

# INJECTION MORTAR-BINDER



**Küchler**  
Technik

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Anchoring

Drilling

Measurement

Injection

# INJECTION MORTAR - BINDER

## OVERVIEW

= suitable

= our recommendation

For other types see geothermal

### BINDER

- Special binder
- Injection mortar

### APPLICATIONS

- Anchor injection Primarily
- Anchor injection Re-injection
- Anchor nails
- KSB Self-drilling anchor
- Micropiles Primarily
- Micro-driven piles
- Retaining wall support
- Larssen support Backfilling
- Collar pipes Shell filling
- Collar pipes Re-injection
- Soil consolidation
- Cavity injections
- Cavity injections Force locking
- Crack injection
- Jetting
- Pipe piles
- Geothermal probe

### PROPERTIES

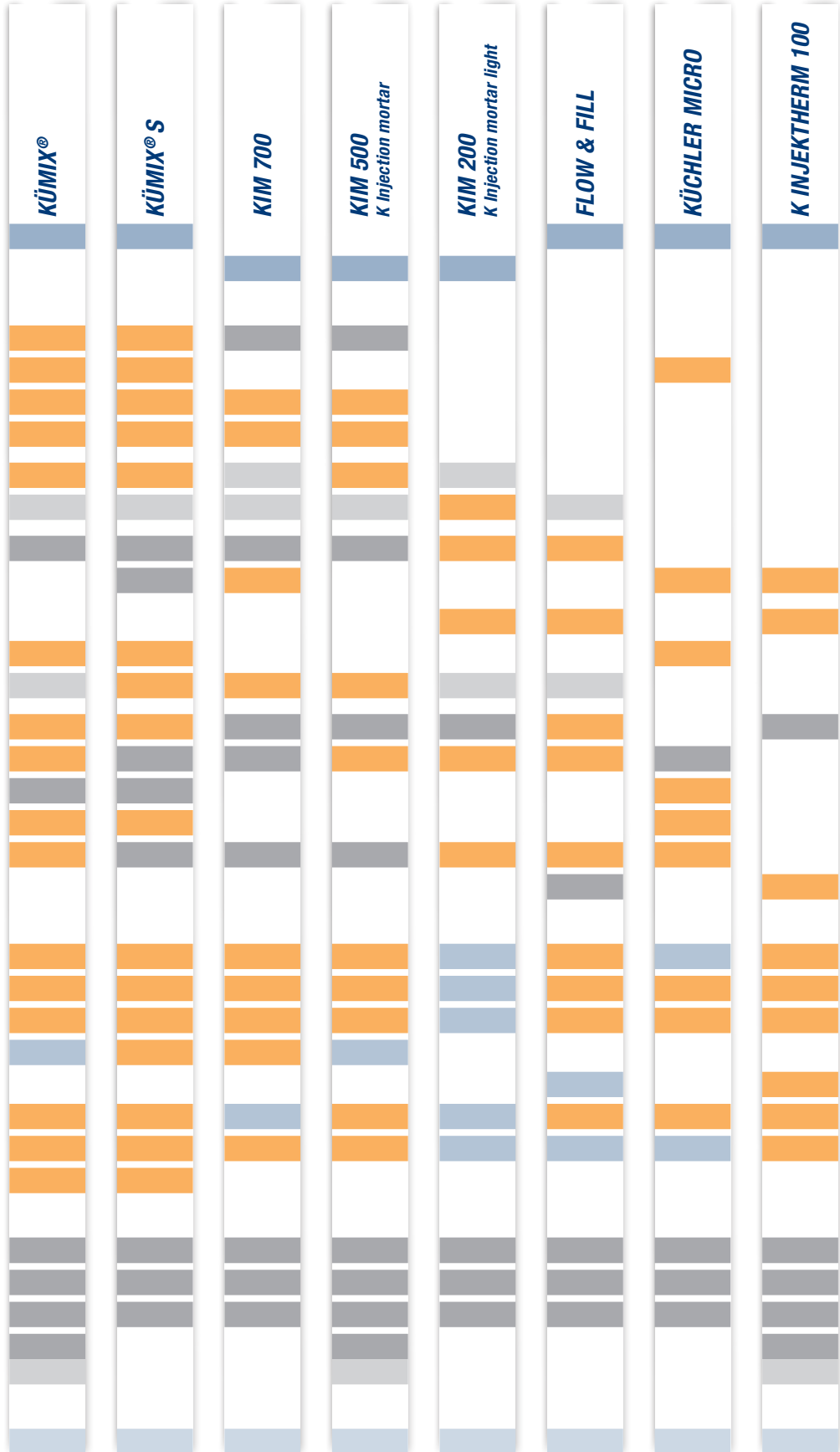
- Thixotropic behavior
- Good flow behavior
- Processing time
- High early stage strength
- Low final strength
- Waterproof
- Shrinkage compensation
- Sulfate resistant

