TEBAR
Test Belgelendirme Araştırma ve Geliştirme Ticaret A.Ş.

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AB-0302-T CPR-2164
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TEBAR TEST BELGELENDİRME ARAŞTIRMA ve GELİŞTİRME TİC. A.Ş.
Adres: Şerifali Çiftliği Hendem Caddesi No:58 Y.Dudullu 34775 Ümraniye/İSTANBUL

TEBAR A.Ş; 20.10.2015 tarih ve 29508 sayılı Resmi Gazetede yayımlanan Yapı Malzemeleri Yönetmeliği (305/2011/AB) Kapsamında TEBAR Test Belgelendirme Araştırma ve Geliştirme Ticaret A.Ş.'nin Onaylanmış Kuruluş Olarak Görevlendirilmesine Dair Tebliğ (Tebliğ No: MHG/2015-19) ile Çevre ve Şehircilik Bakanlığı tarafından yetkilendirilmiştir.

Onaylanmış Kuruluş Numarası: 2164

DENEY RAPORU
TEST REPORT

Customer Name/Adresse: AKDE KİMYA END. SAN. VE TİC. LTD ŞTİ.
Yeşilbayır Mah. Şimşir Sok. No:3 Hadımköy/İSTANBUL

Order No: UDİ1500037

Specimen No: UDN1500337

Name and identity of test item: Thermal insulation products made from sprayed rigid polyurethane (PU) foam : "SPR230"

The date of receipt of test item: 16.11.2015

The date of receipt of test item: 16.11.2015

Remarks: Test sample of "Polyurethane Foam" sent by the client to the laboratory.

Date of Test: 10.12.2015-16.12.2015 (dd/mm/yyyy)

Raporun Sayfa Sayısı: 1/5

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The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

Seal Mühür	*Date* Tarih	*Person in charge of test* Deneyi Yapan Kimya Teknikeri/*Chemistry Tec.*	*Head of Testing Laboratory* Teknik Laboratuvar Yöneticisi
	03.02.2016	H.ATABAY	E.KARA

* işareti ile gösterilen deney metotları Akreditasyon kapsamı dışındadır.
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FR.082/03/01.07.2013

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Adres: Şerifali Çiftliği Hendem Caddesi No:58 Y.Dudullu 34775 Ümraniye/İSTANBUL

DENEY RAPORU
TEST REPORT

Polyurethane foam (density: 30 kg/m^3, Thickness:50mm) for test samples, which sent by the client to the laboratory in 16 November 2015, tested according to EN 14315-1 EK C ve TS EN 12667 and test results with related information given below.

Tests performed without any treatments to reduce edge heat losses according to EN 12667 "Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Products of high and medium thermal resistance" and EN 14315 Annex C "Thermal insulating products for buildings - In-situ formed sprayed rigid polyurethane (PUR) and polyisocyanurate (PIR) foam products - Part 1: Specification for the rigid foam spray system before installation" by using single heat flow meter with specimen symmetrical configuration and analytical balance and dial gauge and metal ruler. During the tests, ambient temperature of the environment surrounding the apparatus was (23±5) °C

Product Standard applicable to tested specimens: EN 14315: Thermal insulating products for buildings - In-situ formed sprayed rigid polyurethane (PUR) and polyisocyanurate (PIR) foam products - Part 1: Specification for the rigid foam spray system before installation

b-)Product Description: Thermal insulation products made from sprayed rigid polyurethane (PU) foam

- **Sponsor/Client:** AKDE KİMYA END. SAN. VE TİC. LTD ŞTİ.
- **Production Plant:** Yeşilbayır Mah. Şimşir Sok. No:3 Hadımköy/İSTANBUL
- **Brand Name:** SPR230
- **Lot Number/Production Code/Serial Number:**-/-/-
- **Production Date:** 21.10.2015

Test specimen size: (300x300)mm

c-)Product description, sampling and reference to product Standard for specimen preparation procedure:

Test samples which are described in clause (b) were taken by the client and sent to the laboratory

TEBAR TEST BELGELENDİRME ARAŞTIRMA ve GELİŞTİRME TİC. A.Ş.
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DENEY RAPORU
TEST REPORT

Product Standard applicable to the test specimen: EN 14315-1: Thermal insulating products for buildings - In-situ formed sprayed rigid polyurethane (PUR) and polyisocyanurate (PIR) foam products - Part 1: Specification for the rigid foam spray system before installation

d-) Thickness of test specimen

Measurement results according to EN 12085

$D_{specimen}$ = 0,04208m (42,08mm)

Thickness value of the test specimen after placing in the equipment:

$D_{specimen}$ = 0,042367m (42,367mm)

Thickness value of the test specimen : 50 mm

After placing the device in place of the test piece is based on the measured thickness value.

e-) Method and Temperatures of Conditioning: Test specimen stored at (23±3)°C and %(50±10) relative humidity for 48 hours.

