European
Federation of
Concrete Admixtures
Associations

EFCA-Seal of Environmental Quality for Concrete and Mortar Admixtures

1 Aim of the EFCA-Seal of Environmental Quality

The EFCA-Seal of Environmental Quality (EFCA EQ-Seal) specifies environmental criteria for concrete and mortar admixtures. The aim is to minimise the effect on man and the environment arising from the use of concrete admixtures. The EFCA EQ-Seal is awarded to products that have no foreseeable effects on the environment and are, therefore, regarded to be environmentally compatible. Aspects from the entire life cycle of concrete admixtures are taken into consideration. Products that carry the EFCA EQ-Seal fulfil the following requirements:

- They are neither classified as toxic nor harmful to humans or the environment.
- They have neither explosive or inflammable effects nor are a fire hazard when properly used.
- They have neither corrosive, irritant nor sensitising effects when properly used.
- Building materials that contain products carrying the EFCA EQ-Seal are inert materials in accordance with the respective legislation for waste disposal and can be recycled.
- The packaging has been optimised.

2 Criteria for Awarding the EFCA EQ-Seal

2.1 Criteria concerning prohibited substances

The following substances must not be intentionally added as ingredients:

- toxic, persistent, and bioaccumulating compounds, e.g. chlorinated organic compounds according to the Stockholm Convention on Persistent Organic Pollutants from 22 May 2001
- priority substances in the field of water policy according to Decision No 2455/2001/EC of the European Parliament and of the Council of 20 November 2001 establishing the list of priority substances in the field of water policy and amending Directive 2000/60/EC
- substances from the current OSPAR-List of Chemicals for Priority Action according to the OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic from 22 September 1992
- organic compounds that cause adverse health effects by changes in endocrine function according to Commission Staff Working Document on Implementation of the Community Strategy for Endocrine Disrupters (COM (1999) 706) - a range of substances suspected of interfering with the hormone systems of humans and wildlife (SEC(2004) 1372, Tables 1, 2 and 3 of the document).

The product contains less than the concentration limits of the following substances:

- biocides < 0.5%
- formaldehyde < 0.5% (method using dinitrophenylhydrazine with HPLC)

Products intended for interior use or that could end up in building interiors, contain no volatile organic compounds (boiling point < 150 °C at 1013.25 mbar and vapour pressure >1 mbar at 20 °C).

2.2 Criteria concerning classification of the products

- The products have been tested and classified in accordance with the European chemical legislation (directives 67/548/EEC and 1999/45/EC). The safety data sheets are completely and correctly filled out in accordance with directive 91/155/EEC and 2001/58/EC (second amendment of 91/155/EEC).

- The products shall not have been assigned any R-phrase at the time of applying for the EFCA EQ-Seal, indicating explosive or flammable properties and toxic or harmful effects to humans or the environment according to Directive 67/548/EEC and Directive 1999/45/EC. The following R-phrases are considered relevant in this respect: R2, R3, R10, R11, R12, R15, R17, R20, R21, R22, R23, R24, R25, R26, R27, R28, R33, R39, R40, R45, R46, R48, R49, R50, R51, R52, R53, R54, R55, R56, R57, R58, R59, R60, R61, R62, R63, R64, R65, R68 and combinations thereof (see annex B for wording of R-phrases).

- If a product is classified with one of the following R-phrases, a detailed examination must follow (see section 3.2): R1, R4, R5, R6, R7, R8, R9, R14, R16, R18, R19, R30, R31, R32.

- If a product is classified as corrosive, irritant or sensitising, a detailed examination must follow (see section 3.2). Accelerators for sprayed concrete must not be corrosive according to the European chemical legislation.

2.3 Criteria concerning waste management and packaging

Concrete that contains products carrying the EFCA EQ-Seal has to fulfil the criteria for waste acceptable at landfills for inert materials. For the EFCA EQ-Seal it has been specified that the contents in the leachate are below the corresponding limit values of the Swiss Technical Ordinance on Waste (TOW) by at least a factor two. The limit values for inert materials as specified in the TOW form the practical basis for the classification of recycling material. The limit value for inert materials regarding DOC, as specified in the TOW, is more stringent than the criteria specified in the EU. For inorganic parameters such as ammonia, nitrite and phosphate no leaching limit values are specified in the EU. The difference to the limit values as defined in the respective legal documents (for DOC: a factor of 2 in Switzerland and a factor of 5 in the EU) can be explained as follows:

- Concrete from demolition works contains various chemical products such as binders, glues, dyes, polymers, etc.). Therefore, limit values should never be exploited by only 1 product.
- If material is used after demolition for instance as road foundations, more stringent criteria should be applied as for landfilling.
- Nowadays, a major fraction of concrete is recycled. It has to be expected that the requirements for the quality of recycling material will be more stringent in the future. Therefore, the emissions from the concrete should be minimal.