### DELIVERY

- Bag
- BIG BAG
- Loose / Silo
- Availability from factory
- Availability from Kriens

### PROCESSING

- K MUNGG® Pump



**METHOD**

**Loose in silo**



Automatic injection at the touch of a button with the Küchler system

**BIG BAG**



Injecting with bagged material or BIG BAG for smaller jobs

**Bagged material**



**APPLICATIONS**



Filling with mortar, cement or KÜMIX®



Re-injection with cement or KÜMIX®



Jet grouting with KÜMIX® (40–150 bar)

Further details can be found in the following documents:





## THE CLASSIC

KÜMIX®

## INJECTIONS AND ANCHOR

**Applications**

KÜMIX®

- Is used for the injection of permanent and temporary anchors and nails (WIF-value  $\leq 0.6$ )
- Ideally suited for repeated injections
- Suitable for the production of micro piles, injection piles, soil injections as well as tunnels and underwater injections
- Can be used to make underpinnings in jet grouting process as well as other static elements

**Properties**

- A thixotropic and shrinkage compensated mortar with high early stage and final strength.
- Sulfate-resistant, waterproof and very finely ground
- No shrinkage, no bleeding and no settling in comparison to cement
- Very efficient and easy to mix
- Can be pumped easily over long distances thanks to its good flow and pump behavior
- Volume stable and easy to introduce under pressure and into the smallest cross sections
- Sets, like cement, when hydrated calcium-free which provides the alkaline corrosion protection
- Causes only minor wear and tear on machinery

**Processing**

Mixed in accordance with the requirements of the compressive strength and fluidity as a suspension and can be processed with an industry standard mortar mixer pump (e.g. K MUNG®). It is important to ensure that the suspension is homogeneously mixed and free of lumps. To be processed ideally immediately after mixing, but no later than two hours thereafter.

Bag contents		25 kg	
Grain size		cement fine	
Blaine value		7 500 cm <sup>2</sup> /gr	
Yield	per bag	approx. 19.5 ℓ	W/F0.40
	per ton	approx. 743 ℓ	W/F0.40
Water addition	per bag	10 ℓ	W/F0.40
	per ton	400 ℓ	W/F0.40
Compressive strengths	7 d	39 N/mm	W/F0.40
	28 d	52 N/mm	W/F0.40
Bulk density		800 kg/m <sup>3</sup>	
Fresh mortar raw density		1.89 kg/ℓ	W/F0.40



We offer various injection packers for injections to be monitored by mortar and machine suppliers in the initial processing. On request we can test the pull-out strength of the offset anchor.

**Composition**

KÜMIX® is a factory-made hydraulic binder from CEM I Portland cement clinker and hydrolith, a latent hydraulic pozzolan. KÜMIX® consists only of hydraulic and latent hydraulic binder and is free of chemicals and inert fillers.

**Delivery**

In 25-kg bags, BIG BAG or loose in silo

**Storage**

Keep dry on wooden grids  
Shelf life minimum 6 months according to Directive 2003/53/EC at 20 °C, 65 % r. F.  
For date of manufacture see package printing

**More technical specifications on the reverse side**

**KÜMIX®****THE CLASSIC****SPECIFICATIONS****MIXING RATIO WATER / KÜMIX®**

		<b>W/S-value (water/solid value)</b>						
<b>Mixing ratio</b>		0.4	0.5	0.6	0.7	0.8	0.9	1.0
Quantity KÜMIX® (kg/m³)		1 345	1 166	1 078	974	893	813	776
Quantity water (ℓ/m³)		538	582	647	682	713	732	776
Yield (ℓ/t)		743	840	928	1 025	1 121	1 229	1 325
Fresh mortar raw density (kg/ℓ)		1.89	1.78	1.73	1.66	1.61	1.55	1.51
Flow time (Marsh-hopper)	(sec)	–	–	–	76	48	40	36
Settlement (Vol. %)	after 2 h	–	–	–	0.5	1.0	3.0	7.4
Compressive strength (N/mm²) after	1 d	9	5	2	1	<1	<1	<1
	after 2 d	19	9	5	2	1	1	<1
	after 7 d	39	24	14	9	5	4	3
	after 28 d	52	38	24	19	14	11	9

