

MM1018 FL #1866

Product description

MM1018 - The Liquid-Shim® - is a highly filled metal polymer for full-surface and force-fit compensation and filling of inaccuracies and unevenness between metal elements such as end plates, bridge bearings, crane runways and rail guides as well as steel components. Due to its high dimensional stability, MM1018 is also suitable for use in preloaded connections. More than 2.000 structures worldwide already stand on the Liquid-Shim®, DIAMANT MM1018.

MM1018 FL: Liquid variant for casting or injecting. Product cures at room conditions. Compressive strength of up to 160 N/mm².

MM1018 FL (liquid) is a product with general building approval (abZ) approval number: Z-3.82-2042 ([link to abZ](#)).



Characteristics

- Very high compressive strength
- Low creep properties
- Fatigue strength up to 10 million load cycles (proof of strength for steel)
- Fast curing
- Resistant to corrosion and weathering
- Injection or grouting for almost any gap situation
- General building approval (abZ)
- Seawater-resistant, stainless

Typical applications

Gap compensation, force-fit connection to

- Head plate joints
- Bridge bearings
- Crane and guide rails
- Silos
- Steel hydraulic engineering structures
- Steel construction and structural steel engineering
- Tunnelling

for steel-steel and steel-concrete joints.

MM1018 – The Liquid-Shim®

- Always fits
- Saves time and costs

Available in the following versions

ARTICLE	PRODUCT	DESCRIPTION
#1866	MM1018 FL	0,5 kg, 1 kg, 1,5 kg, 4,5 kg, special sizes on request

Product data condition of delivery

PROPERTIES	VALUE
Colour component A (resin) Colour component B (hardener)	Grey Transparent (slightly yellowish)
Storability	Store in the original, unopened container in a dry and frost-free place (5°C to +20°C). Shelf life 2 years. Protect from direct sunlight. Higher temperatures reduce the shelf life.
Density of component A (resin) Density of component B (hardener)	3,0 g/cm ³ 1,0 g/cm ³
Maximum grain size in mixture	125 µm
Mixing ratio component A (resin) Mixing ratio component B (hardener)	21,3 g 1 g
Pot life	89 min ±20% (T15K, DIN EN ISO 9514)
Processing temperature material temperature Processing temperature component surface	+5 °C to +30 °C +5 °C to +40 °C
Consumption/yield	<p>The calculation basis for the material consumption (M in g) is the base area (A in cm²) and the average gap size (d in cm) are required.</p> <p>M (in g) = A cm² * d cm * 1,2 * 2,66 g/cm²</p> <p>Example: 1m² contact surface with 1 mm gap M = 10.000 cm² * 0,1 cm * 1,2 * 2,66 g/cm² = 3.192 g = 3,192 kg</p> <p>This calculation includes an excess material of 20 % to compensate for tolerances and application-related additional consumption.</p>
Maximum layer thickness tested by the manufacturer	Up to 140 mm
Maximum layer thickness approved according to abZ	Up to 10 mm. It is authorised to reduce the gap size by inserting lining sheets and to apply MM1018 FL in several layers up to a maximum of 10 mm, for example.

Product data fully cured product

PROPERTIES	VALUE
Density	2.66 g/cm ³
Compressive strength	161 N/mm ² DIN EN 13412:2006
Hardness (ShoreD)	89
E-modulus	10.000 N/mm ² DIN EN 12190:1998
Thermal expansion coefficient	0.00002 1/K -20 °C to +60 °C
Temperature resistance	Up to 160 °C
Shrinkage	0.035 % DIN EN 12617-4:2002
Colour	Grey

PROPERTIES	VALUE
Creep coefficient	1.1 DIN EN ISO 13584:2003-11
Friction coefficient μ_{ect}	0.46 DIN EN 1090-2 Attachment G
Viscosity	16.900 mPas DIN EN ISO 3219:1994
Service temperature according to abZ	-20 °C to +50 °C
Loss of pre-tensioning force after 50 years	~ 10 % Relaxation test 2 mm gap, log. extrapolated, restrained

Storage / shelf life

Store in the original, unopened container in a dry, cool and frost-free place (5°C to 20°C). Shelf life 2 years. Protect from direct sunlight. Higher temperatures reduce the shelf life.

