

TPU

TPU USED IN COMPOUND

TPU history / TPU Chemistry / TPU Application / TPU Compound

TPU is a unique type of plastic bridging the gap between rubbers and plastics. The key to TPU's versatility is that its hardness can be highly customized.

KUNSUN POLYMER MATERIAL (FUJIAN) CO., LTD.

Koslen TPU

Established in 1993, KINJOIN CO., LTD. (Taiwan) is a professional manufacturer of thermoplastic elastomers which are green and environmentally friendly products. We mainly produce TPU thermoplastic elastomer and sold all over the world with outstanding quality and considerate service. With the responsible attitude towards natural environmental protection, our company has developed KOSLEN® TPU which enjoy great and consistent stabilized quality reputation among customers. ◦



CONTENTS

01 . TPU history

02 . TPU Chemistry

03 . TPU Application

04 . TPU Compound

PHILOSOPHY

pursuing excellence, service-oriented and sustainable development
sustainable development

01

TPU History

TPU Invent



1958:

Thermoplastic polyurethane (TPU) was invented by DuPont in 1958

01

1937:

A major breakthrough occurred with the discovery of the basic diisocyanate polyaddition reaction in 1937, which was first applied to produce polyurethane fibers and then to the development of some elastomeric polyurethanes at DuPont. The work at DuPont focused on elastic fibers and led to the invention of elastic linear copolyesters, prepared by melt-ester interchange between two melt copolymerized polymers. This synthetic elastomer had higher strength than vulcanized natural rubber and exhibited a rapid elastic recovery. It was considered to be the first thermoplastic elastomer.

02

01

TPU Chemistry

- What is TPU
- TPU Chemistry
- TPU raw material

What is TPU

Introduction of Properties

What is thermoplastic polyurethane (TPU)? – TPU is a highly versatile elastomer with unique properties that offers both superior performance and processing flexibility. TPU is a unique type of plastic **bridging the gap between rubbers and plastics**. The key to TPU's versatility is that its hardness can be highly customized. **TPU can be as soft as rubber or as hard as rigid plastics.**

TPU plastic is **recyclable** and can be used in many industries. TPU resin can decompose after a certain period of time, and will not cause pollution to the environment. TPU does not contain banned substances such as plasticizers and phthalates, as well halogen which will produce highly toxic when burned. TPU Elastomer **environmental safety and environmental friendly** plastic material.



High abrasion resistance



High elasticity



High shear strength



Oil and grease resistance



Transparency



Low temperature performance

TPU Chemistry



4,4' MDI + 1,4-butanediol



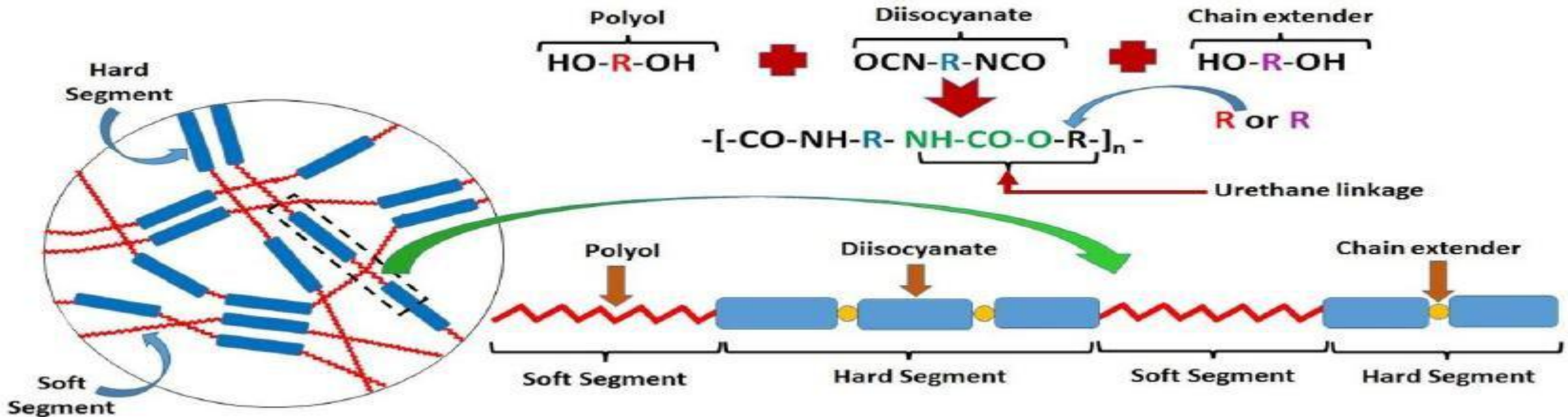
polyesterdiol
polyetherdiol
different polymerdiols



A TPU is a block copolymer consisting of alternating sequences of **hard and soft segments**. Its adaptability is due to the presence of both these hard and soft segments in its chemical structure. The proportion of hard and soft segments can be manipulated to produce a wide range of hardness. A greater ratio of hard to soft segments will result in a more rigid TPU.

TPU raw material

The three basic raw materials required to produce a TPU



Soft Segment (polyether or polyester): It is built out of a polyol and an Diisocyanate which provides flexibility and elastomeric character of a TPU.