- Cut a test specimen of minimum dimensions 200mm length and width 20(+2/-0)mm thickness from the central area of the product sample. Stored the test specimen at (70±2) °C for (21±1) days. After reconditioning for 16 h at (23±3)°C and %(50±10) relative humidity determined the aged value of thermal conductivity of the test specimen. The difference between the aged and the initial values of thermal conductivity is not more than 0,0060 W/(m.K) for pentane blown.Aged thermal conductivity is calculated as adding 0,006W/(m.K) value to the value of initial thermal conductivity value (manufacturer declared that blowing agent is 365 mfc).

f-) Densities of conditioned materials as tested:

$\rho_{speciment}$ = 46,69 kg/m^3

Declared apparent density value: 30kg/m^3

g-) Relative mass changes during conditioning: $\Delta m_{cspeciment}$= 0,0

h-) Relative mass changes during the test: $\Delta m_{wspecimen}$ = 0,0

- **Observed thickness and volume changes during the test:**

$\Delta d_{specimen}$ = 0,00mm (Changes in thickness), $\Delta l_{specimen}$ = 0,0mm (Changes in length),

$\Delta w_{specimen}$ = 0,0mm (Changes in width)

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DENEY RAPORU
TEST REPORT

i-) Average temperature difference across the specimens during the test:

20,00°C (20,00 K)

j-) Mean temperature of test: 10,01°C (283,01 K)

k-) Density of heat flow rate through the specimens during the test

$q_{specimen}$= 9,61 W/m^2

l-) Thermal resistance of test specimens:

$R_{specimen}$ =2,08 m^2.K / W

m-)

- Date of completion of the tests/duration: 16.12.2015/ $t_{specimsn-t}$ = 1h8dk.
- Steady state part of the tests : $t_{specimen-t}$ = 1h3dk.
- Date of last heat flow meter calibration :11.12.2015
- Type of the calibration specimen used: IRRM 440-A
- Thermal conductivity of calibration specimen:

Temperature	Thermal Conductivity W/(m.K)	
	Cerification Value	Uncertainty of measurement
-10°C ≤ T ≤50°C	$2{,}93949\cdot10^{-2}+\frac{T}{°C}\cdot1{,}060\cdot10^{-4}+\frac{T^2}{(°C)^2}\cdot2{,}047\cdot10^{-7}$	0,00028

- Thermal conductivity of calibration specimen:
- Date of calibration specimen certification: 01.04.2015
- Orientation of the apparatus: Horizontal
- The position of the hot side of the specimen: Bottom

n-) Usage of water-vapour tight envelopes: Water-vapour tight envelopes not used for tests

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Adres: Şerifali Çiftliği Hendem Caddesi No:58 Y.Dudullu 34775 Ümraniye/İSTANBUL

DENEY RAPORU
TEST REPORT

Uncertainty of measurement: Thermal conductivity=(0,02635±0,002) W/m.K *
*: k=2 ve %95 Confidence Interval

Test specimen/piece ▶ / **Test parameters ▼**	**UDN 1500337 (10°C)**
Densities of conditioned materials as tested, (kg/m^3)	46,69
Declared density of test specimen, (kg/m^3)	30
Relative mass changes during conditioning	0,0
Relative mass changes during test,	0,0
Declared thickness value of the test specimen, (m)	50
Measured thickness of test specimen as tested (TS EN 12085), m	0,04208
Thickness value of the test specimen after placing in the equipment, (m)	0,042367
Observed thickness change during the test, (mm)	0,0
Observed length change during the test, (mm)	0,0
Observed width change during the test, (mm)	0,0
Density of heat flow rate through the specimens during the test, (W/m^2)	9,61
Thermal resistance of test specimen, (m^2.K/W)	2,08
Test duration, (min)	1h8dk.
Steady state part of the tests, (min)	1h3dk.
Thermal Conductivity, (W/m.K)	0,02035
Aged Thermal Conductivity, (W/m.K) (Blowing agent:365 mfc)	**0,02635**

* işareti ile gösterilen deney metotları Akreditasyon kapsamı dışındadır.

