SAERTEX LEO®

REINFORCING YOUR IDEAS

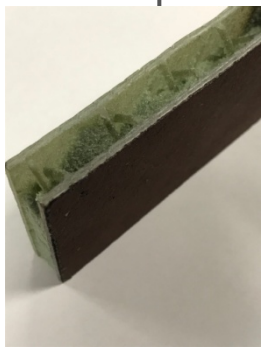
SAERTEX LEO®

WE ARE **SAERTEX®**-
A FAMILY-OWNED BUSINESS

COMPOSITE PANEL - POSSIBILITIES ….

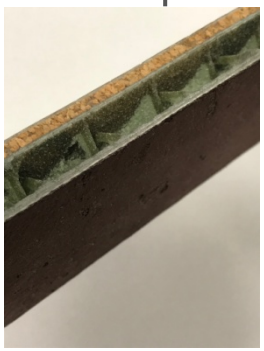
Huge range of Possibilies

Huge range of Possibilies



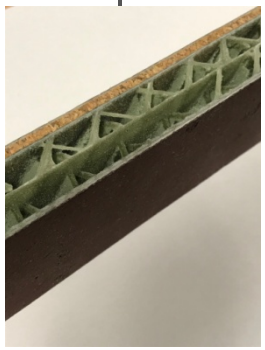
Fire Protection

Amount
Thickness
Kind of Material
Insulation?



Sound Insulation

Nessesary ?
Kind of …
Thickness
…



Core Material

Nessesary ?
Architecture
Material
…

Core Material

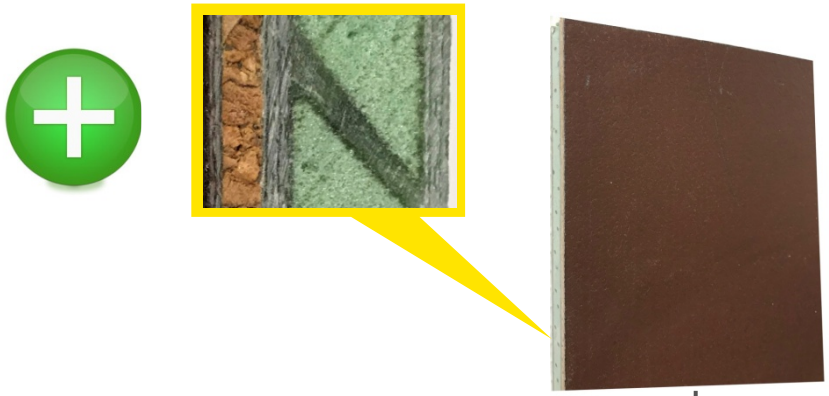
Thickness
…

Skins

Material
Thickness
Architecture
…

REINFORCING YOUR IDEAS

COMPOSITE PANEL - STANDARDIZED PANEL



use this as a
Baseline for your project

Fire Protection

- Heat release
- Smoke
- Toxicity
- Structural integrity

IMO FTP Code :
- Part 2
- Part 3
- Part 5
- Part 10
- Part 11

Sound Insulation

Rw value

- according ISO 10140-2

Core Material

Can be individually configurated

Strenght, weight, thickness and material

Can be adjusted by changing the density

and alignment of the brigdes

Core Material

Skins

Mechanical values

of the Composite are

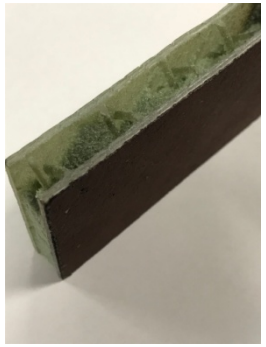
known and tested.