Leachate limit values for concrete containing admixtures carrying the EFCA EQ-Seal:

- Organic compounds in the leachate < 10 mg/l (DOC)
- Content of ammonia in the leachate: < 0.25 mg N/l
- Content of nitrite in the leachate: < 0.05 mg NO_2/l
- Content of phosphate in the leachate: < 0.5 mg P/l

The packaging fulfils international transport regulations (ADR/RID/IMDG/IATA). Amounts of product in excess of 50 kg are supplied in recyclable/reusable containers. The disposal requirements are included in the safety data sheets. A telephone number is given on the container, in the technical instructions, or on the safety data sheets, where information concerning disposal can be obtained.

3 Test Procedure

The documents (application form and safety data sheet) are sent to the independent control body which checks the completeness of the application forms and the enclosed documents. The test procedure is carried out in two stages (see flow chart in annex A).

3.1 First stage: Assessment on the basis of the ingredients

The assessment is based on the data from the safety data sheets and additional data of the ingredients.

⇨ In case a product meets all criteria, it is regarded to be environmentally compatible and it is awarded with the EFCA EQ-Seal. The assessment is finished.

⇨ In case a product does not meet all criteria, a detailed examination of the safety measures described in the safety data sheet is performed (see second stage).

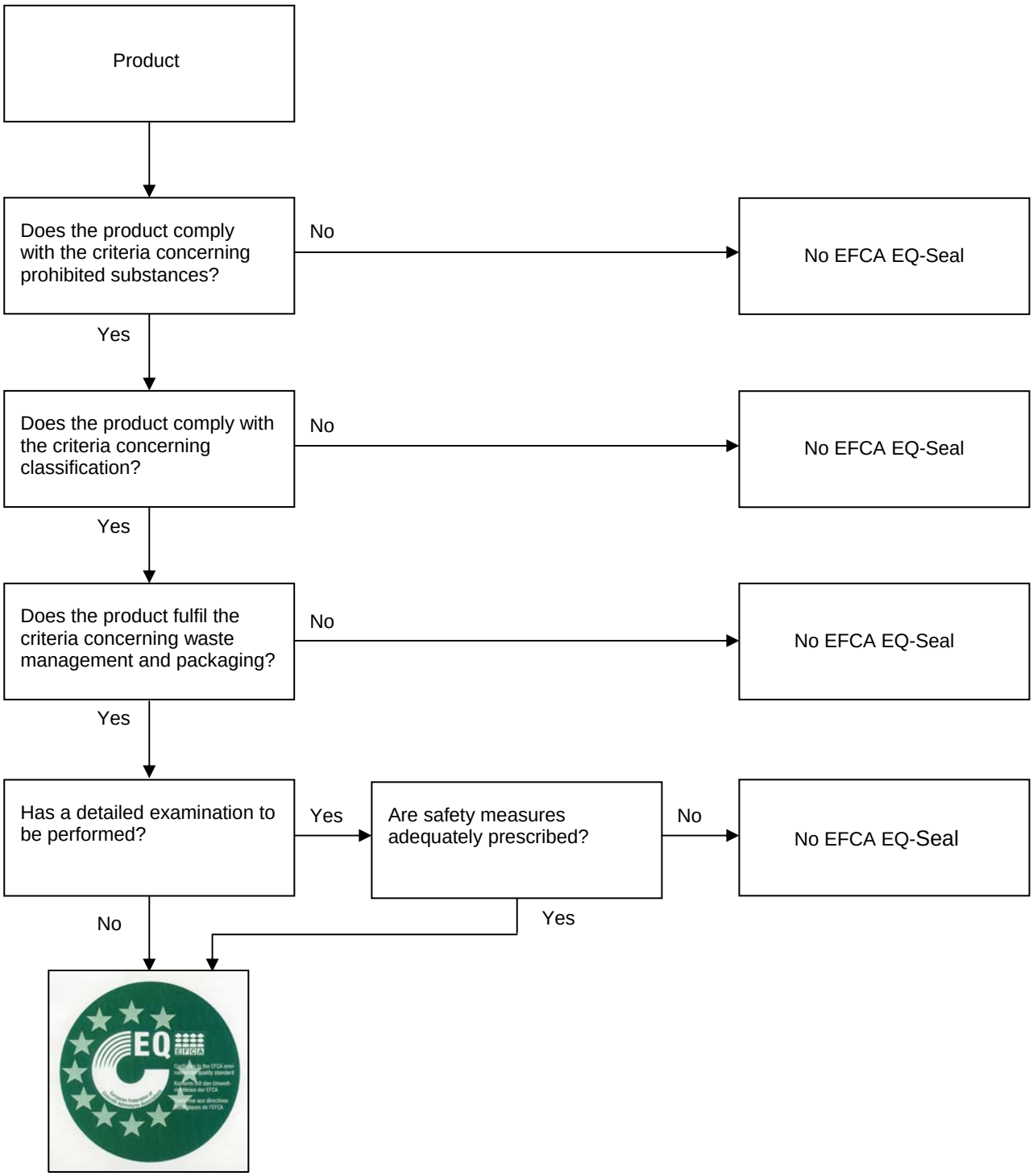
3.2 Second stage: Detailed examination of the safety measures taken

