Forschungsinstitut für Wärmeschutz e.V.
München

EC-CERTIFICATE OF CONFORMITY

0751-CPD.2-016.0-01-01/12

In compliance with the Directive 89/106/EEC of the Council of European Communities of 21 December 1988 on the approximation of laws, regulations and administrative provisions of the Member States relating to the construction products (Construction Products Directive - CPD), amended by the Directive 93/68/EEC of the Council of European Communities of 22 July 1993, it has been stated that the construction product

Factory made mineral wool (MW) products
with the trade name

PIPELANE

as thermal insulation products for building equipment and industrial installations
for uses subject to regulations on reaction to fire

(product parameters and classes, description of the product, the declaration and the use of the product is presented in the annex)

placed on the market by **SAGER AG**
Dornhügelstraße 10
5724 Dürrenäsch / Switzerland

and produced in the factory Dornhügelstraße 10
5724 Dürrenäsch / Switzerland

is submitted by the manufacturer to a factory production control and to the further testing of samples taken at the factory in accordance with a prescribed test plan and that the notified body

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has performed the initial type-testing for the relevant characteristics of the product, the initial inspection of the factory and of the factory production control and performs the continuous surveillance, assessment and approval of the factory production control.

This certificate attests that all provisions concerning the attestation of conformity and the performances described in Annex ZA of the standard

EN 14303:2009
with the Annex B and C of EN 13172:2008
and Section 5 of EN ISO 13787:2003

were applied and that the product fulfils all the prescribed requirements.

This certificate was first issued on June 28, 2012 and remains valid as long as the conditions laid down in the harmonised technical specification in reference or the manufacturing conditions in the factory or the Factory Production Control itself are not modified significantly.

Gräfelfing, June 28, 2012

Head of Certification Body

Forschungsinstitut für Wärmeschutz e.V. München FIW MÜNCHEN 8

Dr.-Ing. Martin Zeitler

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Date: June 28, 2012

Factory:	**SAGER AG, Dornhügelstraße 10, 5724 Dürrenäsch / Switzerland**
Construction product(s):	Factory made mineral wool (MW) products according to EN 14303:2009
Intended use:	Thermal insulation products for building equipment and industrial installations
Level(s) or class(es) reaction to fire:	for uses subject to regulations on reaction to fire A1/A2. Products for which a clearly identifiable stage in the production process results in an improvement of the reaction to fire classification by limiting of organic material
Attestation of conformity system:	1

Table 1: Designation and description of the products

No.	Product				Nominal thickness	Product data sheet		Reaction to fire class EN 13501-1	Designation code	Thermal conductivity according Table 2	Additional perform-ance **)
	Form	Type	Description	produced on	in mm	Name	Dated				
1	Pipe Section	PIPELANE SGR	Non-combustible glass wool concentri-cally wound pipe section	Line 1 PU1 *)	20 – 140 Length: 1200 mm Inside diameter: 15 – 612 mm	PIPELANE SGR	06 / 2012	$A1_L$	Outside diameter < 150 mm: MW-EN 14303-T8-ST(+)500-WS1-CL10 Outside diameter ≥ 150 mm MW-EN 14303-T9-ST(+)500-WS1-CL10	TC1	acoustic

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No.	Product				Nominal thickness	Product data sheet		Reaction to fire class EN 13501-1	Designation code	Thermal conductivity according Table 2	Additional perform-ance **)
	Form	Type	Description	produced on	in mm	Name	Dated				
2	Pipe Section	PIPELANE SGR 1	Non-combustible glass wool concentri-cally wound pipe section faced with reinforced aluminium foil	Line 1 PU1 *)	20 – 140 Length: 1200 mm Inside diameter: 15 – 612 mm	PIPLANE SGR 1	06 / 2012	Outside diameter ≥ 75 mm and ≤ 300mm: $A2_L$-s1,d0 Outside diameter > 300 mm: A2-s1,d0	Outside diameter < 150 mm: MW-EN 14303-T8-ST(+)500-WS1-MV1-CL10 Outside diameter ≥ 150 mm MW-EN 14303-T9-ST(+)500-WS1-MV1-CL10	TC1	acoustic

