FUNCOSIL WS
AQUEOUS, HYDROPHOBIZING AGENT
FOR CEMENTITIOUS BUILDING MATERIALS

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Protection of cementitious building materials above all means moisture protection because water is primarily responsible for damaging physical, chemical and biological processes on buildings. That is why especially in the area of facade protection, the requirements placed on impregnation agent are very high. To reduce the load on the environment and to improve industrial safety. Remmers has developed a product with an aqueous silane emulsion that is especially distinguished by its aqueous formulation. Through this, it was possible to completely eliminate the addition of organic solvents.

Up until now, practically only solvent-bases products have been used for moisture protection on facades. Only in solvents was it possible to distribute water insoluble silicone finely enough so that it could penetrate completely into the pores and capillaries of the building material. But is had a disadvantage: During application and the drying process, solvents escaped from the ready-to-use products into the environment and therefore into the atmosphere. It is estimated that in Germany 15,000 tons, mainly combustible organic solvents used in impregnation agents, are given off annually into the atmosphere after being applied.

The objective of development work at Remmers has therefore been to formulate an environmentally compatible, completely solvent free impregnation agent with high penetration capacity and excellent water repelling properties.

Stated simply, this product is an emulsion of silane in water. The emulsions break down during application so that a reaction between the hydrophobizing ingredients and the building material can take place. After application, the optimal combination of ingredients does not allow water, salts dissolved in water or aggressive gases to penetrate into the building material and damage it chemically or physically.

CONCLUSION

Funcosil WS applied to masonry resists to the very high alkalinity of fresh mortar (pH 12.5) as well as to the low pH value of very acid rain (pH 3.5).

Behaviour of Funcosil WS on various types of masonry unit

	yellow soft mud brick of lime containing clay	dark red extruded brick of clay	white broken sand-lime brick	white sand-lime brick with moulding hide
absorbed water repellent (kg/m²)	0,78 ltr/m²	0,3 ltr/m²	1,13 ltr/m²	0,73 ltr/m²
beading effect	good	good	excellent	excellent
resistance to water pressure (mmWK)	excellent	excellent	excellent	excellent
impregnation depth (mm)	weighed ave 10 mm	weighed ave 16 mm	weighed ave 7 mm	weighed ave 3 mm

Capillary water absorption in conformity with DIN 52617
Bentheimer Sandstone, red

treatment	weight change M% after 10 min.	weight change M% after 30 min.	weight change M% after 1 hour	weight change M% after 24 hours	impregnation depth in mm
zero sample	3.0	3.6	3.7	3.8	
silane emulsion effective ingredient content > 10% in water	0.0	0.0	0.0	0.08	6
silicone micro-emulsion effective ingredient content > 10%	0.0	0.6	0.13	0.19	4
siloxane in solvent effenctive ingredient content > 7%	0.0	0.0	0.06	0.12	8

Capillary water absorption in conformity with DIN 52617
Sand-lime brick

treatment	weight change M% after 10 min.	weight change M% after 30 min.	weight change M% after 1 hour	weight change M% after 24 hours	impregnation depth in mm
zero sample	2.56	3	4.63	9.4	
silane emulsion effective ingredient content > 10% in water	0.0	0.0	0.04	0.34	10
silicone micro-emulsion effective ingredient content > 10%	0.04	0.09	0.09	0.41	5
siloxane in solvent effenctive ingredient content > 7%	0.0	0.04	0.09	0.44	7

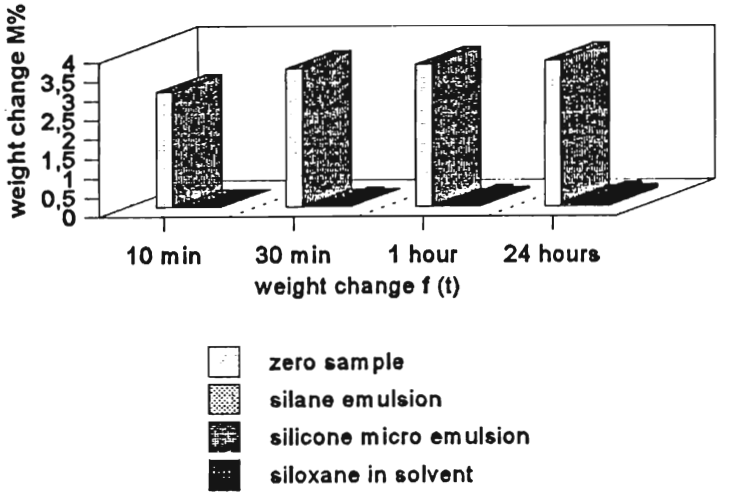
Capillary water absorption in conformity with DIN 52617
Red brick

treatment	weight change M% after 10 min.	weight change M% after 30 min.	weight change M% after 1 hour	weight change M% after 24 hours	impregnation depth in mm
zero sample	11.6	12.0	12.0	12.8	
silane emulsion effective ingredient content > 10% in water	0.0	0.0	0.0	0.15	20
silicone micro-emulsion effective ingredient content > 10%	0.0	0.0	0.15	0.43	10
siloxane in solvent effenctive ingredient content > 7%	0.0	0.0	0.06	0.10	20

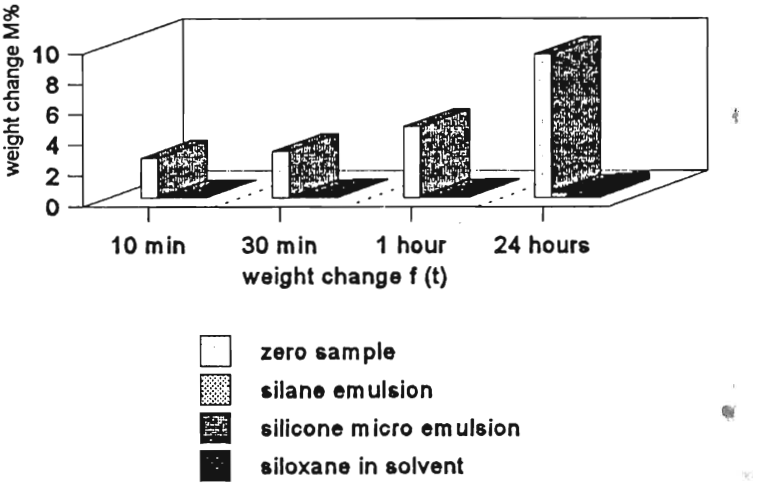
Comparison of environmental relevant data on Funcosil impregnation agents

Funcosil	GGVS	regulations on hazardous working materials	flammability class	WGK (water endagerment class)	TLV value	pH value	flashpoint	shelf-life	range of use	org. solvent	notes
SNL art.nr. 0602	Cl 3 nr. 31 c	flammable R10	AII	2	200 ml/m³	--	40°C	12. mo.	universal	yes	not for solvent sensitive substrates
WS art.nr. 0614	---	---	---	0	---	7 neutral	---	6 mo. frost free	universal	no	one-component system

Bentheimer Sandstone



Sand-lime brick



Red brick