Textiles & Flooring Institute GmbH

TFI Report 441874-14

Reaction to fire test

For the classification according to EN 13501-1:2010

Customer

LG Hausys Ltd.
One IFC, 20 Yeouido-gong, Yeongdeungpo-gu
150-876 Seoul
SOUTH KOREA

Product

resilient floor covering
DSW Decotile 3.0

Responsible at TFI

Dipl.-Ing. Ulrike Balg
Tel: +49 241 9679 133
u.balg@tfi-online.de

This report includes 3 pages and 4 annexes.

Aachen, 25 March 2015

Dr. Jens-Christian Winkler
authorized manager

The present document is provided with a qualified electronic signature and is valid without autograph signature.

TEXTILES & FLOORING INSTITUTE GMBH AACHEN

This report only applies to the tested specimens and has been established to the best of our knowledge. Only the entire report shall be reproduced. Under no circumstances, extracts shall be used. Furthermore, we apply the "General Terms and Conditions for the Execution of Contracts" of the Textiles & Flooring Institute GmbH, also with regard to the order execution.

Textiles & Flooring Institute GmbH

1 Transaction

Test order	Reaction to fire test for construction products according to EN ISO 11925-2:2010 and EN ISO 9239-1:2010
Order date	25 November 2014
Your reference	Dan Bi
Product designation	DSW Decotile 3.0
TFI sample number	14-11-0278
Date of manufacture	not specified
Date of sample receipt	24 November 2014
Sampling performed by	Customer

2 Product Specification

cf. annex KT

3 Results

Ignitability of products subjected to direct impingement of flame according to EN ISO 11925-2:2010

Ignition	no
Flame tip	≤ 150 mm
Burning droplets	not relevant

Burning behaviour using a radiant heat source according to EN ISO 9239-1:2010

Average critical heat flux [kW/m²]	≥ 11.0
Integrated smoke density [% x min]	86
Adhesion	none
Substrate according to EN 13238:2010	fibre cement board

This test report is the basis for a classification report according to EN 13501-1:2010.

The test results relate to the behaviour of the test specimens of a construction product under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the construction product in use.

Notified Body No. 1658

Testing laboratory, inspection and certification body recognised by the DIBt (Deutsches Institut für Bautechnik)

DAkkS Deutsche Akkreditierungsstelle D-PL-17152-01-00

Accredited for the methods indicated in the annex to the DAkkS certificate

Charlottenburger Allee 41
52068 Aachen · Germany
Tel: +49.241.9679 00
www.tfi-online.de

HRB 8157 Aachen
VAT No. DE209411312
Managing Director
Dr. Ernst Schröder

Textiles & Flooring Institute GmbH

4 Annexes

Photographs	F 441874-14
Ignitability [a]	KB 441874-14
Characteristics of the construction product [a]	KT 441874-14
Reaction to Fire [a]	RP 441874-14

The annexes marked [a] are based on tests accredited in accordance with EN ISO/IEC 17025.

Notified Body
No. 1658

Testing laboratory,
inspection and certification
body recognised by the DIBt
(Deutsches Institut für Bautechnik)

DAkkS
Deutsche
Akkreditierungsstelle
D-PL-17152-01-00

Accredited for the methods indicated
in the annex to the DAkkS certificate

Charlottenburger Allee 41
52068 Aachen · Germany
Tel: +49.241.9679 00
www.tfi-online.de

