



# CIVIL ENGINEERING & MINING

*Injection materials product range*



**F. Willich**

SINCE 1882

# CIVIL ENGINEERING & MINING

*Injection · Waterproofing · Consolidation · Repair · Anchoring*

The fields of application of our products in civil engineering & mining as well as in other areas of construction are the consolidation of soil, rock or raw materials, in the sealing against water, the safe and economical filling of cavities, in anchor technology and the repair of structures.

To solve these often-challenging problems, we have at our disposal not only a full range of tried-and-tested grouting and repair products, that properly combined with injection equipment, data recording, injection anchors and injection accessories allows to master the challenges in underground construction and waterproofing.

We would be pleased to support you with our experience and personnel know-how, when it comes to anchoring, sealing, backfilling, consolidation, repair, worldwide.





# CONTENTS

<b>1 - 1G INJECTION RESINS (SPUR) &amp; CATALYSTS</b> .....	04
• WILLSTOP® .....	06
Catalysts .....	08
<b>2 - 2C INJECTION RESINS (PUR) &amp; CATALYSTS</b> .....	10
• WILLPUR® .....	12
Catalysts .....	17
Cleaning and Maintenance .....	17
<b>3 - SILICATE RESINS</b> .....	18
• WILLKAT® .....	20
• WILLBOLT® .....	23
<b>4 - ACRYLATE GELS &amp; ADDITIVES</b> .....	24
• WILLGEL® .....	26
Additives .....	27
<b>5 - EPOXY RESINS</b> .....	28
• WILLPOX® .....	28
<b>6 - PHENOLIC RESINS</b> .....	29
• WILLFLEX® .....	29
<b>OUR PACKAGING</b> .....	30



# 1

## WILLSTOP® 1C INJECTION RESINS & CATALYSTS

**WILLSTOP®** products are single-component polyurethane foam resins to be processed to stop water ingress in groundwater, to seal cracks in concrete structures or to consolidate soil in geotechnics. The products require water as a reactant and only react by foaming when they come into contact with moisture or water. Depending on the system, the end product is a solid or flexible high-expansion foam, low or high foamed.

All **WILLSTOP®** systems can be adjusted in the reaction times by adding catalysts. Processing is carried out using lightweight air-driven piston pumps or electrically operated diaphragm pumps. The injection pumps are cleaned with **WILLPUR® WS Cleaner** and then with **WILLPUR® WS Flushing oil** as the final rinsing and care agent.

## WILLSTOP® 1

### One-component, water-reactive, highly foaming SPUR for sealing water inflows, reaction times adjustable

To stop water ingress in building construction, civil engineering, tunnel construction and hydraulic engineering, to seal pressurized water cracks in concrete and masonry, to consolidate soil, for example in launch and arrival shafts in pipe jacking.

- high foam factor ~ 70
- reaction times can be adjusted between 1 - 10% (weight fractions) by adding WILLADD® 1

Article designation	Size	Packaging	Article number
WILLSTOP® 1K	10 kg	Metal can	WSTOP-1-2-10
	20 kg	Metal can	WSTOP-1-20

## WILLSTOP® 1K+

### One-component, water-reactive, highly foaming SPUR for sealing water inflows (pre-catalyzed)

To stop water ingress in building construction, civil engineering, tunnel construction and hydraulic engineering, to seal pressurized water-carrying cracks in concrete and masonry.

- fast reaction
- foam factor ~ 50 - 70
- ready to use
- can be further accelerated if necessary by adding max. 5% (weight fractions) of WILLADD® 1
- tested with regard to effects on soil and groundwater

Article designation	Size	Packaging	Article number
WILLSTOP® 1K+	10 kg	Metal can	WSTOP-1K+-2-10
	20 kg	Metal can	WSTOP-1K+-20

**WILLSTOP® FLEX**

CE MARKING ACCORDING TO EN 1504-5

**One-component, water-reactive, flexible SPUR for sealing water inflows**

For sealing cracks in reinforced concrete structures or masonry, for sealing excavation pit enclosures such as sheet piles, slotted or bored pile walls, especially when subjected to movement.

