

WILLPUR® WS- X

Slow reacting two-component injection resin

1. Applications

WILLPUR® WS- X is a slow-setting 2-component injection resin, free from CFCs and halogens. It is used for sealing and consolidating in dry and water-bearing areas. Without water contact, the product cures very slowly to a high-strength, non-foamed polyurethane resin; when in contact with water, a faster reaction occurs, the product hardens to a compact, firm foam.

WILLPUR® WS- X is an injection resin with variable reaction time. Depending on the amount of catalyst added, the reaction time can be adapted to the needs on site (see pot life table).

The product

- is used to consolidate dry and water-bearing rock
- Seals water inflows from rock, soil or cracks in concrete and brickwork
- is used for surface sealing (curtain injection)
- closes cracks in the rock during tunnelling and prevents water flow along the tunnel axis
- is used for force-locking injection in concrete and masonry
- is used for the consolidation of soil under foundations and other monolithic building elements used
- penetrates well into areas to be sealed
- can be processed with 1-component injection pumps and 2-component injection pumps

2. Substance data*

		WILLPUR® WS- X -A	WILLPUR® WS- X -B	Standard
Form		light yellow liquid	brown liquid	
Viscosity at 5°C	mPa*s	1620 ± 200	1650 ± 200	DIN EN ISO 3219
Viscosity at 10°C	mPa*s	950 ± 100	1010 ± 100	DIN EN ISO 3219
Viscosity at 15°C	mPa*s	600 ± 100	560 ± 100	DIN EN ISO 3219
Viscosity at 20°C	mPa*s	380 ± 50	340 ± 50	DIN EN ISO 3219
Viscosity at 25°C	mPa*s	250 ± 50	210 ± 50	DIN EN ISO 3219
Mixing viscosity at 25°C	mPa*s	240 ± 50		DIN EN ISO 3219
Density at 5°C	g/cm ³	1.039 ± 0.05	1.237 ± 0.05	DIN 51757
Density at 10°C	g/cm ³	1.032 ± 0.05	1.237 ± 0.05	DIN 51757

Density at 15°C	g/cm ³	1.025 ± 0.05	1.237 ± 0.05	DIN 51757
Density at 20°C	g/cm ³	1.024 ± 0.05	1.237 ± 0.05	DIN 51757
Density at 25°C	g/cm ³	1.017 ± 0.05	1.232 ± 0.05	DIN 51757

3. Reaction and mechanical data*

Reaction profile without water:		10°C	15°C	25°C	Standard
Curing time*	h	4	3	2	DIN EN ISO 10364:2018
Foam factor		1.0 – 1.1	1.0 – 1.1	1.0 – 1.1	PV_FW16

Start of foaming and end of foaming measured according to DIN EN ISO 10364:2018
Foam factor measured according to PV_FW16

Reaction profile		With 1 % water (related to the mixture)		With 2 % water (related to the mixture)	
		min:sec	SF	min:sec	SF
15°C	Start of foaming*	04:55	2 - 3	03:00	4
15°C	Foaming*	61:00		23:00	
25°C	Start of foaming*	03:00	3	02:10	5 - 6
25°C	Foaming*	40:00		17:00	

		25°C	Standard
Time up to 1000 mPas	min	56	DIN EN ISO 2555:2018-9

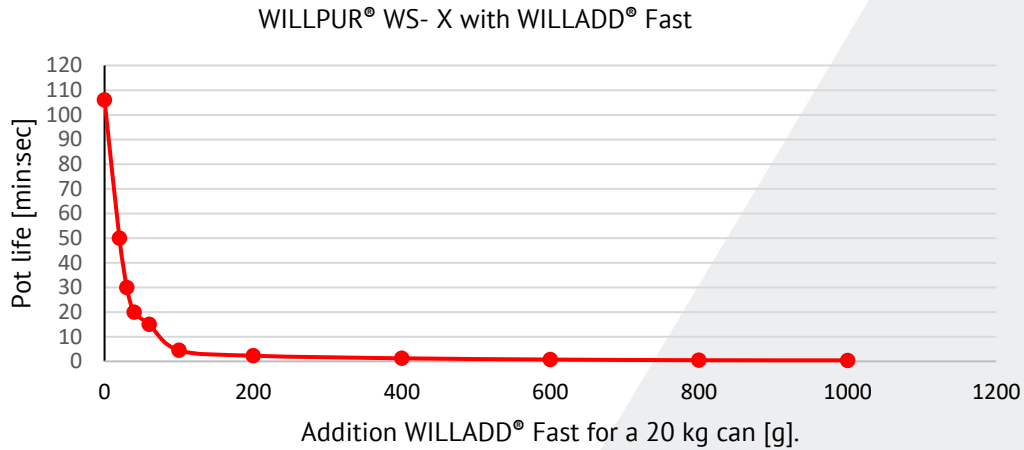
*The times given are laboratory values (100g A + 120g B) with a scatter of ± 15%.

