

# **Polyurethane: Industrial Applications and Scope**

**Presented by**

**Jayant Khadilkar, Managing Director,**

**Jay Elastomers Pvt. Ltd. Navi Mumbai, India**

**AT**

**TechnoBiz Polyurethane & Adhesive Expo, Bangkok**

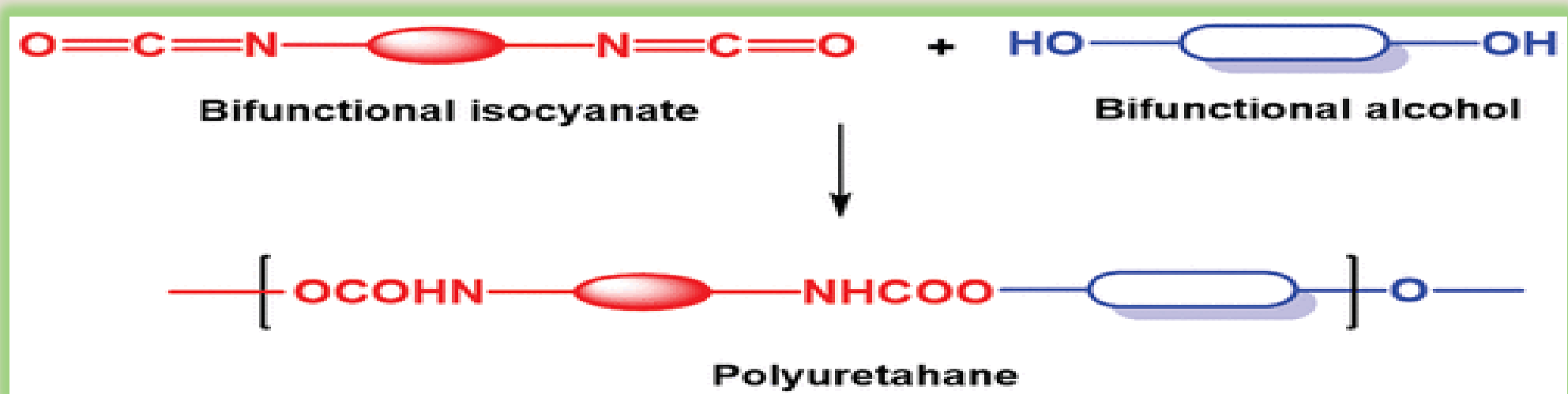
**Dated 13<sup>th</sup> March 2025**

**[www.jayelastomers.com](http://www.jayelastomers.com)**

## What is Polyurethane(PU) ?

"From comfort in cushions to strength in construction; PU shapes the world around us. The shape-shifter of materials, blending flexibility, resilience & durability to meet the demands of an ever-evolving world."

Synthetic polymer belongs to family of **Engineering Plastics** formed by the reaction of Polyols with Diisocyanatos & caters to almost all major industries like Auto, Appliances, Construction, Energy, Defence , Paints & Coatings, Furniture & Footwear.



- **FOAMS** -- Rigid, Soft, Viscoelastic, Model Making, Reticulated, Syntactic
- **COATINGS** -- Solvent Free, With Solvents, Moisture Curing
- **ADHESIVES** – One & Two Component, Reactive Hot Melt, Contact, Foaming, Spray, Structural
- **SEALANTS** -- One-Two Components, High-low Modulus, Waterproof, Elastomeric, Non-Sag
- **BINDERS** -- One-Two Components, Rigid-Flexible, Spray, Rebounded, and Hot Melt
- **ELASTOMERS** -- Hot Cast, TPU, Spray, Foam, Cold Cast, Millable
- **ARTIFICIAL LEATHER** -- Standard, Bi-Cast, Recycled, Crosslinked, Flexible, Two Tone, Microfiber
- **RECYCLED PRODUCTS** -- Construction, Rebounded, Insulation, Sports Surfaces, Decoration, Customized

**PU Flexible soft Foams** – They are most common form of PU and can be divided into flexible and rigid foams. Flexible PU Foam are Soft, cushion-like material. Found in mattresses, furniture cushions, and car seats. Used in soundproofing and packaging materials. Foams constitutes more than 75 % of total polyurethane consumption.