- highly foaming
- foam factor ~ 10 - 15
- flexible
- closed-cell foam
- reaction times adjustable between 1 - 5% (weight fractions) by adding WILLADD® FLEX
- tested with regard to effects on soil and groundwater

Article designation	Size	Packaging	Article number
WILLSTOP® FLEX	1 kg	Metal can	WSTOP-FLEX-1-1
	10 kg	Metal can	WSTOP-FLEX-2-10

**WILLSTOP® FLEX+**

CE MARKING ACCORDING TO EN 1504-5

**One-component, water-reactive, flexible SPUR for sealing water inflows (pre-catalyzed)**

For sealing cracks in reinforced concrete structures or masonry, for sealing excavation pit enclosures such as sheet piles, slotted or bored pile walls, especially when subjected to movement.

- highly foaming
- foam factor ~ 10 - 15
- flexible
- closed-cell foam
- reaction times adjustable between 1 - 5% (weight fractions) by adding WILLADD® FLEX

Article designation	Size	Packaging	Article number
WILLSTOP® FLEX+	10 kg	Metal can	WSTOP-FLEX+-2-10

## WILLSTOP® 42

**One-component, water-reactive, low-viscosity SPUR especially for soil consolidation**

For the consolidation of non-cohesive soils and loose rock, for increasing the soil characteristics under foundations or other solid structures.

- foam factor ~ 2 - 3
- very low viscosity
- solidified soils can be easily mechanically processed
- reaction times can be adjusted between 1 - 2.5% (weight percentages) by adding WILLADD® 42

Article designation	Size	Packaging	Article number
WILLSTOP® 42	10 kg	Metal can	WSTOP-42-1-10
	20 kg	Metal can	WSTOP-42-1-20

## WILLADD® 1

**Accelerator for the 1K polyurethane foam resins WILLSTOP® 1 and WILLSTOP® 1K+**

To accelerate reaction times, especially at low temperatures or strong water inflow.

- dosage 1 - 10% (weight percentages) for WILLSTOP® 1
- dosage max. 5% (weight percentages) for WILLSTOP® 1K+

Article designation	Size	Packaging	Article number
WILLADD® 1	1 kg	Metal can	WADD-1-1
	5 kg	Metal can	WADD-1-5



## WILLADD® FLEX

Accelerator for the one-component polyurethane foam resin WILLSTOP® FLEX and WILLSTOP® FLEX+

To accelerate reaction times, especially at low temperatures or strong water inflow.

- dosage 1 - 5% (weight percentages)

Article designation	Size	Packaging	Article number
WILLADD® FLEX	1 kg	Metal can	WADD-FLEX-1
	5 kg	Metal can	WADD-FLEX-5
	20 kg	Metal can	WADD-FLEX-20

## WILLADD® 42

Accelerator for the 1K polyurethane foam resin WILLSTOP® 42

To accelerate reaction times, especially at low temperatures.

- dosage 1 - 2.5% (weight percentages)

Article designation	Size	Packaging	Article number
WILLADD® 42	1 kg	Metal can	WADD-42-1
	5 kg	Metal can	WADD-42-5



# 2

## WILLPUR® 2C INJECTION RESINS & CATALYSTS

Depending on the product, our **WILLPUR®** polyurethane systems can be applied as one or two component. All systems are pure liquids and consist of a polyol component on the A side and a modified isocyanate on the B side. The processing takes place in a volume ratio of 1 : 1. Depending on the system selected, the product hardens either into an elastic or a rigid polyurethane resin with high or low foam factor and high mechanical properties. Except for the explicit foaming types, usually in absence of water, the systems harden without foam.

The response times of the **WILLPUR®** systems range from a few seconds to more than an hour. The **WILLPUR®** systems can be used in a variety of ways and are the ideal solution for waterproofing and hardening purposes in dry, damp or highly water-bearing areas as well as in concrete repair for strength or maintenance. Limited elastic crack grouting.

At low temperatures or in the case of very strong water ingress, the typical **WILLPUR®** systems can be further accelerated or strongly thixotropized in their reaction by adding catalysts.

**WILLPUR® CS**

CE MARKING ACCORDING TO EN 1504-5

**Two-component polyurethane resin, low viscosity, ductility, slow reaction time**

For sealing crack injection in reinforced concrete structures in accordance with EN 1504-5, for the injection of construction joints, for the grouting of injection hoses, for the sealing of segment joints in tunnel construction and for the consolidation and sealing of soil and rock in difficult subsoil.

