

## Easy Pur

### Technical Data Sheet

#### Uses

Non-foaming elasticised three-component resin having good adhesion even on moist surfaces for the application of short liners in local sewer repair.

#### Easy Pur

- impregnates ECR fibre glass mats (Advantex®)
- adheres to moist surfaces especially glazed stone ware
- does not foam, even in the presence of water
- cures well and fast even in thin layers
- can easily be demoulded
- has high resistance to aggressive water, acids as well as alkaline brines, does not hydrolyse

Easy Pur is a three component system, the curing time of which can be adjusted by the addition of component C.

- Advantages:**
- German approval (DIBt)
  - fast application (cycle time 60 min.)
  - no emission of odour
  - high adhesive strength
  - high chemical resistance
  - low cost repair method

#### Data

The processing data below are guide values only. They may vary in practice due to thermal exchange between resin and strata, surface properties of the stone, humidity, pressure and other factors. So the pot life basically depends on the temperature of the grout while the demould time depends on the ambient temperature.

#### Example of dosages and times

##### Easy Pur 3K

##### Reaction Data (typical values)

| Start temperature                   | 10 °C           | 15 °C           | 20 °C           |
|-------------------------------------|-----------------|-----------------|-----------------|
| Pot life (for spreading)            | approx. 10 min  |                 |                 |
| Time for placing                    | approx. 20 min  |                 |                 |
| Demould time                        | approx. 60 min  |                 |                 |
| Mixing ratio A : B : C (Vol.-parts) | 100 : 200 : 4.0 | 100 : 200 : 3.0 | 100 : 200 : 2.0 |

### Easy Pur 2K Summer

#### Reaction Data (typical values)

| Start temperature        | 20 °C                | 25 °C          | 30 °C          |
|--------------------------|----------------------|----------------|----------------|
| Pot life (for spreading) | approx. 15 min       | approx. 12 min | approx. 8 min  |
| Time for placing         | approx. 25 min       | approx. 20 min | approx. 10 min |
| Demould time             | approx. 90 min       | approx. 60 min | approx. 50 min |
| Mixing ratio A : B       | 100 : 200 Vol.-parts |                |                |

### Easy Pur 2K Winter

#### Reaction Data (typical values)

| Start temperature        | 10 °C                | 15 °C          | 20 °C          |
|--------------------------|----------------------|----------------|----------------|
| Pot life (for spreading) | approx. 12 min       | approx. 10 min | approx. 8 min  |
| Time for placing         | approx. 25 min       | approx. 20 min | approx. 10 min |
| Demould time             | approx. 90 min       | approx. 60 min | approx. 50 min |
| Mixing ratio A : B       | 100 : 200 Vol.-parts |                |                |

### Easy Pur 2K Fast

#### Reaction Data (typical values)

| Start temperature        | 10 °C                | 15 °C          | 20 °C          |
|--------------------------|----------------------|----------------|----------------|
| Pot life (for spreading) | approx. 8 min        | approx. 6 min  | approx. 4 min  |
| Time for placing         | approx. 15 min       | approx. 10 min | approx. 5 min  |
| Demould time             | approx. 50 min       | approx. 40 min | approx. 35 min |
| Mixing ratio A : B       | 100 : 200 Vol.-parts |                |                |

→ For more details in temperature range (5 °C to 25 °C) see „Instruction Easy Pur Spot Repair System“.

#### Material Data

|                    |                   | Component A | Component B | Component C | Norm      |
|--------------------|-------------------|-------------|-------------|-------------|-----------|
| Density at 25 °C   | kg/m <sup>3</sup> | 1490 ± 50   | 1130 ± 40   | 1120 ± 40   | DIN 12791 |
| Colour             |                   | colourless  | black brown | light brown |           |
| pH-value           |                   | 12 - 13     | n. a.       | 12 - 13     | DIN 19268 |
| Flash point        | °C                | none        | > 200       | 100         | DIN 53213 |
| Viscosity at 25 °C | mPa*s             | 270 ± 140   | 150 ± 100   | 40 ± 10     | ISO 3219  |