Compressive strength test 4 x 4 x16 cm prisms

**Note** All values stated in this technical data sheet are determined under laboratory conditions with the usual metrological tolerances. They offer a reference value for the general suitability and must be checked and where necessary validated by the processor for their validity for the specific site and conditions.

**Internal and external monitoring of KÜMIX®** is checked and self-monitored at the factory laboratory.

**AREAS OF APPLICATION****Self-drilling anchor****Jetting pile****Support drilling system**

The data in this product information is of an advisory nature. Legal obligations may not be derived from this. Subject to product changes due to technical developments.

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THE QUICK ONE

**KÜMIX® S****INJECTIONS AND ANCHOR****Applications****KÜMIX® S**

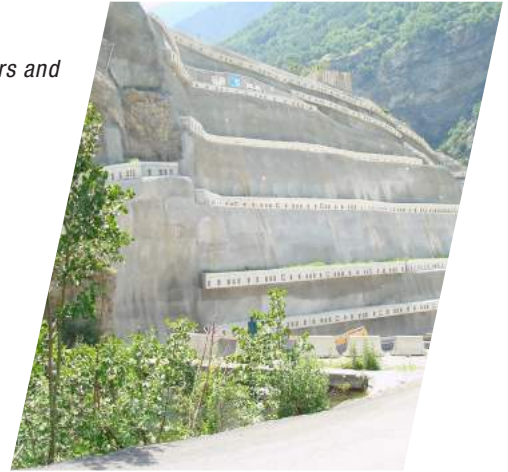
- Is used for the injection of permanent and temporary anchors and nails (WIF-value  $\leq 0.65$ )
- Ideally suited for repeated injections
- Suitable for the production of micro piles, injection piles, soil injections as well as tunnels and underwater injections
- Can be used to make underpinnings in jet grouting process as well as other static elements

**Properties**

- A thixotropic and shrinkage compensated mortar with high early stage and final strength.
- Sulfate-resistant, waterproof and very finely ground
- Does not shrink, does not bleed and does not subside (in contrast to cement)
- Very efficient and easy to mix
- Can be pumped easily over long distances thanks to its good flow and pump behavior
- Volume stable and easy to introduce under pressure and into the smallest cross sections
- Sets, like cement, when hydrated calcium-free, which provides the alkaline corrosion protection
- Causes only minor wear and tear on machinery

**Processing**

Is mixed in accordance with the requirements of the compressive strength and fluidity as a suspension and can be processed with an industry standard mortar mixer pump (e.g., K MUNGGE®). It is important to ensure that the suspension is homogeneously mixed and free of lumps. To be processed ideally immediately after mixing, but no later than two hours thereafter.



We offer various injection packers for injections to be monitored by mortar and machine suppliers in the initial processing. On request we can test the pull-out strength of the offset anchor.

**Composition**

KÜMIX® S is a factory-made hydraulic binder from CEMI Portland cement clinker and Hydrolith, a latent hydraulic pozzolan. It consists only of hydraulic and latent hydraulic binders and is free of inert fillers.

**Delivery**

In 25-kg bags, BIG BAG or loose in silo

**Storage**

Keep dry on wooden grids  
Shelf life minimum 6 months according to Directive 2003/53/EC at 20 °C, 65 % r. F.  
For date of manufacture see package printing

Bag contents		25 kg	
Grain size		cement fine	
Blaine value		6 900 cm <sup>2</sup> /gr	
Yield	per bag	approx. 18 ℓ	W/F0.40
	per ton	approx. 729 ℓ	W/F0.40
Water addition	per bag	10 ℓ	W/F0.40
	per ton	400 ℓ	W/F0.40
Compressive strengths	7 d	42 N/mm	W/F0.40
	28 d	50 N/mm	W/F0.40
Bulk density		900 kg/m <sup>3</sup>	
Fresh mortar raw density		1.92 kg/ℓ	W/F0.40