- processing in a volume ratio of 1 : 1
- one- and two-component processing possible
- ductile crack filler
- pot life (1000 mPa\*s) 40 - 60 min. at 25°C
- foam factor ~ 1 (without water)

Article designation	Size	Packaging	Article number
WILLPUR® CS - A/B	1 kg	Metal can	WPUR-CS-1-A-B-1
WILLPUR® CS - A	4.5 kg	Metal can	WPUR-CS-1-A4.5
WILLPUR® CS - B	5 kg	Metal can	WPUR-CS-1-B5
WILLPUR® CS - A	18 kg	Metal can	WPUR-CS-1-A18
WILLPUR® CS - B	20 kg	Metal can	WPUR-CS-1-B20
WILLPUR® CS - A	195 kg	Metal drum	WPUR-CS-1-A195
WILLPUR® CS - B	214 kg	Metal drum	WPUR-CS-1-B214
WILLPUR® CS - A	950 kg	IBC	WPUR-CS-1-A950
WILLPUR® CS - B	1045 kg	IBC	WPUR-CS-1-B1045

**WILLPUR® HF****Fast-reacting, foaming two-component polyurethane resin with high adhesive strength**

For sealing against water, for solidifying unstable soil, for filling smaller cavities also joints, crevices, pipelines, hollow bodies, etc. Even without contact with water, the product reacts strongly foaming to form a tough-hard PUR rigid foam.

- reaction time (end of foaming) at 25°C after approx. 60 - 80 s
- foam factor 6 - 8

Article designation	Size	Packaging	Article number
WILLPUR® HF - A	21 kg	Metal can	WPUR-HF-1-A21
WILLPUR® HF - B	25 kg	Metal can	WPUR-HF-1-B25

## WILLPUR® SL

### Two-component polyurethane resin with high mechanical properties, low foam factor and fast reaction

For pressing, lifting or fixing massive structures such as foundations, floor slabs, traffic route areas.

Suitable for the consolidation of loose rock, soil or rock fills (gravel), for rock consolidation in the area of fault zones and for the encapsulation of contaminated areas.

- reaction time (end of foaming) at 20 °C after approx. 50 s
- limited foam factor 1.5 - 3
- high final strength
- tough-hard foam
- tested with regard to effects on soil and groundwater

Article designation	Size	Packaging	Article number
WILLPUR® SL - A	20 kg	Metal can	WPUR-SL-1-A20
WILLPUR® SL - B	24 kg	Metal can	WPUR-SL-1-B24
WILLPUR® SL - A	200 kg	Metal drum	WPUR-SL-1-A200
WILLPUR® SL - B	240 kg	Metal drum	WPUR-SL-1-B240
WILLPUR® SL - A	1000 kg	IBC	WPUR-SL-1-A1000
WILLPUR® SL - B	1200 kg	IBC	WPUR-SL-1-B1200

## WILLPUR® HF+

### Fast-reacting two-component polyurethane resin with a high foam factor

For sealing against water, for solidifying unstable soil, for filling smaller cavities also joints, crevices, pipelines, hollow bodies, etc. Even without contact with water, the product reacts strongly foaming to form a tough, hard PUR rigid foam.

- reaction time (end of foaming) at 25°C after approx. 65 - 95 s
- foam factor 14 - 16

Article designation	Size	Packaging	Article number
WILLPUR® HF+ - A	20 kg	Metal can	WPUR-HF+-1-A20
WILLPUR® HF+ - B	23 kg	Metal can	WPUR-HF+-1-B23
WILLPUR® HF+ - A	200 kg	Metal drum	WPUR-HF+-1-A200
WILLPUR® HF+ - B	230 kg	Metal drum	WPUR-HF+-1-B230
WILLPUR® HF+ - A	1040 kg	IBC	WPUR-HF+-1-A1040
WILLPUR® HF+ - B	1210 kg	IBC	WPUR-HF+-1-B1210

**WILLPUR® WS-X**

CE MARKING ACCORDING TO EN 1504-5

**Slow-reacting, two-component polyurethane resin, faster reaction to water contact**

For sealing and solidifying dry and water-bearing areas.  
For sealing surface injection (veil injection) behind structures in contact with the ground such as tunnels, caverns, underground car parks, for non-positive crack repair.

- can be processed in one and two components
- variably adjustable reaction time from 25 s up to 106 min. at 20°C and without contact with water
- foam factor ~ 1 (without water)
- foam factor ~ 4 (with 1% water)
- by adding WILLADD® FAST (accelerator) or WILLADD® THIX (thixotropic agent) the system can be adapted to the on-site requirements
- tested with regard to effects on soil and groundwater

Article designation	Size	Packaging	Article number
WILLPUR® WS-X - A	21 kg	Metal can	WPUR-WSX-1-A21
WILLPUR® WS-X - B	25 kg	Metal can	WPUR-WSX-1-B25

**WILLPUR® WS****Fast-reacting, foam-foaming, two-component polyurethane resin with short reaction time**

For sealing and solidifying dry and highly water-bearing areas, especially against pressurized water, stops water currents and serves to seal structures below and above ground such as tunnels, caverns, dams, locks.

