LEUNA-Harze GmbH

Product Range

EPILOX®

Binder - Systems for the Construction Industry

- Binding Systems
- Guideline Formulations:

Impregnation Resins
Primers
Surfacer
Mortars
Self-Levelling Coatings
Sealings
Specialty Systems

INNOVATIVE SERVICE

FOR THE INDUSTRIE

Epilox® - Systems - Competence for the Building Industry

Content **page**

.

LEUNA-Harze GmbH
PF 43, Bau 6619
D - 06233 Leuna
Phone: 03461-43-3094, Fax: 03461-43-6543
E-mail : wendt.harze@leuna.de
Website : http://www.leuna-harze.de

1 Introduction

The use of epoxy resins in construction industry meets demands on construction of buildings which cannot be realized with customary methods and customary building materials unless a high expenditure is involved.

The use of Epilox® - systems fulfils demands and regulations for the construction of new buildings and renovation of industrial and residential buildings.

Basic conditions for the successful use of Epilox® - systems and further coating materials have to be considered as follows:

- analysis of the given state,
- preparation of the base surface,
- selection of suitable systems and
- processing subject to temperature and humidity.

Particularly, renovation of houses require careful analysis of the buildings. The base surface has always to be inspected for defective and high-risk areas. Defective spots, contaminations and loose parts are removed by wet-blasting, sand-blasting or milling. If layers of higher thickness have to be removed, it is recommendable to start with rough abrasion followed by finer treatments. In this way, damages of deeper areas can be avoided. If the required strength of the base surface cannot be achieved, special measures for strengthening have to be applied.

High performance coatings are realized by the combination of different Epilox® - systems for the single layers. The properties of each layer are determined by the requirements of the properties of the floor. Each layer contributes therefore to the overall functionality.

As it is known, concrete bases tend to crack formation. For this reason, crack-bridging layers have to be applied. As far as expansion joints are concerned, the joints are to be filled with a flexible pouring material, which absorbs deformations and protects following layers. Existing cracks are completely filled with Epilox® - systems. These systems absorb effecting forces and are mostly tight. Applicable processing method is selected according to given circumstances (e.g. thrickling, injection).

An appropriate processing of Epilox® - systems is necessary for a successful application. Keeping the given mix ratio and proper mix method have influences on the result. Equivalent weights of resins and hardeners are included in the data sheets for each product. If a certain quantity of an epoxy resin is given (y gramme), the quantity of needed hardener (x gramme) is simply calculated by using the equivalent weights (refer also to our products range):

$$x\ \text{gramme hardener} = \frac{y\ \text{gramme resin} \cdot \text{amine equivalent weight of the hardner}}{\text{epoxy equivalent weight of the resin}}$$

LEUNA-Harze GmbH
PF 43, Bau 6619
D - 06233 Leuna
Phone: 03461-43-3094, Fax: 03461-43-6543
E-mail : wendt.harze@leuna.de
Website : http://www.leuna-harze.de

For this purpose, electrically driven and controllable agitators are used. Care has to be taken that the agitator blade is completely immersed into the compound mix. Adjust the speed so that air is not drawn into the mixture. Mixing and any modifying shall be finished until a remarkable heat development occurs.

The selection of a coating system (resin and hardener) depends on the demands on the coated surface. The number and thicknesses of the layers of a coating are given in the regulations:

Richtlinien des "Deutschen Ausschuss für Stahlbeton" (DafStB) und des "Deutschen Institut für Bautechnik" (DIB) für Oberflächenschutzsysteme. Main objectives are:

- good adhesion to the surface and between each layer,
- consistent layer thicknesses and
- no defects e.g. voids or blisters in layers

to provide a coating with desired properties.

Definitions

Coating: Application of one or several layers on a base surface to form a new set of characteristics in comparison to the former surface.

Concrete: Minerally curing, two-component system consisting of cement binder and additives. Curing results in cement stone with a dense structure.

Screed: Coating subject to foot traffic, which is applied to a base surface as loadable layer. Top layers have to be applied.