**More technical specifications on the reverse side**

**KÜMIX® S****THE QUICK ONE****SPECIFICATIONS****MIXING RATIO WATER / KÜMIX® S**

Mixing ratio	W/S-value (water/solid value)							
	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
Quantity KÜMIX® S (kg/m <sup>3</sup> )	1 370	1 214	1 082	979	884	816	745	
Quantity water (ℓ/m <sup>3</sup> )	548	607	649	685	707	734	745	
Yield (ℓ/t)	729	824	924	1 024	1 132	1 225	1 342	
Fresh mortar raw density (kg/ℓ)	1.92	1.82	1.73	1.66	1.59	1.55	1.49	
Flow time (Marsh-hopper) (sec)	–	–	123	51	40	35	33	
Settlement (Vol. %) after 2 h	<1.0	1.5	1.5	3	3.5	8	15	
Compressive strength (N/mm <sup>2</sup> ) after	1 d	18	12	5	3	2	<2	1
	2 d	29	16	6	5	4	4	3
	7 d	42	28	22	19	14	12	7
	28 d	50	35	29	23	21	18	14

Compressive strength test 4 x 4 x 16 cm prisms

**Strand anchor**

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## HIGH EARLY STAGE STRENGTH

## KIM 700

## FOR THE INJECT OF ANCHORS

**Applications****KIM 700**

- Is used for the injection of permanent and temporary anchors and nails (W/F-value  $\leq 0.4$ )
- Has been specially developed for the early loading of anchors
- Suitable for the production of micro piles, injection piles, soil injections as well as tunnels and underwater injections

**Properties**

- A thixotropic, water-impermeable and expanding mortar with high early stage and final strength
- Sets, like cement, when hydrated calcium-free, which provides the alkaline corrosion protection
- Is easy to mix and has very good pump and flow behavior
- Causes only minor wear and tear on machinery

**Processing**

Mixed in accordance with the requirements of the compressive strength and Fluidity mixed as a suspension and processed with a industry standard mortar mixer pump (e.g. K MUNGGE®). It is important to ensure that the suspension is homogeneously mixed and free of lumps. To be processed ideally immediately after mixing, but no later than one hour thereafter.

We offer various injection packers for injections to be monitored by mortar and machine suppliers in the initial processing. On request we can test the pull-out strength of the offset anchor.

**Composition**

KIM 700 is a factory-produced, cementitious mortar with coordinated grading curve and additives.

**Delivery**

In 25-kg bags, BIG BAG or loose in silo

**Storage**

Keep dry on wooden grids  
Shelf life minimum 6 months in accordance with Directive 2003/53/EG at 20 °C, 65 % r. F.  
For date of manufacture see package printing

Bag contents		25 kg	
Grain size		cement fine	
Yield	per bag	approx. 15 ℓ	W/F0.22
	per ton	approx. 602 ℓ	W/F0.22
Water addition	per bag	5.5 ℓ	W/F0.22
	per ton	220 ℓ	W/F0.22
Compressive strengths	1 d	19 N/mm	W/F0.22
	28 d	42 N/mm	W/F0.22
Bulk density		1 000 kg/m <sup>3</sup>	
Fresh mortar raw density		2.04 kg/ℓ	W/F0.22

**More technical specifications on the reverse side**



## HIGH EARLY STAGE STRENGTH

## KIM 700

## SPECIFICATIONS

## MIXING RATIO WATER / KIM 700

	W/S-value (water/solid value)						
Mixing ratio	0.22	0.27	0.30	0.35	0.40	0.45	0.90
Quantity KIM 700 (kg/m <sup>3</sup> )	1 661	1 551	1 448	1 349	1 270	1 197	774
Quantity water (ℓ/m <sup>3</sup> )	374	419	456	486	515	538	697
Yield (ℓ/t)	602	645	691	741	787	836	1 292
Fresh mortar raw density (kg/ℓ)	2.04	1.97	1.90	1.84	1.79	1.74	1.47
Slump (%)	0.6	0.5	0.4	0.3	0.2	00	-2.3
Compressive strength (N/mm <sup>2</sup> ) after 1 d	19	16	12	9	7	4	1
after 2 d	25	21	17	14	12	8	3
after 7 d	34	31	27	23	19	15	5
after 28 d	42	38	35	30	26	21	9

Compressive strength test 4 x 4 x 16 cm prisms

**Note** All values stated in this technical data sheet are determined under laboratory conditions with the usual metrological tolerances. They offer a reference value for the general suitability and must be checked and where necessary validated by the processor for their validity for the specific site and conditions.