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Adres: Şerifali Çiftliği Hendem Caddesi No:58 Y.Dudullu 34775 Ümraniye/İSTANBUL

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Onaylanmış Kuruluş Numarası: 2164

DENEY RAPORU
TEST REPORT

Customer Name/Adresse: AKDE KİMYA END. SAN. VE TİC. LTD ŞTİ.
Yeşilbayır Mah. Şimşir Sok. No:3 Hadımköy/İSTANBUL

Order No: UDİ1500037

Specimen No: UDN1500338

Name and identity of test item: Thermal insulation products made from sprayed rigid polyurethane (PU) foam : "SPR230"

The date of receipt of test item: 16.11.2015

The date of receipt of test item: 16.11.2015

Remarks: Test sample of "Polyurethane Foam" sent by the client to the laboratory.

Date of Test: 10.12.2015-16.12.2015 (dd/mm/yyyy)

Raporun Sayfa Sayısı: 1/5

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The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

Seal Mühür	*Date* Tarih	*Person in charge of test* Deneyi Yapan Kimya Teknikeri/*Chemistry Tec.*	*Head of Testing Laboratory* Teknik Laboratuvar Yöneticisi
	03.02.2016	H.ATABAY	E.KARA

* işareti ile gösterilen deney metotları Akreditasyon kapsamı dışındadır.
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Adres: Şerifali Çiftliği Hendem Caddesi No:58 Y.Dudullu 34775 Ümraniye/İSTANBUL

DENEY RAPORU
TEST REPORT

Polyurethane foam (density: 30 kg/m^3, Thickness:30mm) for test samples, which sent by the client to the laboratory in 16 November 2015, tested according to EN 14315-1 EK C ve TS EN 12667 and test results with related information given below.

Tests performed without any treatments to reduce edge heat losses according to EN 12667 "Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Products of high and medium thermal resistance" and EN 14315 Annex C "Thermal insulating products for buildings - In-situ formed sprayed rigid polyurethane (PUR) and polyisocyanurate (PIR) foam products - Part 1: Specification for the rigid foam spray system before installation" by using single heat flow meter with specimen symmetrical configuration and analytical balance and dial gauge and metal ruler. During the tests, ambient temperature of the environment surrounding the apparatus was (23±5) °C

Product Standard applicable to tested specimens: EN 14315: Thermal insulating products for buildings - In-situ formed sprayed rigid polyurethane (PUR) and polyisocyanurate (PIR) foam products - Part 1: Specification for the rigid foam spray system before installation

b-)Product Description: Thermal insulation products made from sprayed rigid polyurethane (PU) foam

- **Sponsor/Client:** AKDE KİMYA END. SAN. VE TİC. LTD ŞTİ.
- **Production Plant:** Yeşilbayır Mah. Şimşir Sok. No:3 Hadımköy/İSTANBUL
- **Brand Name:** SPR230
- **Lot Number/Production Code/Serial Number:**-/-/-
- **Production Date:** 06.11.2015

Test specimen size: (293x302)mm

c-)Product description, sampling and reference to product Standard for specimen preparation procedure:

Test samples which are described in clause (b) were taken by the client and sent to the laboratory

DENEY RAPORU
TEST REPORT

Product Standard applicable to the test specimen: EN 14315-1: Thermal insulating products for buildings - In-situ formed sprayed rigid polyurethane (PUR) and polyisocyanurate (PIR) foam products - Part 1: Specification for the rigid foam spray system before installation

d-) Thickness of test specimen

Measurement results according to EN 12085

$d_{specimen}$ = 0,03637m (36,37mm)

Thickness value of the test specimen after placing in the equipment:

$d_{specimen}$ = 0,036938m (36,938mm)

Thickness value of the test specimen : 30 mm

After placing the device in place of the test piece is based on the measured thickness value.

e-) Method and Temperatures of Conditioning: Test specimen stored at (23±3)°C and %(50±10) relative humidity for 48 hours.

