

Press release

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fischer's white paper on seismic fastenings

A secure hold even when the ground is shaking

Even smaller and medium-sized earthquakes can cause devastating damage to buildings and present a risk to life and limb. fischer provides structural engineers and planners with the knowledge necessary to safely design and use earthquake-proof fastenings in its latest white paper titled 'safe anchoring in earthquake zones: Fastenings under seismic actions'. The fixing specialist also has the corresponding fastening solutions in its range of products.

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The earth is constantly in motion. Not only does it rotate on its axis and around the sun, but there is also constant activity in the earth's interior. According to the German Federal Institute for Geosciences and Natural Resources (BGR), an average of more than 150 earthquakes with a magnitude of 6.0 and above occur worldwide every year. More devastating earthquakes with a magnitude between 7.0 and 8.0 occur 15 times per year on average. European regions along the eastern Mediterranean Sea, including Italy, Greece and the Balkans, are affected more frequently than average due to shifts in the tectonic plates. In addition to tectonic earthquakes, induced earthquakes are triggered by oil production or geothermal energy, for instance. Planning buildings in areas prone to earthquakes presents tremendous challenges to planners and structural engineers. It's not just the stability of the building

that's impaired by earthquakes. Components that are fastened to the building can be damaged and present a potential risk, including pipes and conduits, suspended ceilings, cable runs, air conditioning units and facades.

If seismic loading is to be expected, structural engineers and planners should always plan to use earthquake-resistant fasteners, even for non-load-bearing components. fischer now offers the 'safe anchoring in earthquake zones: Fastenings under seismic actions' white paper free of charge to support engineers with this task. The 20-page brochure provides professionals with the knowledge necessary to safely design and use earthquake-proof fastenings. Upgrading post-installed, earthquake-proof fastenings is also addressed in the white paper.

In addition to a general section on the evolution and prevalence of earthquakes, the white paper also thoroughly examines the key standards that are relevant to the design of fastenings under seismic loading. EN 1992-4, Annex C, forms the basis for the design of fastenings under seismic loading. European Technical Assessments (ETA) are a prerequisite for the application of EN 1992-4 and document the seismic qualification of a fastener. The specifications for calculating the actions for seismic loading can be found in EN 1998-1 (EC8-1). The brochure provides planners and structural engineers with step-by-step explanations on how to carry out valid fixing element designs under seismic loading with the help of the three abovementioned documents. Various processes including capacity design, elastic design and design with consideration of the ductility of the fastening are introduced in the white paper. The brochure furthermore illustrates performance categories C1 and C2 for the seismic qualification of fastenings. Depending on the category of the building (I-IV),

the fastening must be carried out with an anchor qualified for category C1 or C2.

As a fixing specialist, fischer offers multiple solutions for seismic fastenings. Its chemical anchors include the universal mortar FIS V Plus, the concrete specialist FIS EM Plus and the superbond FIS SB (also available as a resin capsule RSB). These injection mortars are processed with system components such as the fischer anchor rods FIS A and RG M. fischer's range also includes several steel anchors that are suitable for seismic fastenings, including the concrete screw UltraCut FBS II, the bolt anchor FAZ II, the high-performance anchor FH II as well as the Zykon undercut anchor FZA. These chemical and mechanical solutions cover all load ranges.

fischer continues to support planners and structural engineers with a comprehensive range of services. The Technical Advice service can be contacted by phone, email or chat. Earthquake-proof fastenings can easily be designed either online or offline with the modular fischer FiXperience software suite. The C-FIX Online module for designing steel and bonded anchors in concrete allows users to determine the stiffness of the base plate and calculate realistic anchor forces with a linear spring model in combination with the FEM. All three design methods for seismic design as per EN 1992-4 are available in the C-FIX Online module. For those interested in refreshing or expanding their knowledge of seismic anchorages, the fischer Academy provides a wide range of online and in-person training sessions.

Download:

The 'safe anchoring in earthquake zones: Fastenings under seismic actions' white paper can be downloaded from <https://www.fischer-international.com/en/expertise/seismic>.

Image captions:

Image 1

The new 'safe anchoring in earthquake zones: Fastenings under seismic actions' white paper provides planners and structural engineers with all the answers to questions about selecting and designing fastenings in areas prone to earthquakes.

Image 2

fischer offers chemical and mechanical fixing solutions that resist high seismic actions.

Images: fischer

The fischer Group of Companies

The fischer Group of Companies, headquartered in Waldachtal in Germany's northern Black Forest, generated sales of 988 million euro in 2021 with a worldwide staff of 5,400 employees. The family-owned company operates 50 subsidiaries in 38 countries and exports to more than 120 countries. It includes the five divisions: fischer fixing systems, fischer Automotive, fischertechnik, fischer Consulting and fischer Electronic Solutions.

fischer fixing systems is the technological market leader in key areas of fixing technology. fischer offers products that deliver technical perfection to a wide range of customers, from do-it-yourselfers to tradespeople to key account partners.

fischer Automotive manufactures high-quality parts for vehicle interiors. The company is highly competent in the plastics processing segment and is an important partner for the automotive industry. Its range of products includes air vents, cup holders, trays and multi-function components.

With its construction kits, fischertechnik is active in both the toymaking and the educational sector. fischertechnik is one of the last remaining toy makers to exclusively develop and produce in Germany.

fischer Consulting evolved from the competence developed in the company itself, which includes the fischer ProcessSystem with its central aim of permanent improvement for the ultimate benefit of the customer. fischer Consulting advises small and medium-sized businesses, government agencies and major companies on their path towards lean and efficient processes.

fischer Electronic Solutions develops and manufactures electronic solutions including product and system developments based on the latest technology as well as custom production orders processed in the company's own production facilities. As an experienced provider of development and production services for custom systems such as multi-touch solutions made of glass and the corresponding controller units, fischer Electronic Solutions forms the perfect link between the customer and the final product.

www.fischer.group

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