*) PU = production unit

**) acoustic = Airflow resistivity according to EN 29053 > 5 kPa·s/m² (informative)

Date: June 28, 2012

Table 2: **Declared values of thermal conductivity $\lambda_{N,R}$ in W/(m·K) according EN 13787**
Pipe Tester, based on test results of EN ISO 8497

Thermal Conductivity $\lambda_{N,R}$ in W/(m·K)	Product Type	Mean temperature ϑ_m in °C				
		50	100	150	200	300
TC1	PIPELANE SGR PIPELANE SGR 1	0,036	0,043	0,052	0,063	0,093

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All products are exonerated from classification "possible carcinogenic" by note Q of Commission Directive 97/69/EC

Gräfelfing, June 28, 2012

Head of Certification Body

Dr.-Ing. Martin Zeitler

Thermal conductivity according to DIN EN ISO 8497

Test report No: G.2-044a/12

Applicant: **SAGER AG, 5724 Dürrenäsch, Schweiz**

Material: **PIPELANE SGR 1**
production date: 23/01/11

Labeling: (as given by producer) -----

Material identification: (as given) Concentric wound pipe section made of resin bonded mineral wool with facing of aluminium foil

Nominal dimensions: Internal diameter: 35 mm Insulation thickness: 90 mm Length: 1200 mm
Nominal density: ----- kg/m³

Sampling: By employee of the test institute in the plant Dürrenäsch/Switzerland on 21.11.11

Goods Receipt: No. 5174

Test equipment: Test pipe with calculated end caps according to DIN EN ISO 8497 Diameter 34 mm, horizontal, Length 2000 mm

Preparation: Experimental data according to EN 13467 :
Internal diameter: 35 mm Insulation thickness: 90 mm Length: 1201 mm
Density: 58.2 kg/m³

Installation according to DIN 4140: Internal diameter: 35 mm Insulation thickness: 90 mm Length: 2300 mm
Density: *) 58.5 kg/m³ Mass: 4.89 kg

Remarks: The pipe insulation was installed in state of delivery on the test pipe.

Experimental data:

Test	Heat flow rate	Temperature of the		Average temperature of the specimen	Temperature-difference of the specimen	Thermal conductivity
		Warm Side	Cold Side			
No	W	°C	°C	°C	K	W/(m·K)
1	4.71	40.3	19.6	30.0	20.7	0.0332
2	4.70	51.2	31.2	41.2	20.0	0.0344
3	4.68	79.1	60.5	69.8	18.6	0.0370
4	4.65	107.4	90.4	98.9	17.0	0.0399
5	-----	-----	-----	-----	-----	-----

Uncertainty: < 3% Thermal conductivity is calculated for temperature differences on the specimen.

Properties of the material after conductivity-measurement up to 107.4 °C warm side: (Values at end of the test)

Density: *) 58.5 kg/m³ Mass: 4.89 kg Change in mass: 0.0 %

Remarks: -------

*) The given values of the density refer to the insulation of the specimens installed on the test pipe without facings.

Results:

Mean temperature °C	30	40	50	100	----	----	----	----	----
Thermal conductivity W/(m·K) *)	0.034	0.035	0.036	0.040	----	----	----	----	----

*) according to EN ISO 13787 rounded upwards to the next 0.001 W/(m·K)
These thermal conductivity values refer to the material in a dry state installed as pipe insulation and are related to the mean te mperature of the specimen. ($\lambda_{Lab,R}$ as specified in the guidelines VDI-2055)

Final remarks: ---------

Gräfelfing, 26.03.2012

Department Specialist

Dipl.-Ing. R. Schreiner

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Tester

S. Tana

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Thermal conductivity according to DIN EN ISO 8497

Test report No: G.3-043b/12

Applicant: **SAGER AG, 5724 Dürrenäsch, Schweiz**

Material: **PIPELANE SGR**
production date: 11/11/11

Labeling: (as given by producer) -----

Material identification: (as given) Concentric wound pipe section made of resin bonded mineral wool.

