



PROFESSIONAL SOLUTIONS

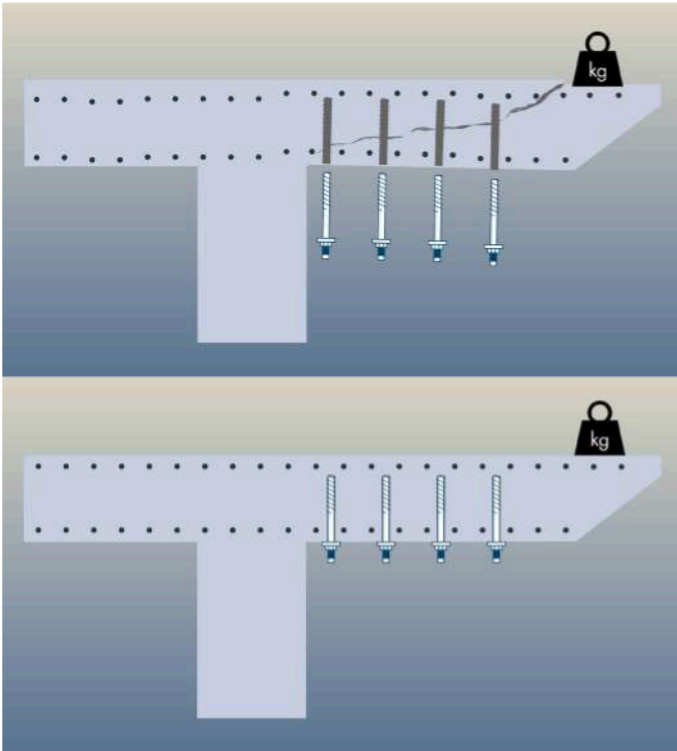
RELAST®

Structural reinforcement

DECADES OF MASTERY | TRANSFORMATIONAL RESILIENCE



The approved, sustainable and efficient system for post-installed reinforcement of existing bridges, tunnels, parking garages and buildings.



Functioning of RELAST®

During ongoing operation, the high-performance bonded screw anchors are screwed from below or above into the structure to be renovated. Since the installation takes place from one side, the operation of the building or, for example, traffic on a bridge can be kept running.

With RELAST®, the compression and tension zones in the concrete are connected. Released tensile forces are taken by the bonded screw anchor. This prevents damage from occurring and guarantees the complete functionality of the structure.



Design with RELAST®

Design is carried out in accordance with construction product approval Z-15.1-344 for shear reinforcement or Z-15.1-345 for punching shear reinforcement. To make it as easy as possible for the engineer in charge, they are very much in line with DIN EN 1992-1-1. Würth Technical Software II was added a module for designing the RELAST® bonded screw anchor. After defining the component to be reinforced and entering the boundary conditions, such as the concrete class, dimensions and loads, the program automatically performs the design and suggests the most economical arrangement of the screws.

As soon as the user changes the diameter of the bonded screw anchors or other parameters, such as the installation status, they receive immediate feedback on the revised arrangement and the number of screws. (<https://wtsonline.wuerth.com/relast>).



RELAST®

THE APPROVED SYSTEM FOR SHEAR AND PUNCHING SHEAR REINFORCEMENT OF EXISTING STRUCTURES



The RELAST® reinforcement system is a technically innovative and resource-efficient procedure for reinforcing the shear and punching shear resistance of concrete structures such as bridges, tunnels, underpasses, parking garages or buildings. This unique system is a solution to a number of highly complex restoration scenarios. It can be installed quickly and easily without having to interrupt operation or traffic.