- Cut a test specimen of minimum dimensions 200mm length and width 20(+2/-0)mm thickness from the central area of the product sample. Stored the test specimen at (70±2) °C for (21±1) days. After reconditioning for 16 h at (23±3)°C and %(50±10) relative humidity determined the aged value of thermal conductivity of the test specimen. The difference between the aged and the initial values of thermal conductivity is not more than 0,0060 W/(m.K) for pentane blown.Aged thermal conductivity is calculated as adding 0,006W/(m.K) value to the value of initial thermal conductivity value (manufacturer declared that blowing agent is 365 mfc).

f-) Densities of conditioned materials as tested:

$\rho_{speciment}$ = 49,56 kg/m^3

Declared apparent density value: 30kg/m^3

g-) Relative mass changes during conditioning: $\Delta m_{cspeciment}$= 0,0

h-) Relative mass changes during the test: $\Delta m_{wspecimen}$ = 0,0

- **Observed thickness and volume changes during the test:**

$\Delta d_{specimen}$ = 0,00mm (Changes in thickness), $\Delta l_{specimen}$ = 0,0mm (Changes in length),

$\Delta w_{specimen}$ = 0,0mm (Changes in width)

TEBAR TEST BELGELENDİRME ARAŞTIRMA ve GELİŞTİRME TİC. A.Ş.
Adres: Şerifali Çiftliği Hendem Caddesi No:58 Y.Dudullu 34775 Ümraniye/İSTANBUL

DENEY RAPORU
TEST REPORT

i-) Average temperature difference across the specimens during the test:

20,00°C (20,00 K)

j-) Mean temperature of test: 10,01°C (283,01 K)

k-) Density of heat flow rate through the specimens during the test

$q_{specimen}$= 11,5 W/m^2

l-) Thermal resistance of test specimens:

$R_{specimen}$ =1,74 m^2.K / W

m-)

- Date of completion of the tests/duration: 16.12.2015/ $t_{specimsn\text{-}t}$ = 1h5dk.
- Steady state part of the tests : $t_{specimen\text{-}t}$ = 1h
- Date of last heat flow meter calibration :11.12.2015
- Type of the calibration specimen used: IRRM 440-A
- Thermal conductivity of calibration specimen:

Temperature	Thermal Conductivity W/(m.K)	
	Cerification Value	Uncertainty of measurement
-10°C ≤ T ≤50°C	$2{,}93949\cdot10^{-2}+\frac{T}{°C}\cdot1{,}060\cdot10^{-4}+\frac{T^2}{(°C)^2}\cdot2{,}047\cdot10^{-7}$	0,00028

- Thermal conductivity of calibration specimen:
- Date of calibration specimen certification: 01.04.2015
- Orientation of the apparatus: Horizontal
- The position of the hot side of the specimen: Bottom

n-) Usage of water-vapour tight envelopes: Water-vapour tight envelopes not used for tests

TEBAR TEST BELGELENDİRME ARAŞTIRMA ve GELİŞTİRME TİC. A.Ş.
Adres: Şerifali Çiftliği Hendem Caddesi No:58 Y.Dudullu 34775 Ümraniye/İSTANBUL

DENEY RAPORU
TEST REPORT

Uncertainty of measurement: Thermal conductivity=(0,02719±0,002) W/m.K *
*: k=2 ve %95 Confidence Interval

Test specimen/piece ▶ / **Test parameters ▼**	**UDN 1500338 (10°C)**
Densities of conditioned materials as tested, (kg/m^3)	49,56
Declared density of test specimen, (kg/m^3)	30
Relative mass changes during conditioning	0,0
Relative mass changes during test,	0,0
Declared thickness value of the test specimen, (m)	30
Measured thickness of test specimen as tested (TS EN 12085), m	0,03637
Thickness value of the test specimen after placing in the equipment, (m)	0,036938
Observed thickness change during the test, (mm)	0,0
Observed length change during the test, (mm)	0,0
Observed width change during the test, (mm)	0,0
Density of heat flow rate through the specimens during the test, (W/m^2)	11,5
Thermal resistance of test specimen, (m^2.K/W)	1,74
Test duration, (min)	1h5dk.
Steady state part of the tests, (min)	1h.
Thermal Conductivity, (W/m.K)	0,02119
Aged Thermal Conductivity, (W/m.K) (Blowing agent:365 mfc)	**0,02719**

