



Surface leaching from Synthetic Membranes

ESWA / SGS Project:

Synthetic membranes [Plastic sheets, as described in CEN TC254] for roof waterproofing are construction products intended to protect buildings and constructions from rain water and hence by nature be in contact with rain water.

Within the framework of the European Construction Products Regulation (EU No 305/2011), CEN TC 351 adopt assessment methods of construction products on the release of dangerous substances. The test method is described in document CEN/TS 16637-2 (Assessment of release of dangerous substances. Part 2: Horizontal dynamic surface leaching test).

Synthetic membranes for roof waterproofing are designed for long-life water tightness. An average reference service life up to 30 years is to be expected. A general property of these synthetic membranes is that they do not release relevant amounts of their components in a wet environment. If there is a release this will be heavily diluted by rainwater. Different tests revealed also that the synthetic membrane absorbs external substances during the contact with rainwater, interpreted as contamination of the original product.

Several EU member states have voluntary technical approvals. Some have included environmental aspects based on declaration of components and/or leaching of components. According our knowledge there is no legal requirement to test or declare the leaching of components of synthetic membranes. ESWA being the European manufacturer association for synthetic membrane for waterproofing launched a scientific study to evaluate the limits of the leaching test (CEN/TS 16637-2) for their products. ESWA contacted the Dutch branch of the Swiss company SGS (Société Générale de Surveillance) for advice, for witness and for execution of the tests. SGS specialists are actively involved in the work of TC351. Another reason for choosing SGS is that they have long-term experience with certification and auditing of ESWA products and production facilities.

The ESWA scientific study incorporates following parameters: the recipe, processing and UV ageing. Synthetic membrane samples based on different polymers like PVC, PP copolymer, PIB, EVA; different plasticizers like DIDP, DINP, DPHP, polymeric; different thermal stabilizers like CaZn, BaZn, Hals; different fire retarders like Sb₂O₃, Al (OH)₃; mineral filler like CaCO₃; UV protection like TiO₂, carbon black, UV absorbers, antioxidants; others like biocide. ESWA underline that all members comply with European regulations (Reach) and that their products all have a CE marking. Previous recipes and recycled material are considered through incorporating DEHP, Pb, Cd in some samples. ESWA under the umbrella of VinylPlus has had a recycling system in place since 2003.

Auditors of SGS witnessed the recipe, the specific batches of the different components and the industrial production of the different samples. For each component a material safety data sheet and certificate of analysis was made available.

The samples were submitted to the SGS accredited laboratory in the Netherlands. According to the test procedure (CEN/TS 16637-2) the eluate fractions are analysed for the presence of 15 metals, 4 anions and 5 phthalates, independent whether the components were present in the recipe or present by contamination.



The main results of this scientific study are:

The concentration of the analysed components of the eluate are at a very low level and well below 0,1 % (weight by weight), being the threshold concentration for substances of the REACH candidate list. Pre-aged (100 h QUV) samples of membrane, representative for installation and new samples were tested.

Because there are today no harmonized requirements in Europe the detected release is compared with the limit values from the Dutch Soil Quality Decree. The only component detected with risk of leaching was Zink (Zn) at highest measured level below 15 % of any maximum approved value. The pre-aged samples leached significantly less than new samples.

The leaching results were dominated by external impurities and contaminations from air etc.

ESWA recommends:

The requirement of leaching for all synthetic membranes should be based on declared content rather than on leaching test results.

ESWA requires a limitation for building products about leaching tests as proposed by TC2545C2 and/or in some national regulations. If a synthetic membrane has a minor content of water-soluble inorganic components a leaching test (according CEN/TS 16637-2) shall not be required.