### Flexible Foam:



## Examples of Rigid Polyurethane

Used for insulation in construction industry and refrigerators. They are stiff and lightweight with excellent insulation properties. Helps improve energy efficiency in **Home Appliances, Nuclear and Aerospace**. For theaters and hospitals customized foams are used for **Sound Insulation**



## Examples of Polyurethane Coatings:

PU coatings provide durability, protection, and resistance to wear and tear. They are used on **wooden furniture and floors** to protect against scratches and moisture. PU Coatings on **industrial floor and structural fabrications** is proven application



## Examples of Polyurethane Coatings

Automotive Paints



Marine Coating



## **Polyurethane Adhesives:**

- High-strength adhesives. Provide excellent bonding to a wide range of materials such as wood, metal, plastics, and glass. Known for their flexibility, durability, and resistance to environmental factors like moisture and temperature.
- Often used in construction, automotive, and furniture industries

## **Polyurethane Sealants:**

- Used to fill gaps or seal joints in construction and industrial applications. Offers strong adhesion, elasticity, and weather resistance, making them ideal for sealing windows, doors, roofing, and expansion joints.
- They also perform well under UV exposure and various climatic conditions.



## **Polyurethane Binders:**

- Used to bond different materials together, such as particles in wood composites (like particleboard or MDF) or rubber granules in playground surfaces and running tracks.
- They enhance the structural integrity, durability, and flexibility of these products.

Each of these forms of polyurethane has unique properties tailored for specific applications

## Examples Of Polyurethane adhesives and sealants



## Examples of Polyurethane binders



# Polyurethane Artificial Leather

PU artificial leather, often referred to as PU leather, is a synthetic material designed to mimic the look and feel of genuine leather.

## Composition:

- Made by coating a fabric base (usually polyester or cotton) with a layer of polyurethane, a type of plastic polymer. Some types, like bicast leather, combine a layer of real leather with a polyurethane coating.

## Features:

- **Cost-Effective:** It's more affordable than genuine leather.
- **Vegan-Friendly:** 100% PU leather is considered vegan, as it doesn't involve animal products.

## PU leather Features (Contd)

- **Customizable:** Available in a variety of colors, textures, and finishes.
- **Low Maintenance:** Resistant to water and easy to clean.

## Applications:

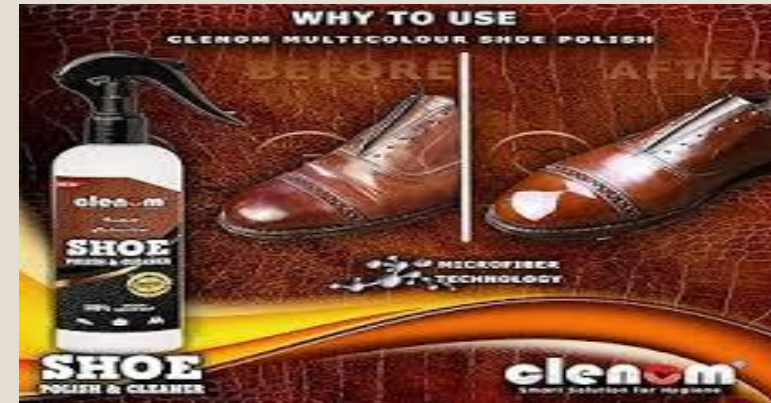
- **Fashion:** Used in clothing, shoes, and accessories.
- **Furniture:** Common in sofas, chairs, and upholstery.
- **Automotive:** Frequently used for car interiors.

While PU leather is a popular alternative to genuine leather, it has some drawbacks, such as being less durable and prone to cracking over time.

# Examples of Artificial Leather



**Possible Use**



## Polyurethane Elastomers

They are known for their exceptional flexibility, durability, and resilience. Versatile materials with **Elastomeric Memory**.