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TEBAR TEST BELGELENDİRME ARAŞTIRMA ve GELİŞTİRME TİC. A.Ş.
Adres: Şerifali Çiftliği Hendem Caddesi No:58 Y.Dudullu 34775 Ümraniye/İSTANBUL

TEBAR A.Ş; 20.10.2015 tarih ve 29508 sayılı Resmi Gazetede yayımlanan Yapı Malzemeleri Yönetmeliği (305/2011/AB) Kapsamında TEBAR Test Belgelendirme Araştırma ve Geliştirme Ticaret A.Ş.'nin Onaylanmış Kuruluş Olarak Görevlendirilmesine Dair Tebliğ (Tebliğ No: MHG/2015-19) ile Çevre ve Şehircilik Bakanlığı tarafından yetkilendirilmiştir.

Onaylanmış Kuruluş Numarası: 2164

DENEY RAPORU
TEST REPORT

Customer Name/Adresse: AKDE KİMYA END. SAN. VE TİC. LTD ŞTİ.
Yeşilbayır Mah. Şimşir Sok. No:3 Hadımköy/İSTANBUL

Order No: UDİ1500037

Specimen No: UDN1500339

Name and identity of test item: Thermal insulation products made from sprayed rigid polyurethane (PU) foam : "SPR230"

The date of receipt of test item: 16.11.2015

The date of receipt of test item: 16.11.2015

Remarks: Test sample of "Polyurethane Foam" sent by the client to the laboratory.

Date of Test: 10.12.2015-16.12.2015 (dd/mm/yyyy)

Raporun Sayfa Sayısı: 1/5

Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınması konusunda Avrupa Akreditasyon Birliği (EA) ve Uluslar arası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanınma antlaşması imzalamıştır.
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The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

Seal Mühür	*Date* Tarih	*Person in charge of test* Deneyi Yapan Kimya Teknikeri/*Chemistry Tec.*	*Head of Testing Laboratory* Teknik Laboratuvar Yöneticisi
	03.02.2016	H.ATABAY	E.KARA

* işareti ile gösterilen deney metotları Akreditasyon kapsamı dışındadır.

TEBAR TEST BELGELENDİRME ARAŞTIRMA ve GELİŞTİRME TİC. A.Ş.
Adres: Şerifali Çiftliği Hendem Caddesi No:58 Y.Dudullu 34775 Ümraniye/İSTANBUL

DENEY RAPORU
TEST REPORT

Polyurethane foam (density: 30 kg/m^3, Thickness:50mm) for test samples, which sent by the client to the laboratory in 16 November 2015, tested according to EN 14315-1 EK C ve TS EN 12667 and test results with related information given below.

Tests performed without any treatments to reduce edge heat losses according to EN 12667 "Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Products of high and medium thermal resistance" and EN 14315 Annex C "Thermal insulating products for buildings - In-situ formed sprayed rigid polyurethane (PUR) and polyisocyanurate (PIR) foam products - Part 1: Specification for the rigid foam spray system before installation" by using single heat flow meter with specimen symmetrical configuration and analytical balance and dial gauge and metal ruler. During the tests, ambient temperature of the environment surrounding the apparatus was (23±5) °C

Product Standard applicable to tested specimens: EN 14315: Thermal insulating products for buildings - In-situ formed sprayed rigid polyurethane (PUR) and polyisocyanurate (PIR) foam products - Part 1: Specification for the rigid foam spray system before installation

b-)Product Description: Thermal insulation products made from sprayed rigid polyurethane (PU) foam

- **Sponsor/Client:** AKDE KİMYA END. SAN. VE TİC. LTD ŞTİ.
- **Production Plant:** Yeşilbayır Mah. Şimşir Sok. No:3 Hadımköy/ISTANBUL
- **Brand Name:** SPR230
- **Lot Number/Production Code/Serial Number:**-/-/-
- **Production Date:** 15.10.2015

Test specimen size: (304x307)mm

c-)Product description, sampling and reference to product Standard for specimen preparation procedure:

Test samples which are described in clause (b) were taken by the client and sent to the laboratory

TEBAR TEST BELGELENDİRME ARAŞTIRMA ve GELİŞTİRME TİC. A.Ş.
Adres: Şerifali Çiftliği Hendem Caddesi No:58 Y.Dudullu 34775 Ümraniye/İSTANBUL

