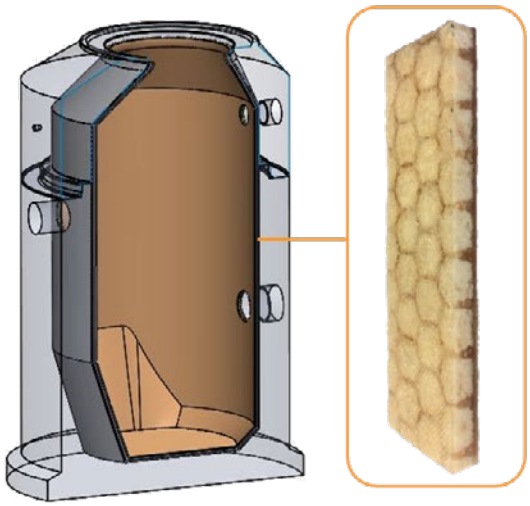
Federal Ministry
for Economic Affairs
and Climate Action

Best practice example

for lightweighting in Germany

Innovative coating technology



Rehabilitation of support structures using media-resistant fibre-composite sandwich structures

Rehabilitation of support structures for pump wells made of concrete

Fields of application

Construction sector (building stock, retrofitting of buildings)

In this example, lightweighting allowed for the following reductions compared to a conventional model made of thermoplastic:

Weight approx. -45 % Energy approx. -60 %

Cost approx. -50 % Implementation period approx. -50 %

Application

This coating technology is an innovative retrofitting procedure based on fibre-reinforced materials that can be used to restore supportive structures of subterranean concrete pump wells exposed to strong media influence, for instance in small wastewater treatment plants or sewer systems. The work can be done in any season.

Challenge

There is much need for efficient retrofitting procedures for existing pump wells, especially for restoring load-bearing capacity. Most of the retrofitting methods on the market limit themselves to the surface coating of support structures made of concrete, without bolstering the structures' load-bearing capacity.

Solution

The technology introduced here is about adapting an optical-fibre based coating to the individual building in question. This does not require removing the chamber cone. The textile semi-finished products are waterproofed and cured by means of vacuum infusion. A heating system, which later serves for leakage monitoring, is integrated to allow for the work to be carried out in any season.

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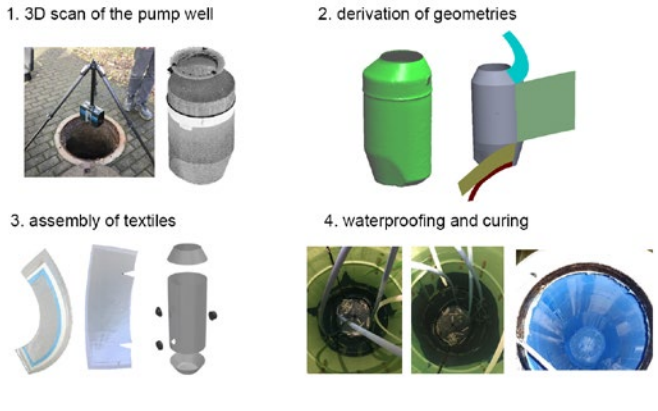

Process flow of the rehabilitation process

Other possible applications

Other potential applications

Machinery and plant construction

The retrofitting procedure has been used in pilot retrofitting projects for pump wells and is currently being introduced to the market. The technology can also be used for the retrofitting of industrial containers, biogas installations, silos and all kinds of underground buildings.

The high degree of flexibility of the semi-finished products used allows even for complex and barely accessible geometries and installation spaces to be coated. The cost of material and the duration of the process are approx. 50% less compared to a traditional retrofitting procedure. Also, no civil engineering work is required. This drastically improves performance in terms of efficiency, economic viability, and safety.

Compliance with all requirements relevant for the sector is being ensured. Research activities are being conducted so as to further improve health and safety, environmental protection and recycling.

The LIGHTWEIGHTING ATLAS

The LIGHTWEIGHTING ATLAS is an interactive web portal that pools information on those active in lightweighting and their skills across different industries and materials. The atlas is free to use and entries into the atlas are also free. You can find the LIGHTWEIGHTING ATLAS at www.leichtbauatlas.de

The Lightweighting Initiative

Modern lightweighting is of pivotal importance for German industry and its competitiveness. Federal Ministry for Economic Affairs and Climate Action has established the Lightweighting Initiative to support lightweighting in Germany. The Lightweighting Initiative Coordination Office in Berlin, which is financed as part of the initiative, pools all activities relevant to lightweighting and supports German companies, especially SMEs, as they implement lightweighting.

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