RELAST® benefits

- Reinforcement system approved by building authorities
- Significant increase in shear and punching shear capacity
- Significant extension of the structure's useful life
- Little intervention in the existing structure
- Suitable for structures subjected to fatigue loads
- Quick and easy installation while keeping the structures in service
- Immediate load-bearing capacity
- Replacement by new structures is avoided
- Huge cost savings compared to new structures
- Positive contribution to the carbon footprint
- Economic damage is minimized as road closures, congestions and diversions are avoided

The RELAST® bonded screw anchor consists of a concrete cutting thread on one side and a metric connection thread on the other. Injection mortar, pressure distribution washer, wedge lock washer and hexagon nut complete the system. This results in a unique combination of mechanical interlock and bonding effect of the injection mortar.

Bridge over federal road B21 (Bundesstraße), Bad Reichenhall

Reason for renovation:

Insufficient shear reinforcement in the area of the four intermediate supports

Solution:

Post-installed shear reinforcement in running traffic

Special features:

- Installation of 1.224 bonded screw anchors within 14 working days
- Avoidance of extensive shear diversion routes
- Minimal interference with rail traffic



**INNOVATIVE SYSTEM
THAT HAS BEEN
USED SUCCESSFULLY
MANY TIMES**

Two bridges across A81 highway

Reason for renovation:

Lack of shear reinforcement

Solution:

Post-installed shear reinforcement

Special features:

- Reinforcement without taking the bridges out of service
- Use of standard lengths
- No closures
- No diversions



Parking garage

Reason for renovation:

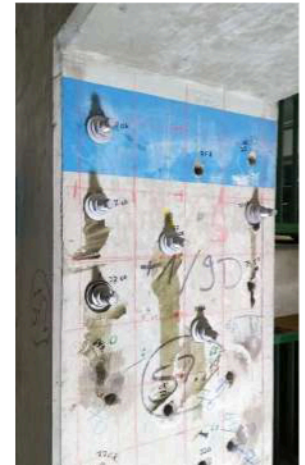
Lack of shear reinforcement due to load increase (storeys added to parking garage)

Solution:

Post-installed shear reinforcement of frame shafts

Special features:

- Reinforcement without taking the building out of service
- Only partial locks required in small areas



REFERENCE PROJECTS:

Hotel in Ostfildern

Shear reinforcement with
364 bonded screw anchors

Parking garage in Innsbruck

Reinforcement with 345
bonded screw anchors

EXAMPLE APPLICATIONS

Shear reinforcement

Reason for renovation:

Heavily corroded reinforcement of the cantilevers of the gallery

Solution:

Post-installed shear reinforcement from above

Special features:

- Listed building
- Bonded screw anchor do not protrude as they are integrated in floor structure



Foundation reinforcement

Reason for renovation:

Lack of punching shear reinforcement in the area of the supports

Solution:

Post-installed punching shear reinforcement of the foundation

Special features:

- Reinforcement while in use
- Installation of bonded screw anchors within one working day



Punching shear reinforcement

Reason for renovation:

Missing punching shear reinforcement due to load increase

Solution:

Post-installed punching shear reinforcement

Special features:

- Installation of 432 bonded screw anchors within a few working days
- No impact on the further construction process
- Anchors do not protrude as they are integrated in floor structure



Find more information at: www.wuerth-professional.com/relast.php

**Werbellin channel,
Eichhorst**

(with video documentation)
Punching shear reinforcement
with 230 bonded screw
anchors

**Amerikaweg, A96,
Lindau**

Shear reinforcement with
160 bonded screw anchors

**Ludwigsbrücke
(bridge), Munich**

Reinforcement for higher
splitting tensile strength
with a total of 1.114 bonded
screw anchors so far

**Hamburg Central
Station**

Shear reinforcement of a
joist with 60 bonded screw
anchors

Library in Augsburg

Shear reinforcement of
several joists with 100 bond-
ed screw anchors

**Bridge across Isar river,
Bad Tölz**

Shear reinforcement with
158 bonded screw anchors

**Vorbachbrücke
(bridge), Weikersheim**

Shear reinforcement with
193 bonded screw anchors

**Roman bath
(indoor bath), Austria**

Punching shear reinforcement
with 626 bonded screw
anchors



RELAST® STRUCTURAL REINFORCEMENT

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