If a product does not fulfil the criteria regarding prohibited substances, classification or waste management and packaging, the EFCA EQ-Seal is definitely not awarded.

For products which have corrosive, irritating and sensitising effects and/or are classified with one of the R-phrases R1, R4, R5, R6, R7, R8, R9, R14, R16, R18, R19, R30, R31 or R32 (see section 2.2), a detailed examination of the safety measures must follow. The safety measures listed on the safety data sheets are examined regarding their completeness and effectiveness. The recommended measures on the safety data sheet must prevent dangerous impacts on human health and the environment during the entire life cycle of the product.

⇨ If the safety measures are adequately prescribed, the EFCA EQ-Seal is awarded.

Annex A - Flow Chart of the Test Procedure



Annex B - Wording of Risk-Phrases

R1	Explosive when dry
R2	Risk of explosion by shock, friction, fire or other sources of ignition
R3	Extreme risk of explosion by shock, friction, fire or other sources of ignition
R4	Forms very sensitive explosive metallic compounds
R5	Heating may cause an explosion
R6	Explosive with or without contact with air
R7	May cause fire
R8	Contact with combustible material may cause fire
R9	Explosive when mixed with combustible material
R10	Flammable
R11	Highly flammable
R12	Extremely flammable
R14	Reacts violently with water
R15	Contact with water liberates extremely flammable gases
R16	Explosive when mixed with oxidising substances
R17	Spontaneously flammable in air
R18	In use, may form flammable/explosive vapour-air mixture
R19	May form explosive peroxides
R20	Harmful by inhalation
R21	Harmful in contact with skin
R22	Harmful if swallowed
R23	Toxic by inhalation
R24	Toxic in contact with skin
R25	Toxic if swallowed
R26	Very toxic by inhalation
R27	Very toxic in contact with skin
R28	Very toxic if swallowed
R30	Can become highly flammable in use
R31	Contact with acids liberates toxic gas
R32	Contact with acids liberates very toxic gas
R33	Danger of cumulative effects
R39	Danger of very serious irreversible effects
R40	Limited evidence of a carcinogenic effect
R45	May cause cancer
R46	May cause heritable genetic damage
R48	Danger of serious damage to health by prolonged exposure
R49	May cause cancer by inhalation
R50	Very toxic to aquatic organisms
R51	Toxic to aquatic organisms
R52	Harmful to aquatic organisms
R53	May cause long-term adverse effects in the aquatic environment
R54	Toxic to flora
R55	Toxic to fauna
R56	Toxic to soil organisms
R57	Toxic to bees
R58	May cause long-term adverse effects in the environment
R59	Dangerous for the ozone layer
R60	May impair fertility
R61	May cause harm to the unborn child
R62	Possible risk of impaired fertility
R63	Possible risk of harm to the unborn child
R64	May cause harm to breast-fed babies
R65	Harmful: may cause lung damage if swallowed
R68	Possible risk of irreversible effects