DENEY RAPORU
TEST REPORT

Product Standard applicable to the test specimen: EN 14315-1: Thermal insulating products for buildings - In-situ formed sprayed rigid polyurethane (PUR) and polyisocyanurate (PIR) foam products - Part 1: Specification for the rigid foam spray system before installation

d-) Thickness of test specimen

Measurement results according to EN 12085

$d_{specimen}$ = 0,04151m (41,51mm)

Thickness value of the test specimen after placing in the equipment:

$d_{specimen}$ = 0,04198m (41,980mm)

Thickness value of the test specimen : 50 mm

After placing the device in place of the test piece is based on the measured thickness value.

e-) Method and Temperatures of Conditioning: Test specimen stored at (23±3)°C and %(50±10) relative humidity for 48 hours.

- Cut a test specimen of minimum dimensions 200mm length and width 20(+2/-0)mm thickness from the central area of the product sample. Stored the test specimen at (70±2) °C for (21±1) days. After reconditioning for 16 h at (23±3)°C and %(50±10) relative humidity determined the aged value of thermal conductivity of the test specimen. The difference between the aged and the initial values of thermal conductivity is not more than 0,0060 W/(m.K) for pentane blown.Aged thermal conductivity is calculatcd as adding 0,006W/(m.K) value to the value of initial thermal conductivity value (manufacturer declared that blowing agent is 365 mfc).

f-) Densities of conditioned materials as tested:

$\rho_{speciment}$ = 45,16 kg/m^3

Declared apparent density value: 30kg/m^3

g-) Relative mass changes during conditioning: $\Delta m_{cspeciment}$= 0,0

h-) Relative mass changes during the test: $\Delta m_{wspecimen}$ = 0,0

- **Observed thickness and volume changes during the test:**

$\Delta d_{specimen}$ = 0,00mm (Changes in thickness), $\Delta l_{specimen}$ = 0,0mm (Changes in length),

$\Delta w_{specimen}$ = 0,0mm (Changes in width)

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TEST REPORT

i-) Average temperature difference across the specimens during the test:

20,00°C (20,00 K)

j-) Mean temperature of test: 10,01°C (283,01 K)

k-) Density of heat flow rate through the specimens during the test

$q_{specimen}$= 9,67 W/m^2

l-) Thermal resistance of test specimens:

$R_{specimen}$ =2,07 m^2.K / W

m-)

- Date of completion of the tests/duration: 16.12.2015/ $t_{specimsn\text{-}t}$ = 1h4dk.
- Steady state part of the tests : $t_{specimen\text{-}t}$ = 59dk.
- Date of last heat flow meter calibration :11.12.2015
- Type of the calibration specimen used: IRRM 440-A
- Thermal conductivity of calibration specimen:

Temperature	Thermal Conductivity W/(m.K)	
	Cerification Value	Uncertainty of measurement
-10°C ≤ T ≤50°C	$2{,}93949\cdot10^{-2}+\frac{T}{°C}\cdot1{,}060\cdot10^{-4}+\frac{T^2}{(°C)^2}\cdot2{,}047\cdot10^{-7}$	0,00028

- Thermal conductivity of calibration specimen:
- Date of calibration specimen certification: 01.04.2015
- Orientation of the apparatus: Horizontal
- The position of the hot side of the specimen: Bottom

n-) Usage of water-vapour tight envelopes: Water-vapour tight envelopes not used for tests

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Uncertainty of measurement: Thermal conductivity=(0,02630±0,002) W/m.K *
*: k=2 ve %95 Confidence Interval

Test specimen/piece ▶ / **Test parameters ▼**	**UDN 1500339 (10°C)**
Densities of conditioned materials as tested, (kg/m^3)	45,16
Declared density of test specimen, (kg/m^3)	30
Relative mass changes during conditioning	0,0
Relative mass changes during test,	0,0
Declared thickness value of the test specimen, (m)	50
Measured thickness of test specimen as tested (TS EN 12085), m	0,04151
Thickness value of the test specimen after placing in the equipment, (m)	0,041980
Observed thickness change during the test, (mm)	0,0
Observed length change during the test, (mm)	0,0
Observed width change during the test, (mm)	0,0
Density of heat flow rate through the specimens during the test, (W/m^2)	9,97
Thermal resistance of test specimen, (m^2.K/W)	2,07
Test duration, (min)	1h4dk.
Steady state part of the tests, (min)	59dk.
Thermal Conductivity, (W/m.K)	0,02030
Aged Thermal Conductivity, (W/m.K) (Blowing agent:365 mfc)	**0,02630**

* işareti ile gösterilen deney metotları Akreditasyon kapsamı dışındadır.