Hard Segment (aromatic or aliphatic): It is constructed from a chain extender and Diisocyanate giving TPU its toughness and physical performance properties

01

TPU Application

- Used in different industry
- Used in difference processing

TPU application

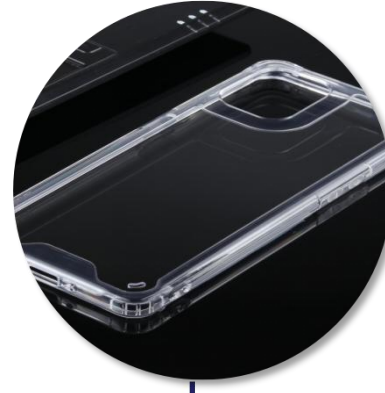
TPU application in different process



CALENDERING



EXTRUSION



INJECTION



BLOW MOLDING

TPU application

TPU application in different industry



FOOTWEAR

sports shoes, shoe soles,
women's shoes heel



COMPOUNDING

compound with PVC, ABS,
EPDM, EVA, POM, SEBS



FILM AND SHEET

conveyor belts, protect
film



MOLDED PARTS

caster wheels, power
tools

01

TPU Compound

- Benefits of TPU compounding
- TPU compound application

Benefits of TPU compounding

TPU is an outstanding contributor of properties in polymer blends. When added to polymers such as PVC, TPU helps **improve toughness, abrasion resistance, low temperature flexibility and compression set**. When compounded with polycarbonate, ABS or acetal, a TPU resin with a nominal 18,000 flexural modulus can produce resins with a flexural modulus value of up to 150,000 psi. Specialized resins can be made that blend the properties of engineering plastics with the features and benefits of TPU. Whether for its outstanding abrasion resistance, improved product durability, or ease of manufacturing, **TPU is a versatile performer in today's TPE marketplace**. TPU bridges the gap between rubber and plastics. Its range of physical properties enables TPU to be used as both a hard rubber and as a soft engineering thermoplastic.

Benefits

toughness

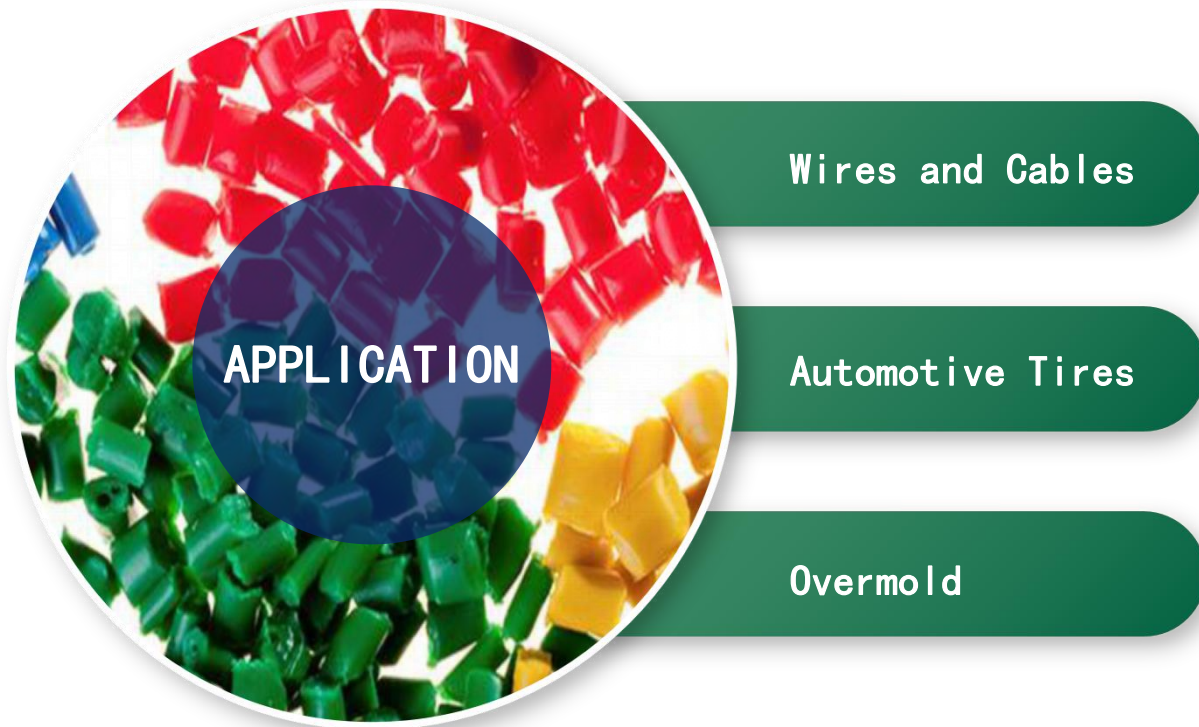
abrasion resistance

low temperature flexibility

compression set



TPU compound Application



TPU compound that is resistant to abrasion and ozone and also maintains a rubbery feel

As a compound, TPU is incredibly versatile. A TPE compound manufacturer can customize a TPU compound blend based on the demands of the materials application. TPU compounds can stand up to even the most rigorous applications, like wires, cables, and automotive tires.

In general, TPU has excellent tensile strength, high elongation, and good load bearing capacity. The specific capabilities of your compound will depend on the intended application.



Thank You

千图网络中心