Processing parameters

The processing time (pot life) of the material begins as soon as the two components A and B are added together. Pot life and hardening time depend on the amount of material and the temperature. With larger containers, the pot life may be reduced due to a higher reaction heat. The following table gives practical pot life values for a 1 kg pack:

TEMPERATURE (°C)	POT LIFE (minutes)
10	110
20	55
30	30

Pot life at different temperatures measured on a 1 kg batch.

Material curing can be accelerated by heating. The maximum permissible temperature for accelerated curing is 50 °C. The required minimum curing temperature is +5 °C. We recommend at temperatures < 10 °C, we recommend preheating the components and the material.

TEMPERATURE (°C)	COMPRESSIVE STRENGTH (N/mm ²)	TIME TO REACH THE COMPRESSIVE STRENGTH
5	-	24 hours
5	138	7 days
21	156	24 hours
21	161	7 days
30	166	24 hours
30	182	7 days

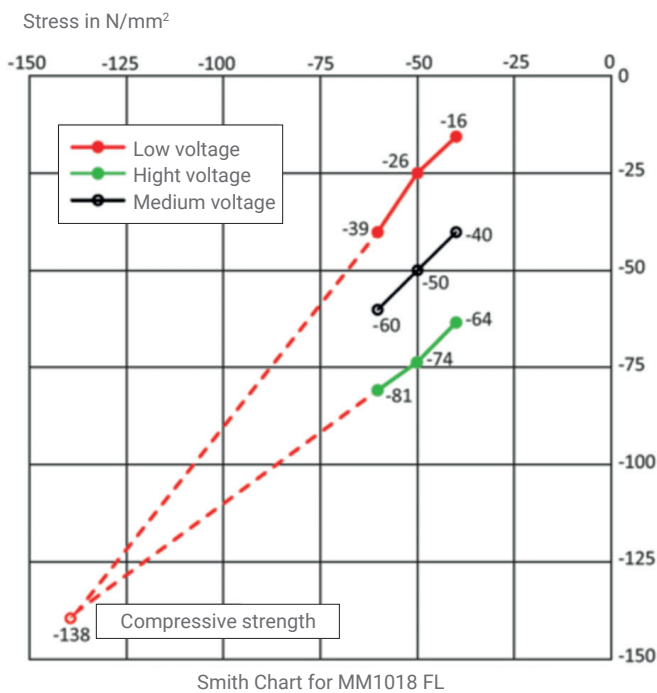
Compressive strength as a function of curing temperature and curing time, compressive swelling load.

Fatigue strength

Extensive fatigue tests (pressure threshold tests M1999 ibac RWTH Aachen) were carried out on MM1018 FL to determine the behaviour of the material under alternating load. Below you will find a brief extract of the data obtained. Further information is available on request.

MEDIUM TENSION (N/mm ²)	AMPLITUDE (N/mm ²)	ACHIEVED CYCLE NUMBER
40	24	10,000,000
50	24	10,000,000
60	21	10,000,000

Maximum achieved amplitude per medium stress.



Work preparation

If possible, contact surfaces that are wetted with MM1018 must be cleaned of dirt and loose particles using de-oiled compressed air (e.g. DIAMANT cleaner #1417). Screws must be protected if necessary (e.g. with DIAMANT screw protection #8880) to prevent the threads from sticking to MM1018 at a later date. If the contact surfaces need to be separated again at a later date, it is necessary to apply a release agent (e.g. DIAMANT Separator #1354) in advance.