This datas can be used as

Input for FEM calculation

REINFORCING YOUR IDEAS

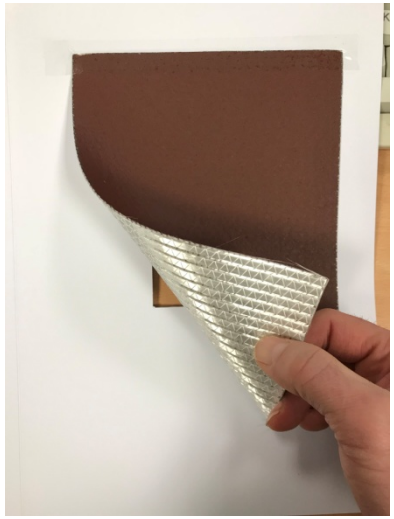
COMPOSITE PANEL - FIRE TEST

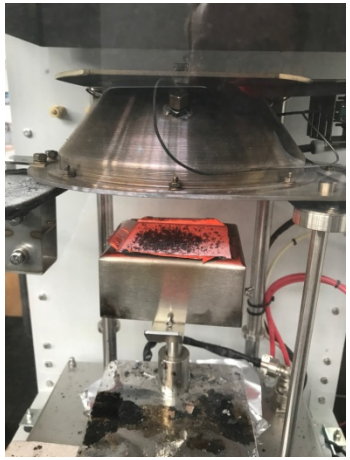


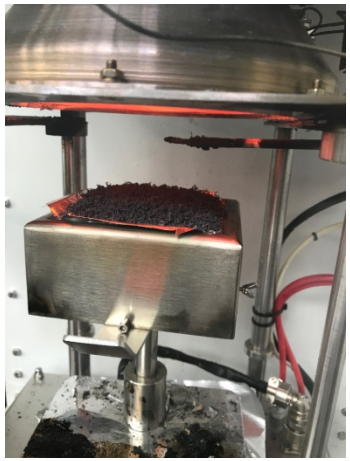
Fire Protection

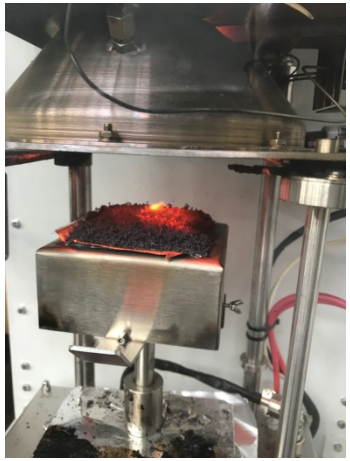
IMO FTP Code Appendix 2

FIRE TEST PROCEDURES FOR HEAT RELEASE, SMOKE PRODUCTION AND MASS LOSS RATE
FOR MATERIALS USES FOR FURNITURE AND OTHER COMPONENTS ON HIGH SPEED CRAFT
„ISO 5660“



