

Positioning paper

With this paper SGS INTRON B.V. declares that based on the results of leaching tests (column test and dynamic surface leaching test) on behalf of Rockwool Lapinus B.V. the construction product

Lapinus[®] WM (Rockflow)



complies with limit values for the release of dangerous substances according to the Dutch Soil Quality Decree.

In addition to the environmental quality (release of dangerous substances) of the product additional information is documented about CE-marking and ETA, assessment to other legislations, durability, circularity and end-of life.

Sittard, May 13th 2019

SGS INTRON B.V.



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WHEN YOU NEED TO BE SURE

SGS

Rockwool B.V., Lapinus produces Stone wool elements for water management solutions. These elements are put into the market under the product name: Lapinus® WM (Rockflow).

The use of these elements provides a slow infiltration of water to the surrounding soil.

The subjects that are treated in this letter by SGS INTRON are:

- CE-marking and ETA;
- Environmental quality and the Dutch Soil Quality Decree and adjacent legislations;
- Release of dangerous substances and other environmental aspects;
- Environmental declaration of performance;
- Durability, circularity and end of life.

CE-marking and ETA

According to the European Construction Products Regulation (CPR) all construction products with a harmonized standard must be CE-marked.

Since Lapinus® WM (Rockflow) is a new product there is no European harmonized standard in which the performance and the properties is stated. Lapinus started a European Technical Assessment (ETA) to be able to bring the product to the European market with CE-marking. An ETA can be issued for construction products if they are not covered by any harmonized European Standard. In this ETA the assessment of the performance of this construction product, in relation to its essential characteristics is documented.

The ETA provides manufacturers with a voluntary way for CE marking their innovative non-standard construction product and thus bringing it to the European internal market.

The ETA is the basis for a Declaration of Performance (DoP) which the manufacturer is required to draw up in accordance with the CPR before CE-marking the product.

In the ETA all relevant required properties are stated such as water absorption, water retention, release of dangerous substances, durability etc.

Lapinus has started the development to draw up a European Assessment Document (EAD) which takes into account up-to-date technical and scientific knowledge as a basis for the preparation and issuing of the ETA for the Lapinus® WM (Rockflow) product.

Environmental quality, the Dutch Soil Quality Decree and adjacent legislations

The main drive for CE-marking is to bring safe products to the European market. Save in the way of technical as well as environmental performance.

In the DoP the manufacturer declares a statement about the release of dangerous substances to give information about the protection of the environment during the working life of the product. To determine the release of dangerous substances to the environment, several harmonised leaching tests can be used depending on the type of product tested.

For granular construction products, a percolation test (column test CEN/TS 16637-3) is used.

For monolithic, plate-like or sheet like construction products the horizontal dynamic surface leaching test (tank-test CEN/TS 16637-2) is used.

The leaching characteristics of the Lapinus® WM (Rockflow) product is obtained by both tests (tank-test as well as column test). The column test as leaching test for the Lapinus® WM (Rockflow) product is used to give information about the possible maximum emission of elements after grinding to the desired fineness of < 4 mm before testing. Based on the results of this leaching test the relevant elements for additional testing on the plate-like product is performed by the tanktest.

In the Netherlands leaching tests and assessment of leaching behaviour of building products are done for more than 20 years. To determine the leaching behaviour the same leaching tests (column as well as tank test) are used. All primary as well as recycling products (granular or shaped) must meet the Dutch limits for release of 15 heavy metals (antimony (Sb), arsenic (As), barium (Ba), cadmium (Cd) chromium (Cr), cobalt (Co), copper (Cu), mercury (Hg), lead (Pb) molybdenum (Mo), nickel (Ni), selenium (Se), tin (Sn), vanadium (V), zinc (Zn)) and 4 salts (fluoride (F), chloride (Cl), bromide (Br) and sulphate (SO₄)).

In addition to the limits for the leaching of inorganic compounds limits are also set for the content of organic components: volatile organic hydrocarbons (benzene, toluene, ethylbenzene, xylenes), phenol and the semi-volatile hydrocarbons (mineral oil, poly-aromatic hydrocarbons (PAH), poly-chlorinated biphenyl's (PCB's)).

The Lapinus® WM (Rockflow) product is designated as a construction product (based on the total content of silica, calcium and aluminum) under the action of the Dutch Soil Quality Decree.

In the Dutch Soil Quality Decree leaching limits are set for all the 19 elements stated. The leaching limits of the elements are based on the fact that no increase of more than 1% of the element in the soil should occur within 100 years by using the building product in or upon the Dutch soil or in surface water.

In this Dutch Soil Quality Decree, the limits in the law for the use of fertilizers, the law for soil protection and the law to protect surface waters are incorporated. This has the additional benefit that if the product complies to the Dutch Soil Quality Decree all other legislation on environmental aspects of the building product are fulfilled.