**Internal and external monitoring** KIM 700 is checked and self-monitored at the factory laboratory.

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october 2018

## THE EXPANDING

**KIM 500**

## FOR THE INJECT OF ANCHORS

**Applications****KIM 500**

- Is used for the injection of permanent and temporary anchors and nails (W/F-value  $\leq 0.3$ )
- Suitable for the production of micro piles, injection piles, soil injections as well as tunnels and underwater injections

**Properties**

- A thixotropic, water-impermeable and expanding mortar with high early stage and final strength
- Is easy to mix and has very good pump and flow behavior
- Sets, like cement, when hydrated calcium-free, which provides the alkaline corrosion protection
- Causes only minor wear and tear on machinery

**Processing**

Mixed in accordance with the requirements of the compressive strength and Fluidity mixed as a suspension and processed with a industry standard mortar mixer pump (e.g. K MUNG®). It is important to ensure that the suspension is homogeneously mixed and free of lumps. To be processed ideally immediately after mixing, but no later than one hour thereafter.

We offer various injection packers for injections to be monitored by mortar and machine suppliers in the initial processing. On request we can test the pull-out strength of the offset anchor.

**Composition**

KIM 500 is a factory-produced, cement bound mortar with coordinated grading curve and additives.

**Delivery**

In 25-kg bags, BIG BAG or loose in silo

**Storage**

Keep dry on wooden grids  
Shelf life minimum 6 months in accordance with Directive 2003/53/EC at 20 °C, 65 % r. F.  
For date of manufacture see package printing

Bag contents		25 kg	
Grain size		cement fine	
Yield	per bag	approx. 14.5 ℓ	W/F 0.20
	per ton	approx. 574 ℓ	W/F 0.20
Water addition	per bag	5 ℓ	W/F 0.20
	per ton	200 ℓ	W/F 0.20
Compressive strengths	7 d	28 N/mm	W/F 0.20
	28 d	39 N/mm	W/F 0.20
Bulk density		1 056 kg/m <sup>3</sup>	
Fresh mortar raw density		2.10 kg/ℓ	W/F 0.20
E-module		19 281 N/mm <sup>2</sup>	

**More technical specifications on the reverse side**

# KIM 500

## THE EXPANDING

### SPECIFICATIONS

#### MIXING RATIO WATER / KIM 500

	W/S-value (water/solid value)						
	0.18	0.20	0.25	0.30	0.40	0.50	0.70
Mixing ratio	0.18	0.20	0.25	0.30	0.40	0.50	0.70
Quantity KIM 500 (kg/m <sup>3</sup> )	1 843	1 735	1 632	1 484	1 410	1 171	886
Quantity water (ℓ/m <sup>3</sup> )	323	364	400	467	494	574	621
Yield (ℓ/t)	535	574	613	674	709	854	1 128
Fresh mortar raw density (kg/ℓ)	2.17	2.10	2.03	1.95	1.90	1.75	1.51
Slump (%)	1.4	1	0.6	0.2	0.0	-0.5	-5.5
Compressive strength (N/mm <sup>2</sup> ) after	1 d	10	9	7	4	3	2
	after 2 d	21	19	16	12	7	6
	after 7 d	32	28	25	17	12	10
	after 28 d	42	39	34	25	19	16

Compressive strength test 4 x 4 x 16 cm prisms

**Note** All values stated in this technical data sheet are determined under laboratory conditions with the usual metrological tolerances. They offer a reference value for the general suitability and must be checked and where necessary validated by the processor for their validity for the specific site and conditions.

**Internal and external monitoring** KIM 500 is checked and self-monitored at the factory laboratory.



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october 2018



# K INJECTION MORTAR 0.5

## FOR FILLING ANCHORS AND MICRO PILES

### Applications

**K INJECTION MORTAR 0.5**

- A versatile filling and injection mortar
- Used for filling micro piles, mini piles, self-drilling anchors (KSB®), anchors, anchor nails and injection lines
- Is used for filling various cavities for example, behind tunnel walls, segments, pipe joints and drill holes

### Properties

- A frost-resistant and waterproof mortar
- Thixotropic and shrinkage compensated
- Can be easily processed and has very good pump and flow behavior
- Sets, like cement, when hydrated calcium-free, which provides the alkaline corrosion protection

### Processing

Mixed in accordance with the requirements of the compressive strength and industry standard mortar mixer pump (e.g. K MUNG®). It is important to ensure that the suspension is homogeneously mixed and free of lumps. To be processed ideally immediately after mixing, but no later than one hour thereafter.



