

POLYURETHANE vs POLYMER

Get a Grip the Right Way

For decades, silicone and polyurethane adhesives have been the standard solution in construction for sealing joints, creating watertight connections, and bonding materials together. Much like the word “iPad” became a generic term for tablets, silicone and polyurethane have become synonymous with almost every adhesive or sealant application in the building industry.

And in construction, there is often one dominant philosophy: **“If it ain’t broke, don’t fix it.”** However, modern façade construction is evolving rapidly. Increasing demands regarding durability, safety, sustainability, and performance are driving the industry toward smarter and more advanced bonding technologies.

This is exactly where modern polymer-based adhesives make the difference.

Why More Professionals Are Switching to Polymer Technology

Polymer adhesives combine outstanding bonding performance with superior safety, flexibility, and durability. Compared to traditional polyurethane and silicone systems, polymers offer significant technical and practical advantages for modern façade applications.

Safety: Better for Applicators and the Environment

One of the biggest differences between polyurethane and polymer adhesives is the presence of isocyanates.

Polyurethane adhesives — and even some coloured silicone systems — contain isocyanates as curing agents. Polymer-based adhesives do not.

Exposure to isocyanates can lead to serious health risks, including:

- Occupational asthma
- Skin irritation and dermatitis
- Irritation of eyes, nose, and throat
- Respiratory complications
- Chemical bronchitis and pneumonitis

As health and safety regulations become increasingly strict, many contractors and façade specialists are actively looking for safer alternatives.

Polymer-based adhesives offer a much healthier solution because they are:

- Free from isocyanates
- Solvent-free
- Safer for installers
- More environmentally friendly
- Better suited for sustainable construction projects

Especially on construction sites exposed to rain and environmental runoff, solvent-free polymer technology contributes to cleaner and safer working conditions.

Superior Adhesion Across Multiple Substrates

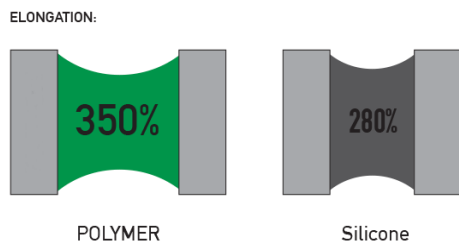
For years, silicone and polyurethane were considered “universal” adhesive systems. But modern polymer technology goes far beyond traditional bonding capabilities.

Polymer adhesives offer exceptional cohesion strength and excellent adhesion on a wide range of substrates, including:

- Composite panels
- GRP materials
- Polycoated steel
- Concrete and masonry
- EPDM and PVC membranes
- Both rigid and flexible substrates

Many polymer systems also function simultaneously as both adhesive and sealant, simplifying installation and improving efficiency on-site.

Exceptional Flexibility and Long-Term Performance



Modern façades are constantly exposed to movement caused by temperature changes, wind loads, and structural expansion or contraction. This is where polymer technology truly excels.

Some polymer adhesives achieve elongation at break values up to

350%, compared to approximately **280%** for many traditional silicone alternatives.

More importantly, polymer adhesives maintain strong adhesion to both substrates even under extreme movement conditions. This makes them particularly suitable for ventilated façade systems and dynamic construction applications.

Advanced Durability and Mechanical Strength

Another major advantage of polymer technology is long-term durability and hardness performance.

Many silicone-based adhesives have relatively low Shore A hardness ratings. In contrast, advanced TWEHA® polymer systems achieve a Shore A value of approximately **60**, creating an extremely strong and durable bonded connection.

The result is a bonding system capable of withstanding:

- High wind loads
- Mechanical stress
- Climatic influences
- Long-term façade movements
- Challenging environmental conditions

In practice, the adhesive becomes almost a structural component within the façade system itself.

Cleaner Finishes and Better Workability

Polymer adhesives also provide significant advantages during installation and finishing.

During curing, polymer systems:

- Do not attract dirt or dust particles
- Do not bubble
- Create smooth and clean finishes
- Offer excellent paintability with water-based paints

This not only improves the visual quality of the finished façade but also contributes to safer and cleaner working environments.

The Future of Bonding Technology

The façade industry is moving toward safer, stronger, and more sustainable construction solutions. Polymer technology perfectly aligns with these modern demands.

Compared to traditional polyurethane and silicone systems, polymer adhesives offer:

- Better health and safety
- Superior substrate compatibility
- Exceptional flexibility and durability
- Cleaner finishing results
- Long-term façade reliability

At TWEHA®, we believe the future of façade bonding belongs to advanced polymer technology.

Would you like to know which polymer bonding solution is best suited for your façade application?

Our specialists are ready to help you choose safe, durable, and high-performance bonding systems for your next project.

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