

How Much Do You Already Know?



....About This **Remarkable Technology**



POLYUREA IS A REMARKABLE COATING AND ADHESIVE TECHNOLOGY.



History....

Polyureas were first developed in the early 1980's for automotive fascia applications due to their high strength and impact resistance.

These systems were fast reacting and utilized an expensive reaction injection molding (RIM) process to make body parts.

The first sprayable polyureas hit the market in the late 1980's as a plural component system that could be applied using less expensive, portable and commercially available equipment.

Today...

Numerous companies all over the world have developed numerous formulations with physical properties that rival, and often, exceed, those of traditional protective materials such as polyurethanes, polyesters and epoxies.

Of particular interest to specifiers, applicators and end-users are the fast set characteristics of polyureas compared to traditional systems.

Depending on the formulation used and the application, polyureas are saving time and thus money with their ability to return the treated surface to service in minutes, often seconds.

Polyurea....

A remarkable technology for elastomers with a range of uses limited only to your imagination.

With its strength and adhesion characteristics and its ability to resist abrasion and corrosion, it goes on fast and stays on long.

Read on to find out how polyurea can benefit you.

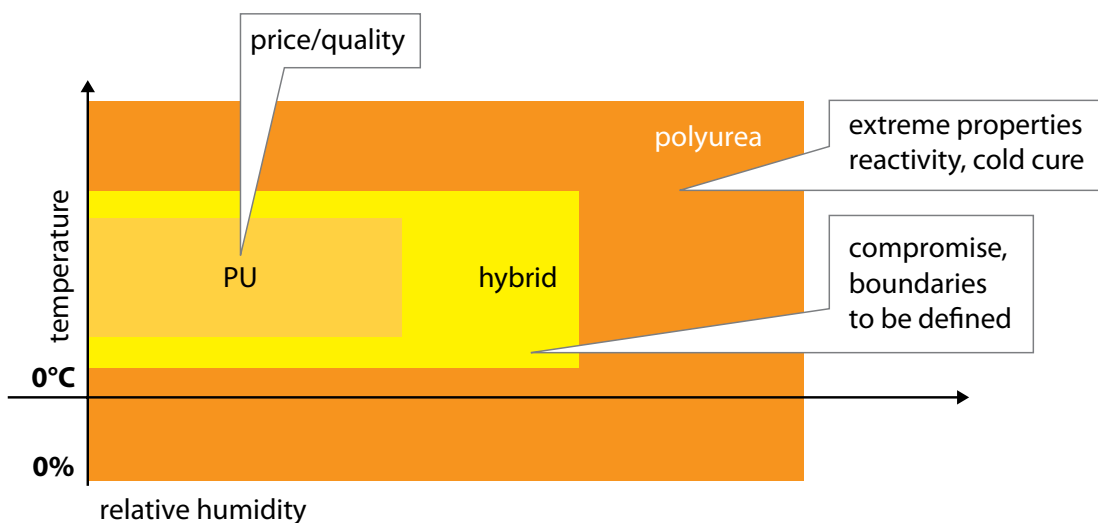
ADVANTAGES...

Polyurea-based products are characterized by their high performance and are therefore used in various application areas worldwide. Formulation and the resulting performance characteristics of polyurea products are adjusted for the respective application areas. They typically have the following advantages in spray applications:

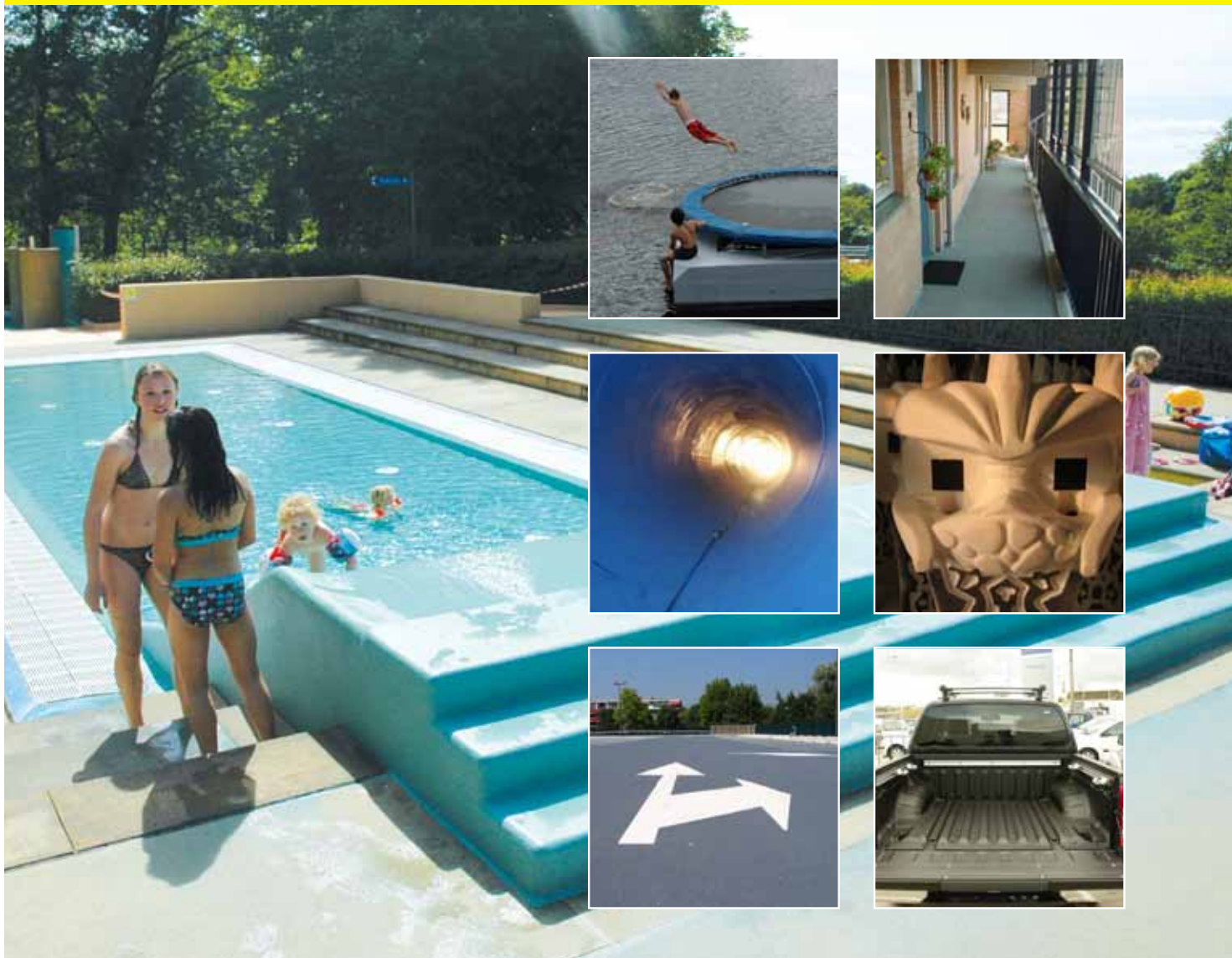
- react, set and cure **quickly** – treated surfaces can return to service fast or be further processed in just a few hours.
- can be used in a **wide temperature** and **humidity range** (larger application window)
- have **high thermal resistance** and good low temperature flexibility
- have outstanding **mechanical** and **chemical resistance**
- are hydrolysis stable and **insensitive to water**
- **color stability** is possible (aliphatic systems)
- **do not contain solvents** (100 % solids)
- form **flexible**, seamless and elastic films.
- because of the fast reaction speed, even vertical surfaces can be coated in any desired layer thickness in **one pass** (seamless, three-dimensional waterproofing)
- **adhere well to all substrates**
- **do not need catalysts** which results in a further improvement of the hydrolysis stability.

Hand-applied polyurea systems have most of the properties listed above and are complementary to spray systems. They are used as top coats and/or repair coats. Essential differences are their slower reaction time, the possibility to be applied by hand, and the occasional use of solvents.

CONDITIONS OF APPLICABILITY



APPLICATIONS



- Waste Water Treatment Linings
- Tank Coatings and Linings
- Pipe/Pipeline Coatings and Linings
- Manhole and Sewer Linings
- Flooring and Parking Decks
- Bridge Deck Coating

- Truck Bed Liners
- Railcar Lining and Track Containment
- Water Parks and Playgrounds
- Landscaping and Water Containment
- Fuel Storage and Containment
- Aquarium Lining
- Architectural Design

- Theme Park and Decorative Design
- Roof Coating
- Marine Applications
- Automotive Fascia Molded Parts (RIM)
- Line Striping
- Joint Fill / Caulk
- Adhesives and Sealants

TECHNICAL INFORMATION

Polyurea definitions and boundaries

Polyurea (PUA)

The cross-linking reaction takes place solely between the isocyanate and the amine-terminated compounds.

Hydroxyl groups added through additives or pigment pastes should not have a significant influence on the cross-linking reaction. Humidity cross-linking and humidity activated polyurea based reactive polymers are not PUAs within this definition.

This distinguishes polyurea from polyurethanes and polyurethane-polyurea hybrids where the cross-linking takes place between the isocyanate and hydroxyl-terminated compounds. The significantly faster reaction between isocyanates and amino groups over hydroxyl groups and the higher thermal and hydrolytic stability of the urea over the urethane bond leads to the unique properties of polyurea.



