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USt.-IdNr.: DE 155293995



Test Report

**“Identification at preinsulated bonded pipe Ø 60,3/125 mm
PUR foam BASF Elastopor H2130/83
manufactured by IZOTERMS Ltd.”**

Short Title: IZOTERMS Ø 60,3/125 mm - BASF H2130/83



Deutsche
Akkreditierungsstelle
D-PL-13119-02-00

Test Report No.: V352/17.1

Order No.: 402307126

Issued by Department Pipe Systems

Laboratory for Pipe System Testing

Recognised test laboratory of DVGW, DIN CERTCO and DIBt

The recognitions are valid for the test methods stated in the attachments of certificates of approval
DVGW LW-BU0023, DIN CERTCO PL121 and DIBt SAC 08

Test Report

IZOTERMS Ø 60,3/125 mm - BASF H2130/83

Test Report No.: V352/17.1



Test Specimen: Preinsulated bonded pipe, Ø 60,3/125 mm

Customer: BASF UAB
SAUSIO 13-osios g. 4A
LT-04343 Vilnius
LITHUANIA

Manufacturer: IZOTERMS Ltd.
Gaujas iela 24
Vangazi, Incukalna novads
LV-2136
LATVIJA

Order no. of the Customer: PO 4939239451

Test Laboratory: IMA Materialforschung und Anwendungstechnik
Laboratory for Pipe System Testing
Wilhelmine-Reichard-Ring 4
01109 Dresden
GERMANY

Test Specimen received on: 2017-09-04

Test Period: September 2017

Person in Charge: Dipl.-Ing. Matthias Thölert

Distribution List: 1 x BASF Polyurethanes GmbH
2 x IMA Dresden

Authorized
Dresden, 25 September 2017
IMA Materialforschung und
Anwendungstechnik GmbH

A handwritten signature in black ink, appearing to be 'H. Below', written over a horizontal line.

Dipl.-Ing. Heiko Below
Head of Department Pipe Systems

The test results refer exclusively to the specimen under test.
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1 Task Definition

BASF UAB commissioned IMA Materialforschung und Anwendungstechnik GmbH with conducting tests on a preinsulated bonded pipe Ø 60,3/125 mm in accordance with DIN EN 253 to the characteristic thermal conductivity (unaged condition).

2 Requirements

DIN EN 253:2015-12

District heating pipes - Preinsulated bonded pipe systems for directly buried hot water networks - Pipe assembly of steel service pipe, polyurethane thermal insulation and outer casing of polyethylene; German version EN 253:2009+A2:2015

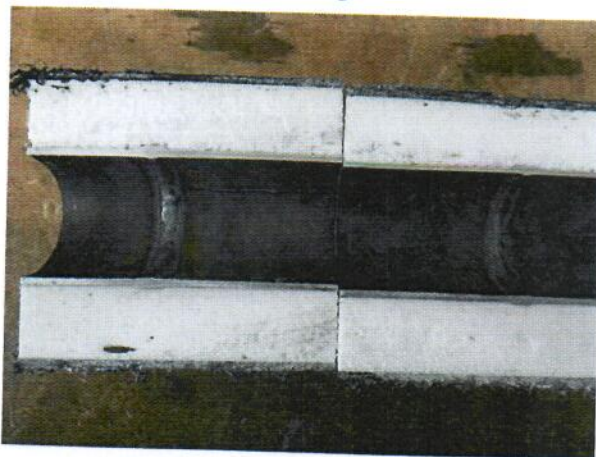
Table 2-1 Requirements and tests according to DIN EN 253:2015-12

| Characteristics | Requirements acc. to clause | Test methods / remarks |
|--|-----------------------------|------------------------|
| Thermal conductivity in unaged condition | 4.5.6 | 5.4.4 |

3 Test Specimen

- Preinsulated bonded pipe, Ø 60,3/125 mm, type manufactured by IZOTERMS Ltd
- Service pipe: steel
- Casing pipe: HDPE
- Foam system: PUR foam BASF Elastopor H2130/83
- Delivery of the sample material to IMA Dresden: 2017-09-04
- Storage of the sample material before preparation and test: 72 h at 23 ± 2 °C and 50 ± 10 % R.H.

Note: The test specimen had a circular weld in the middle. The circular and longitudinal weld were inwards protruding, see Figure 3-1.



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Figure 3-1 Circular and longitudinal weld

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4 Testing procedure and results - Thermal conductivity (unaged condition)

The determination of thermal conductivity (unaged condition) at the preinsulated pipe Ø 60,3/125 mm was carried out based on EN 253:2015 and ISO 8497.

Test equipment: Test-equipment for determination of thermal conductivity on pre-insulated pipes according to EN 253:2015, Annex F
Manufacturer: IMA Dresden / PMK B98-B2

Temperature measurement: 2 x 6 thermocouples

End apparatus: calibrated endcaps; correction according to van Rinsum

Steel service pipe: $D_{S1} = 54,27$ mm, $D_{S2} = 60,32$ mm, $T = 3,02$ mm

Thermal insulation: PUR foam, BASF H2130/83

PE- Casing pipe: $D_{C3} = 118,68$ mm, $D_{C4} = 125,31$ mm; $e_{PE} = 3,32$ mm

Number of measurements: 3

Technician: Mr. Lehmann

Table 4-1 Test results – Thermal conductivity (unaged condition)

| Heat flow - rate ϕ [W] | Temperature | | Difference in temperature sample surface $\bar{T}_1 - \bar{T}_4$ [K] | Mean temperature of sample T_m [°C] | Thermal conductivity of PUR-foam λ_{PUR} [W/(m·K)] |
|-----------------------------------|---|--|---|---|---|
| | hot sample surface \bar{T}_1 [°C] | cold sample surface \bar{T}_4 [°C] | | | |
| 20,45 | 71,89 | 26,54 | 45,35 | 49,32 | 0,0235 |
| 20,99 | 72,74 | 26,78 | 45,96 | 49,87 | 0,0238 |
| 21,85 | 74,08 | 26,90 | 47,18 | 50,61 | 0,0241 |
| $\lambda_{50} = 0,0238$ W/(m·K) | | | | | |

5 Summary

The test results documented in this test report verify that the tested characteristic thermal conductivity (unaged condition) of the preinsulated pipe Ø 60,3/125 mm with PUR rigid foam system BASF H2130/83 meet the requirements of DIN EN 253:2015-12.

Reviewed

Dipl.-Ing. Heiko Below
Laboratory for Pipe Systems

Created

Dipl.-Ing. Matthias Thöler
Person in Charge