HRB 8157 Aachen
VAT No. DE209411312
Managing Director
Dr. Ernst Schröder

Textiles & Flooring Institute GmbH

Annex F - Photographs

1 Transaction

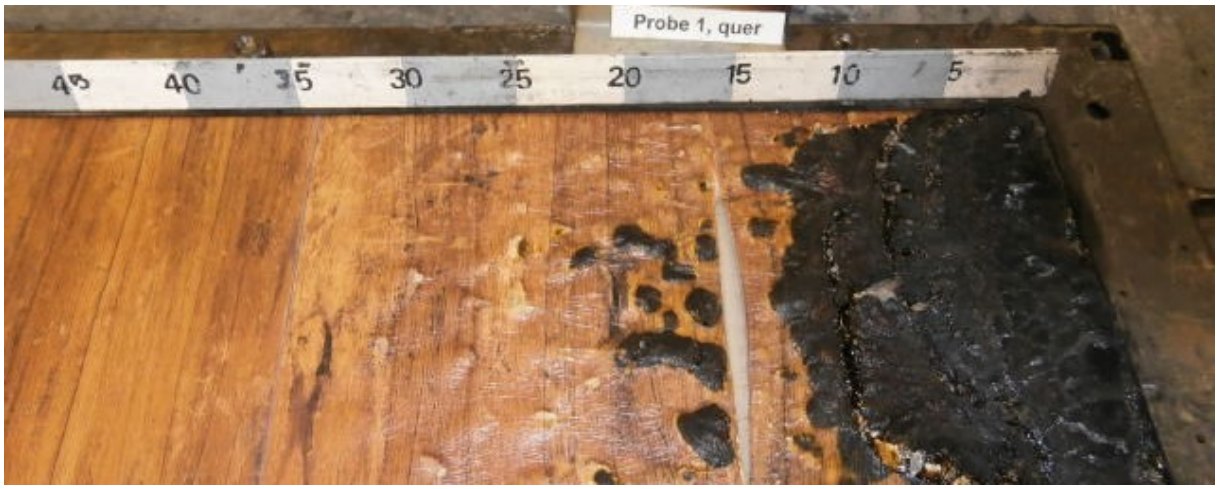
Product designation	DSW Decotile 3.0
TFI sample number	14-11-0278
Testing period	25 February 2015

2 Test Method / Requirements

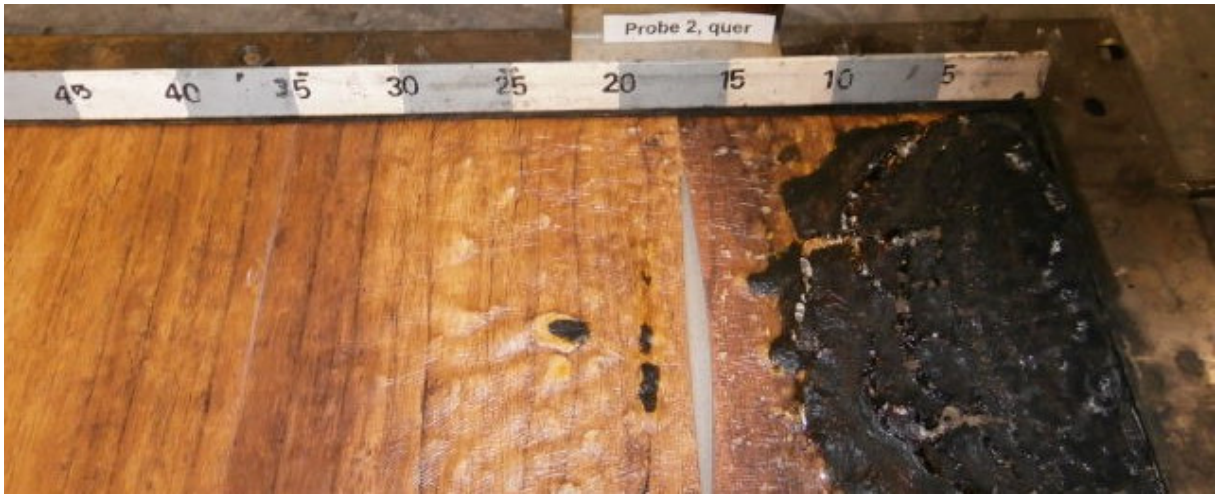
-not specified-

3 Results

3.1. Specimen 1, cross production direction



3.2. Specimen 2, cross production direction



Notified Body
No. 1658

Testing laboratory,
inspection and certification
body recognised by the DIBt
(Deutsches Institut für Bautechnik)

DAkkS
Deutsche
Akkreditierungsstelle
D-PL-17152-01-00

Accredited for the methods indicated
in the annex to the DAkkS certificate

Charlottenburger Allee 41
52068 Aachen · Germany
Tel: +49.241.9679 00
www.tfi-online.de

HRB 8157 Aachen
VAT No. DE209411312
Managing Director
Dr. Ernst Schröder

Textiles & Flooring Institute GmbH

3.3. Specimen 3, cross production direction

3.4. Specimen 4, in production direction

Notified Body
No. 1658

Testing laboratory,
inspection and certification
body recognised by the DIBt
(Deutsches Institut für Bautechnik)

DAkkS
Deutsche
Akkreditierungsstelle
D-PL-17152-01-00

Accredited for the methods indicated
in the annex to the DAkkS certificate

Charlottenburger Allee 41
52068 Aachen · Germany
Tel: +49.241.9679 00
www.tfi-online.de

HRB 8157 Aachen
VAT No. DE209411312
Managing Director
Dr. Ernst Schröder

Textiles & Flooring Institute GmbH

Annex KB - Ignitability

1 Transaction

Product designation	DSW Decotile 3.0
TFI sample number	14-11-0278
Testing period	25 February 2015

