

Product data sheet re-plate

«for statically loaded elements»



Product data

re-plate «memory®-steel plate» is used for retrofitting of structures «for statically and in exceptional cases non statically loaded elements». re-plate is anchored on both sides and functions as an external, unbonded tensile strip. re-plate is prestained in the factory and supplied pre-punched at the ends ready to use on-site.

The mechanical end anchorage is composed of a Hilti direct fastening system. For activation of the “prestressing”, the plate is heated using a gas burner or infrared heater.

Product	Cross-section	Max. tensile stress*	Max. tensile force*	Elongation at break
re-plate 120 / 1.5 mm	180 mm ²	460 N/mm ²	83.1 kN	25 %

* Design value for 12 nails and and a concrete strength (cube) >20 N/mm² (with safety factor 1.3)

Product	Heat temperature	Prestress	Prestressing force	Relaxation
re-plate – standard solution	Gas 300 - 350 °C	380 N/mm ²	68.4 kN	15 % nach t _∞
Corrosion coating or fire risk	Infrarot 165 °C	300 N/mm ²	54.0 kN	15 % nach t _∞

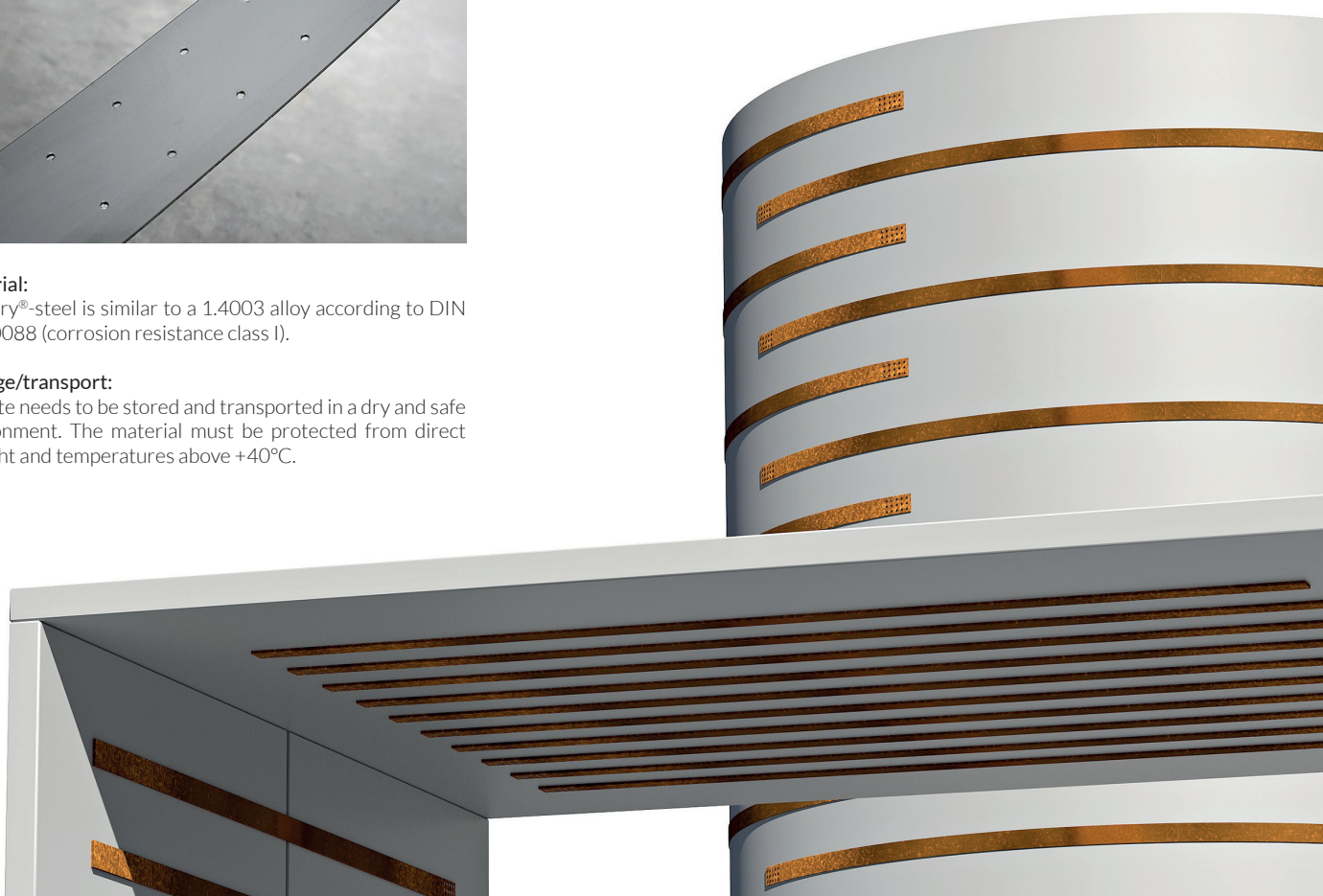


Material:

memory®-steel is similar to a 1.4003 alloy according to DIN EN 10088 (corrosion resistance class I).

Storage/transport:

re-plate needs to be stored and transported in a dry and safe environment. The material must be protected from direct sunlight and temperatures above +40°C.



Information

Condition of the substrate

re-plate strengthening system can be used retrofitting of reinforced concrete structures. The concrete substrate must be able to transfer the load and must have a compression strength of $>20 \text{ N/mm}^2$ (cube, C16/20 acc. to EN 206-1). For lower concrete qualities, the anchorage resistance should be discussed with the re-fer engineer. Protrusions, plaster, or insulation around re-plate must be removed beforehand.