Addition WILLADD® Fast [%]	0	0.1	0.15	0.2	0.3	0.5	1	2	3	4	5
Addition WILLADD® Fast [g]	0	20	30	40	60	100	200	400	600	800	1000
Start time [min]						2:30	1:25	0:45	0:30	0:21	0:15
Pot life [min]	106	50	30	20	15	4:30	2:20	1:15	0:45	0:28	0:25

Pot life depending on the amount of catalyst WILLADD® Fast

Times measured at 20°C without water contact, start and pot life according to DIN EN ISO 10364:2018

Catalyst addition related to 20 kg A-component



			Standard
Compressive strength at 10% compression after 7 days	N/mm ²	42	DIN EN ISO 604:2003-12
Bending stress at 2% after 7 days	MPa	33	DIN EN ISO 178:2018-08
Flexural modulus of elasticity after 7 days	MPa	1647	DIN EN ISO 178:2018-08
Shore hardness D		78	ISO 7619-1

4. Composition and properties

WILLPUR® WS-X -A is a mixture of different polyols and additives. **WILLPUR® WS-X -B** is a modified polyisocyanate. The two components react to form a tough, hard polyurethane resin. The mixture reacts slowly on contact with water the reaction is accelerated, and a solid foam is formed.

5. Preparation/Processing

Mixture:

The two components are injected via a 1-K or 2-K injection pump in the Volume ratio 1:1 processed.

For 1-component processing, the components must first be intensively mixed together in a suitable, clean vessel using a stirrer. Subsequently, the homogeneous,

The mixture, which is free of streaks, is then injected via a single-component pump into the area to be sealed or consolidated.

For 2-component processing, the components are pumped directly from the containers in a mixing ratio of 1:1 (parts by volume) via two-component pumps.

Mixing takes place via a static mixer. In both cases, injection is carried out via packers or injection lances.

On contact with water, the reaction is accelerated and the product foams up.

Recommended processing temperature (component temperature) between 5-35°C

Recommended processing temperature (product) between 15-25 °C

By adding a WILLADD Fast catalyst to the A-component, the reaction time can be adjusted to the needs on site (see pot life table).

6. Safety notes

WILLPUR® WS- X - B is classified as dangerous according to REGULATION (EC) No. 1272/2008.

Before starting processing, it is necessary to inform yourself about precautionary measures and safety advice by means of the safety data sheets.

7. Storage

At least six months from date of delivery or twelve months from date of production when stored in a dry place between 10°C and 30°C. The minimum durability is reflected by the batch number on the container. If this time is exceeded, we recommend the material is checked by F. Willich GmbH + Co. KG for compliance with the specification.

8. Delivery form

	WILLPUR® WS- X - A (item no.)	WILLPUR® WS- X - B (item no.)
20 l tin can à	21 kg (WPUR-WSX-1-A21)	25 kg (WPUR-WSX-1-B25)

Other delivery forms on request.

9. Waste management

In Germany, empty packaging can be taken back by the KBS or Interseroh-System for steel or plastic packaging. The return is limited exclusively to used, completely empty packaging of the same type, shape, and size that we carry in our product range.

Transport and outer packaging are not included.

For more information on the location and further modalities of the return, please visit the website of the recycling partner acting on our behalf:



Interseroh+ GmbH

www.interseroh.plus
info@interseroh.plus
Tel.: +49 (0)2203 9147 - 1268



Kreislaufsystem

Blechverpackungen Stahl GmbH

www.kbs-recycling.de
info@kbs-recycling.de
Tel.: +49 (0)211 239228 - 0

Reacted product residues can be disposed of in smaller quantities with household waste, in larger quantities as construction waste or incinerated.
Non-reacted product components must be disposed of in accordance with local regulations.

10. Test certificates/Approvals

Hygiene examination (orienting examination), Hygiene-Institut des Ruhrgebiets July 2022

11. Legal notes

***The indicated data are laboratory values.**

Our technical application advice, which we give to support the customer or applicator on the base of our experience and to the best of our knowledge according to the current state of knowledge in practice and science, is non-binding and does not represent an agreed quality. The data and processing instructions are based on laboratory tests.

In practice, the measured values may be different due to influences outside our control. We explicitly reserve the right to make technical changes during further development.

The technical documents should be read carefully before starting work.

With the publication of a new version of the technical data sheet, all previous data sheets lose their validity. The applicator must test the products for their suitability for the intended application.

With the publication of this data sheet, previous editions become void.

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