A-1-1   Silicone technology for the protection of masonry and construction

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ABSTRACT

The ultimate aim of all hydrophobic impregnations is to prevent masonry and construction from capillary uptake of water and damaging reactions ignited by aggressive substances dissolved therein. Common technologies are the application of coatings or alternatively colorless, non-film-forming and penetrating agents. A large number of water repellents based on Silicones have been developed since the 1950ies as products deriving from the Mueller-Rochow-Process. This process allows the conversion of silicone metal into silicone-organic chlorosilanes, which are further functionalized for the use in various industries. Only specific sub-units ("T-units") from this product stream are really suitable for the use in masonry and construction protection. Some of the products from the "early years" are still in use, and, not least for reasons of quality assurance remain available. Nowadays silanes and siloxanes represent the basis of modern water-repellents. They are available in a large variety of application forms for almost all different kinds of mineral substrates, and have proven outstanding properties. The presentation will cover a short historical survey of silane/siloxane-based products´ history including latest developments. The principal chemical reactions to achieve a long-lasting silicone-resin-network will be explained and the major decision criteria and critical success factors for the effectiveness of a treatment will be discussed. Finally a variety of examples for the use of silicone-based applications in the Construction Industry will demonstrate the macroeconomic benefits of sustainable and long-lasting protection against moisture and from corresponding damaging processes.

KEY-WORDS: Mueller-Rochow-Process, silanes, siloxanes, silicone resins, hydrophobic, protection, masonry, construction.