



TECHNICAL BULLETIN 123

Subject: **Silicones vs. Urethanes – which is the better sealant?**

Architects and contractors often ask the question – what are the differences between a urethane-based sealant and a silicone-based sealant and which is better?

The simple answer is this. A silicone based sealant carries a longer term warranty ranging from 2 to 4 times as many years as opposed to a common urethane warranty. By choosing silicones with longer term warranties, the life cycle cost of sealing your building could be greatly reduced. Would you rather seal your building two to three times over a twenty year period or just once? Both chemistries are capable of sealing your building and providing the waterproofing desired. So the simple answer basically comes down to warranty period and what makes sense concerning life cycle cost for your particular building.

A somewhat more involved answer will touch on the differences in adhesion properties, application and appearance differences, and base polymer properties with respect to weatherability.

- Adhesion properties are mostly determined by specific formula differences among manufacturers and generalizations cannot be made across sealant chemistries. It's best to do the work up front on large projects utilizing the testing services supplied at no charge by most reputable sealant manufacturers.
- Application, handling characteristics, appearance, and color availability are determined more by individual formulation variations and will need to be assessed by the applicator as to preference and suitability.
- The base polymer used in silicone sealant compounding is poly-di-methylsiloxane which is inherently stable when exposed to UV light – meaning it will not degrade or deteriorate. Some like to say that the silicone polymer is inorganic because it has no organic components that deteriorate when exposed to typical weathering conditions. The inorganic portion being silica atoms or as the mineral more commonly known as sand. Silicone polymers do in fact contain carbon atoms thereby excluding them from the purely inorganic family of materials.
- The most significant difference of a silicone based polymer when compared to a urethane polymer is the Si-O (silica-oxygen) bond as opposed to the C-O (carbon-oxygen) bond found in urethane sealants. The Si-O bond is much more UV stable than the C-O bond, hence better inherent weatherability of the silicone based sealant regardless of formula variation. The less UV stable C-O bond can be improved upon through the addition of UV protectors, anti-oxidants, UV absorbers, etc. Thus the weatherability of the urethane based material is more determined by the formula differences among manufacturers as opposed to the base polymer used.

In conclusion, the choice between silicone and urethane will invariably come down to one of cost and warranty period when factoring out personal preference and formula specific differences. However, don't overlook perhaps the most important factor to consider when choosing the proper sealant for the job: the services provided by the sealant manufacturer may ultimately have much more to do with your success than your choice of sealant chemistry.

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