Mortar: Filled binder which is either self-levelling (low filled) or filler with high filler level.

Impregnation: Shall penetrate into the base surface, cure and harden the surface and/or give repelling properties without closing the pores.

Primer: Wetting of the surface and bonding layer for following layers.

Coat: Consists of one or more layers of the same composition with certain functions.

Layer: Application made within one working procedure.

Sealing: Final, colourless or coloured part of the coating with total saturation and film formation at the surface.

LEUNA-Harze GmbH
PF 43, Bau 6619
D - 06233 Leuna
Phone: 03461-43-3094, Fax: 03461-43-6543
E-mail : wendt.harze@leuna.de
Website : http://www.leuna-harze.de

A typical composition of a coating consists of consecutive layers:

1. impregnation
2. priming (sprinkling), possibly reinforced
3. 1. trowel
4. 2. trowel or self-levelling (then sprinkling)
5. top coat
6. matting

It is often not necessary to apply such a complex coating. Sometimes, certain layers may not be applied in dependence on the state of the base surface and on desired properties of the coating.

2 Selection of binder systems

Formulations given in this brochure are only guideline examples and are not a guarantee for described properties or suitability for a certain application.

The user has to perform own tests for prooving desired properties. Special requirements of a coating have to be certified by established institutions according to valid recommendations and regulations.

It is possible to exchange products of the given formulations by further Epilox® - products of our product range with similar properties. In such cases, processing conditions (mix ratio, reactivity, vicosity) and final properties of cured formulations may change and have to be proofed by own tests.

Changes of the present offer may occur in dependence on technical progress. We will inform you of improved products or new types upon request.

LEUNA-Harze GmbH
PF 43, Bau 6619
D - 06233 Leuna
Phone: 03461-43-3094, Fax: 03461-43-6543
E-mail : wendt.harze@leuna.de
Website : http://www.leuna-harze.de

3 Guideline formulations

3.1 Impregnations

Impregnations strengthen the basic ground to permit a good adhesion of following layers. The binder system is selected according to the required mix viscosity < 300 mPa·s.

3.1.1 Impregnation with deep penetration

Epilox® T 19-34/400
Epilox® - hardener H 10-69
Mix Ratio: 100 g Epilox® T 19-34/400 + 27 g Epilox® - hardener H 10-69
Pot Life (200 g, 23 °C): 25 min (until 40 °C)

3.1.2 Impregnation with weak strengthening, reasonable alternative

Epilox® T 19-38/500
Epilox® - hardener H 10-32
Mix Ratio: 100 g Epilox® T 19-38/500 + 44 g Epilox® - hardener H 10-32
Pot Life (200 g, 23 °C): 35 min (until 40 °C)

3.2 Primers

Primers have a strengthening effect and guarantee a good adhesion to the following layer (filler, mortar or self-levelling coating).

3.2.1 All-Purpose primer, accelerated, weak flexibilization

Epilox® T 19-38/700
Epilox® - hardener H 10-30
Mix Ratio: 100 g Epilox® T 19-38/700 + 50 g Epilox® - hardener H 10-30
Pot Life (200 g, 23 °C): 12 min (until 40 °C)

3.2.2 All-Purpose primer, reduced reactivity, weak flexibilization

Epilox® T 19-38/700
Epilox® - hardener H 10-33
Mix Ratio: 100 g Epilox® T 19-38/700 + 50 g Epilox® - hardener H 10-33
Pot Life (200 g, 23 °C): 27 min (until 40 °C)

LEUNA-Harze GmbH
PF 43, Bau 6619
D - 06233 Leuna
Phone: 03461-43-3094, Fax: 03461-43-6543
E-mail : wendt.harze@leuna.de
Website : http://www.leuna-harze.de

3.2.3 Primer with good resistance to heavy mechanical loads

Epilox® T 19-27
Epilox® - hardener H 10-32
Mix Ratio: 100 g Epilox® T 19-27 + 47 g Epilox® - hardener H 10-32
Pot Life (200 g, 23 °C): 35 min (until 40 °C)

3.2.4 Primer for wet surfaces

Epilox® T 19-38/1000
Epilox® - hardener M 715
Mix Ratio: 100 g Epilox® T 19-38/1000 + 100 g Epilox® - hardener M 715
Pot Life (200 g, 23 °C): 45 min (until 40 °C)

3.3. Surfacer

Surfacer are formulated from a binder system and quartz material (sand or flour). The mix ratio is 3 to 4 pbw quartz material to 1 pbw binder (resin and hardener). The quartz material is often offered by the supplier as a ready-to-use mixture. The grain size should be from 0 to 1 mm.