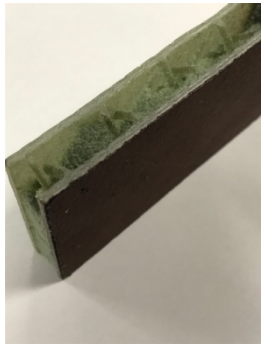






MAHRE : 45 kW/m²

COMPOSITE PANEL - FIRE TEST



Fire Protection

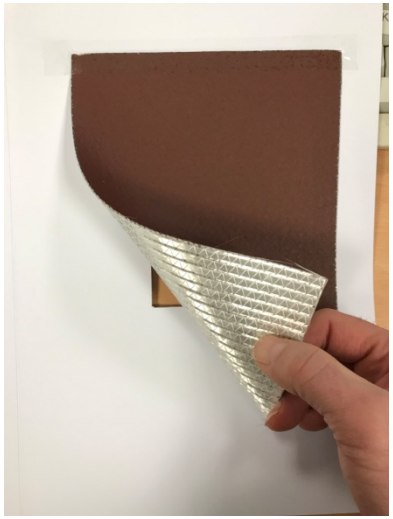
IMO FTP Code Part 2

Smoke and Toxicity Test

&

IMO FTP Code Part 5

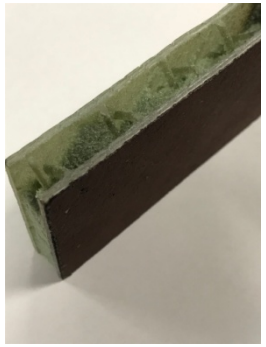
Test for surface flamability



IMO Part 5

IMO Part 2: 50 kW ohne Zündflamme /
50kW without ignition flame

COMPOSITE PANEL - FIRE TEST

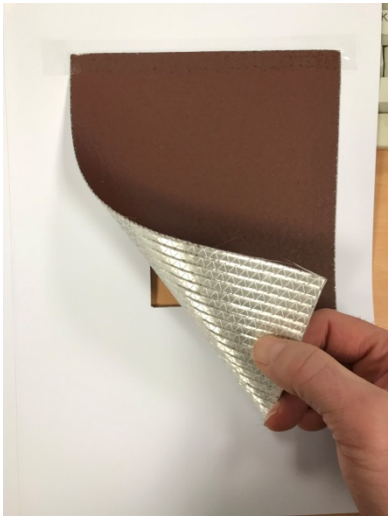


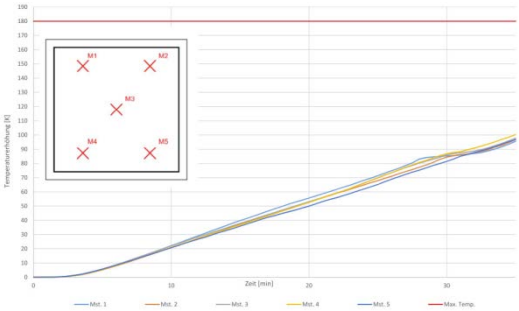
Fire Protection

IMO FTP CODE PART 3

TEST FOR "A", "B" AND "F" CLASS DIVISIONS

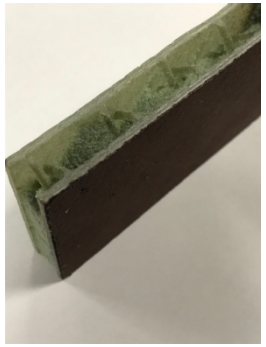
15 – 60 Minutes





REINFORCING YOUR IDEAS

COMPOSITE PANEL - POSSIBILITIES

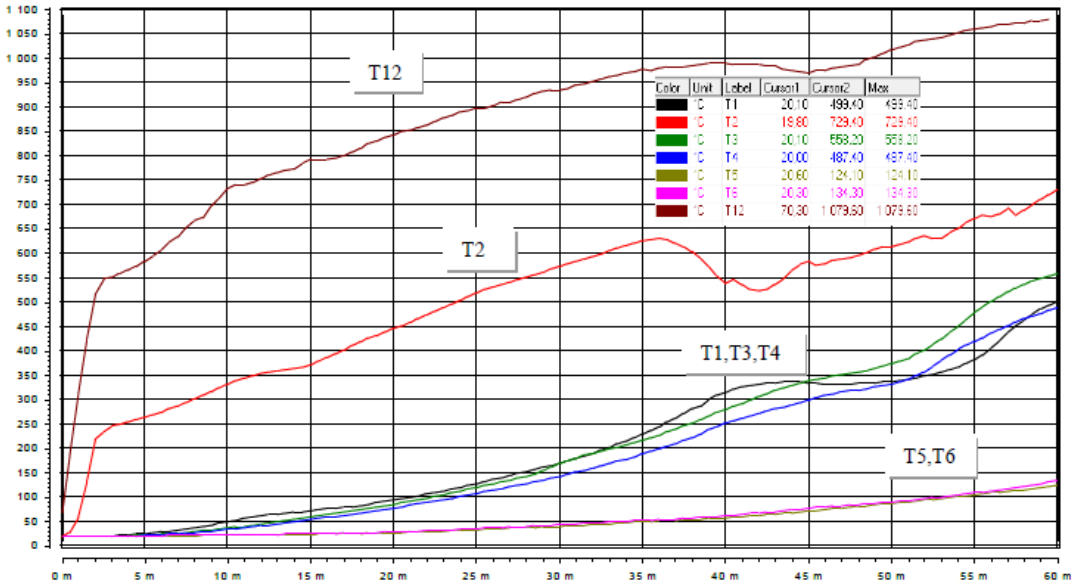


Fire Protection

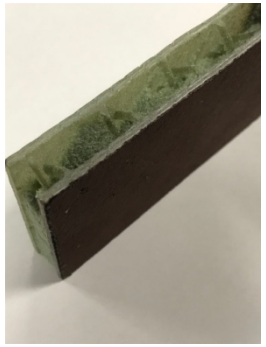
IMO FTP Code Part 11

Small scale funace test with temperature and load as defined in IMO Res. A.754(18)

Temperature registration – "SAERfoam LEO 8020" (absolute temperatures, i.e. not temperature rise)