Typical Physical Properties

| | | |
|---------------------|---------------|--------------|
| Tensile Strength | MPa | 10 – 30 |
| Shore Hardness | | A 30 to D 65 |
| Elongation % | | up to 1000 |
| Tear Strength, N/mm | | 20 to 125 |
| 100% Modulus, MPa | | 3.5 to 15 |
| Abrasion, mg | | 150 - 500 |
| Flex/Crack Bridging | (-26°C/-15°F) | >3 mm |

Systems Available

- *Aromatic Based Spray Formulations*
 - Standard systems with good overall performance
 - Limited color stability in outdoor applications
- *Aliphatic Based Spray Formulations*
 - Excellent color stability in outdoor applications
 - More costly than aromatic based systems
- *Slow Cure Joint Sealants*
- *Brush Grade Systems for Top Coats and Repair*
- *Industrial Adhesives*

Systems with CE labelling are available

POLYUREA DEVELOPMENT ASSOCIATION

PDA Objectives

- Further the sustainable growth of the polyurea industry
- Serve as a platform for sharing of information on polyurea
- Develop polyurea marketing programs for all pertinent market applications
- Establish protocol and standards for polyurea applications
- Determine and respond to training needs
- Organize and host industry trade meetings as a forum for technical reviews and new product introductions, training and member networking opportunities
- Represent and establish polyurea in national and supranational regulatory activities

PDA Structure

Programme Committee

The PDA Programme Committee's global task is to organise the annual and the special meetings.

It involves many actions such as:

- developing the activities programme and agenda
- creating convention theme & topic
- organizing calls for speakers & papers
- budgeting the events
- finding exhibitors and sponsors
- promoting through advertising, brochures, websites...
- organising the practical details (location, bookings...)

Education Committee

The Education Committee has engaged itself to develop and provide educational and professional opportunities to our member companies and their employees covering the fields of introduction to the technology, applicator training including

spray courses, surface preparation courses as a first priority. Next to application-based programs, a Safety, Health and Environment program will also be made available in cooperation with the governing bodies already active in this field.

These courses will be available on the annual conferences but will also be made available to our members if and when market demands and opportunities arise at other times. The Education Committee also plans to set up guidelines, product and application specifications tailored to the requirements of architects and design engineers to increase market perception and acceptance of the technology. The Committee will also follow the increasing amount of harmonized European Standards concerning concrete repair and protection methods and coatings.

Industry Relations Committee

The Industry Relations Committee develops and implements strategies and programs for advancing the awareness and acceptance of the association and polyurea technology to the broadest audience. Target industries and application areas are to be identified and contacts with relevant organisations and key persons are to be established. Thus a network is being built enabling to spread out information about polyurea to relevant associations, conventions and programs.

To support the networking promotional and communication tools such as PR campaigns, brochures, videos, and other items are provided.



Who should be a member ?

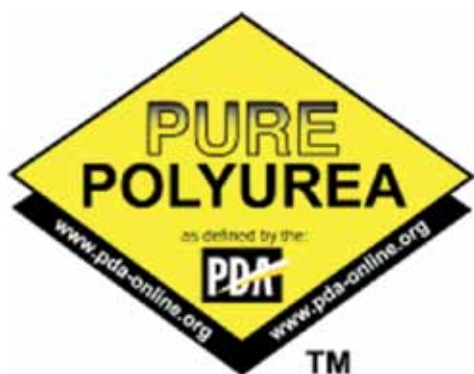
We have members in all of these categories:

- Contractors
- Specifiers
- Applicators
- Formulators
- Raw Material Suppliers
- Consultants
- Equipment Suppliers
- Project Engineers

Annual Conferences

Professionals from around the globe gather annually to discuss and learn of current and future trends in the Polyurea Industry.

- Reach Key Buyers in the CASE industry
- Meet with customers and potential customers
- Meet with related associations and their members to exchange needs and opportunities
- Meet with Government Officials, Institutes and learn about regulatory requirements



Product Logo

The PDA has developed a „Pure Polyurea“ product certification program for members to use to promote their Pure Polyurea Products. Display or publication of the PDA Product Logo is reserved exclusively in connection with identification of applicant's product as a product or system, which fully meets and complies with the definition of polyurea as currently adopted by the PDA. Visit our website for more details.

Safety

Safety in product handling and application is critical and a subject that gets a lot of attention inside the PDA.

Presentations on hazards and better safety practices are made annually at our conference and are available for use by our members. We are also working closely together with ISOPA (www.isopa.org) and their Walk The Talk campaign.



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