

The Huntsman logo, consisting of the word "HUNTSMAN" in a bold, white, sans-serif font, enclosed within a white rectangular border.

HUNTSMAN

Enriching lives through innovation

Polyurethanes

POLYRESYST™ *polyurea systems*

Lots of shapes. Lots of surfaces. One simple solution.

Cutting edge polyurea technology

For super-versatile industrial solutions

Polyurea spray systems offer many advantages over traditional chemistries, including polyurethane systems and polyurethane / urea hybrids.

Using our POLYRESYST™ polyurea systems as a formulator, a coating producer, or an applicator, you can create spray systems with:

- Quick or slow cure capabilities – depending on requirements
- A predictable, consistent reactivity profile – without the use of catalysts
- A resilience to atmospheric changes during application – e.g. humidity or temperature changes
- 100% solid levels – eliminating / reducing the need for multiple coats
- Low VOC, low emissions – making the systems friendly for users AND the environment
- Excellent physical properties – including thermal stability up to 150°C
- Good additive compatibility – including pigments, fibers and fillers

Easy application

Suitable for touch-ups,
and small to large projects

Friendly for users and the environment

100% solid
Low VOC, low emissions

Superfast cure and return to service

Enabling higher production
output

Excellent physical properties

Resulting in strong industrial
solutions



Easy application

Suitable for touch-ups,
and small to large projects

The range of POLYRESYST™ polyurea systems comprises many different grades that are specially designed to accommodate all types of projects.

Consistently fast curing POLYRESYST™ polyurea systems are the solution, even for the most challenging applications.

This speed permits an effortless vertical or even overhead non-drip application ensuring you will always get the smoothest results possible.

For touch-ups, or small to medium polyurea projects, POLYRESYST™ low viscosity polyurea system is suitable for use with compact & portable spray equipment, enabling easier application.



Superfast cure and return to service

Enabling higher production
output



Under normal equipment operating conditions, both components of the polyurea spray system (isocyanate and resin) will react almost instantaneously; typically, the gel and tack free times are within 15 seconds, enabling higher production throughput and a superfast return to service for coating application work.

Friendly for users and the environment

100% solid, low VOC, low emissions

STRIVING FOR SUSTAINABILITY

We are dedicated to the development of sustainable solutions that can support the industry's environmental ambitions.

As signatory to the United Nations Global Compact (UNGC) - the world's largest voluntary corporate citizenship initiative - our work is guided by the UN's 17 Sustainable Development Goals. All 17 UN Sustainable Development Goals are important to our business - with three of particular relevance to our work in the coating and adhesive sectors.



- 100% solid content
- Low VOC and low emissions
- Non-drip application



- Excellent adhesion on variety of substrates
- Thermal stability
- Waterproofing
- Abrasion resistance



- Fast cure
- Durability of performance
- Extending substrate lifetime and reducing maintenance requirements
- Adaptable to compact & portable spray equipment for optimal resources efficiency



