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Silicone sealants are at the heart of impact-resistant glazing on new Westin Diplomat Hotel

Impact-resistant glazing in rooms and suites at the new Westin Diplomat was constructed with *Dow Corning*® 995 Silicone Structural Adhesive, while the flowing 6-story glass canopy used *Dow Corning*® 795 Silicone Building Sealant. Perimeter Joints were sealed with *Dow Corning*® 790 silicone Building Sealant, an ultra-low modulus, high-elongation material.

Extensive use of glass and unique glazed canopy presented some unique sealing challenges for the Westin diplomat Hotel in Hollywood, Florida.

High performance silicone sealants are playing a key dual role at the elegant Westin diplomat Hotel and Spa in Hollywood, Florida, providing critical weatherproofing in this hurricane-prone region. The 1000-room facility was completed under the South Florida Building Code, which contains the toughest wind-and impact-resistance standards in the nation.

In addition to the windows and sliding doors in all rooms and suites, the silicone sealants were used for all glazing in over 200,000 square feet of meeting and convention space, which is offset by a five-story atrium featuring some of South Florida's most stunning use of glass. The convention center hosts a 50,000-square-foot unobstructed Great Hall and four ballrooms, with the largest showcasing an ocean view window that is 20 feet high and 150 feet across. Beyond the lobby is the infinity-edge pool with its trademark see-through bottom (also sealed with silicone) and waterfalls spilling into the 240-foot lagoon-style pool below.

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EPOXY vs POLYUREA

What you should know about the comparative advantages and disadvantages, similarities and differences of these two types of industrial floor joint fillers

In the 1990's a new type of floor joint filler with different chemistry entered the market dominated for decades by semi-rigid epoxy fillers. Generically these fillers are known as "polyureas," and they are often promoted as being superior to the epoxies. As manufacturers of both polyurea and epoxy fillers, we, Metzger/McGuire, are very much aware of the inherent advantages and shortcomings of both materials. Defining these differences will help specifiers, facility owners, and contractors make an informed product selection.

1. Shore A Hardness

The Shore-A gauge measures the relative hardness of plastics and rubbers. When the dull needle is pressed against cured material, it yields a reading from 1-100.

If you press a Shore-A gauge against an A80 polyurea and an A80 epoxy you will notice something strange; while both readings are A80, the polyurea will feel much more flexible than the epoxy, and the epoxy will feel stiffer. This is because the needle is also measuring the penetration resistance of the filler surface. The more dense surface matrix of the polyurea gives a reading that distorts its actual relative hardness.

An A80 polyurea is more flexible than an A80 epoxy. Logic therefore tells us that the A80 epoxy will likely support greater loads before deflecting than a supposedly comparable A80 polyurea. When choosing a polyurea, be sure it will adequately support the anticipated loads

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(From Front Page)

Project Details

The glazing consultant on the Diplomat project was IBA Consultants. IBA provided pre-construction design consulting, including approval of the impact-resistant systems using *Dow*

Corning® 995 Silicone Structural Adhesive for the capture window systems in rooms and suites. "The sweeping wave of curved glass that flows over 300 feet from the east side of the building to the west presented some unique considerations, sheltering the main lobby and carports at both ends of the structure," said IBA president Mark Baker.

The complex geometry and intricate details of the design presented some challenges," Baker observed. "The aesthetics were obviously very important, but every window system throughout the building had to meet the extremely rigid standards for design pressure and impact resistance set out in the South Florida Building Code, the nation's first code requiring hurricane resistance for building envelope systems," he said. "This code set the standard for impact-resistant design now incorporated into the new Florida Building Code and International Building Codes."

"The combination of structural strength and flexibility in the sealant is a key to meeting the impact-resistant glazing standards," added IBA's Baker. "While several other material types could deliver the strength to withstand the test's initial impact requirement, I'm not aware of any sealant other than silicone that also provides the flexibility to hold up under the 9000-cycle wind load testing that followed.

A Dow Corning/Atlas Supply Note:

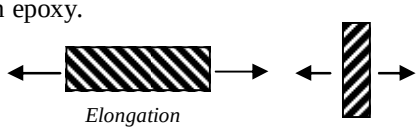
Lorne Andrusiak will be leaving Dow Corning after 18-1/2 years of service; including 5 years serving as the Northwest's Construction Representative. Lorne is looking forward to early retirement splitting his time in Canada visiting his two daughters and enjoying the sun in Arizona. We welcome Lorne's replacement, ***Chris Combs***, this summer in July. Chris is originally from Michigan and will be relocating to the Northwest from Cleveland, OH. He began at Dow Corning over 20 years ago as a technical Service Engineer. Prior to joining us in the Northwest, Chris held positions managing territories in Southern California, Texas, and Ohio.

(Epoxy/Polyurea from Front Page)

2. Elongation (As Relating to Movement Capability)

Many poyureas are promoted on the basis of their high "elongation" reading, implying that the filler will "expand" at a proportionate rate. It won't!

A A80 polyurea with an elongation of 400% will expand only 5-12% laterally (side-to-side) before the bond to the concrete yields. At the same time an A80 epoxy with only 25% elongation will usually tolerate 5-8% expansion. Thus, the high elongation polyurea offers little in expansion advantage over an epoxy.