### Key Features:

- **Elasticity:** Have excellent elasticity & ideal for applications requiring flexibility.
- **Durability:** High resistance to abrasion, tearing & impact ensures long-lasting performance.
- **Chemical and Weather Resistance:** Polyurethane elastomers are resistant to oils, chemicals, and environmental factors like UV rays and moisture.
- **Customizability:** Their properties can be tailored by modifying their chemical composition to suit specific requirements.

## Applications:

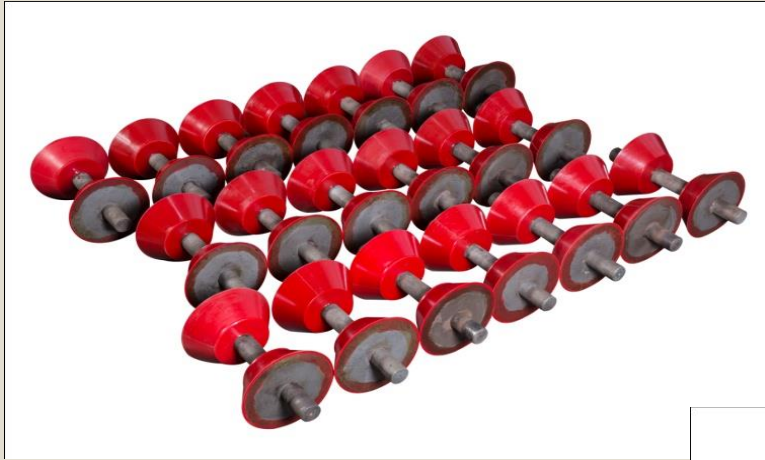
- **Automotive Industry:** Used for bushings, suspension components, and gaskets due to their durability.
- **Industrial Equipment:** Ideal for wheels, rollers, and seals in machinery.
- **Footwear:** Commonly used in shoe soles for comfort and wear resistance.
- **Sporting Goods:** Found in items like skateboard wheels and athletic equipment.
- **Medical Devices:** Used in tubing and flexible components due to their biocompatibility.



## Examples of Polyurethane Elastomers

Industrial Belts & Seals, Pipeline Pigs, High wear resistance





**Shoe Soles:** Offers cushioning and flexibility.



**Medical Applications**



**Recycled polyurethane (RPU)** is a sustainable material that can be repurposed into a variety of products while retaining many of its original properties, such as durability and flexibility. Here are some examples of products made from recycled polyurethane:

- **Insulation:** Used in construction for wall, ceiling & floor insulation as well as in refrigeration units
- **Furniture:** Recycled PU foam is often used in cushions, mattresses, and upholstery.
- **Automotive Parts:** Components like seats, bumpers, and interior panels can be made from recycled PU.

- **Flooring:** Durable and flexible flooring materials, including gym mats and industrial flooring.
- **Packaging:** Lightweight and protective packaging materials.
- **Sporting Goods:** Items like surfboards, skateboard wheels, and other athletic equipment.

**Recycling polyurethane helps reduce waste and environmental impact, making it a valuable choice for eco-conscious industries.**

## Examples Of Recycled Products



## Global Demand Situation for PU products

Demand consistent & showing upward trajectory, driven by versatile applications across various industries. Market Size and Growth Projections as under:

- **2024:** Global PU market was valued at approx. USD 86.28 billion.
- **2025:** Market is projected to reach around USD 89.82 billion. Steady growth.
- **2034:** Forecasts suggest the market will surpass USD 128.95 billion, with a Compound Annual Growth Rate (CAGR) of 4.10% from 2024 to 2034.

## **Global Demand Situation for PU products : Regional Insights**

**Asia-Pacific:** Leading region for global PU market, accounting for 46% of the total revenue in 2023. **Reason:** Rapid urbanization and industrialization in countries like China and India.

### **Product Segmentation:**

**Rigid Foam:** In 2023, largest market share of this segment, representing approximately 33% of the total market.

**Flexible Foam:** This segment anticipated to grow at a CAGR of 6.2% from 2024 to 2034, driven by its applications in furniture, bedding, and automotive seating.



## **Global Demand Situation for PU products**

### **Key Growth Drivers:**

**Energy Efficiency:** Increasing emphasis on energy-efficient buildings has propelled the demand for PU insulation materials.