2 Test Method / Requirements

EN ISO 11925-2:2010 Part 2	Ignitability of products subjected to direct impingement of flame
Substrate according to EN 13238:2010	Fibre cement board
Type of fixation	Loosely laid
Conditioning	Conditioning to constant mass according to EN 13238:2010
Type of ignition	Surface ignition
Ignition time [s]	15
Deviation from the standard	- none -

3 Results

Parameter	Specimen no.					
	1	2	3	4	5	6
Orientation to the direction of production	in production direction	in production direction	in production direction	cross production direction	cross production direction	cross production direction
Ignition of the specimen	no	no	no	no	no	no
Flame tip (moment [s])	<150 mm (n.r.)	<150 mm (n.r.)	<150 mm (n.r.)	<150 mm (n.r.)	<150 mm (n.r.)	<150 mm (n.r.)
Maximum flame height [mm] (moment [s])	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.
Burning droplets	no	no	no	no	no	no
Ignition of the filter paper	no	no	no	no	no	no

Observations: - none -

Notified Body No. 1658

Testing laboratory, inspection and certification body recognised by the DIBt (Deutsches Institut für Bautechnik)

DAkkS Deutsche Akkreditierungsstelle D-PL-17152-01-00

Accredited for the methods indicated in the annex to the DAkkS certificate

Charlottenburger Allee 41
52068 Aachen · Germany
Tel: +49.241.9679 00
www.tfi-online.de

HRB 8157 Aachen
VAT No. DE209411312
Managing Director
Dr. Ernst Schröder

Textiles & Flooring Institute GmbH

Annex KT – Characteristics of the construction product

1 Transaction

Product designation	DSW Decotile 3.0
TFI sample number	14-11-0278
Testing period	05 December 2014

2 Test Method / Requirements

EN ISO 24346:2012	Resilient floor coverings - Determination of total thickness
EN ISO 23997:2012	Resilient floor coverings - Determination of mass per unit area
Deviation	- none -

3 Results

Parameter	Manufacturer's data	TFI results
Use surface	PVC, CaCo2, Plasticizer	not tested
Construction	heterogeneous	heterogeneous
Structure	- none -	flat
Pattern	- none -	multicoloured, unpatterned
Colour of the use surface	- none -	black, brown
Type of delivery	tiles	modules
Total thickness [mm]	3.0	3.01
Thickness of use surface [mm]	0.55	not tested
Total mass per unit area [g/m²]	5800	5520

Notified Body No. 1658

Testing laboratory, inspection and certification body recognised by the DIBt (Deutsches Institut für Bautechnik)

DAkkS Deutsche Akkreditierungsstelle D-PL-17152-01-00

Accredited for the methods indicated in the annex to the DAkkS certificate

Charlottenburger Allee 41
52068 Aachen · Germany
Tel: +49.241.9679 00
www.tfi-online.de

HRB 8157 Aachen
VAT No. DE209411312
Managing Director
Dr. Ernst Schröder

Textiles & Flooring Institute GmbH

Annex RP – Reaction to Fire

1 Transaction

Product designation	DSW Decotile 3.0
TFI sample number	14-11-0278
Testing period	25 February 2015

2 Test Method / Requirements

EN ISO 9239-1:2010 Part 1	Determination of the burning behaviour using a radiant heat source
Substrate according to EN 13238:2010	Fibre cement board
Adhesion	-none -
Joint according to EN ISO 9239-1:2010	No
Conditioning	Conditioning to constant mass according to EN 13238:2010
Deviation	- none-

3 Results

cf page 2 - 5

Notified Body
No. 1658

Testing laboratory,
inspection and certification
body recognised by the DIBt
(Deutsches Institut für Bautechnik)

DAkkS
Deutsche
Akkreditierungsstelle
D-PL-17152-01-00

Accredited for the methods indicated
in the annex to the DAkkS certificate

Charlottenburger Allee 41
52068 Aachen · Germany
Tel: +49.241.9679 00
www.tfi-online.de