Elongation *Expansion*

Don't be mislead by elongation. It is a basically irrelevant property. Focus on the fillers' ability to support traffic loads and hard wheels, thus protecting joints from related damage.

3. Adhesion to Concrete

From our evaluations we're convinced that both products have adequate adhesion to concrete.

4. Application Temperatures

Below freezing temperatures will geneally prevent epoxies from completing their total molecular cure. Thus, epoxies should be used only when the installation temperature is above 32ºF (0ºC). Be sure the product tech data specifically approves freezer installations.

5. Moisture Sensitivity At Installation

Most epoxies tend not to be adversely affected by moisture, other than substantial moisture on the joint wall surfaces which may compromise adhesion. Many polyureas are moisture sensitive at dispensing time. Some will react with moisture in the joint and bubble. If the bubbles are small, they will not affect the fillers load-support or performance. Moisture in the joint can also compromise the fillers adhesion, especially since polyureas cure so rapidly that they can't work past the moisture to gain bond.

6. Proper Filler Depth

To be effective in protecting joint edges against hard wheel damage, both polyurea and epoxy fillers must be installed full depth (typically 1-1/2") in saw cuts and 2" deep (minimum) in construction (formed) joints. These criteria comply with American Concrete Institute 302 and 360 and the Portland Cement Association guidelines for filler depth.

7. Dispensing

Both epoxies and polyureas can be dispensed with dual-fee, power pump equipment. Epoxies can also be dispensed with manual bulk-type guns. Polyureas generally cannot be dispensed with manual bulk-type guns because their potlife (a few minutes) is too short. Since power dispensing pumps are costly, smaller contractors are often not able to bid on or perform polyurea installations.

8. Overfill-And –Shave Process

With both products, the overfill-and-shave procedure is recommended to achieve a flush filler profile. There are several significant differences in the shaving process between the materials.

Timing - Filler overfill should not be razored-off until the filler has set into a complete solid. Due to their early set time polyureas can be shaved in the first few hours, some as early as fifteen (15) minutes. Epoxies generally can't be shaved for 4-12 hours. Same-day shaveability is the main reason some installers prefer polyureas. Epoxies are usually easily shaved the second day. If they have gotten too hard to shave smoothly, a slight warming with a torch makes them shaveable. Some polyureas cannot be flame heated since they can release harmful isocyanate fumes or re-liquefy.

Wide or Uneven Joints - In wider or uneven joints, shaving a material flush is more difficult. Grinding is generally the best option to achieve a truly flush profile, but polyureas do not generally react well to shaving/sanding procedures, and they often re-liquefy or shred like cotton candy in the process. Conversely, nearly all epoxies can be ground or sanded and are thus a better choice in wide/uneven joints.

The difficulty in removing a polyurea filler which has been low filled or shallow filled (over debris, backer rod, etc.) may outweigh the benefits offered by a faster and easier shave. Installing the filler properly the first time is critical

9. Access After Filling

Because polyureas set so fast, the work area can usually be opened to light traffic in an hour or two, sometimes even earlier. Epoxy filled joints generally can't be opened to light traffic for 6-12 hours. While the polyureas are the clear winner in

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(Epoxy/Polyurea from Page 2)

this situation, one must ask if a floor area must truly be open to access so rapidly. Construction schedules are seldom that tight. Thus, the polyurea's advantage may be a moot point.

10. When Filler Expand

Contrary to popular belief, polyureas with an A80 hardness or greater cannot tolerate expansion greater than 5-12% when installed 3/4" deep or deeper. Epoxies will generally expand 5-8% before de-bonding. Even 12% of a joint width is so small that normal joint opening due to shrinkage will cause the polyurea to de-bond. Even if a lower Shore A polyurea expands as the joint widens, it is a hollow achievement. When an elastomer expands and stretches it takes on an hourglass profile, leaving a concave surface that offers reduced edge protection.

Do not rely on polyureas to expand with the joint. They generally won't. If by some chance they do, joint edge protection is compromised by the filler's flexibility and reduced load deflection capabilities.

11. Polyureas and Epoxies Separate Differently

Correction of separation voids differs with both products. With epoxies, due to the alternating separation voids, it can be difficult to refill the voids. Most applicators prefer to saw cut out the top 1/2" of epoxy and refill the joint flush. Polyurea separation must be corrected by refilling the voids since most polyureas cannot be saw cut. The heat from the blade causes them to revert into a gooey liquid or shred like cotton candy, gumming up the blade.

12. UV Related Color Changes

Many newer lighting systems emit a UV spectrum that will cause fillers to turn greenish or yellowish. Both polyureas and epoxies may be affected. The color change, while less than pleasing, will not affect the fillers' performance.

Installed cost

Polyurea and epoxy materials are generally in the same price range. Polyureas require a power dispensing unit, epoxies can be hand gunned or dispensed through pumps. Savings can be achieved applying both materials thourgh pumping due to increased production. Joint preparation, a sizeable part of the installation cost, is the same for both. Overall, we find the installed cost of both polyureas and epoxies to be very similar.