**Automotive Industry:** Shift towards lightweight vehicles & the rise of EVs

**Furniture and Bedding:** Growing demand for comfortable and durable furniture has increased the use of PU foams in this sector.

**In summary, the global PU market is poised for sustained growth, driven by its diverse applications and the rising demand for high-performance materials across various industries.**

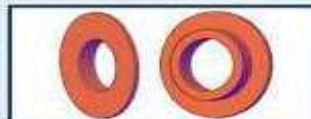
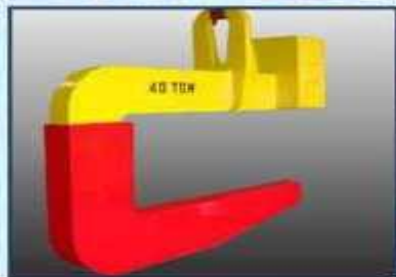
## About Jay Elastomers Pvt. Ltd

- One of the leading Polyurethane and Rubber product manufacturing and exporting company based in Navi Mumbai, India;
- We offer customized solution to the industries for developments ,innovations and pilot plant projects
- We have Chemical technology expertise and design our own formulations for Rubber and PU.
- We make specialised products for Défense, Steel Plants, Offshore and Material handling equipment's
- We are socially responsible Company and also offer processing technology for Recycling of Waste Polymers free of cost

# Cost Effective Challenge With Customized Solutions !



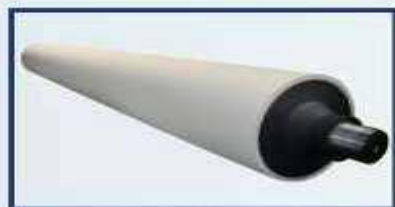
- ◆ Rollers
- ◆ Wheels
- ◆ Molds
- ◆ System Development
- ◆ Satisfaction



**Pu rollers**



**Material Handling  
Wheel**



**Jayplon Acid & Alkali  
Resistance Rollers**



**Stripper Rings And  
Cutter Disc**

### Polyurethane Rollers

- a. Applicator Rollers
- b. Coater Rollers
- c. Pinch/Feed/Snubber Rollers
- d. Deflector/Bridle/Accumulator Rollers.
- e. Guide/Idler/Conveyor Rolls



### Coil resting pads

- a. V-shaped 11141011
- b. U- shape



### Expander mandrel Sleeves

- a. Un-coiler/Re-coiler Sleeves.
- b. 508 dia/610 dia working dia.



### Metal finishing products

- a. Vibratory bowls/Truff
- b. Tumbling mixer barrels.



### Sealing/ Guide and Spacer discs.

- a. From 5 mm to 100 mm width.
- b. From 150 mm Dia to 450 mm Dia
- c. Only PU I PU with metal Insert.



### Material Handling Equipments

- a. r or 'J' Lifting Hook Lining
- b. Coil Lifting Collar

### Composite Products

- a. Customized development assignments.

### Special Products

- a. PSLV Rocket Holding Clamp Polymer Lining
- b. Turbo Generator Door Sealing Pad for mega size BHEL Generators
- c. High Density Model Making Foam For Ship Building Models
- d. Radiation Resistant Solid Tyres for Nuclear Fuel Dispensing Cart



## JAY ELASTOMERS PVT. LTD.

EL-78, TTC, MAHAPE, M.I.D.C. NAVI MUMBAI - 400710. INDIA  
 Tel. : +91-22-27688279 Tel. Fax : +91-22-27688280 Mobile : 9820400441  
 Email : marketing@jayelastomers.com / info@jayelastomers.com  
 www.jayelastomers.com



ISO 9001:2008 Certified Co.