Mixing process

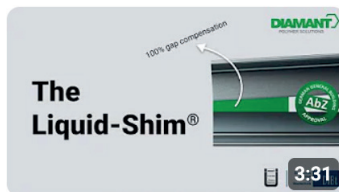
To mix MM1018, add component B completely to the container with component A. Mix intensively using a hand drill and the DIAMANT mixing propeller (art. no. #0789) (max. 250 rpm for approx. 2 minutes). Remove any material adhering to the walls of the container with a spatula and add to the mixture. Mix thoroughly again.

Application

MM1018 FL can be applied by pouring or injection. In both cases it is necessary that the gap is sealed all round to prevent MM1018 FL from leaking out of the gap. The use of MM1018 SEAL #2108 is recommended for sealing the gap. Information on material and processing can be found in the technical data sheet MM1018 SEAL #2108.

You can find a detailed explanation in this video:

[100% gap compensation in steel and bridge construction | MM1018 FL - The Liquid-Shim® \(youtube.com\)](#)



WATCH VIDEO

Casting

The mixed MM1018 FL can be used by pouring it into a cavity for gap closure. Before pouring, the mixed MM1018 FL must be de-aired into a clean container. The material can be poured directly into the cavity from this container. Ensure sufficient ventilation and bubble-free pouring.

Injection

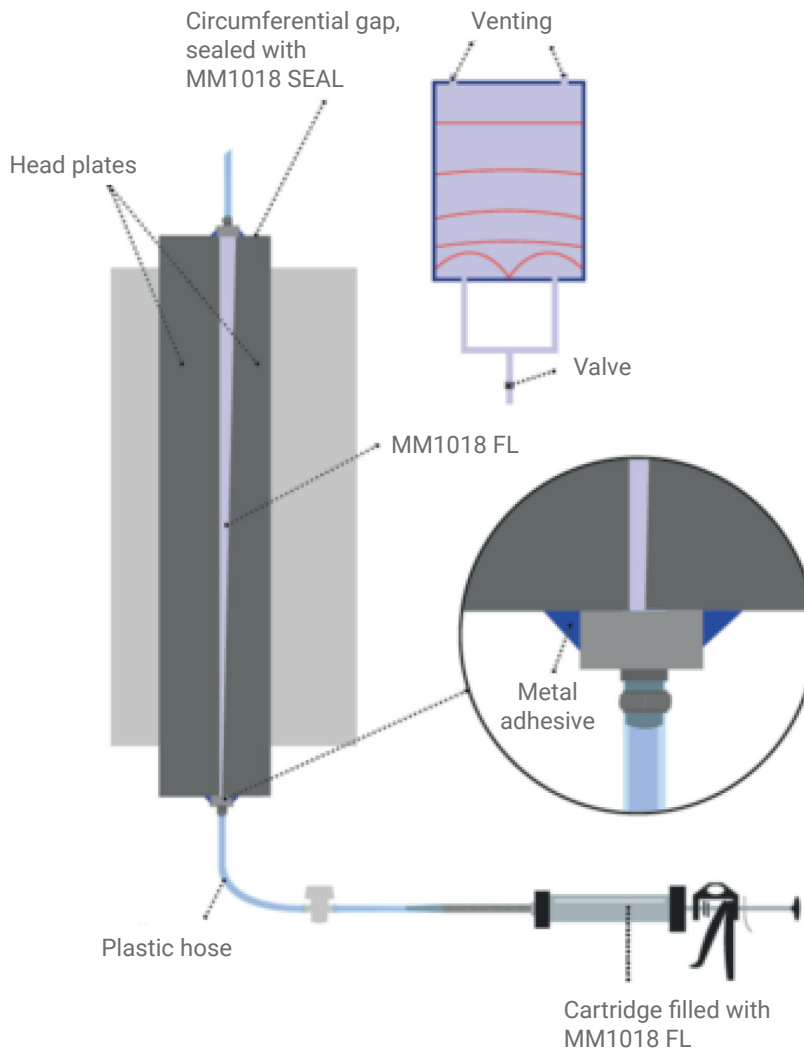
MM1018 FL can be injected into a sealed cavity. A prerequisite for the injection are appropriate injection and ventilation openings which must be planned depending on the existing gap dimension or cavity. Injection is carried out via flexible plastic hoses (Prod. No. #1579) using shut-off valves (Prod. No. #1577) which are attached to the inlet and outlet points via R1/4" screw connections (Prod. No. #1578). An approx. 150 mm long plastic hose, a shut-off valve and a further piece of hose designed according to the working conditions for connecting the injection cartridge or for venting must be attached via suitable hose points (Prod. No. #1576). MM1018 FL is mixed according to the processing instructions. The mixed product is then poured into an empty cartridge (Prod. No. #1573 - 320ml) in as thin a stream as possible, avoiding the formation of air bubbles. After filling, the cartridge is closed with a cartridge piston and slowly rotated to allow the liquid MM1018 to flow from the tip to the piston. This causes the trapped air in the cartridge to rise to the tip of the cartridge. This process is particularly important for a bubble-free injection!

