

THE NEW WATERPROOFING COMPOUND STOPS STRUCTURAL DECAY AND CORROSION

Vesa Koponen, CEO of Build Care Ltd, has developed a new type of elastic and water-soluble waterproofing compound. The new compound has already proven highly effective in stopping the decay of concrete and corrosion of steel.

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Koponen introduced the Elastop waterproofing compound on the market in 2006. Since then the product has been used for a multitude of applications, including the surfacing of concrete and steel surfaces, repairs of roofs and balconies, sealing of structures and penetrations, and waterproofing of foundation walls.

In 2007, VTT Technical Research Centre of Finland conducted extensive tests on Elastop, measuring such properties as waterproofness, adherence and durability. The durability of Elastop was measured in a speeded-up test in a temperature of +70 °C. The test lasted for 163 days, which corresponds to 12–13 years in a temperature of +20 °C.

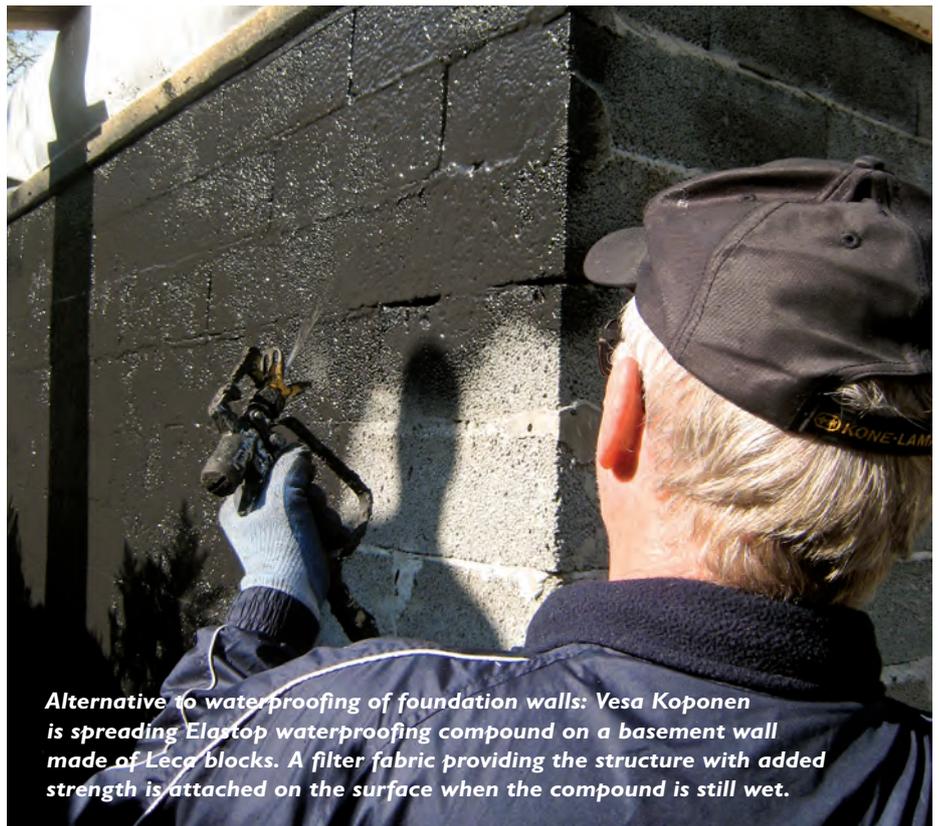
The product exceeded all requirements set for it and the tests also indicated that when exposed to ordinary outdoor temperatures, Elastop may last for decades. The fact that the compound is used in drying houses of sawmills where conditions are very aggressive, lends credibility to these findings.

“Based on the tests and the experiences in drying houses, one can say that in outdoor use, the compound lasts for at least 60 years,” says Koponen.

One of the advantages of the new waterproofing compound is its environmental friendliness. According to Koponen, the water-dilutable product is completely harmless to humans, the environment and structures.

“The compound adheres to all building surfaces, damp or dry. It makes structures waterproof but penetrates gases and it is

not affected by ultraviolet radiation. Because the compound is elastic, it adheres to different types of materials even if they expand and contract depending on the humidity and temperature,” explains Koponen. He also gives a promise: “The compound will remain elastic and waterproof for years”.



Alternative to waterproofing of foundation walls: Vesa Koponen is spreading Elastop waterproofing compound on a basement wall made of Leca blocks. A filter fabric providing the structure with added strength is attached on the surface when the compound is still wet.

Seeking a partner

Introducing a new product on the market is a highly demanding process. However, Koponen says that he is in no hurry:

“I have decided that I will not build a separate organization to support this product any more. At the moment, I’m doing surfacing and waterproofing work with my partners”.

The Foundation for Finnish Inventions has described the product a mega invention that may become a global success. The fact that the product is durable and provides protection against corrosion is enough to make Elastop a world-beater if it can fulfill its promise.

“Every year, huge sums of money are spent on making steel structures corrosion resistant. Steel surfaces on such structures as ships, bridges and buildings need protection and with Elastop, the cost of maintaining them can be much lower,” says Risto Paajanen, Business Development Manager at the Foundation for Finnish Inventions, describing the market potential of the product.

According to Koponen, the Finnish construction sector is conservative and he does not believe that he will find a partner of sufficient size in Finland. For this reason, he has started efforts to find a foreign buyer for his invention and in this, he is supported by the Foundation for Finnish Inventions.

A long road

Vesa Koponen did not invent Elastop by accident. Finding the right formula required thousands of tests.

Koponen graduated from the Åbo Akademi University in the late 1960s as Master of Science (Technology) with chemistry as his major subject. He became familiar with different types of surfacing materials in his work as the research and development director of Valmet. In those years, he also concluded that surfacing materials containing toxic components should not be the only way to protect building materials and prevent corrosion and decay.