## Mechanical properties of resin

|                                   |       |                   | Norm                   |
|-----------------------------------|-------|-------------------|------------------------|
| Density                           | 1270  | kg/m <sup>3</sup> | DIN EN 1183-1          |
| Tensile strenght                  | ≥ 11  | MPa               | DIN EN 527-2           |
| E-modulus tensile                 | ≥ 90  | kPa               | DIN EN 527-2           |
| Compressive strenght              | ≥ 35  | MPa               | DIN EN 604             |
| E-modulus compression             | ≥ 500 | MPa               | DIN EN 604             |
| Flexural stress at 2 % elongation | ≥ 9   | MPa               | DIN EN ISO 178         |
| Shore D-hardness                  | > 60  | MPa               | DIN 53505              |
| Shrinkage value                   | ≤ 0.1 | %                 | based on ISO 2577:2007 |

## Mechanical properties of liner

|   |        |     | Norm                    | Expertise |
|---|--------|-----|-------------------------|-----------|
| Ring stiffness (apex thrust)*                               | 140    | kPa | DIN EN 1228             | 5         |
| E-modulus apex thrust test*                                 | ≥ 4500 | MPa | DIN EN 1228             | 5         |
| Ring stiffness (apex thrust) short time** (S <sub>0</sub> ) | 2.6    | kPa | DIN EN 1228             | 2         |
| E-modulus apex thrust test, short time**                    | ≥ 4500 | MPa | DIN EN 1228             | 2         |
| E-modulus apex thrust test, 400 d**                         | ≥ 4500 | MPa | DIN EN 1228, DIN EN 761 | 2         |
| Flexural strenght axial / radial                            | ≥ 100  | MPa | DIN EN ISO 178          | 2.7       |
| Flexural modulus axial / radial                             | ≥ 4500 | MPa | DIN EN ISO 178          | 7         |
| Adhesive strenght (glazed clay pipe)                        | ≥ 2.0  | MPa | DIN EN ISO 24624        | 2/8       |

\* Pipe i.d. 150 mm, liner thickness 4 mm; \*\*Pipe i.d. 300 mm, liner thickness 4 mm

The values are taken from the indicated approvals; they are to be regarded as orientation values.

## Composition and properties

### Components

Easy Pur component A is a special water-glass component (aqueous sodium silicate) with additives.

Component B is a modified polyisocyanate. Component C is a blend of additives improving the components and regulating the pot life of the mix. 2K systems: the component C is included in the component A.

### System

The curing of component A results in a silicate; simultaneously a solid polyisocyanurate/polyurea is formed from the component B.

### Final product

- Together they form an interpenetrating network, a tough-elastic, non-foamed silicate resin (organomineral resin).
- In conjunction with ECR glass fibre mats, a properly placed short liner can endure multiple washings with 120 bar (1700 psi)(at the nozzle) without significant damage even after only 3 days curing. <sup>6</sup> Please note for safety reasons that you must limit the pressure at the rising nozzle on 80 bar (1130psi) (water temperature < 20 °C, not longer than 3 min in a place).

- It is resistant against acids and alkali (24 hour storage in 10 % sulphuric acid or 5 % caustic soda)<sup>2,7</sup>, likewise against a multiplicity of organic and inorganic liquids such as gasoline, diesel and mineraloils.<sup>9</sup>
- Easy Pur complies with the German requirements for large and small scale seals in drinking water.<sup>4</sup>
- Also after 200000 changes of „Darmstädter Kipprinne“ the short placed short liner was waterproof.<sup>2</sup>

## Processing

### Mixing

By appropriate addition of component C, the resin setting speed can be adjusted to meet the requirements of temperature, size of the liner and installation time.

Component C is first homogenised and then mixed into the component A at the required dosage. This blend is mixed with double the volume of component B and stirred vigorously for two minutes.

### Soaking of the fibre glass mats

The ECR fibre glass mats shall be a substrate for the resin. In order to achieve the prescribed liner thickness of at least 3 mm, either a double folded glass fibre mat of  $1400 \text{ g/m}^2 \pm 4 \%$  or a triple folded mat of  $1100 \text{ g/m}^2 \pm 4 \%$  is used. The random layer (CSM) has to be on the exposed surface.

