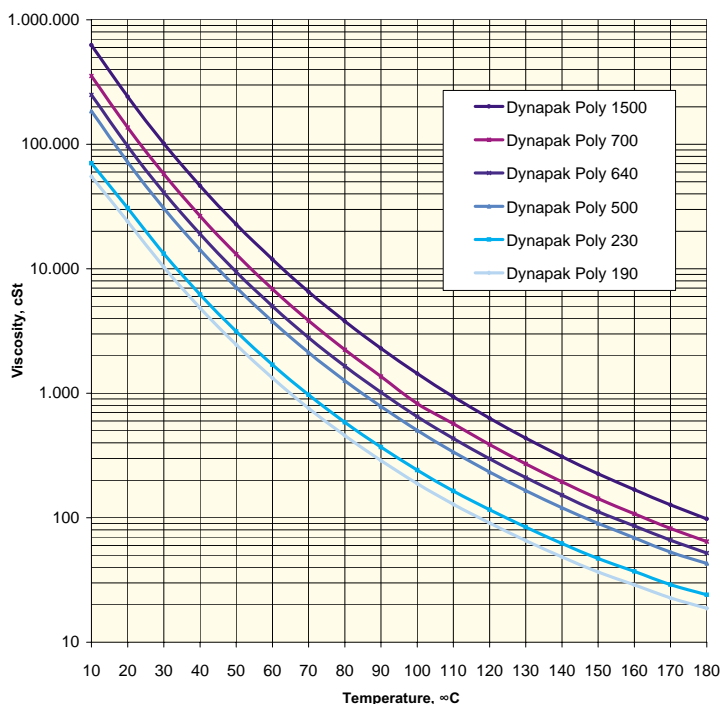


# Technical Information

## Viscosity and Viscosity index

These properties often determine which Dynapak Poly grade is the most suitable for certain applications and production processes. The high grades contain longer molecular chains and are therefore more tacky and viscous than the low grades with their shorter chains. Fig.1 shows the viscosity index of some popular Dynapak Poly grades.

Compared to conventional pb Dynapak Poly exhibits a lower viscosity at the same molecular weight, providing advantages for cosmetics and lubricants.



## Chain structure

The narrow weight distribution from PIB derives from the production process. The use of pure isobutene in the production of Dynapak Poly leads to the absence of n-butene in the chains and thus to more consistent and similar molecules compared to conventional pb.

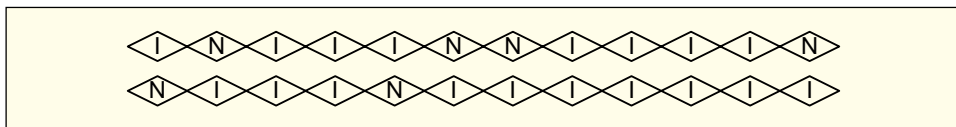


Fig. 3  
Possible variations in conventional pb, consisting of N-butene and I-butene

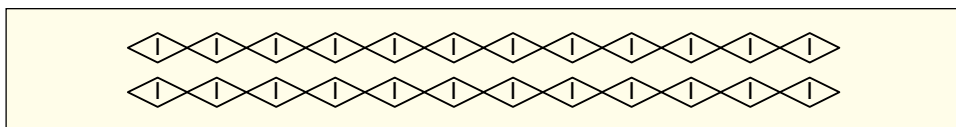


Fig. 4  
Dynapak Poly, Only consisting of I-butene

## Narrow Molecular Weight Distribution

Compared to conventional pb, Dynapak Poly has a narrower molecular weight distribution. This means that the presence of shorter and longer chains around the average chain length, belonging to the specific grade, is greatly diminished.

For many applications this facilitates the use of PIB in a more accurate and economical way. For sealants the diminished low chain presence leads to reduced fogging.

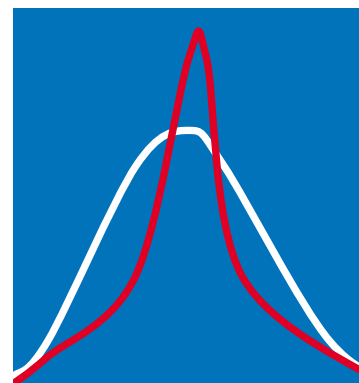


Figure 2  
illustrates the difference in molecular weight distribution between Dynapak Poly and conventional pb

# Applications



## Caulks, Sealants & Coatings

Caulks, sealants and coatings are exposed to various conditions over a potentially long period of time. The aging characteristics of these products are therefore an essential part of their performance. Dynapak Poly having good color stability, being chemically inert, providing permanent pliability and adhesion can be used as a primary vehicle or modifier in caulk and sealant formulations. It will diminish the cracking and hardening of Caulks, bring improved and prolonged adhesion to sealants and offers water resistance to waterproof coatings.

Products such as gun caulks, coatings for waterproof protection, putties and glazing compounds are products that gain in quality by containing Dynapak Poly



## Electric insulation

The non-conductivity of Dynapak Poly qualify it for use in a wide variety of electrical applications. Additional characteristics such as high resistance to oxidation, moisture and gas evolution under electrical stress give Dynapak Poly a superior edge in electrical insulation. The most common applications are in cable gels and to impregnate wire insulation.



## Asphalt modifier

The current profile of traffic and the outlook on traffic development require an ever improving performance of asphalt.

Transportation loads are getting heavier and volumes increase.

Dynapak Poly, a hydrophobic and viscous liquid, can contribute to the durability of asphalt. It provides improved low temperature flexibility, moisture damage reduction and product stability during storage. Dynapak Poly can be used in asphalt based undercoats as well as in asphalt emulsions with rubber latex.