HRB 8157 Aachen
VAT No. DE209411312
Managing Director
Dr. Ernst Schröder

Textiles & Flooring Institute GmbH

Annex RP - Burning behaviour

Sample designation 14-11-0278

Sample

Sample No.: 1
Direction: cross production direction

Observation

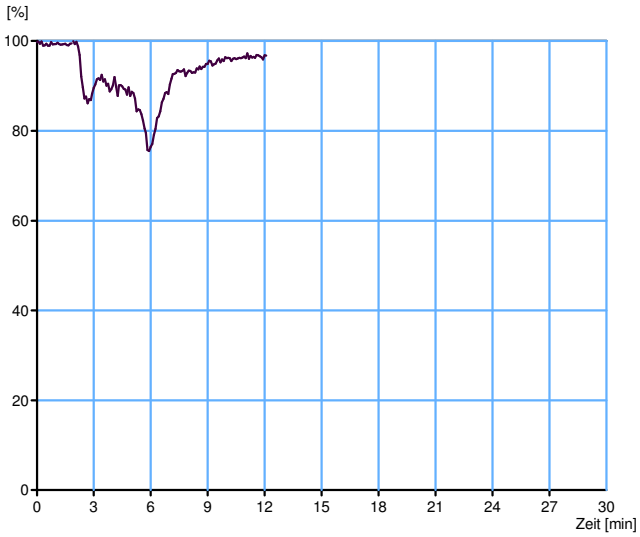
molten/singed during pre-radiation up to	0 mm
buckled/contracted from pilot flame area up to	100 mm
penetration of flame through substrate	-
transitory flaming	-
blistering	x
glowing, after flame has extinguished	-

Results

Position [mm]	Time [min:s]	Heat Flow [kW/m²]
50	04:41	12.33
100	-	-
150	-	-
200	-	-
250	-	-
300	-	-
350	-	-
400	-	-
450	-	-
500	-	-
550	-	-
600	-	-
650	-	-
700	-	-
750	-	-
800	-	-
850	-	-
900	-	-
950	-	-
1000	-	-

Time [min:s]	Position [mm]	Heat Flow [kW/m²]
10:00	86	11.63
20:00	-	-
30:00	-	-

Smoke density



CHF [kW/m²]	>= 11
HF_30 [kW/m²]	0.00
Smoke density integral [%*min]	89.0
Flame extinguished after [min:s]	12:00
max. burnt distance [mm]	86
max. light attantuation [%]	24.5

Textiles & Flooring Institute GmbH

Annex RP - Burning behaviour

Sample designation 14-11-0278

Sample

Sample No.: 2
Direction: cross production direction

Observation

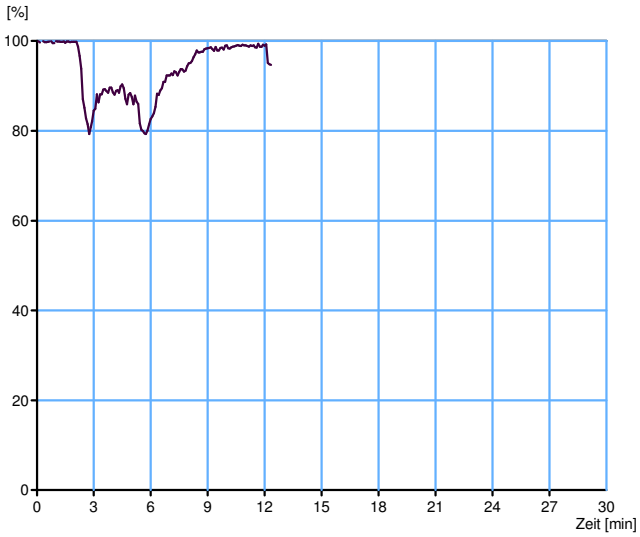
molten/singed during pre-radiation up to	0 mm
buckled/contracted from pilot flame area up to	100 mm
penetration of flame through substrate	-
transitory flaming	-
blistering	x
glowing, after flame has extinguished	-

Results

Position [mm]	Time [min:s]	Heat Flow [kW/m²]
50	05:25	12.33
100	-	-
150	-	-
200	-	-
250	-	-
300	-	-
350	-	-
400	-	-
450	-	-
500	-	-
550	-	-
600	-	-
650	-	-
700	-	-
750	-	-
800	-	-
850	-	-
900	-	-
950	-	-
1000	-	-

Time [min:s]	Position [mm]	Heat Flow [kW/m²]
10:00	77	11.81
20:00	-	-
30:00	-	-

Smoke density



CHF [kW/m²]	>= 11
HF_30 [kW/m²]	0.00
Smoke density integral [%*min]	79.1
Flame extinguished after [min:s]	12:23
max. burnt distance [mm]	77
max. light attantuation [%]	20.7