In the 1980s, he established a business specializing in the repairs and maintenance

of facades, bridges and sawmill drying houses. Koponen was able to establish customer relationships with sawmills because Valmet, his previous employer, had also supplied equipment for this sector. Koponen was thoroughly familiar with the conditions and problems at drying houses of sawmills.

“As the new century dawned, I gave up my business and returned to chemistry. I started developing an environmentally friendly product as an alternative to surfacing materials already on the market. After more than five years of work and countless trials and errors I came up with a formula that has remained more or less unchanged since then,” he explains.

After carrying out a novelty search, the National Board of Patents and Registration of Finland concluded that there are no similar products anywhere in the world. Koponen has, however, not submitted a patent application for his product:

“I should apply for a world-wide patent, which would be very expensive. A world-wide patent would not give full protection

Conditions in drying houses are demanding

» **FOR SAWMILLS**, Elastop is a substance that allows them to keep concrete and steel structures in drying houses in good condition.

It is hot and very humid inside drying houses. The sawn goods are dried in channels and chambers where temperatures vary between + 50 °C and more than + 75 °C. Relative humidity is between 70% and almost 100%. In such conditions, decay of concrete and corrosion of steel can occur very quickly.

Metsäliitto has used the new waterproofing compound on the concrete surfaces of the drying house at its Renko sawmill for a couple of years. Maintenance manager Jorma Nieminen is satisfied with the results. Elastop has replaced pitch epoxy as the surfacing material used in the maintenance of the structures.

According to Nieminen, the concrete structures would rapidly decay beyond repair if they were not surfaced.

“The new product has met our expectations. The com-

ound has proven durable and it adheres to the surfaces on which it has been applied. As a result, it has prevented the concrete from decaying,” concludes Nieminen.

The new method is now also in use at the Kitee sawmill of Stora Enso where the inner surfaces of the drying house are covered with acid-resistant steel. Nevertheless, the frame beams and door frames are made of structural steel and are thus sensitive to corrosion.

According to Tuomo Kokko, who is responsible for maintenance at the sawmill, frame beams damaged by corrosion have been repaired many times with sandblasting and by applying pitch epoxy on them. In the summer of 2008, Elastop was used instead.

“The surface was first sandblasted. After that, a thin layer of Elastop was applied on the surface and a reinforcement fabric laid on it. Finally, a thin layer of Elastop was spread on the surface for the second time. The surfacing has proven very durable,” says Kokko.



A door frame made of structural steel has been repaired using Elastop waterproofing compound and a reinforcement fabric.



After being surfaced with the waterproofing compound, the steel surfaces of the drying house have remained in good condition for three and half years. Normally, the surface material starts peeling off in large areas within a year.

because there are countries where patents are not respected. Besides, I couldn't afford court cases arising from possible patent infringements".

For this reason, Koponen has kept the formula of the waterproofing compound a secret that only he knows. He says that the formula of the product is so complex that similar products are unlikely to be invented in the foreseeable future.

A wide range of uses

At the moment, Build Care produces about eight tonnes of Elastop each year. Depending on the surface, the consumption is between 0.5 and 1.6 kg/m, which means that nearly 10,000 square meters is surfaced with Elastop each year.

Elastop has been used for such purposes as waterproofing of foundation walls, basements, balconies and inner yards.

Because Elastop adheres to all types of building surfaces, it can be used for sealing different types of penetrations and joints and for filling cracks, holes and leaks. The area treated with Elastop can be strengthened using such materials as filter or glass fiber fabrics. Koponen has even applied Elastop on the skirts of his van to make them corrosion resistant.

Using Elastop as the bonding agent, balconies of apartment blocks can be repaired by attaching a polypropylene-coated sheet on the cleaned balcony slab. The sheet has a polypropylene, waterproofing and a reinforcement layer.

"The balcony only needs to be out of use for a couple of days and the whole process is only half as expensive as repairs carried out using traditional methods," Koponen explains.

Elastop has also been used for repairing felt, sheet metal and minerite roofs. In most cases, one only needs to remove loose matter from the roof using a pressure washer after which the compound can be spread on the surface. The layer spread on the roof has a thickness of slightly more than one millimeter.

Roof repairs with Elastop cost between EUR 20 and 30/square meter (including pressure washing). The price may be higher if accessing the roof is difficult and the work requires safety equipment such as harnesses. The consumption of the compound and the number of protective layers required also have an impact on the price. ■

»THIS Article is originally published in Finnish in the Promaint 6/2011 Magazine

Some of the properties of the new waterproofing compound

- > adheres to all building surfaces – damp or dry
- > is durable
- > can also be used for sealing porous materials, such as Leca blocks, gypsum board and filter fabrics
- > stops corrosion
- > penetrates gases but not water
- > retains its elasticity
- > fills cracks
- > becomes touch-dry in two hours (in a temperature of + 20 °C)
- > can be covered with paint, plastering, etc.
- > provides an elastic surface for boards, slabs, tiles and asphalt
- > resistant to solar UV radiation and most chemicals and can withstand a variety of conditions
- > is completely solvent-free
- > comes in two different versions – Elastop S for spray application and Elastop H for manual application
- > harmless to humans, the environment and structures



There are probably still a large number of potential applications for Elastop. Vesa Koponen has coated the skirts of his old van with the compound to make them corrosion resistant.



A balcony has been repaired by attaching a polypropylene-coated sheet on the balcony slab using Elastop.



An old sheet metal roof has been repaired by spreading a thin layer (slightly more than one millimeter) of Elastop on it. The surface can be finished with paint.