3.3.1 Surfacer wit low filler level, increased reactivity

Epilox® T 19-27
Epilox® - hardener H 10-30
Mix Ratio: 100 g Epilox® T 19-27 + 52 g Epilox® - hardener H 10-30
Pot Life (200 g, 23 °C): 40 min (until 40 °C, 3 : 1 filled)

3.3.2 Surfacer with medium filler level, low reactivity

Epilox® T 19-38/700
Epilox® - hardener H 10-33
Mix Ratio: 100 g Epilox® T 19-38/700 + 50 g Epilox® - hardener H 10-33
Pot Life (200 g, 23 °C): 60 min (until 40 °C, 3,5 : 1 filled)

3.3.3 Surfacer with high filler level, increased reactivity

Epilox® T 19-32/1000
Epilox® - hardener H 10-36
Mix Ratio: 100 g Epilox® T 19-32/1000 + 50 g Epilox® - hardener H 10-36
Pot Life (200 g, 23 °C): 45 min (until 40 °C, 4 : 1 filled)

LEUNA-Harze GmbH
PF 43, Bau 6619
D - 06233 Leuna
Phone: 03461-43-3094, Fax: 03461-43-6543
E-mail : wendt.harze@leuna.de
Website : http://www.leuna-harze.de

3.4 Mortars

Mortars are highly filled mixtures of a binder system and quartz material which has passed a defined sieve size. The quantity of the binder is from 6 to 15 pbw. This and the grain size of the quartz material determine the characteristics of the mortar. A mortar can be formulated as a dense, impermeable layer or as a porous, slightly permeable layer. Mortars should be applied onto a fresh primer layer to provide a good bonding.

3.4.1 Mortar for heavy mechanical loads, porous

Epilox® T 19-32/1000
Epilox® - hardener H 10-30
Mix Ratio: 100 g Epilox® T 19-32/1000 + 52 g Epilox® - hardener H 10-30
Pot Life (200 g, 23 °C): 70 min (16 : 1 filled)
(requires an intermediate layer if a following layer shall be applied)

3.4.2 Mortar for medium and heavy mechanical loads

Epilox® T 19-32/1000
Epilox® - hardener H 10-36
Mix Ratio: 100 g Epilox® T 19-32 + 50 g Epilox® - hardener H 10-36
Pot Life (200 g, 23 °C): 75 min (14 : 1 filled)
(requires an intermediate layer, if a following layer shall be applied)

3.4.3 Mortar for weak loads

Epilox® T 19-38/700
Epilox® - hardener H 10-33
Mix Ratio: 100 g Epilox® T 19-38/700 + 50 g Epilox® - hardener H 10-33
Pot Life (200 g, 23 °C): 100 min (8 : 1 filled)

LEUNA-Harze GmbH
PF 43, Bau 6619
D - 06233 Leuna
Phone: 03461-43-3094, Fax: 03461-43-6543
E-mail : wendt.harze@leuna.de
Website : http://www.leuna-harze.de

3.5 Self-Levelling coatings

A self-levelling coating is a binder system with low filler level which shows self-levelling effect after its application. This coating is often coloured and contains a deaeration agent because it is the final layer of a coating (top coat). The daeration agent prevents blister formation during mix procedure, during application of the coating and during curing process. Further measures, e.g. rolling with spike roller, may be necessary.

The selection of the binder system depends on its own colour, its yellowing tendency and its curing procedure during processing. Selection of the fillers, mostly quartz sand and quartz flour depends on the thickness of the finished coating. The diameter of the biggest grain should not exceed one third of the thickness of the coating.