## Agricultural applications

Pest entrapment and agricultural adhesives for pheromones containing Dynapak Poly benefit from the tackiness, hydrophobicity and clear color that polyisobutenes offer.

Pest entrapment such as entrapment sheets used for population control and research usually consist of a wax and polyisobutene blend applied on chip or corrugated board. The characteristics of the PIB ensure that the sheets are and remain sufficiently sticky over a prolonged period of exposure to atmospheric conditions.

Pheromones are used in very small amounts to catch insects or confuse them to refrain from mating. The pheromones are sprayed on the crop. In order to have the pheromones land on and stick to the plants, Dynapak Poly is used. The hydrophobicity of the PIB keeps the pheromones on the plant even as it rains. Pheromones are highly expensive and the use of Dynapak Poly is an important ingredient to reach an optimal result.

# Applications



## Lubes and greases

The high shear stability and lubricating capacity of Dynapak Poly qualify it as an ingredient for lubricants. Additional properties make it an excellent product for several applications in this area.

Dynapak Poly is ashless and non-staining after combustion or evaporation. This contributes to the performance of lubricating applications for operations with above average pressure or temperature. Products such as two-stroke oils, gear oils and metal working fluids show a cleaner and more efficient use when containing PIB.

For all lubricating fluids in contact with metals it is essential that they are non corrosive. Dynapak Poly will not cause corrosion and can safely be used on all metals.



## Adhesives

Natural tack, stability and water white color make Dynapak Poly a very attractive additive or for adhesive formulations. Particularly in Hot-melt adhesives and Pressure sensitive adhesives the properties of Dynapak Poly offer a competitive edge in product quality.

Hot-melt adhesives are used in packaging, woodworking, product assembly, bookbinding and labeling. In these applications the adhesive must remain flexible. Dynapak Poly serves as a plasticizer ensuring cold temperature flexibility.

Pressure sensitive adhesives contain polyisobutenes as tackifier and plasticizer. Improving the peel strength of elastomers and the quick stick effect.

Pressure sensitive adhesives can be found in various types of tapes, labels, glazing strips, paper and foil lamination



## Cling film

Dynapak Poly is added to stretch wrap film providing excellent tack. This tackiness is not immediately noticeable after the film is produced as it takes some time for the Dynapak Poly to migrate to the surface of the film. The lower the molecular weight of the PIB the faster it migrates to the surface.

Not only does Dynapak Poly provide excellent tack it also has a positive impact on tear resistance, flow and low temperature flexibility.

Dynapak Poly can be incorporated into both cast and blown film. In either methods the PIB can be added to the master batch creating a pre blended mixture, by working with a finished resin that contains the desired amount of PIB or it can be injected into the barrel of the extruder.

Pallet wrapping, suitcase safety wrapping, agricultural wrapping for baling and household wrapping are just a few of the many applications of cling film.

Typical grades used in cling film are Dynapak Poly 500 and 640



## Cosmetics

Mainly used in (protective) lipstick and lipgloss. The tackiness and hydrophobic qualities of PIB ensure that lipstick sticks to lips and will not be washed off by water. PIB also contributes to the protective care. Thanks to low moisture transmission of PIB lips are protected against dehydration.

Compared to conventional polybutenes Dynapak Poly has an extremely low chlorine content drastically reducing the risk of skin irritation.

In general the quality of the end product is better as Dynapak Poly is of a more consistent quality and purity than conventional polybutenes.

# Univar Locations in Europe

## Univar Germany

Ruhrallee 201  
45136 Essen  
or  
P.O. Box 340234  
45074 Essen  
Tel : +49-201-8959-0  
Fax: +49-201-8959-100

## Univar Switzerland

Drahtzugstrasse 18  
P.O. Box  
CH-8032 Zürich  
Switzerland  
Tel : +41-1-384-51-11  
Fax: +41-1-422-21-66

## Univar France

17, avenue Louison Bobet  
94132 Fontenay-Sous-Bois  
France  
Tel : +01.49.74.80.80  
Fax: +01.49.74.81.11

## Univar UK

Lakeside 5500  
Cheadle Royal Business Park  
Cheadle  
Cheshire  
SK8 3GR  
Tel : +44 (0) 161 741 7000  
Fax: +44 (0) 161 741 7047

## Univar Italy

20153 Milano - Via Caldera 21  
Italy  
Tel : + 02/452771  
Fax: +02/4525810 - 40918002  
Fax: 02/48201166 - 40915179

## Univar Ireland

Grange Mills  
12th Lock  
Newcastle Road  
Lucan  
County Dublin  
Ireland  
Tel : +00 353 1628 2888  
Fax: +00 353 1628 0769

## Univar Nordic

Göteborg Office  
Univar AB  
Marieholmsgatan 56  
Box 48  
SE-401 20 GÖTEBORG  
Tel : +46 31 83 80 00  
Fax: +46 31 84 39 80

## Univar Iberia S.A.

C/ Tarragona, 149-157, Planta 15  
08014 - Barcelona  
Spain  
Tel : +34 93 229 10 05  
Fax: +34 93 229 03 35

## Univar Benelux

Klein Eilandstraat 4  
1070 Brussels  
Belgium  
Tel : +32 2 525 05 11  
Fax: +32 2 520 17 51

## European Service Centre Univar Logistics & Services B.V.

Blaak 333  
3011 GB Rotterdam  
P.O. Box 21407  
3001 AK Rotterdam  
The Netherlands  
Tel : +31 (0)10 2757800  
Fax : +31 (0)10 4131372  
Email: [info.dynapak@univareurope.com](mailto:info.dynapak@univareurope.com)

The content of this brochure is for information purposes. As conditions of use for Dynapak Poly may vary and are beyond our control, Univar can not be held responsible or liable for the accuracy or reliability of the data