COMPOSITE PANEL - FIRE TEST



Fire Protection

IMO FTP Code Part 10

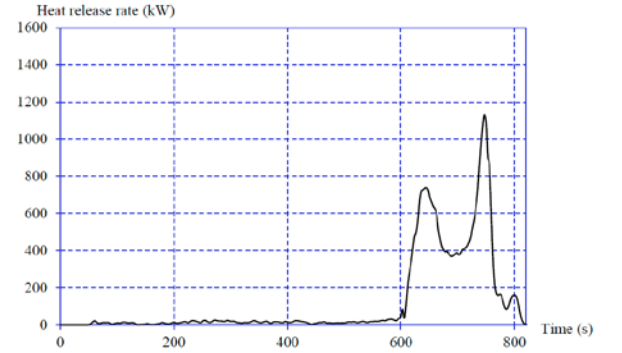
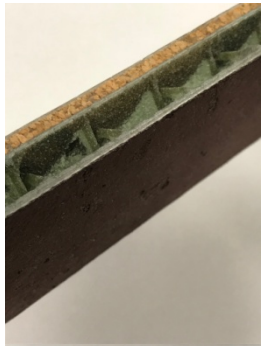


Figure 1 Heat release rate from "LEO composite panel" during test excluding burner heat output.

COMPOSITE PANEL - SOUND ABSORBTION



Sound Insulation

according to ISO 10140-2

Schalldämm-Maß nach ISO 10140-2

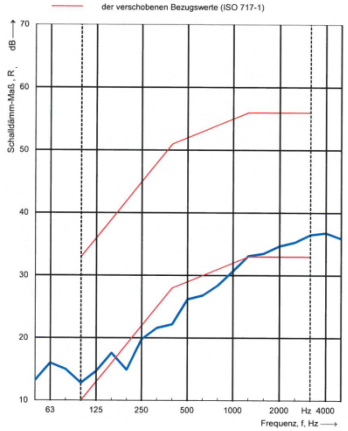
Messung der Luftschalldämmung von Bauteilen im Prüfstand

Auftraggeber: Saertex GmbH & Co. KG, Brochterbecker Damm 52, Saerbeck — Prüfdatum: 18.12.2017
Hersteller:
Kennzeichnung der Prüfräume:
Prüfgegenstand eingebaut von:
Produktebezeichnung: LEO coated fabric (1200 gsm)

Aufbau des Prüfgegenstandes:
- 3 mm Kork
- 2 Lagen LEO Quadrax 1200 gsm
- 10 mm Saerfoam (PIR-Schaum)
- 2 Lagen LEO Quadrax 1200 gsm

Luftdruck:
Lufttempertatur: 19,0 °C
Relative Luftfeuchtigkeit: 58,0 %
Flächenbezogene Masse: 12,3 kg/m²
Fläche der Prüföffnung: 0,90 m²
Senderaum Volumen: 121,6 m³
Empfangsraum Volumen: 118,1 m³