- reaction time (foaming end) at 15°C approx. 100 s
- foam factor ~ 1 (without water)
- foam factor ~ 6 (with 1% water)
- by adding WILLADD® FAST (accelerator) or WILLADD® THIX (thixotropic agent) the system can be adapted to the on-site requirements

Article designation	Size	Packaging	Article number
WILLPUR® WS - A/B	400 ml	Double chamber cartridge	WPUR-WS-1-A/B2K-400
	1500 ml	Double chamber cartridge	WPUR-WS-1A/B2K-1500
WILLPUR® WS - A	21 kg	Metal can	WPUR-WS-1-A21
WILLPUR® WS - B	25 kg	Metal can	WPUR-WS-1-B25
WILLPUR® WS - A	210 kg	Metal drum	WPUR-WS-1-A210
WILLPUR® WS - B	250 kg	Metal drum	WPUR-WS-1-B250

**WILLPUR® WS-F****CE MARKING ACCORDING TO EN 1504-5****Fast-reacting, foam-foaming, two-component polyurethane resin with short reaction time**

For permanent sealing and consolidation in dry and highly water-bearing areas, reliably seals pressure-bearing water inflows from rock, soil or structures, closes cracks and fissures in the rock and prevents waterflow along the tunnel axis for a long time. WILLPUR® WS-F is also used by filling the annular gap between the rock and the standpipe for the safe bonding of icing pipes.

- reaction time at 15°C approx. 3 min. 20 s
- foam factor ~ 1 (without water contact)
- foam factor ~ 4 - 5 (at 1% water)
- is used for frictional injection into concrete and masonry
- can be used at ambient temperatures down to -15°C
- can be used in combination with WILLPUR® WS-X or WILLPUR® WS-FA by adding WILLADD® FAST (accelerator) or WILLADD® THIX (thixotropic agent)
- the system can be adapted to the on-site requirements
- tested with regard to effects on soil and groundwater

Article designation	Size	Packaging	Article number
WILLPUR® WS-F - A	21 kg	Metal can	WPUR-WSF-1-A21
WILLPUR® WS-F - B	25 kg	Metal can	WPUR-WSF-1-B25

**WILLPUR® WS-L****Very fast-reacting, foam-foaming, two-component polyurethane resin with short reaction time even at low temperatures**

For sealing and solidifying in dry and highly water-bearing areas, reliably seals pressure-bearing water inflows from rock, soil or structures, closes cracks and fissures in the rock and prevents waterflow along the tunnel axis for a long time.

- reaction time at 15°C approx. 1 min. 35 s
- foam factor ~ 1 (without water contact)
- foam factor ~ 4 (at 1% water)
- by adding WILLADD® FAST (accelerator) or WILLADD® THIX (thixotropic agent) the system can be adapted to the on-site requirements

Article designation	Size	Packaging	Article number
WILLPUR® WS-L - A	18 kg	Metal can	WPUR-WSL-1-A18
WILLPUR® WS-L - B	23 kg	Metal can	WPUR-WSL-1-B23
WILLPUR® WS-L - A	200 kg	Metal drum	WPUR-WSL-1-A200
WILLPUR® WS-L - B	250 kg	Metal drum	WPUR-WSL-1-B250

## WILLPUR® WS-FA

### Very fast-reacting, two-component polyurethane resin that foams on contact with water

For permanent sealing and solidification in dry, wet and pressurized areas with high water currents. WILLPUR® WS-FA is also used to glue in rock anchors. Can be used at ambient temperatures down to -15 °C.

- reaction time (end of foam) at 15°C approx. 1 min. 15 s
- foam factor ~ 1 (without contact with water)
- foam factor ~ 5 - 8 (at 1% water)
- can be used in combination with WILLPUR® WS-X or WILLPUR® WS-F
- by adding WILLADD® FAST (accelerator) or WILLADD® THIX (thixotropic agent), the system can be adapted to the on-site requirements
- tested with regard to effects on soil and groundwater

Article designation	Size	Packaging	Article number
WILLPUR® WS FA - A	21 kg	Metal can	WPUR-WSFA-1-A21
WILLPUR® WS FA - B	25 kg	Metal can	WPUR-WSFA-1-B25

## WILLPUR® WS HF

### Very fast-reacting two-component polyurethane resin with a very high foam factor

Lightweight, tough elastic foam for sealing and solidifying in wet to pressurized areas with high water currents.