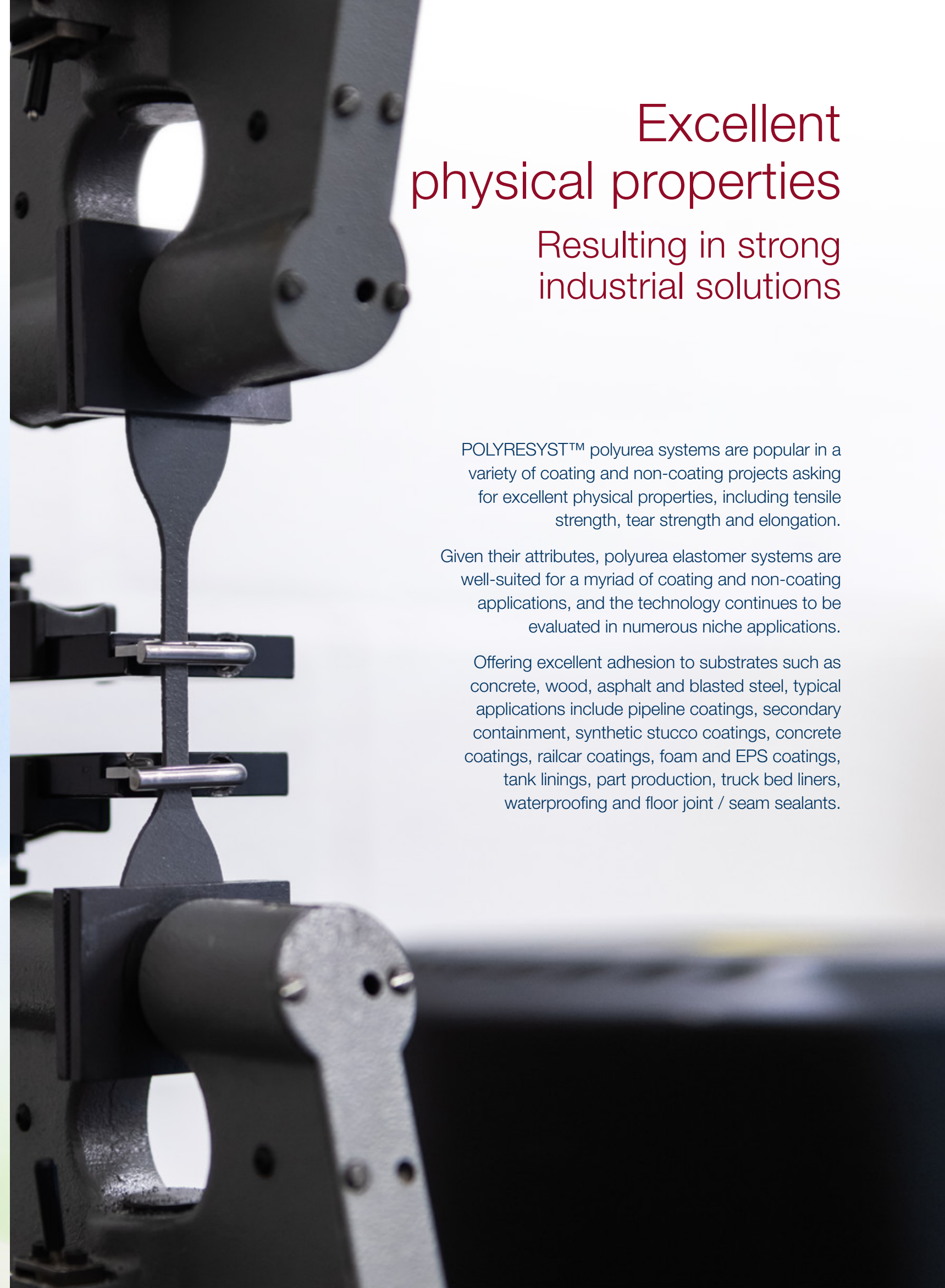
Excellent physical properties

Resulting in strong
industrial solutions

POLYRESYST™ polyurea systems are popular in a variety of coating and non-coating projects asking for excellent physical properties, including tensile strength, tear strength and elongation.

Given their attributes, polyurea elastomer systems are well-suited for a myriad of coating and non-coating applications, and the technology continues to be evaluated in numerous niche applications.

Offering excellent adhesion to substrates such as concrete, wood, asphalt and blasted steel, typical applications include pipeline coatings, secondary containment, synthetic stucco coatings, concrete coatings, railcar coatings, foam and EPS coatings, tank linings, part production, truck bed liners, waterproofing and floor joint / seam sealants.



Handling procedure

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OBJECTIVES

Best practice procedure for the use of POLYRESYST™ two-component polyurea systems for protective coatings.

HANDLING ADVICE

The processing and spraying of polyurea spray coatings requires experience and the use of specialist equipment, and should only be undertaken by trained applicators.

Mixing

The isocyanate / amine reaction of a polyurea coating is normally rapid. Working times generally, fall within the sub-five-second range so the use of specialist mixing and application equipment is required. High-pressure, two-component spray machines equipped with impingement mixing devices are an efficient and entirely adequate method for the blending and rapid dispensing of polyurea raw materials.

Surface preparation

As with other quick cure coatings, the rapid setting of polyurea systems can sometimes limit the wetting and penetration of substrate surfaces. This in turn can affect mechanical bonding. For this reason, end users are advised to test the adhesion of sprayed elastomer films on target substrates to assess the coating bond. Where necessary, the use of surface primers and adhesion promoters may be required.

Spray equipment

The processing and application of spray polyurea coatings requires the use of specialist, high-pressure, high temperature impingement mixing equipment. The ability to heat the individual components of a polyurea coating prior to mixing and spraying is key – and will reduce system viscosity. This will improve the mix and lead to the improvement of the coating performance and appearance. Temperature and pressure settings can be found on the Product Datasheet.