3.5.1 Self-Levelling coating, accelerated curing

Epilox® T 19-38/700	
Epilox® - hardener H 10-30	
Mix Ratio:	100 g Epilox® T 19-38/700 + 50 g Epilox® - hardener H 10-30
Pot Life (200 g, 23 °C):	25 min (1 : 1.6 filled)

3.5.2 Self-Levelling coating, retarded curing

Epilox® T 19-38/700	
Epilox® - hardener H 10-33	
Mix Ratio:	100 g Epilox® T 19-38/700 + 50 g Epilox® - hardener H 10-33
Pot Life (200 g, 23 °C):	40 min (1 : 1.6 filled)

3.5.3 Self-Levelling coating, reduced yellowing tendency

Epilox® T 19-38/700	
Epilox® - hardener H 10-34	
Mix Ratio:	100 g Epilox® T 19-38/700 + 50 g Epilox® - hardener H 10-34
Pot Life (200 g, 23 °C):	35 min (1 : 1.6 filled)

LEUNA-Harze GmbH
PF 43, Bau 6619
D - 06233 Leuna
Phone: 03461-43-3094, Fax: 03461-43-6543
E-mail : wendt.harze@leuna.de
Website : http://www.leuna-harze.de

3.6 Sealings

Sealings provide an abrasion-resistant and smooth surface which can easily be cleaned. Systems with low yellowing tendency should be applied for outside use or for floors in rooms with sunlight exposure. Decorative coatings contain pigments and colouring pastes. Non-skid coatings are formulated with thixotroping agents. In this way, the free surface of the filler is completely covered before sealing.

3.6.1 Sealing, medium reactivity, low yellowing tendency

Epilox® T 19-38/1000	
Epilox® - hardener H 10-34	
Mix Ratio:	100 g Epilox® T 19-38/700 + 50 g Epilox® - hardener H 10-30
Pot Life (200 g, 23 °C):	22 min (until 40 °C)

3.6.2 Sealing, high reactivity, early water resistance

Epilox® T 19-34/700	
Epilox® - hardener H 10-38	
Mix Ratio:	100 g Epilox® T 19-34/700 + 50 g Epilox® - hardener H 10-39
Pot Life (200 g, 23 °C):	15 min (until 40 °C)

3.6.3 Sealing, good chemical resistance

Epilox® T 19-69	
Epilox® - hardener H 10-69	
Mix Ratio:	100 g Epilox® T 19-69 + 24 g Epilox® - hardener H 10-69
Pot Life (200 g, 23 °C):	15 min (until 40 °C)

LEUNA-Harze GmbH
PF 43, Bau 6619
D - 06233 Leuna
Phone: 03461-43-3094, Fax: 03461-43-6543
E-mail : wendt.harze@leuna.de
Website : http://www.leuna-harze.de

3.7 Specialty systems

Binder systems are used for standard applications but also for the formulation of coatings with low yellowing tendency and good chemical resistance. In the following chapters it is reported about binder systems for use in the foodstuffs sector, about flexible and aqueous systems.

3.7.1 Binders for floorings in the foodstuffs sector

Binders in the foodstuffs sector are used for floorings in bakeries, butcher's shops etc. It must be guaranteed that volatile compounds from cured systems doesn't move through the air into the foodstuff. Such binder systems are tested by a sensory test. The system must be approved by a certificate from an established institution.

A: Epilox® T 19-36/1000
Epilox® - hardener H 10-32
Mix Ratio: 100 g Epilox® T 19-36/1000 + 43 g Epilox® - hardener H 10-32
Pot Life (200 g, 23 °C): 35 min (until 40 °C)

B: Epilox® T 19-36/1000
Epilox® - hardener H 10-31
Epilox® - hardener H 10-40
Mix Ratio: 100 g Epilox® T 19-36/1000 +
30 g Epilox® - hardener H 10-31 + 25 g Epilox® - hardener H 10-40
Pot Life (200 g, 23 °C): 30 min (until 40 °C)

3.7.2 Flexible and flexibilized Epilox® - systems

The following binder systems may be used for crack-bridging coatings as well as for repairs of elastic floorings.