Bag contents		30 kg	
Grain size		< 0.5 mm	
Yield	per bag	approx. 19 ℓ	W/F 0.25
	per ton	approx. 630 ℓ	W/F 0.25
Water addition	per bag	7.5 ℓ	W/F 0.25
	per ton	250 ℓ	W/F 0.25
Compressive strengths	7 d	> 20 N/mm	W/F 0.25
	28 d	> 35 N/mm	W/F 0.25
Fresh mortar raw density		2.00 kg/ℓ	W/F 0.25

### Composition

K INJECTION MORTAR 0.5 is a factory manufactured, cement-bound mortar with coordinated grading curve and additives.

### Delivery

In 30-kg bags, BIG BAG or loose in silo

### Storage

Keep dry on wooden grids

Shelf life minimum 6 months according to Directive 2003/53/EC at 20 °C, 65 % r. F.

For date of manufacture see package printing

# KIM 200

## THE FILLING MORTAR

### Applications

#### KIM 200

- A versatile filling and injection mortar
- Is used for filling piles, retaining walls, and tunnel tube screens
- Is used for sheathing compounds of collar tubes and for consolidations
- Is suitable for filling various cavities for example, behind tunnel walls, segments, pipe joints and drill holes

### Properties

- Is easy to mix, process and pump
- Sets, like cement, when hydrated calcium-free, which provides the alkaline corrosion protection

### Processing

Is mixed in accordance with the requirements of the compressive strength and fluidity mixed as a suspension and can be processed with an industry standard mortar mixer pump (e.g. K MUNG®). It is important to ensure that the suspension is homogeneously mixed and free of lumps. The suspension should be processed ideally immediately after mixing, but no later than one hour thereafter.



### Composition

KIM 200 is a cement bound mortar with coordinated grading curve and additives.

### Delivery

In 25-kg bags, BIG BAG or loose in silo

### Storage

Keep dry on wooden grids  
Shelf life minimum 6 months in accordance with Directive 2003/53/EC at 20 °C, 65 % r. F.  
For date of manufacture see package printing

Bag contents		25 kg	
Grain size		cement fine or 05. mm	
Yield	per bag	approx. 15.5 ℓ	W/F 0.20
	per ton	approx. 627 ℓ	W/F 0.20
Water addition	per bag	5 ℓ	W/F 0.20
	per ton	200 ℓ	W/F 0.20
Compressive strengths	7 d	17 N/mm	W/F 0.20
	28 d	22 N/mm	W/F 0.20
Bulk density		983 kg/m <sup>3</sup>	
Fresh mortar raw density		1.91 kg/ℓ	W/F 0.20

More technical specifications on the reverse side

october 2018

# KIM 200

## SPECIFICATIONS

### MIXING RATIO WATER / KIM 200

	W/S-value (water/solid value)						
Mixing ratio	0.20	0.25	0.30	0.35	0.40	0.45	0.50
Quantity KIM 200 (kg/m <sup>3</sup> )	1592	1509	1432	1361	1277	1193	1119
Quantity water (ℓ/m <sup>3</sup> )	318	377	430	477	511	537	560
Yield (ℓ/t)	627	663	698	734	783	838	893
Fresh mortar raw density (kg/ℓ)	1.91	1.89	1.86	1.84	1.79	1.73	1.68
Slump (%)	0.10	0.00	-0.10	-0.20	-0.30	-0.40	-0.50
Compressive strength (N/mm <sup>2</sup> ) after 1 d	>5.00	5.00	3.50	2.00	1.50	1.00	–
after 2 d	10	9	6	4	3	2	1
after 7 d	17	14	11	8	6	4	3
after 28 d	22	19	16	14	11	8	5

Compressive strength test 4 x 4 x 16 cm prisms

**Note** All values stated in this technical data sheet are determined under laboratory conditions with the usual metrological tolerances. They offer a reference value for the general suitability and must be checked and where necessary validated by the processor for their validity for the specific site and conditions.