General health and safety

Potential health and safety hazards associated with the spray application described above may arise from both the toxicological properties of the chemical components and the mechanical aspects of the high-pressure equipment involved. Before undertaking any spray work, applicators should be qualified and trained with the safe operation of potential hazards and risks of the chemicals used and equipment and should follow all instructions and safety precautions provided by the chemicals and equipment suppliers.

Under correct equipment operating conditions, the isocyanate and resin components of a polyurea spray system will react almost instantaneously-reducing potential exposure risk. However, even under ideal operating conditions, unreacted MDI (methyl diphenyl diisocyanate), IPDI (isophorone diisocyanate), DETDA (diethyltoluene diamine) or IPDA (isophorone diamine), depending on the formulation of the resin component, may be present as an aerosol or vapor and hence adherence to the prescribed risk reduction measures must be applied.

Prior to handling or using any component of a polyurea spray system, or engaging in any polyurea spray work, the manufacturer's Safety Data Sheet (SDS) for both the isocyanate component and the resin component should be read and understood. All recommendations for appropriate ventilation, respiratory and dermal protection measures when handling, using or spraying products, should be adhered to.

Additional information available from Huntsman about the safe handling of the different components should also be consulted. To minimize any risk of exposure to chemicals used, or to the particulate matter created in polyurea spray applications, spraying should only occur in well-ventilated locations (either outdoors or where mechanical fans are used) or in a properly ventilated spray booth. Applicators should wear appropriate personal protective clothing and equipment, and in areas with poor ventilation, or where oxygen supply is at risk, supplied air breathing equipment must be worn or equipment that has an efficiency of 97.5%, such as Turbohood or mask protection equipment.

CLEANING AGENTS

The following cleaning agents or cleaning agent mixtures can be used to efficiently clean any uncured traces of POLYRESYST™ polyurea systems.

JEFFSOL® PC propylene carbonate

http://www.huntsman.com/performance_products

For improved efficiency, JEFFSOL® PC propylene carbonate can be used mixed with acetone (up to 20 weight %).

MESAMOLL® alkylsulfonic acid phenylester

RECOMMENDATIONS

In case of doubt / abnormal results, or to discuss the outcome of an experiment, please contact:
pu_coatings@huntsman.com

Huntsman is member of The Polyurea Development Association Europe (PDA Europe), the official trade association for the European Polyurea industry. The association offers best practice information on areas of environmental consideration and safety.

A Code of Good Practice for the proper use of Polyurea is available for the association's members.

<http://pda-europe.org>





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POLYRESYST™ polyurea systems:

Contact a Huntsman representative
or visit our website at

www.huntsman.com/polyresystcoatings

About Huntsman:

Huntsman Corporation is a publicly traded global manufacturer and marketer of differentiated and specialty chemicals with 2017 revenues of approximately \$8 billion. Our chemical products number in the thousands and are sold worldwide to manufacturers serving a broad and diverse range of consumer and industrial end markets. We operate more than 75 manufacturing, R&D and operations facilities in approximately 30 countries and employ approximately 10,000 associates within our four distinct business divisions. For more information about Huntsman, please visit the company's website at **www.huntsman.com**.

Huntsman Polyurethanes warrants only that its products meet the specifications agreed with the buyer. Typical properties, where stated, are to be considered as representative of current production and should not be treated as specifications.

While all the information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NO GUARANTY, WARRANTY OR REPRESENTATION IS MADE, INTENDED OR IMPLIED AS TO THE CORRECTNESS OR SUFFICIENCY OF ANY INFORMATION OR RECOMMENDATION OR AS TO THE MERCHANTABILITY, SUITABILITY OR FITNESS OF ANY PRODUCTS FOR ANY PARTICULAR USE OR PURPOSE.

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Products may be toxic and require special precautions in handling. The user should obtain Safety Data Sheets from Huntsman Polyurethanes and Huntsman Performance Products containing detailed information on toxicity, together with proper shipping, handling and storage procedures, and should comply with all applicable safety and environmental standards.

Hazards, toxicity and behavior of the products may differ when used with other materials and are dependent on the manufacturing circumstances or other processes. Such hazards, toxicity and behavior should be determined by the user and made known to handlers, processors and end users.

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