The cartridge can now be opened at the top with a knife and the tip unscrewed. It is advisable to shorten the cartridge tip slightly so that it has an internal diameter of approx. 8 mm. This reduces the resistance during injection and makes it easier to press in. The cartridge tip is now placed on the free end of the hose by hand and injection can begin once the shut-off valve has been opened. Injection should be carried out at a constant pressure. It is essential to ensure that no air bubbles are pressed through the hose into the cavity! To change or refill the cartridge, the shut-off valve is closed to prevent the already injected material from flowing back. The free end of the hose is fixed for the cartridge change so that no material can leak out. Injection is terminated as soon as the material emerges from the upper vent opening. Close the shut-off valve before removing the cartridge. Any material flowing back out of the injection hose must be collected with a cloth, for example, and disposed of properly. After 24 hours of curing at 20°C, the injection and vent connections can be cut off and disposed of.

Time schedule

1. Clean and apply DIAMANT separator if necessary
2. Attach screw protection if necessary
3. Prepare and install the injection opening
4. All-round sealing with MM1018 SEAL or use the injection pad
5. Allow MM1018 SEAL to harden
6. Injection with MM1018 FL
7. Allow MM1018 FL to harden
8. Knock off the injection connections and clean the gap area if necessary
9. Apply corrosion protection if necessary

Exemplary illustration for the gap compensation of a keel gap at head plate joints



Disposal

Unused material can be disposed of normally if it has been mixed in the correct ratio and is fully cured (EWC 170203). Unmixed material must be disposed of as chemical waste (EAKV 080111) **When booking our DIAMANT application service, we will take care of the professional and correct disposal of the waste.**

Qualification & Service

To ensure the best possible quality and error-free application, we offer the following services:

- Product training
- Site supervision and monitoring (supervising)
- Complete realisation of the work by our experienced application technicians and fitters

Contact us, we will be happy to advise you and will be on site immediately.

Safety Data Sheet

Please read the relevant safety data sheet before processing the product. Safety data sheets are available on a daily basis on request via info@diamant-polymer.de or by telephone on +49-2166-98360.

DIAMANT guarantees the product properties as long as they are stored and used in accordance with the specifications listed here. DIAMANT accepts no responsibility for the processing of the material. Our technicians will be happy to answer any further questions you may have.

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The technical data listed here was determined under laboratory conditions and verified by quality assurance processes on the day of product manufacture. We reserve the right to make changes without prior notice. The customer is responsible for verifying the up-to-dateness of the data and should contact DIAMANT before ordering the material. Application, use and processing are beyond our control and are therefore the sole responsibility of the purchaser. Should liability nevertheless arise, this is limited to the value of the goods supplied by us and used by you. We guarantee the flawless quality of our products in accordance with our general terms and conditions of sale and delivery. All technical data vary depending on the loads and conditions of use. We will provide specific application data on request in each individual case.