**Internal and external monitoring** KIM 200 is checked and self-monitored at the factory laboratory.

The data in this product information is of an advisory nature. Legal obligations may not be derived from this. Subject to product changes due to technical developments.



# FLOW&FILL

## CAVITY FILLINGS

### Applications

*FLOW&FILL is suitable for filling cavities of any kind, such as wells, drill holes, tunnels, annuli, pipes, ducts, shafts, etc. It is used for backfilling of retaining walls and tunnel walls, for the sealing of wells, etc.*

### Properties

- Can be pumped easily over long distances thanks to its good flow and pump behavior
- A fine ground cement that fills even the smallest cross sections
- Volume stable and easy to introduce under pressure
- Corresponds to the SIA standard 384/6 Appendix F3 for the filling of drill hole heat exchangers
- Sets, like cement, when hydrated calcium-free, which provides the alkaline corrosion protection

### Processing

*Can be processed using a customary mortar mixing pump (e.g. K MUNG®). It is important to ensure that the suspension is homogeneously mixed and free of lumps. To be processed ideally immediately after mixing, but no later than two hours thereafter.*



Bag contents		25 kg	
Grain size		cement fine	
Yield	per bag	approx. 29 ℓ	W/F 0.80
	per ton	approx. 1164 ℓ	W/F 0.80
Water addition	per bag	approx. 20 ℓ	W/F 0.80
	per ton	800 ℓ	W/F 0.80
Compressive strengths	28 d	2.5 N/mm	W/F 0.80
Bulk density		830 kg/m <sup>3</sup>	
Fresh mortar raw density		1.55 kg/ℓ	W/F 0.80

### Composition

*FLOW&FILL is a factory-made hydraulic binder from Portland cement clinker and hydrolith, a latent hydraulic pozzolan.*

*Consisting only of hydraulic and latent hydraulic binders and is free of inert fillers and chemical admixtures.*

### Delivery

*In 25-kg bags, BIG BAG or loose in silo*

### Storage

*Keep dry on wooden grids*

*Shelf life minimum 6 months in accordance with Directive 2003/53/EC at 20 °C, 65 % r. F.*

*For date of manufacture see package printing*

**More technical specifications on the reverse side**

october 2018

# FLOW&FILL

## SPECIFICATIONS

### MIXING RATIO WATER / FLOW&FILL

		W/S-value (water/solid value)				
Mixing ratio		0.6	0.7	0.8	0.9	1.0
Quantity FLOW&FILL (kg/m <sup>3</sup> )		1 033	940	859	807	735
Quantity water (ℓ/m <sup>3</sup> )		620	658	687	726	735
Yield (ℓ/t)		967	1 063	1 164	1 239	1 361
Suspension density (kg/ℓ)		1.65	1.60	1.55	1.53	1.47
Flow time (Marsh-hopper)	(sec)	–	–	60	48	40
Settlement (Vol. %)	after 2 h	–	1	1	1.5	1.5
Settlement (Vol. %)	after 24 h	–	1	1	1.5	1.5
Compressive strength (N/mm <sup>2</sup> ) after 28 d		6.5	4.0	2.5	2	1.5
Compressive strength test 4 x 4 x 16 cm prisms						

**Note** All values stated in this technical data sheet are determined under laboratory conditions with the usual metrological tolerances. They offer a reference value for the general suitability and must be checked and where necessary validated by the processor for their validity for the specific site and conditions.

**Internal and external monitoring** FLOW&FILL is checked and self-monitored at the factory laboratory.

### AREAS OF APPLICATION

Tunnel Sörenberg 5000 m – pumped at 3500 m



Installation



Mixing pump



Control system

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# KÜCHLER MICRO

**MICROCEMENT** 12 000 CM<sup>2</sup>/G TO BLAINE

## Applications

KÜCHLER MICRO is used in geotechnical engineering, foundation engineering and in concrete renovation

- For the injection of sandy and gravelly soils
- For sealing against groundwater
- For soil stabilization
- For nozzle joints, finished injections, cracked concrete injections and contact injections

## Properties

- Very finely ground (12 000 cm<sup>2</sup>/g to Blaine)
- Permanently strengthens the foundation soil
- Easy to mix and pumps very good well
- Volumetrically and volume stable
- Low heat development
- Sets, like cement, when hydrated calcium-free, which provides the alkaline corrosion protection
- Is easy to introduce into the smallest cross sections and cracks due to the grain size distribution

## Processing

Mixed in accordance with the requirements of the compressive strength and Fluidity mixed as a suspension and can be processed with an industry standard colloidal mixer. It is important to ensure that the suspension is homogeneously mixed and free of lumps. To be processed ideally immediately after mixing, but no later than two hours thereafter.



