

THE DIFFERENCE BETWEEN ADHESIVES AND SEALANTS

Understanding the Right Solution for Structural Façade Bonding

Although adhesives and sealants are sometimes used in similar environments, they are fundamentally different products designed for completely different purposes. In façade engineering and cladding applications, understanding this difference is essential for safety, durability and long-term performance.

At TWEHA®, we regularly see confusion between sealants and structural adhesives.

However, using the wrong product in a façade construction can lead to structural failure, reduced durability and safety risks.

What Is a Sealant?

As the name suggests, a sealant is primarily intended to seal joints and gaps between surfaces. The main purpose is to create:

- air-tight connections,
- water-tight joints,
- and protection against environmental influences.

Sealants are designed to remain flexible and accommodate movement between building components. They are excellent for expansion joints, weatherproofing and preventing water infiltration.

However, sealants are generally **not designed to structurally bond materials together**. Their adhesive strength is limited, and they are subject to creep when continuously loaded.

What Is an Adhesive?

Adhesives are specifically developed to bond materials together with long-term structural strength.

A structural adhesive can transfer loads between bonded components and maintaining the integrity of the connection under mechanical stress, thermal movement and environmental exposure.

Compared to sealants, adhesives:

- provide significantly higher bonding strength,
- have greater mechanical performance,
- offer superior durability,
- and maintain structural integrity over long periods of time.

The difference in simple terms

- Sealants protect
- Adhesives connect

The Technical Difference Between Adhesives and Sealants

The main difference between adhesives and sealants lies in their mechanical properties.

Generally:

- adhesives have high strength and lower elongation,
- Sealants have lower strength and higher flexibility.

Structural adhesives typically achieve:

- lap shear strengths above 1000 psi,

while sealants are generally:

- below 1000 psi lap shear strength.

This difference is directly related to their molecular structure. Adhesives possess a highly cross-linked polymer structure, resulting in:

- stronger cohesion,
- greater rigidity,
- improved load transfer,
- and enhanced long-term performance.

Sealants, on the other hand, are formulated to remain flexible and elastic, allowing them to absorb movement rather than carry structural loads.

Why Structural Adhesives Matter in Façade Cladding

Modern ventilated façades are exposed to a wide range of forces and environmental conditions:

- wind loads,
- thermal expansion,
- moisture,
- UV exposure,
- dynamic movement,
- and long-term fatigue stresses.

In these situations, a structural adhesive must do far more than simply “stick” materials together. It must maintain a reliable and durable bond throughout the lifetime of the façade system.

This is why TWEHA® structural adhesives are specifically engineered for cladding applications.

Choosing the Right Adhesive System

Selecting the correct adhesive system requires careful engineering evaluation. Several critical questions must be answered before choosing the right product.

1. Is the Bond Structural or Non-Structural?

The first and most important question is whether the bonded connection must carry loads. If the bonded element contributes to the structural integrity of the façade, a structural adhesive is mandatory.

2. Which Materials Are Being Bonded?

Different substrates behave differently under stress and temperature changes.

Examples include:

- aluminum,
- ceramic,
- HPL,
- fiber cement,
- composite panels,
- steel,
- and timber substructures.

Each material has its own:

- coefficient of thermal expansion,
- surface energy,
- stiffness,
- and mechanical behaviour.

The adhesive must be compatible with all bonded substrates.

3. What Environmental Conditions Must Be Withstood?

Façade systems are continuously exposed to environmental influences such as:

- UV radiation,
- humidity,
- rain,
- freeze-thaw cycles,
- temperature fluctuations,
- and chemical exposure.

Mechanical stresses may include:

- tensile loads,
- compressive loads,
- Shear forces,
- vibration,
- and dynamic wind pressures.

A structural adhesive must maintain performance under all these conditions.

4. What Construction Details Influence the Bond?

Additional considerations include:

- surface preparation,
- bond line thickness,
- vertical or horizontal installation,
- curing conditions,
- working time,
- and application methods.

Even the smallest detail can influence long-term façade performance.

TWEHA® Structural Adhesives for Cladding

All these parameters are carefully evaluated during the formulation, production and application of TWEHA® structural adhesives.

TWEHA® adhesive systems are specifically developed for façade cladding applications where:

- safety,
- durability,
- aesthetics,
- and long-term structural reliability are essential.

Unlike conventional sealants, TWEHA® structural adhesives are designed to create durable engineered façade connections capable of withstanding the demanding conditions modern buildings require.

Conclusion

Although adhesives and sealants may appear similar, they serve completely different functions.

Sealants are intended to seal and protect against air and water penetration. Structural adhesives are engineered to permanently bond façade materials together and safely transfer loads over time.

For ventilated façades and bonded cladding systems, selecting the correct structural adhesive is critical to the overall safety and durability of the building envelope.

At TWEHA®, our focus is not simply bonding materials — it is engineering reliable façade systems built to perform for decades.

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