## JEPL ADVANTAGE



Understanding Customer requirements & Technical Specifications

**Partnership Approach**



On field technical support for continuous quality improvement

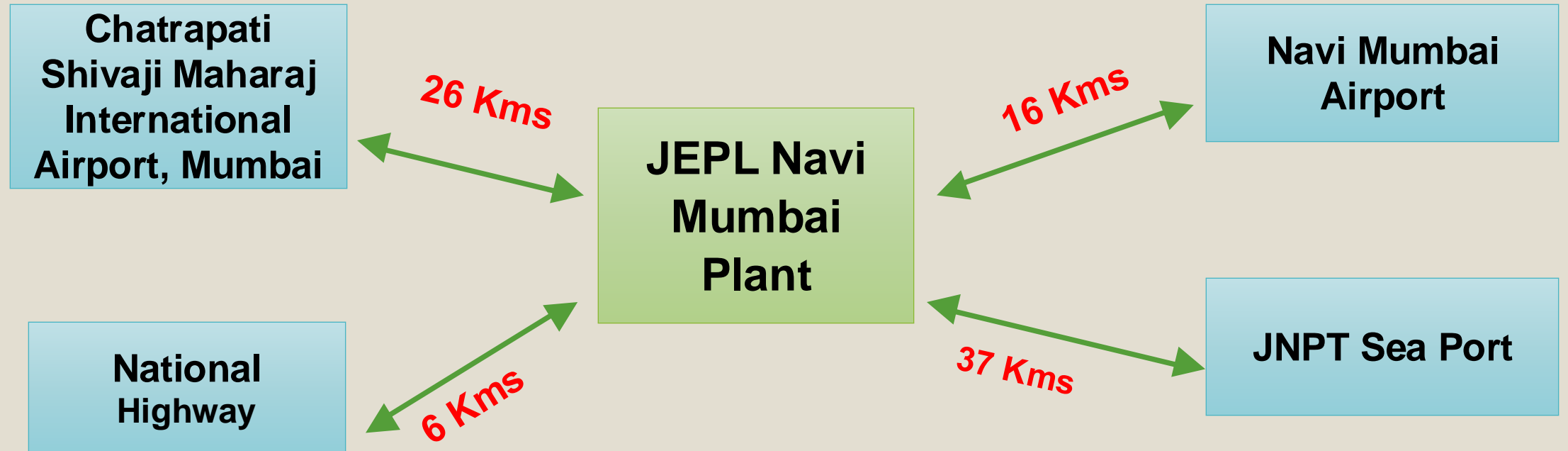
**Gemba Kaizen**



Selecting correct type of Resins suitable to customer applications

**Technical Expertise**

## Locational Advantage Of JEPL:



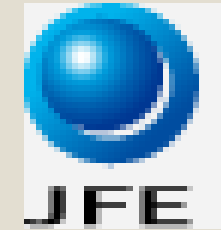
**JAY ELASTOMERS PVT. LTD. EI-78, TTC Industrial Area, Mahape, MIDC, Navi Mumbai, India : 400710**

**JEPL** now supported for Technical and Material support by **OTAKA**

**Rubber Industries, Japan**



and by **JFE Shoji, Japan** for marketing assistance



**JEPL** offer value added solutions to customers on following **3 D** concepts



**JEPL** is **D**ependable



**JEPL** reduces **D**own time



**JEPL** stands for **D**urability

# OTAKA RUBBER(JAPAN) PRODUCTS

1



2

Fantastic Four!

Latest Japanese technology ...

Wringer/ Squeeze rolls with Ceramic embedded  
Rubber

Tough to get cut ,Yet to have great Acid / Alkali  
resistance!

Introducing first time in India

Proud to be Made in India



**For all Business-related queries contact:**

Ms. Shwetha Khadilkar- Business Coordinator -- +919618448234

[shwetha@jayelastomers.com](mailto:shwetha@jayelastomers.com)

Mr.Jagdish Date, Director – Business Development -- + 91 98202 80875

[date@jayelastomers.com](mailto:date@jayelastomers.com)

**JAY ELASTOMERS PVT. LTD.**

EI-78, TTC Industrial Area, Mahape, MIDC,

Navi Mumbai, India : 400710

Tel. No. : 91 0920922126

E-mail: [marketing@jayelastomers.com](mailto:marketing@jayelastomers.com)

**Website : [www.jayelastomers.com](http://www.jayelastomers.com)**





**JAY ELASTOMERS  
PRIVATE LIMITED**

**THANK YOU**