- reaction time (end of foaming) at 20°C approx. 15 s
- foam factor ~ 30
- tested with regard to effects on soil and groundwater

Article designation	Size	Packaging	Article number
WILLPUR® WS HF - A/B	400 ml	Double chamber cartridge	WPUR-WSHF-1-A/B2K-400
	1500 ml	Double chamber cartridge	WPUR-WSHF-1A/B2K-1500
WILLPUR® WS HF - A	22 kg	Metal can	WPUR-WSHF-1-A22
WILLPUR® WS HF - B	25 kg	Metal can	WPUR-WSHF-1-B25
WILLPUR® WS HF - A	29 kg	Plastic can	WPUR-WSHF-1-A29
WILLPUR® WS HF - B	32 kg	Plastic can	WPUR-WSHF-1-B32
WILLPUR® WS HF - A	1060 kg	IBC	WPUR-WSHF-1-A1060
WILLPUR® WS HF - B	1210 kg	IBC	WPUR-WSHF-1-B1210



## WILLADD® FAST

**Accelerator for the two-component polyurethane resin systems WILLPUR® WS, WILLPUR® WS-X, WILLPUR® WS-L, WILLPUR® WS-F, WILLPUR® WS-FA**

Catalyst for shortening reaction times, especially at low temperatures or strong water inflow.

- dosage 1 - 5% (by weight) of the respective WILLPUR® A component

Article designation	Size	Packaging	Article number
WILLADD® FAST	5 kg	Metal can	WADD-FAST-1-5

## WILLADD® THIX

**Thixotropic agents for two-component polyurethanes WILLPUR® WS, WILLPUR® WS-X, WILLPUR® WS-L, WILLPUR® WS-F und WILLPUR® WS-FA**

By adding WILLADD® THIX to the respective A-component, the injection resin thickens strongly after mixing. The injection system can therefore also be used against the strongest water currents.

- dosage 1 - 5% (by weight) of the respective WILLPUR® A component

Article designation	Size	Packaging	Article number
WILLADD® THIX	4 kg	Metal can	WADD-THIX-1-4

## WILLPUR® WS CLEANER & WILLPUR® WS FLUSHING OIL

**Flushing and caring agent for injection pumps**

WILLPUR® WS Cleaner is a universal cleaning agent for degreasing and cleaning pumps and equipment used to process polyurethane resins.

WILLPUR® WS Flushing oil is an effective means of rinsing and maintaining injection pumps.

Article designation	Size	Packaging	Article number
WILLPUR® WS Cleaner	4 kg	Metal can	WPUR-1-4
WILLPUR® WS Flushing oil	11 kg	Metal can	WPUR-SÖ-1-11



# 3

## SILICATE RESINS

**WILLKAT®** and **WILLBOLT®** injection resins are two-component silicate resin systems consisting of a water glass component on the A side and a modified isocyanate on the B side. Processing is carried out in a volume ratio of 1 : 1.

**WILLKAT®** and **WILLBOLT®** can be used to optimally solve a wide range of tasks such as rock and soil consolidation, cavity filling, anchor bolting or even press-under of solid structures. Depending on the task (backfilling, solidifying, sealing, anchoring), either high-foaming or non-foaming products are used.

Water does not play a role in the reaction, the products are emulsions that do not react with water, for example by foaming, but displace the water and harden unfoamed even under water. The viscosity of the products also depends on the respective application and varies from low viscosity to stable, thixotropic consistency, for example when used as anchor resin.

In contrast to the hard viscoelastic polyurethanes, silicate resin systems can be easily mechanically processed after application. This means that consolidated areas can be easily mechanically detached from the surrounding rocky structure without further fracturing due to excessive hardening.

## WILLKAT® FOAM

### Two-component, very highly foaming and very fast-reacting silicate resin for rock consolidation and cavity filling

WILLKAT® Foam is a highly expanding filling foam that makes it possible to fill cavities safely, quickly and economically. For sealing and consolidating rolling soils or fault zones in tunnelling. Due to the low shear strength of the foam, mechanized loosening of the solidified rock is very possible.