Nominal dimensions: Internal diameter: 114 mm Insulation thickness: 30 mm Length: 1200 mm
Nominal density: ----- kg/m³

Sampling: By employee of the testing institute in the plant Dürrenäsch/Switzerland on 21.11.11

Goods Receipt: No. 5174

Test equipment: Test pipe with calculated end caps according to DIN EN ISO 8497 Diameter 114 mm, horizontal, Length 3000 mm

Preparation: Experimental data according to EN 13467 :
Internal diameter: 114 mm Insulation thickness: 30 mm Length: 1201 mm
Density: 61.2 kg/m³

Installation according to DIN 4140: Internal diameter: 114.3 mm Insulation thickness: 30 mm Length: 3000 mm
Density: *) 62.8 kg/m³ Mass: 2.54 kg

Remarks: The pipe insulation was installed in state of delivery on the test pipe.

Experimental data:

Test	Heat flow rate	Temperature of the Warm Side	Temperature of the Cold Side	Average temperature of the specimen	Temperature-difference of the specimen	Thermal conductivity
No	W	°C	°C	°C	K	W/(m·K)
1	25.9	37.0	19.2	28.1	17.8	0.0323
2	252	171.6	37.8	104.7	133.8	0.0420
3	529	278.7	57.0	167.9	221.7	0.0532
4	861	369.5	78.5	224.0	291.0	0.0659
5	1290	455.2	102.2	278.7	353.0	0.0815

Uncertainty: < 3% Thermal conductivity is calculated for temperature differences on the specimen.

Properties of the material after conductivity-measurement up to 455.2 °C warm side: (Values at end of the test)

Density: *) 61.8 kg/m³ Mass: 2.50 kg Change in mass: -1.6 %

Remarks: -------

*) The given values of the density refer to the insulation of the specimens installed on the test pipe without facings.

Results:

Mean temperature °C	40	50	100	150	200	250	300	----	----
Thermal conductivity W/(m·K) *)	0.034	0.035	0.042	0.050	0.060	0.073	0.089	----	----

*) according to EN ISO 13787 rounded upwards to the next 0.001 W/(m·K)
These thermal conductivity values refer to the material in a dry state installed as pipe insulation and are related to the mean te mperature of the specimen. ($\lambda_{Lab,R}$ as specified in the guidelines VDI-2055)

Final remarks: ---------

Gräfelfing, 26.03.2012

Department Specialist

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Thermal conductivity according to DIN EN ISO 8497

Test report No: G.2-222a/10

Applicant: **SAGER AG, 5724 Dürrenäsch, Schweiz**

Material: **PIPELANE SGR**
production date: 18/11/10

Labeling: (as given by producer) -----

Material identification: (as given) Concentric wound pipe section made of resin bonded mineral wool

Nominal dimensions: Internal diameter: 18 mm Insulation thickness: 20 mm Length: 1200 mm
Nominal density: ----- kg/m³

Sampling: By employee of the testing institute in the plant Dürrenäsch/Switzerland on 18.11.10

Goods Receipt: No. 3610

Test equipment: Test pipe with calculated end caps according to DIN EN ISO 8497 Diameter 18 mm, horizontal, Length 2000 mm

Preparation: Experimental data according to EN 13467 :
Internal diameter: 19 mm Insulation thickness: 19 mm Length: 1199 mm
Density: 78.9 kg/m³

Installation according to DIN 4140: Internal diameter: 18.1 mm Insulation thickness: 19 mm Length: 2305 mm
Density: *) 83.9 kg/m³ Mass: 0.423 kg

Remarks: The pipe insulation was installed in state of delivery on the test pipe.