Environmental declaration of performance

SGS INTRON has sampled and tested the Lapinus® WM (Rockflow) product of 6 individual batches until now. Each batch consist of 480 stone wool elements. The sampling was performed by an accredited SGS INTRON sampler notified by the Dutch Accreditation Body (RVA). The SGS INTRON Laboratory performed the leaching tests under the NEN-EN-ISO 17025 accreditation stated in the Dutch accreditation program (AP04).

All 6 tested batches comply with the environmental limits for shaped products in the (SQD).

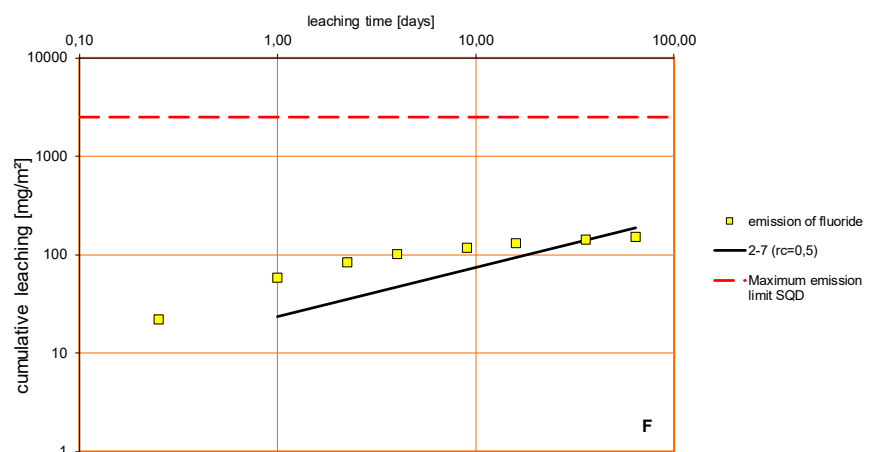
All 6 tested batches comply with the limits for organic content and leaching of inorganic compounds set for unbound and shaped products. Until now, the environmental quality according to the SQD is demonstrated by batch-tests. Later on, an environmental declaration of performance will be provided by SGS INTRON Certification as notified body. This environmental declaration of performance must be based on a minimum of 10 batch-tests.

A worst-case approach of leaching is also performed by a column test were the Lapinus® WM (Rockflow) product is crushed to a fineness < 4 mm. For all the elements of interest no leaching or very slight leaching, 2% of the leaching limit for crushed material) is determined except for fluoride (F) and sulphate (SO₄). For these 2 elements, the additional leaching is tested for all 6 batches by the tank test.

For the shaped Lapinus® WM (Rockflow) product there is only a little leaching determined for fluoride (F) and sulphate (SO₄) above the detection limit of the method used. The average leaching of fluoride analysed in the 6 batches is only 4% of the maximum emission value for fluoride (F) set in the SQD. For sulphate, the average leaching is only 0,5 % of the maximum emission value.

In the chart the emission of fluoride is presented against the maximum emission value for fluoride in de SQD. The chart also shows that after a short period (several days) depletion (no increase in leaching) of fluoride is observed.

Leaching behaviour of fluoride (F) from Rockflow



An environmental calculation is done based upon the data of the individual 6 batch tests. In this calculation the average environmental quality and the standard deviation of the data are used. The standard deviation between the 6 batches appears to be very small which implicates that an environmental quality declaration to the Dutch Soil Quality Decree is expected to be very well possible.

After issuing of this declaration no further environmental batch testing will be needed in the future if the present quality is maintained.

In the prospective DoP the release of dangerous substances can be declared by WTF (without further testing).

Leaching in a European perspective.

With respect to other European member states only Belgium (Flanders and Wallonia) and France have maximum emission limits for this product based on the same harmonized European test methods (column and/or tank test). Only in Flanders there are emission limits set for shaped products. These are significantly lower than the emission limits set in the SQD in the Netherlands.

The Lapinus® WM (Rockflow) product also complies with these emission limits of Flanders.

Additional information based on the dynamic surface leaching test (tank test):

- very little change in acidity/alkalinity. The pH of the water increases slightly to 7,5 – 8,5. No damage to micro-organisms in soil or water is expected due to this slight change in pH.
- This slight pH change by the stone wool product can be compared to the pH change due to the use of concrete products, where the pH changes to 12. Even this increase in pH for concrete products occurs only in the near vicinity of the product and will be neutralized by the acidity of the soil and carbonation by air. The pH-change from the concrete products in outdoor application is never been an issue, so this applies also to the stone wool product.

Durability, circularity and end of life.

During the tank test no disintegration and no or very little mass loss is detected. According to the Dutch Soil Quality Decree the Lapinus® WM (Rockflow) product is durable and complies to a shape building product since the obtained loss in mass is smaller than the stated limit of 30 g/m².



Due to the plate-like shape of the Lapinus® WM (Rockflow) product is it easy to install and after service life at the original location it can easily be installed in a new construction.

The product has a very fine porous structure that prevent sand particles to penetrate the product. This additional property also ensures a proper reinstallation without mixing of the product with the surrounding sand or soil.

Since there is no disintegration of the product during the first life-cycle the product can be reused in a second life cycle. The working life in the intended use is 50 years.