A: Flexible binders, impact resistance at low temperature

Epilox® E 50-20
Epilox® - hardener H 10-40
Mix Ratio: 100 g Epilox® E 50-20 + 21 g Epilox® - hardener H 10-40
Pot Life (100 g, 23 °C): 35 min (until 40 °C)

B: Flexible binder, preferably for intermediate layers

Epilox® T 19-38/700
Epilox® - hardener M 773
Mix Ratio: 100 g Epilox® T 19-38/700 + 46 g Epilox® - hardener M 773
Pot Life (100, 23 °C): 15 min (until 40 °C)

LEUNA-Harze GmbH
PF 43, Bau 6619
D - 06233 Leuna
Phone: 03461-43-3094, Fax: 03461-43-6543
E-mail : wendt.harze@leuna.de
Website : http://www.leuna-harze.de

The above mentioned binder systems may be used according to demands of ZTV-RISS (”Herstellung einer begrenzt dehnfähigen Verbindung zweier Rissufer“ (Dehnungsriss bzw. -fuge)). Relative elongations of cured systems are ca 80 % at room temperature.

Flexibilized binder systems achieve less relative elongations as flexible systems but are able to absorb much higher stresses.

C: Flexibilized binder, impact resistance at cold temperature

Epilox® TE 19-50
Epilox® - hardener H 10-30

Mix Ratio:	100 g Epilox® TE 19-50 + 36 g Epilox® - hardener H 10-30
Pot Life (100 g, 23 °C):	20 min (until 40 °C)

D: Flexibilized binder

Epilox® M 711
Epilox® - hardener H 10-30

Mix Ratio:	100 g Epilox® M 711 + 48 g Epilox® - hardener H 10-30
Pot Life (100 g, 23 °C):	15 min (until 40 °C)

3.7.3 Aqueous Epilox® - systems

Epilox® - hardeners M 715 and H 12-01 are able to emulsify all liquid epoxy resins. The use case determines the choice of the binder system. Epilox® - hardeners M 715 and H 12-01 are used in systems for primers and bonding layers at temperatures down to + 15 °C. The latter may be used with suitable epoxy resins at temperatures down to + 10 °C.

The following binder formulations for primers and bonding layers are adjusted to the desired processing viscosity by adding of water.

A: Primer/Bonding layer with good adhesion

Epilox® T 19-32/1000
Epilox® - hardener M 715

Mix Ratio:	100	g Epilox® T 19-32/1000 + 100 g Epilox®- hardener M 715
Pot Life:	45	min (not visible)
Adhesive Strength (Concrete 55):	1.8	N/mm^2 after 2 days
	2.1	N/mm^2 after 8 days

LEUNA-Harze GmbH
PF 43, Bau 6619
D - 06233 Leuna
Phone: 03461-43-3094, Fax: 03461-43-6543
E-mail : wendt.harze@leuna.de
Website : http://www.leuna-harze.de

B: Primer/Bonding layer

Epilox® T 19-27
Epilox® - hardener H 12-01
Mix Ratio: 100 g Epilox® T 19-27 + 115 g Epilox® - hardener H 12-01
Pot Life: 60 min (visible end by rise of viscosity)

C: Primer, flexibilized

Epilox® TE 19-50
Epilox® - hardener M 715
Mix Ratio: 100 g Epilox® TE 19-50 + 75 g Epilox® - hardener M 715
Pot Life: 60 min (end not visible)

The addition of a binder to a cement-binder-water mixture results in the change of the consistency of the mixture. The water-cement number may be reduced clearly. The mixture becomes plastic and soft at a water-cement number of 0.4.

LEUNA-Harze GmbH
PF 43, Bau 6619
D - 06233 Leuna
Phone: 03461-43-3094, Fax: 03461-43-6543
E-mail : wendt.harze@leuna.de
Website : http://www.leuna-harze.de