The mat of the appropriate size is spread on a PE sheet. The resin mix is applied on either side by spatula or rubber wiper. The resin volume which is needed is 1.9 times of the total area ( $\text{m}^2$ ) of the glass fibre mat by using  $1400 \text{ g/m}^2 \pm 4 \%$  glass fibre mat or is 1.5 times of the total area of the glass fibre mat by using the  $1100 \text{ g/m}^2 \pm 4 \%$  glass fibre mat

- ➔ The information about a detailed chart containing different pipe diameters, damage lengths, resultant cuttings and resin quantities please find in the “Manuel Easy Pur Spot Repair System”.

If the surface is uneven (e. g. corroded concrete) or shows a high degree of cracking, the quantity must be accordingly higher.

### Placing of the liner

An inflatable packer is wrapped with a cling foil (in order to prevent adhesion). Then it is wrapped tightly with the impregnated glass fibre mat. The packer is put into position at the place requiring repair within the placing time. The packer is then inflated and, depending on used catalyst volume, kept at 1-2 bar pressure for approx. one hour, deflated and withdrawn.

### Curing of the liner

After demoulding the sewage water may pass through the liner. Complete curing is achieved within one week; the sewer then can be flushed with high pressure water. Complete details see „Instruction Easy Pur Spot Repair System“.

## Risk and safety phrases for handling

Observe the usual precautionary measures for handling chemicals, see material safety data sheets.

## Packing

All forms of packing are approved to the danger goods regulation road (Germany GGVS).

| Component A<br>(white can)  | Component B<br>(black can)  | Component C<br>(silver can) |
|-----------------------------|-----------------------------|-----------------------------|
| 28 kg in a tinfoil can      | 21 kg in a tinfoil can      | 1 kg in a tinfoil can       |
| 14 kg in a tinfoil can (2K) | 21 kg in a tinfoil can (2K) |                             |
| 250 ml in a PE-bottle (2K)  | 500 ml in a PE-bottle (2K)  |                             |
| 335 ml in a PE-bottle (2K)  | 665 ml in a PE-bottle (2K)  |                             |

Other packing units on request.

## Storage, shelf life

At least six months from date of delivery respectively twelve months after production when stored in a dry place between 10 °C and 30 °C. Frost may damage the component A (if flocculation occurs please consult I.S.T. Innovative Sewer Technologies GmbH). If this time is exceeded, we recommend having the material checked by I.S.T. Innovative Sewer Technologies GmbH for compliance with specification.

## Disposal

Follow local regulations.

We recommend either to dispose of liquid residues in an incineration plant (EU disposal code 07 02 08 „other reaction and distillation residues“) or to cure the liquids with each other and dispose of the cured material in a domestic waste landfill or an incineration plant (EU disposal code 20 01 39 “plastic parts”). Empty cans should be cleared of liquid by punching a hole through the edge of the cover and turn them upside down, until no liquid flows out any longer.

## Certificates and expertise available

1. German approval Z-42.3-388 (DIBt, 2016)
2. Test report about short liners (PA 0529, IKT Gelsenkirchen, 2005)
3. Material test report on a liner for spot repair (P 00529, IKT Gelsenkirchen, 2005)
4. Expertise on drinking water compatibility and groundwater hygiene (Hygiene-Institut, Gelsenkirchen, 2005)
5. Material test report on a liner for spot repair (report 00.04905 S Ingenieurbüro Siebert, Oststeinbek, 2000)
6. High pressure washing test according to the Hamburg standard (report 02.057598 S Ingenieurbüro Siebert, Oststeinbek, 2002)
7. Bending strength, chemical resistance (report 02.08394 S Ingenieurbüro Siebert, Oststeinbek, 2002)
8. Tear-off strength (report 03.09773 S Ingenieurbüro Siebert, Oststeinbek, 2003)
9. Chemical stability Easy Pur/ Advantex®-Composit (Minova CarboTech GmbH, 2005)

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The data in this sheet conform to our best knowledge and experience at the date of printing, which is indicated below. The state of knowledge and experience are evolving constantly. Please pay attention therefore, that you always refer to the current version of this data sheet.

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