

## Protection of concrete layer and sanitation with Ekoliner for concreting and for gluing on:

### Description of processing samples:

#### Arrangement:

1. Description and use of the Ekoliners
2. Welding method
3. Special fittings prefabricated by the factory
4. The adhesive Ekoliner
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### 1. Description and use of the Ekoliner

The Ekoliner consists of a sealing sheet or a plate of polyethylene, which is under-laterally coated with an anchor fleece material of PP (see Fig. 1). The anchor fleece material has the task to connect itself firmly with the underground, which can be sealed. Pro m<sup>2</sup> the liner is held by several 10.000 fibers. The peeling off firmness of the fibers from the sealing layer of the Ekoliner corresponds firmness to approx. 10 bar (1 N/mm<sup>2</sup>). By concreting in concrete front a strengtheningness of 0,5 N/mm<sup>2</sup> is reached. The surfaces of the Ekoliners are smooth. Standard colours are black, green and light-grey. The sealing sheets are **2,0 mm** or **3,0 mm** thick. The web is supplied in roles of **1.500 mm** width.

Starting from a thickness of **4,0 mm** boards are supplied (up to 9,0 mm thickness).

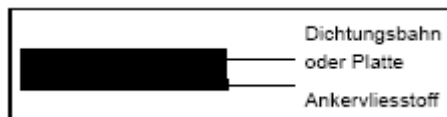


Fig 1: Structure of an Ekoliner.

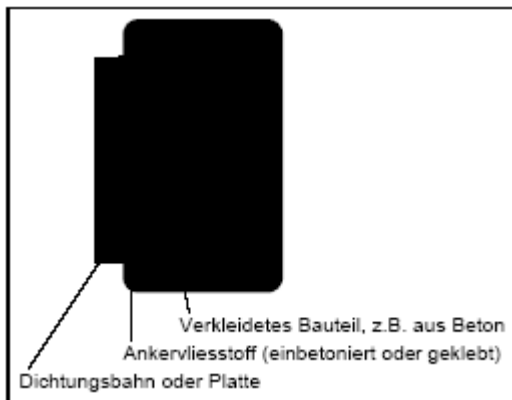
The anchor fleece material can be connected by concreteing or sticking together with the underground, which can be sealed (see Fig 2). Before concreteing the Ekoliner is brought into the formwork. After concreteing the Ekoliner is laminar connected with the concrete. The impacts of the concrete layer webs are welded after concreteing.

### **Example of an employment in a tilting basin from concrete within a range of the water exchange area:**

Here a strip is brought in by 75cm width at all walls of the tilting basin in the height of the water exchange area This protection-rigis protects the particularly stressed water exchange area against corrosion.

## Processing and notes:

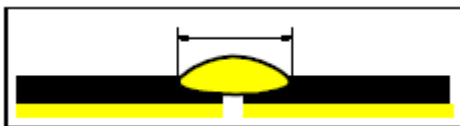
The liner is to be stored protected against wetness and dirt. The fibers of the anchor fleece material on the back of the liner are to be served as anchorage element in the poured concrete. During production as well as at transportation the fibers of the fleece material are squeezed together. Before the installation the fleece material is to be wetted with water, so that the anchor fleece material does not extract the water from the concrete. Subsequently, the anchor fleece material is to be roughened with a rubber puller or a suitable brush (or steel brooms), so that the fibers are projecting and are able to receive the desired joining with the concrete. When sticking the liner together on an underground, no water may be usually used.



**Fig 2: Structure in principle of a sealing with the Ekoliner.**

## 2. Welding methods

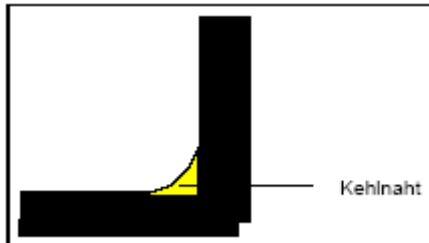
The welding work is to be accomplished always only by welders examined by specialized companies with the valid guidelines of the German federation for welding engineering (DVS). Most frequently on the building sites the extruding deposit welding represented in fig. 3 is used. If the distance of the plates is too large, a strip with two welding seams must be welded over the joint, similarly as in fig. 5 represented cover strips for the heating wedge welding.