Experimental data:

Test	Heat flow rate	Temperature of the Warm Side	Temperature of the Cold Side	Average temperature of the specimen	Temperature-difference of the specimen	Thermal conductivity
No	W	°C	°C	°C	K	W/(m·K)
1	7.18	37.8	17.7	27.8	20.1	0.0319
2	7.15	53.1	33.9	43.5	19.2	0.0334
3	7.13	69.7	51.4	60.6	18.3	0.0350
4	-----	-----	-----	-----	-----	-----
5	-----	-----	-----	-----	-----	-----

Uncertainty: < 3% Thermal conductivity is calculated for temperature differences on the specimen.

Properties of the material after conductivity-measurement up to 69.7 °C warm side: (Values at end of the test)

Density: *) 83.9 kg/m³ Mass: 0.423 kg Change in mass: 0.0 %

Remarks: -------

*) The given values of the density refer to the insulation of the specimens installed on the test pipe without facings.

Results:

Mean temperature °C	30	40	50	60	----	----	----	----	----
Thermal conductivity W/(m·K) *)	**0.033**	**0.033**	**0.034**	**0.035**	----	----	----	----	----

*) according to EN ISO 13787 rounded upwards to the next 0.001 W/(m·K)
These thermal conductivity values refer to the material in a dry state installed as pipe insulation and are related to the mean te mperature of the specimen. ($\lambda_{Lab,R}$ as specified in the guidelines VDI-2055)

Final remarks: ---------

Gräfelfing, 16.12.2010

Department Specialist

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Thermal conductivity according to DIN EN ISO 8497

Test report No: G.3-217b/10

Applicant: **SAGER AG, 5724 Dürrenäsch, Schweiz**

Material: **PIPELANE SGR**
production date: 17/11/10

Labeling: (as given by producer) -----

Material identification: (as given) Concentric wound pipe section made of resin bonded mineral wool

Nominal dimensions: Internal diameter: 114 mm Insulation thickness: 100 mm Length: 1200 mm
Nominal density: ----- kg/m³

Sampling: By employee of the testing institute in the plant Dürrenäsch/Switzerland on 18.11.10

Goods Receipt: No. 3610

Test equipment: Test pipe with calculated end caps according to DIN EN ISO 8497 Diameter 114 mm, horizontal, Length 3000 mm

Preparation: Experimental data according to EN 13467 :
Internal diameter: 114 mm Insulation thickness: 100 mm Length: 1201 mm
Density: 59.5 kg/m³

Installation according to DIN 4140: Internal diameter: 114.3 mm Insulation thickness: 100 mm Length: 3000 mm
Density: *) 60.2 kg/m³ Mass: 12.2 kg

Remarks: The pipe insulation was installed in state of delivery on the test pipe.

Experimental data:

Test	Heat flow rate	Temperature of the Warm Side	Temperature of the Cold Side	Average temperature of the specimen	Temperature-difference of the specimen	Thermal conductivity
No	W	°C	°C	°C	K	W/(m·K)
1	13.5	45.7	24.0	34.9	21.7	0.0334
2	85.3	147.3	31.3	89.3	116.0	0.0395
3	177	241.6	39.7	140.7	201.9	0.0471
4	413	401.3	65.0	233.2	336.3	0.0660
5	685	512.9	87.4	300.2	425.5	0.0865

Uncertainty: < 3% Thermal conductivity is calculated for temperature differences on the specimen.

Properties of the material after conductivity-measurement up to 512.9 °C warm side: (Values at end of the test)

Density: *) 59.0 kg/m³ Mass: 11.9 kg Change in mass: -1.9 %

Remarks: -------

*) The given values of the density refer to the insulation of the specimens installed on the test pipe without facings.

Results:

Mean temperature °C	40	50	100	150	200	250	300	----	----
Thermal conductivity W/(m·K) *)	0.034	0.035	0.041	0.049	0.059	0.071	0.087	----	----

*) according to EN ISO 13787 rounded upwards to the next 0.001 W/(m·K)
These thermal conductivity values refer to the material in a dry state installed as pipe insulation and are related to the mean te mperature of the specimen. ($\lambda_{Lab,R}$ as specified in the guidelines VDI-2055)

Final remarks: ---------

Gräfelfing, 27.04.2011

Department Specialist

Dipl.-Ing. R. Schreiner

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