Textiles & Flooring Institute GmbH

Annex RP - Burning behaviour

Sample designation 14-11-0278

Sample

Sample No.: 3
Direction: cross production direction

Observation

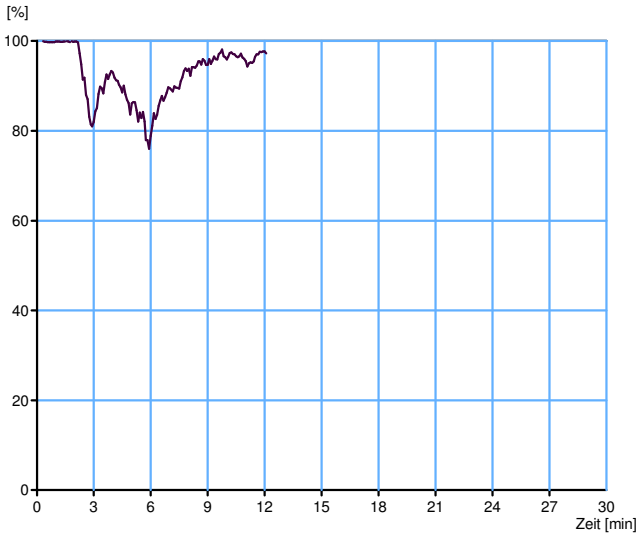
molten/singed during pre-radiation up to	0 mm
buckled/contracted from pilot flame area up to	100 mm
penetration of flame through substrate	-
transitory flaming	-
blistering	x
glowing, after flame has extinguished	-

Results

Position [mm]	Time [min:s]	Heat Flow [kW/m²]
50	04:21	12.33
100	08:03	11.36
150	-	-
200	-	-
250	-	-
300	-	-
350	-	-
400	-	-
450	-	-
500	-	-
550	-	-
600	-	-
650	-	-
700	-	-
750	-	-
800	-	-
850	-	-
900	-	-
950	-	-
1000	-	-

Time [min:s]	Position [mm]	Heat Flow [kW/m²]
10:00	108	11.21
20:00	-	-
30:00	-	-

Smoke density



CHF [kW/m²]	>= 11
HF_30 [kW/m²]	0.00
Smoke density integral [%*min]	88.8
Flame extinguished after [min:s]	12:00
max. burnt distance [mm]	108
max. light attantuation [%]	24.0

Textiles & Flooring Institute GmbH

Annex RP - Burning behaviour

Sample designation 14-11-0278

Sample

Sample No.: 1
Direction: in production direction

Observation

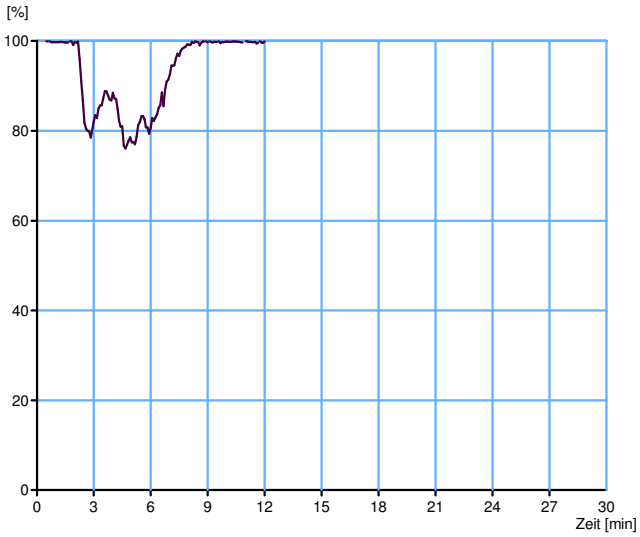
molten/singed during pre-radiation up to	0 mm
buckled/contracted from pilot flame area up to	150 mm
penetration of flame through substrate	-
transitory flaming	-
blistering	x
glowing, after flame has extinguished	-

Results

Position [mm]	Time [min:s]	Heat Flow [kW/m²]
50	03:30	12.33
100	-	-
150	-	-
200	-	-
250	-	-
300	-	-
350	-	-
400	-	-
450	-	-
500	-	-
550	-	-
600	-	-
650	-	-
700	-	-
750	-	-
800	-	-
850	-	-
900	-	-
950	-	-
1000	-	-

Time [min:s]	Position [mm]	Heat Flow [kW/m²]
10:00	79	11.77
20:00	-	-
30:00	-	-

Smoke density



CHF [kW/m²]	>= 11
HF_30 [kW/m²]	0.00
Smoke density integral [%*min]	83.5
Flame extinguished after [min:s]	12:00
max. burnt distance [mm]	79
max. light attantuation [%]	23.9