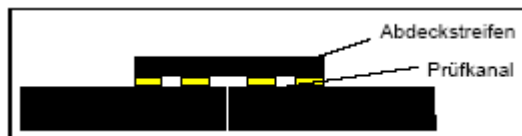
**Fig. 3: extrusion coating joint for welding the Ekoliners.**

Important details are usually the fillet welds. Fillet welds are likewise implemented as the extrusion coating joint (see Fig. 4).

As characteristic the Ekoliner can be welded up to a thickness of 3.0 mm (see Fig. 5) also with automatic heating wedge welding machines. The heating wedge seams are in many cases the most economical seams. They can be made by trained personal fast and with high reliability. This is applicable to prefabrication, manufacturing as even to the building site.



**Fig 4: Extrusion wedge seam as fillet weld.**



**Fig 5: Welding seam with heating wedge welding machine, cover strip and test channels.**

### **3. Special fittings**

For the easement of the installation on the building site, prefabricated by the factory parts are available. The use of these special fittings accelerates the installation. The weldings, which can be accomplished on the building site, can be reduced to a minimum. For large surfaces, large plates with heating element welds are prefabricated by the factory (see Fig. 6). Machines with welding widths up to 3.000 mm are available.



**Fig 6: Blunt with heating element welded plates.**

Folding-ups, gutters and hole boxes (e.g. for lining of columns) are brought to the building site prefabricated (see Fig. 7).

Bevor the beginning of the welding work a complete welding plan is drawn. Drawings of individual construction units and part lists complete the plannings and gives a good basis to instruct the personal for the concreting and weldings.

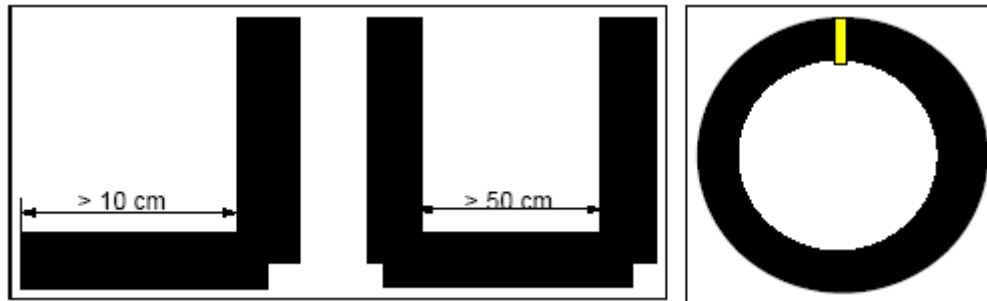


Fig. 7: By the factory prefabricated folding-ups (left) and gutter or boxes (center), Manufactures hoses for the lining of pipes or containers (right).

**Example for an employment: Lining sewer pipes of concrete, pits of concrete, coagulating, container.**

#### 4. The adhesive Ekoliner

The Ekoliner is particularly well suitable for a laminar gluing. The adhesives are particular selected by the material, on which the Ekoliner is to be stuck. Adhesives can be used, with which the anchor fleece material on the back of the Ekoliner can be soaked well. When hardening the adhesive the individual fibers of the anchor fleece material are embedded into the adhesive. The suitability of the adhesive is to be proven in each case in attempts. Both the sticking barness of the Ekoliner on the underground and also the medium stability of the adhesive are to be considered. When using PU-adhesives in the pull out test strengtheningnesses are reached up to 10 bar (1 N/mm<sup>2</sup>). For most applications (e.g. channel linings) 0,5 bar (0,05 N/mm<sup>2</sup>) are enough for the pull out test. With sticking mortars strengtheningnesses are reached up to approx. 1 bar (0,1 N/mm<sup>2</sup>) and even more. For laminar sticking together it is to be noted that the Ekoliner never lies completely without aids. In particular temperature influences can contribute to the fact, that the liner bulges in some places and takes off from the underground, which can be sealed. The Ekoliner is to be pressed in slightly therefore to the underground, which can be lined, until adhesive has asufficient firmness. The processing references of the adhesive manufacturer are to be considered!

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## **5. Important note**

This information corresponds to our present level of knowledge in the described area and serve for you as a helpful suggestion for your own attempts. It is subjected to the revision, as soon as new realizations or experiences result. Orbi-Tech GmbH does not take over guarantee, adhesion or other responsibility for the results of working, which are obtained in connection with this information. This publication justifies no license and does not intend the injury of existing commercial patent rights.