## Composition

KÜCHLER MICRO is a factory-made very finely ground hydraulic special binder from Portland cement clinker and hydrolith, a latent hydraulic pozzolan.

## Delivery

In 25-kg bags, BIG BAG or loose in silo

## Storage

Keep dry on wooden grids  
 Shelf life minimum 6 months in accordance with Directive 2003/53/EC at 20 °C, 65 % r. f.  
 For date of manufacture see package printing

Bag contents		25 kg	
Grain size		ultra fine	
Blaine value		12 000 cm <sup>2</sup> /gr	
Water addition	per bag	25 ℓ	W/F 0.10
	per ton	1 000 ℓ	W/F 0.10
Compressive strengths	7 d	3 N/mm	W/F 1.00
	28 d	> 7 N/mm	W/F 1.00
	28 d	> 32 N/mm	W/F 0.50
Bulk density		660 kg/m <sup>3</sup>	



# DRILL HOLE RATIO

Diameter	Surface	Liter	Kümix	K Injection mortar	Load < 28 Tg, 40 N/mm <sup>2</sup>	Lateral surface
mm	mm <sup>2</sup>	ℓm	kg/ℓm	kg/ℓm	kN	cm <sup>2</sup> /ℓm
10	79	0.08	0.1	0.1	3.1	314
20	314	0.31	0.4	0.5	12.6	628
30	707	0.71	0.8	1.2	28.3	942
40	1 256	1.26	1.5	2.1	50.2	1256
50	1 963	1.96	2.3	3.3	78.5	1570
60	2 826	2.83	3.3	4.7	113.0	1884
70	3 847	3.85	4.5	6.4	153.9	2198
75	4 416	4.42	5.1	7.3	176.6	2355
80	5 024	5.02	5.8	8.3	201.0	2512
90	6 359	6.36	7.4	10.6	254.3	2826
100	7 850	7.85	9.1	13.0	314.0	3140
110	9 499	9.50	11.0	15.8	379.9	3454
115	10 382	10.38	12.1	17.2	415.3	3611
120	11 304	11.30	13.1	18.8	452.2	3768
130	13 267	13.27	15.4	22.0	530.7	4082
140	15 386	15.39	17.9	25.5	615.4	4396
150	17 663	17.66	20.5	29.3	706.5	4710
160	20 096	20.10	23.4	33.4	803.8	5024
170	22 687	22.69	26.4	37.7	907.5	5338
180	25 434	25.43	29.6	42.2	1017.4	5652
190	28 339	28.34	33.0	47.0	1133.5	5966
200	31 400	31.40	36.5	52.1	1256.0	6280
210	34 619	34.62	40.3	57.5	1384.7	6594
250						
300						

4 kW MP2	5 kW MP2	4 kW MP3	4 kW MP8	5 kW MP3	5 kW MP8	4 kW MP13	5 kW MP13
6 ℓ/min	10 ℓ/min	12.5 ℓ/min	20 ℓ/min	5 kW MP3	32 ℓ/min	36.5 ℓ/min	60 ℓ/min
Filling time sec/ℓm K MUNGG							
1	0	0	0	0	0	0	0
3	2	2	1	1	1	1	0
7	4	3	2	1	1	1	1
13	8	6	4	2	2	2	1
20	12	9	6	4	4	3	2
28	17	14	9	5	5	5	3
38	23	18	12	7	6	6	4
44	27	21	13	8	7	7	4
50	31	24	15	9	8	8	5
64	39	31	19	12	10	10	6
79	48	38	24	15	13	13	8
95	58	46	29	18	16	16	9
104	63	50	31	19	17	17	10
113	69	54	34	21	19	19	11
133	81	64	40	25	22	22	13
154	94	74	47	29	25	25	15
177	108	85	54	33	29	29	18
201	123	97	61	38	33	33	20
227	138	109	69	43	37	37	23
254	155	122	77	48	42	42	25
283	173	136	86	53	47	47	28
314	191	151	95	59	52	52	31
346	211	166	105	65	57	57	35