Application / Activation of re-plate

Information on the handling and the installation of our products can be found in the current re-fer brochure.

End anchorage

For the end anchorage a minimum of 12 nails per anchor end is required (total 24 nails). re-plate comes with 16 punched holes on each side (four as additional spares). The concrete substrate is pre-drilled after positioning of re-plate. The anchoring is performed by a Hilti direct fastening system.

Drilling depth:	40 mm	Hilti direct fastening tool:	DX5 Kit
Drilling diameter:	3.5 mm	Hilti universal nail:	X-CR 48 P8 S15
		Hilti cartridge:	DX cartridge 6.8 / 11 M10 STD (red)
In future also the Hilti fastening tool DX6 with corresponding cartridges is available.			

Activation/prestressing re-plate

re-plate is heated and activated with a gas burner. Heating is performed up to a uniform temperature of $300\text{-}350^\circ\text{C}$ and in sections with a length of around 50 cm. A second person monitors the temperature progression. Another possibility is the activation with the infrared-heater IR-3000. The heating unit is pressed onto the re-plate and the temperature is manually controlled. The heating section of the device has a length of 1.30 m.

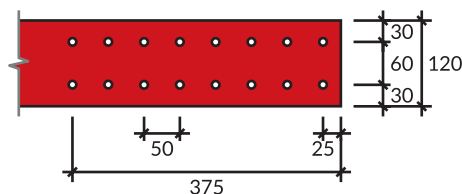
Required power supply for the infrared-heater: 3x400 V, CEE 16A, 400 V, 5-poles

All necessary processing materials and equipment can be purchased from re-fer. Upon request, re-fer offers on-site instructions by an application technician on a rental basis.

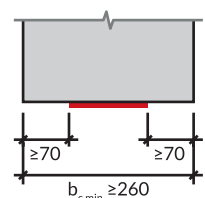
Geometrical arrangement

The following specifications concerning edge distance, axial spacing, and geometrical dimensions need to be respected. Special designs are necessary if these requirements cannot be met. In this case re-fer provides engineering support. Thanks to the weldability of memory®-steel, simple solutions are possible. Welding must be carried out by a qualified stainless-steel welder (tungsten tip, inert gas, weld metal "Böhler A7 CN-IG" 1.6 mm wire). The welding takes place in the factory or directly on-site.

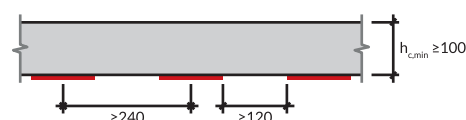
Holes in re-plate:



Beam/bearer:

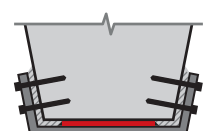


Plate/slab:



Special design:

re-plate welded on anchor plate. Fixation with lateral anchoring and/or adhesion.



Sika Fire protection

The fire protection system for re-plate was tested at the MFPA Leipzig, Germany. Test reports can be found in the download section of our website or are provided by re-fer upon request.

For building construction and bridge building		
SikaCem® Pyrocoat Base	Base coat	Layer thicknesses must always comply with specific national standards or guidelines. Please consider currently valid product information and processing guidelines.
SikaCem® Pyrocoat	Sprayed fire protection mortar	

Additional fire tested mortars in the Sika MonoTop® range are available for outdoor applications and in tunnelling. Fire protection measures and stated layer thicknesses are guide values and must also comply and be compatible with all relevant local regulations and standards.

Sika Corrosion protection

For severely exposed structures in environments with a high chloride concentration and humidity (also construction sites with long construction time in humid environment) an additional corrosion protection should always be considered and applied. Due to this protective coating with «temporary thermal resistance of ca. 180°C», the heat temperature during the prestressing process is limited to 165°C. Correspondingly, a maximum prestressing force of 54 kN/re-plate is applicable. After application and activation, the re-plate is additionally sealed around its four sides with Sikaflex® PRO-3 to prevent water ingress between concrete substrate and the re-plate.

Corrosion protection		
SikaCor® EG-1	high-solid epoxy-based intermediate coat	Factory applied (and on site corrections including nail coating)
Two-sided sealing		
Sikaflex® PRO-3	PU-based sealant	Applied on-site

memory®-steel has been tested in systems with Sika fire and corrosion protection products. re-fer gives no guarantee if other mortars and products are used in combination with memory®-steel.

Information plastering and coating work

The lamella can be directly covered with cement-bound plaster without bonding agent. Larger gaps (>2 mm) are filled with plaster. The plaster is prepared with a toothed trowel, and an alkali-resistant E-glass fabric (4x4 mm, approx. 0.5 m web) is worked in centrally over re-plate to create an approx. 4-5 mm thick layer with embedded mesh. Plaster based on gypsum can lead to corrosion reactions when wet or in case of moisture.

If coatings, paints or similar are applied to re-plate, their chemical compatibility with memory®-steel must be checked.

Notes

All technical values in this product data sheet are subject to the re-fer quality assurance. Current measured values may deviate from the product specifications. For design purpose, re-fer provides engineering support and advice. For further information please visit us at www.re-fer.eu (references, technical data sheets, brochure, tender texts, test reports and publications can be downloaded or are available upon request) or contact our technical service directly.

The information in this product data sheet is valid for the corresponding product delivered by re-fer AG Switzerland. Please note that the data may differ in other countries and please refer to the local product data sheet abroad. The information and data in this technical data sheet are intended to ensure that the product is considered for normal use and is based on our knowledge and experience. However, they do not release the user from the obligation to check the suitability and use of the product on his own responsibility.

Product specifications are subject to change without notice. In all other respects, our terms and conditions of sale and delivery shall apply. The latest product data sheet shall apply.

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08.2022