Summary

We find that the use of polyurea fillers is growing, and that the growth is basically applicator-driven. Applicators, especially larger ones who can afford a pump unit, like the idea of power-dispensing, same day shaving, and shaving without heating the joint.

Even though our polyureas are widely used in ambient temperature, new construction projects, we are not thourghly convinced that polyureas are any better than established epoxy fillers. Perhaps the bottom line is that we see no clear benefit for the facility owner or designer when polyurea fillers are used in ambient temperature, new construction projects.

Unless rapid turnover time of filled areas is critical to the owner, most of the benefits of polyureas accrue to the installers. This is not to say that decision makers should reject out-of-hand a submittal to use a polyurea. It's simply a matter of due-diligence (in comparison with the specified materials), an awareness of the advantages/ disadvantages of both polyureas and epoxies, and good old common sense. ▯

FEATURE PRODUCT

AQUAFIN

Mark Schneider, manufacturer's representative for Aquafin, organized a training at the Atlas Supply warehouses in Seattle and Portland. Customers got a hands-on experience applying the Aquafin 1K and Aquafin 2K/M.

Typical Applications

2K/M

- Above/below grade, interior/exterior
- Horizontal, vertical, or overhead applications to concrete, overlays, masonry, brick, CBU's, drywall, ceramic and quarry tiles and more…
- Exterior (positive side) waterproofing below grade foundations.
- Balconies, planter boxes, plaza decks, stadiums, mechanical and equipment rooms
- Potable water, wastewater, sea water and marine aquarium tanks, and other reinforced concrete structures
- Top soil covered roof structures

1K

- Horizontal or vertical applications to concrete, masonry, brick and parging by brushing, troweling or spraying
- Waterproof coating of above or below grade, positive or negative water pressure side
- Base coat for AQUAFIN-2K/M in negative side applications
- Sealing static hairline cracks in concrete structures not subject to movement
- Especially suited for waterproofing of masonry/brick substrates, basements, potable/ open wastewater tanks, swimming pools, elevator pits, retaining walls, foundations

AQUAFIN® -2K/M is a state of the art load bearing cementitious, acrylic emulsion based highly flexible protective coating and waterproof barrier. This product is two-component (powder, liquid) and resistant to water and abrasion. Its liquid mixing component is solvent free. Available in standard gray and white, or several additional colors. Alternatively, it can be painted, top coated or tiled using flexible thin set adhesives. If a sealed surface is desired AQUAFIN-CS/250 clear acrylic sealer can be applied.

2K/M is a stand-alone product. It can be top or over coated with flexible or rigid mortars, stuccos or coatings for uniform appearance. It bridges static cracks up to 1/16".

Advantages include: Solvent free and non-flammable; environmentally friendly; no priming necessary in most cases; breathable (not a vapor barrier); applied to moist/damp substrates; resists abrasion; mechanical wear and deicing salts; stands up to pedestrian and light traffic; resists strong hydrostatic pressure; excellent root resistance; active barrier to carbon dioxide; permanently flexible-self curing.

AQUAFIN® -1K is a cementitious, ready-mixed powder, which is mixed with water to form a dense, waterproof surface barrier. It consists of Portland cement, well graded quartz sand and polymer enhanced special chemical ingredients, making it slightly flexible.

1K does not contain any ingredients which could negatively affect reinforcement or concrete. After mixing with water it cures to a hard membrane. In zones posed to cracking or movement AQUAFIN® -2k/m is recommended.

Advantages include: Resists strong hydrostatic pressure; applied to positive or negative water pressure side of a structure; easy to use; Excellent freeze/thaw resistance; withstands light foot traffic; non-flammable, no odor, non toxic. ▯

Reduced Prices ... **on products that may be nearing the end of the suggested shelf life, un-sold special order items, overstocks or jobsite returns. Here are a few top sellers on discount:**

The following offers are only good while the supply lasts...

30% Discount: Sikaflex® 15LM (Black & Dark Bronze Sausages) - Sikaflex-15LM is a low-modulus, high-performance, 1-component, polyurethane-based, non-sag elastomeric sealant. Meets Federal Specification TT-S-00230C, Type II, Class A; ASTM C-920, Type S, Grade NHS, Class 25

40% Discount: Bostik® Chem-Calk 915® (White only) - Chem-Calk 915 sealant is a one-component architectural grade polyurethane sealant capable of dynamic joint movement totaling 50% of original joint geometry (± 25%). The sealant cures to a tough, flexible rubber when exposed to moisture present in the atmosphere.

50% Discount: Poecora AC-20® (multiple colors) - AC-20 is a pure acrylic latex sealant for general purpose interior and exterior caulking in architectural applications where slight to moderate movement is anticipated. Formulated with the highest quality ingredients including a touch of silicone for greater adhesion and weatherability, AC-20 is completely compatible with premium-grade latex and oil paints and will not stain adjacent surfaces.

CONGRADULATIONS TO

Richard & Jaime Snider with the new addition of their baby girl, Allison Michelle. Allison was born April 15th, 2009.

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