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Adres: Şerifali Çiftliği Hendem Caddesi No:58 Y.Dudullu 34775 Ümraniye/İSTANBUL

TEBAR A.Ş; 20.10.2015 tarih ve 29508 sayılı Resmi Gazetede yayımlanan Yapı Malzemeleri Yönetmeliği (305/2011/AB) Kapsamında TEBAR Test Belgelendirme Araştırma ve Geliştirme Ticaret A.Ş.'nin Onaylanmış Kuruluş Olarak Görevlendirilmesine Dair Tebliğ (Tebliğ No: MHG/2015-19) ile Çevre ve Şehircilik Bakanlığı tarafından yetkilendirilmiştir.

Onaylanmış Kuruluş Numarası: 2164

DENEY RAPORU
TEST REPORT

Customer Name/Adresse: AKDE KİMYA END. SAN. VE TİC. LTD ŞTİ.
Yeşilbayır Mah. Şimşir Sok. No:3 Hadımköy/İSTANBUL

Order No: UDİ1500037

Specimen No: UDN1500340

Name and identity of test item: Thermal insulation products made from sprayed rigid polyurethane (PU) foam : "SPR230"

The date of receipt of test item: 16.11.2015

The date of receipt of test item: 16.11.2015

Remarks: Test sample of "Polyurethane Foam" sent by the client to the laboratory.

Date of Test: 10.12.2015-16.12.2015 (dd/mm/yyyy)

Raporun Sayfa Sayısı: 1/5

Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınması konusunda Avrupa Akreditasyon Birliği (EA) ve Uluslar arası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanınma antlaşması imzalamıştır.
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The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

Seal Mühür	*Date* Tarih	*Person in charge of test* Deneyi Yapan Kimya Teknikeri/*Chemistry Tec.*	*Head of Testing Laboratory* Teknik Laboratuvar Yöneticisi
	03.02.2016	H.ATABAY	E.KARA

* işareti ile gösterilen deney metotları Akreditasyon kapsamı dışındadır.
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TEST REPORT

Polyurethane foam (density: 30 kg/m^3, Thickness:30mm) for test samples, which sent by the client to the laboratory in 16 November 2015, tested according to EN 14315-1 EK C ve TS EN 12667 and test results with related information given below.

Tests performed without any treatments to reduce edge heat losses according to EN 12667 "Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Products of high and medium thermal resistance" and EN 14315 Annex C "Thermal insulating products for buildings - In-situ formed sprayed rigid polyurethane (PUR) and polyisocyanurate (PIR) foam products - Part 1: Specification for the rigid foam spray system before installation" by using single heat flow meter with specimen symmetrical configuration and analytical balance and dial gauge and metal ruler. During the tests, ambient temperature of the environment surrounding the apparatus was (23±5) °C

Product Standard applicable to tested specimens: EN 14315: Thermal insulating products for buildings - In-situ formed sprayed rigid polyurethane (PUR) and polyisocyanurate (PIR) foam products - Part 1: Specification for the rigid foam spray system before installation

b-)Product Description: Thermal insulation products made from sprayed rigid polyurethane (PU) foam

- **Sponsor/Client:** AKDE KİMYA END. SAN. VE TİC. LTD ŞTİ.
- **Production Plant:** Yeşilbayır Mah. Şimşir Sok. No:3 Hadımköy/İSTANBUL
- **Brand Name:** SPR230
- **Lot Number/Production Code/Serial Number:**-/-/-
- **Production Date:** 26.10.2015

Test specimen size: (304x302)mm

c-)Product description, sampling and reference to product Standard for specimen preparation procedure:

Test samples which are described in clause (b) were taken by the client and sent to the laboratory

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Product Standard applicable to the test specimen: EN 14315-1: Thermal insulating products for buildings - In-situ formed sprayed rigid polyurethane (PUR) and polyisocyanurate (PIR) foam products - Part 1: Specification for the rigid foam spray system before installation

d-) Thickness of test specimen

Measurement results according to EN 12085

$d_{specimen}$ = 0,03685 m (36,85mm)

Thickness value of the test specimen after placing in the equipment:

$d_{specimen}$ = 0,037287m (37,287mm)

Thickness value of the test specimen : 30 mm

After placing the device in place of the test piece is based on the measured thickness value.

e-) Method and Temperatures of Conditioning: Test specimen stored at (23±3)°C and %(50±10) relative humidity for 48 hours.