- hardened foam is mechanically easy to process
- foaming start (20°C) 20 s
- foaming end 45 s
- foam factor 25 - 45
- tested for effects on soil and groundwater
- LOBA approval

Article designation	Size	Packaging	Article number
WILLKAT® Foam - A	26 kg	Metal can	WKAT-FO-1-A26
WILLKAT® Foam - B	24 kg	Metal can	WKAT-FO-1-B24
WILLKAT® Foam - A	34 kg	Plastic can	WKAT-FO-1-A34
WILLKAT® Foam - B	32 kg	Plastic can	WKAT-FO-1-B32
WILLKAT® Foam - A	1400 kg	Metal drum	WKAT-FO-1-A1400
WILLKAT® Foam - B	1330 kg	Metal drum	WKAT-FO-1-B1330

## WILLKAT® BB

### Fast-reacting, non-foaming, low-viscosity elasticized two-component silicate resin

Used for compressing foundations, concrete slabs, track slabs and for ballast bonding, ballast consolidation and stabilization in the track bed.

- non-foaming and non-flammable
- resistant to dynamic loads
- resistant to acids, alkalis, salt solutions and solvents
- curing time (20°C) 6.5 ± 0.5 min

Article designation	Size	Packaging	Article number
WILLKAT® BB - A	28 kg	Metal can	WKAT-BB-1-A28
WILLKAT® BB - B	22 kg	Metal can	WKAT-BB-1-B22S

## WILLKAT® FA

### Two-component silicate resin with rapid strength development

WILLKAT® FA is a fast-reacting, non-foaming, two-component silicate resin with good adhesive properties and high final strength.

WILLKAT® FA is used for pressing, lifting and fixing solid structures such as foundations, floor slabs, traffic route areas and for the frictional injection of cracks > 0.2 mm as well as for filling smaller cavities.

- flow time (20°C) 3 min. 40 s
- solidification time 4 min. 50 s
- compressive strength after 1 hour ~ 48 N/mm<sup>2</sup>
- no reaction with water
- foam factor 1

Article designation	Size	Packaging	Article number
WILLKAT® FA - A	28 kg	Metal can	WKAT-FA-2-A28
WILLKAT® FA - B	24 kg	Metal can	WKAT-FA-1-B24
WILLKAT® FA - A	1390 kg	IBC	WKAT-FA-2-A1390
WILLKAT® FA - B	1150 kg	IBC	WKAT-FA-1-B1150

**WILLKAT® LV**

**Very fast-reacting, non-foaming, two-component silicate resin with good adhesive properties**

For the consolidation of fault zones in dry, damp and wet environments in mining and tunnel construction, injection resin for gluing injection drill anchors.

- flow time (20°C) 60 s
- solidification time 80 s
- bonding strength ~ 4.0 N/mm<sup>2</sup> after 1 hour
- LOBA approval

Article designation	Size	Packaging	Article number
WILLKAT® LV - A	27 kg	Metal can	WKAT-LV-1-A27
WILLKAT® LV - B	21 kg	Metal can	WKAT-LV-1-B21
WILLKAT® LV - A	37 kg	Plastic can	WKAT-LV-1-A37
WILLKAT® LV - B	30 kg	Plastic can	WKAT-LV-1-B30
WILLKAT® LV - A	280 kg	Metal drum	WKAT-LV-1-A280
WILLKAT® LV - B	220 kg	Metal drum	WKAT-LV-1-B220

**WILLBOLT®****Thixotropic, fast-reacting, non-foaming two-component silicate resin**

WILLBOLT® is used for gluing injection drill anchors (steel/GRP) with simultaneous rock consolidation or for sealing against water.

Boreholes (also overhead) can be filled very well with WILLBOLT®, into which rod anchors made of steel or FRP are then inserted and glued.