- Cut a test specimen of minimum dimensions 200mm length and width 20(+2/-0)mm thickness from the central area of the product sample. Stored the test specimen at (70±2) °C for (21±1) days. After reconditioning for 16 h at (23±3)°C and %(50±10) relative humidity determined the aged value of thermal conductivity of the test specimen. The difference between the aged and the initial values of thermal conductivity is not more than 0,0060 W/(m.K) for pentane blown.Aged thermal conductivity is calculated as adding 0,006W/(m.K) value to the value of initial thermal conductivity value (manufacturer declared that blowing agent is 365 mfc).

f-) Densities of conditioned materials as tested:

$\rho_{speciment}$ = 55,03 kg/m^3

Declared apparent density value: 30kg/m^3

g-) Relative mass changes during conditioning: $\Delta m_{cspeciment}$= 0,0

h-) Relative mass changes during the test: $\Delta m_{wspecimen}$ = 0,0

- **Observed thickness and volume changes during the test:**

$\Delta d_{specimen}$ = 0,00mm (Changes in thickness), $\Delta l_{specimen}$ = 0,0mm (Changes in length),

$\Delta w_{specimen}$ = 0,0mm (Changes in width)

DENEY RAPORU
TEST REPORT

i-) Average temperature difference across the specimens during the test:

20,00°C (20,00 K)

j-) Mean temperature of test: 10,01°C (283,01 K)

k-) Density of heat flow rate through the specimens during the test

$q_{specimen}$= 11,1 W/m^2

l-) Thermal resistance of test specimens:

$R_{specimen}$ =1,8 m^2.K / W

m-)

- Date of completion of the tests/duration: 16.12.2015/ $t_{specimsn-t}$ = 1h.
- Steady state part of the tests : $t_{specimen-t}$ = 55dk.
- Date of last heat flow meter calibration :11.12.2015
- Type of the calibration specimen used: IRRM 440-A
- Thermal conductivity of calibration specimen:

Temperature	Thermal Conductivity W/(m.K)	
	Cerification Value	Uncertainty of measurement
-10°C ≤ T ≤50°C	$2{,}93949\cdot10^{-2}+\frac{T}{°C}\cdot1{,}060\cdot10^{-4}+\frac{T^2}{(°C)^2}\cdot2{,}047\cdot10^{-7}$	0,00028

- Thermal conductivity of calibration specimen:
- Date of calibration specimen certification: 01.04.2015
- Orientation of the apparatus: Horizontal
- The position of the hot side of the specimen: Bottom

n-) Usage of water-vapour tight envelopes: Water-vapour tight envelopes not used for tests

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DENEY RAPORU
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Uncertainty of measurement: Thermal conductivity=(0,02678±0,002) W/m.K *

*: k=2 ve %95 Confidence Interval

Test specimen/piece ▶ **Test parameters ▼**	**UDN 1500340 (10°C)**
Densities of conditioned materials as tested, (kg/m^3)	55,03
Declared density of test specimen, (kg/m^3)	30
Relative mass changes during conditioning	0,0
Relative mass changes during test,	0,0
Declared thickness value of the test specimen, (m)	30
Measured thickness of test specimen as tested (TS EN 12085), m	0,03685
Thickness value of the test specimen after placing in the equipment, (m)	0,037287
Observed thickness change during the test, (mm)	0,0
Observed length change during the test, (mm)	0,0
Observed width change during the test, (mm)	0,0
Density of heat flow rate through the specimens during the test, (W/m^2)	11,1
Thermal resistance of test specimen, (m^2.K/W)	1,80
Test duration, (min)	1h.
Steady state part of the tests, (min)	55dk.
Thermal Conductivity, (W/m.K)	0,02078
Aged Thermal Conductivity, (W/m.K) **(Blowing agent:365 mfc)**	**0,02678**

* işareti ile gösterilen deney metotları Akreditasyon kapsamı dışındadır.