- particularly suitable for „overhead processing“
- curing time (20°C) 7 min (slow) and 3.5 min (fast)
- compressive strength > 28 N/mm<sup>2</sup>
- LOBA approval

Article designation	Size	Packaging	Article number
WILLBOLT® - A/B	400 ml	Double chamber cartridge	WBOLT-1-A/B2K-400
WILLBOLT® Fast - A	27 kg	Metal can	WBOLT-1F-A27
WILLBOLT® Slow - A	27 kg	Metal can	WBOLT-1S-A27
WILLBOLT® - B	21 kg	Metal can	WBOLT-1-B21
WILLBOLT® Fast - A	290 kg	Metal drum	WBOLT-1F-A290
WILLBOLT® Slow - A	290 kg	Metal drum	WBOLT-1S-A290
WILLBOLT® - B	225 kg	Metal drum	WBOLT-1-B225
WILLBOLT® Fast - A	1450 kg	IBC	WBOLT-1F-A1450
WILLBOLT® Slow - A	1450 kg	IBC	WBOLT-1S-A1450
WILLBOLT® - B	1130 kg	IBC	WBOLT-1-B1130





# 4

## ACRYLATE GELS & ADDITIVES

Our **WILLGEL**<sup>®</sup> systems are triple component acrylate-based injection gels. The two components A1, A2 on the A side and the B component on the B side. A fourth component (water) is added to the B side before application.

The product is processed as a dual component material after the preparation of mixtures A and B in a volume ratio of 1 : 1. The injection solution consists of a pure liquid with extremely low viscosity and has very good penetration properties due to low surface tension.

Depending on the **WILLGEL**<sup>®</sup> system chosen (**WILLGEL**<sup>®</sup> **PRO**, **WILLGEL**<sup>®</sup> **SWIFT** or **WILLGEL**<sup>®</sup> **Y**), the material hardens to form a product with limited elasticity or high flexibility with a high sealing effect.

The reaction times can be controlled from a few seconds to several minutes via the dosage of the B component. Acrylate gels are used for waterproofing components in contact with the ground and for soil stabilization. In the context of swelling crack repair and also in the sealing of movement joints, a polymer component is used instead of water on the B side.

**WILLGEL® PRO**

CE MARKING ACCORDING TO EN 1504-5

**Rubber-elastic, water-swellaable three-component acrylate gel**

Gel used for structural waterproofing during veil injection, in the production of subsequent horizontal barriers, in crack and injection hose grouting there using WILLGEL® POLY and also for soil stabilization.

- very low viscosity (near water)
- very good penetration behavior
- reaction times adjustable
- stretchable and elastic
- product is reacted after approx. 3 - 7 min (20°C) depending on the addition of the B component

Article designation	Size	Packaging	Article number
WILLGEL® PRO - A1	20 kg	Plastic can	WGEL-PRO-A1
WILLGEL® PRO - A2	1 kg	Plastic bottle	WGEL-PRO-A2-1,0
WILLGEL® PRO - B	0.4 kg	Plastic bottle	WGEL-PRO-B-0,4

**WILLGEL® SWIFT**

CE MARKING ACCORDING TO EN 1504-5

**Soft-elastic, water-swellaable three-component acrylate gel**

Gel used for building waterproofing during veil injection, in particular for sealing building joints using WILLGEL® POLY, for sealing water inflows and for soil consolidation.

- low viscosity
- very good penetration behavior
- reaction times adjustable
- high elasticity
- very good adhesion to mineral surfaces
- product is reacted after approx. 1 - 3 min (20°C) depending on the addition of the B component

Article designation	Size	Packaging	Article number
WILLGEL® SWIFT - A1	20 kg	Plastic can	WGEL-SWIFT-A1
WILLGEL® SWIFT - A2	1 kg	Plastic bottle	WGEL-SWIFT-A2-1,0
WILLGEL® SWIFT - B	0.4 kg	Plastic bottle	WGEL-SWIFT-B-0,4
WILLGEL® SWIFT - A1 red	20 kg	Plastic can	WGEL-SWIFT-A1-20ROT
WILLGEL® SWIFT - A1 blue	20 kg	Plastic can	WGEL-SWIFT-A1-20BLAU

## WILLGEL® Y

### Limited soft elastic three-component acrylate gel

Gel used for soil consolidation, for sealing water inflows and for sealing building joints, e.g. expansion joints, especially in the presence of larger amounts of water.

- low viscosity
- very good penetration behavior
- response times adjustable
- product is reacted after approx. 1 - 3 min (20°C) depending on the addition of the B component

Article designation	Size	Packaging	Article number
WILLGEL® Y - A1	20 kg	Plastic can	WGEL-Y-A1
WILLGEL® Y - A2	1 kg	Plastic bottle	WGEL-Y-A2-1,0
WILLGEL® Y - B	0.4 kg	Plastic bottle	WGEL-Y-B-0,4

## WILLGEL® POLY

### Polymer component as an alternative to water in the production of the B component of acrylate gel

Polymer component with flexibilizing effect, increases the adhesion of the gel to mineral substrates and at the same time reduces the potential for shrinkage in the absence of moisture.

- aqueous dispersion
- low viscosity

Article designation	Size	Packaging	Article number
WILLGEL® POLY	20 kg	Plastic can	WGEL-POLY-20

## WILLGEL® FAST

### Reaction accelerator for acrylate-based polymers

To shorten reaction times, especially at low temperatures, WILLGEL® FAST can be used instead of the standard WILLGEL® A2 components.

- WILLGEL® PRO with WILLGEL® FAST is reacted after approx. 45 s (20°C)
- WILLGEL® SWIFT with WILLGEL® FAST is after approx. 15 s (20°C)
- WILLGEL® Y with WILLGEL® FAST is reacted after approx. 11 s (20°C)

Article designation	Size	Packaging	Article number
WILLGEL® Fast	1 kg	Plastic bottle	WGEL-FAST-1

# 5

## EPOXY RESINS

**WILLPOX® 7147** is a low-viscosity, two-component, epoxy-based reactive resin that is processed in a volume ratio of 2 : 1 (A : B). The two components are homogeneously mixed together in the exact volume ratio until the product is streak-free.

The mixture is then processed one-component, using piston pumps (e.g. **WILLPUMP ERM 1**) or diaphragm pumps (e.g. **WILLPUMPARK 1**). The product reacts to form a thermoset plastic with very good mechanical properties as well as good temperature and chemical resistance.

**WILLPOX® 7147** is used for structural crack injection and for joint sealing via injection hoses. The injection pumps are cleaned with **WILLPUR® WS Cleaner** and then with **WILLPUR® WS Flushing oil** as the final rinsing and care agent.

### WILLPOX® 7147

CE MARKING ACCORDING TO EN 1504-5

Low-viscosity, two-component, epoxy-based crack injection resin



WILLPOX® 7147 is used for the structural closure of cracks in reinforced concrete structures, for the filling of cracks and cavities in concrete and masonry.

- mixing ratio 2 : 1 (vol.)
- pot life 40 min. at 23°C
- mixing viscosity 165 mPa\*s
- solvent-free

Article designation	Size	Packaging	Article number
WILLPOX® 7147	2 kg	Combined Package	WPOX-7147-2,0
	20 kg	Combined Package	WPOX7147-20

# 6

## PHENOLIC RESINS

**WILLFLEX® 09** is a two-component, fast-reacting filling foam based on phenolic resin for the safe, fast and economical filling of cavities, for the avoidance of gas accumulation and for the sealing of mine workings in mine firefighting in mining.

The two components are conveyed in a volume ratio of 4 : 1 via a two-component pump and hoses and mixed and discharged at the discharge site by a static mixer.

Due to the immediate stability and low density of the foam, no or only a small amount of formwork is required. The product is flame retardant, self-extinguishing and LOBA approved.

### WILLFLEX® 09

#### Two-component, fast-reacting injection resin based on phenol-formaldehyde

For the safe, fast and economical filling of cavities in underground mining, for the backfilling of excavations in the face/roadway area, for the production of fire protection compounds, for the sealing of weather dams and for the filling of cavities to prevent methane gas accumulation.

- compressive strength > 20 kPa
- foam factor > 40
- consumption approx. 25 kg/m<sup>3</sup>
- LOBA approval

Article designation	Size	Packaging	Article number
WILLFLEX® 09 - A	30 kg	Plastic can	WFLEX-09-1-A30
WILLFLEX® 09 - B	35 kg	Plastic can	WFLEX-09-1-B35
WILLFLEX® 09 - A	1240 kg	IBC	WFLEX-09-1-A1240
WILLFLEX® 09 - B	1450 kg	IBC	WFLEX-09-1-B1450

# OUR PACKAGING

## DOUBLE CHAMBER CARTRIDGE

400 ml / 1500 ml



## COMBINED PACKAGE

2 Liter / 20 Liter



## PLASTIC CAN

10 Liter / 20 Liter / 26 Liter



## PLASTIC BOTTLE

500 ml / 1 Liter



## PAPER BAG

25 kg





### METAL CAN

5 Liter / 10 Liter / 20 Liter



### PLASTIC DRUM

200 Liter



### METAL DRUM

200 Liter



### METAL BUCKET

12 Liter / 20 Liter



### IBC

1000 Liter



INSULATION



INDUSTRIALS



COATINGS



SEWER REPAIR



CIVIL ENGINEERING & MINING



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