Frequenz f [Hz]	R Terz [dB]
50	13,2
63	16,0
80	15,0
100	12,8
125	14,7
160	17,6
200	14,9
250	19,8
315	21,6
400	22,2
500	26,2
630	26,8
800	28,4
1000	30,7
1250	33,1
1600	33,5
2000	34,7
2500	35,3
3150	36,5
4000	36,8
5000	35,9



Bewertung nach ISO 717-1
R_w $(C;C_{tr})$ = 29 (-1 ; -5) dB
Die Ermittlung basiert auf Prüfstands-Messergebnissen, die in Terzbändern gewonnen wurden.
$C_{50-3150}$ = -1 dB $C_{50-5000}$ = 0 dB $C_{100-5000}$ = 0 dB
$C_{tr,50-3150}$ = -5 dB $C_{tr,50-5000}$ = -5 dB $C_{tr,100-5000}$ = -5 dB

Name des Prüfinstitut: KÖTTER Consulting Engineers GmbH & Co. KG
Nr. des Prüfberichtes:
Datum: 02.01.2018 Unterschrift: i.V.

Schalldämm-Maß nach ISO 10140-2

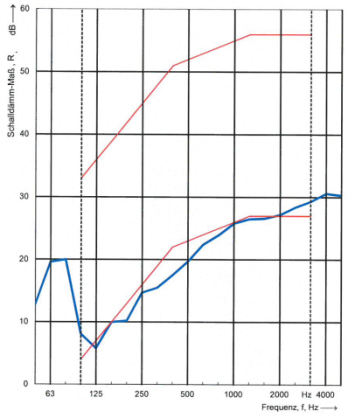
Messung der Luftschalldämmung von Bauteilen im Prüfstand

Auftraggeber: Saertex GmbH & Co. KG, Brochterbecker Damm 52, Saerbeck — Prüfdatum: 18.12.2017
Hersteller:
Kennzeichnung der Prüfräume:
Prüfgegenstand eingebaut von:
Produktebezeichnung: LEO coated fabric (1200 gsm)

Aufbau des Prüfgegenstandes:
- 20 mm Saerfoam (PIR-Schaum)
- 1 Lage LEO Quadrax 1200 gsm

Luftdruck:
Lufttempertatur: 19,0 °C
Relative Luftfeuchtigkeit: 58,0 %
Flächenbezogene Masse: 7,6 kg/m²
Fläche der Prüföffnung: 0,90 m²
Senderaum Volumen: 121,6 m³
Empfangsraum Volumen: 118,1 m³

Frequenz f [Hz]	R Terz [dB]
50	12,8
63	19,6
80	20,0
100	8,1
125	5,8
160	10,0
200	10,2
250	14,7
315	15,5
400	17,5
500	19,7
630	22,4
800	23,9
1000	25,8
1250	26,5
1600	26,6
2000	27,2
2500	28,4
3150	29,3
4000	30,6
5000	30,3



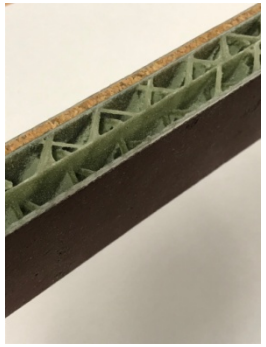
Bewertung nach ISO 717-1
R_w $(C;C_{tr})$ = 23 (-1 ; -4) dB
Die Ermittlung basiert auf Prüfstands-Messergebnissen, die in Terzbändern gewonnen wurden.
$C_{50-3150}$ = -1 dB $C_{50-5000}$ = 0 dB $C_{100-5000}$ = 0 dB
$C_{tr,50-3150}$ = -5 dB $C_{tr,50-5000}$ = -4 dB $C_{tr,100-5000}$ = -4 dB

Name des Prüfinstitut: KÖTTER Consulting Engineers GmbH & Co. KG
Nr. des Prüfberichtes:
Datum: 02.01.2018 Unterschrift: i.V.

R_w value
= **29,5**

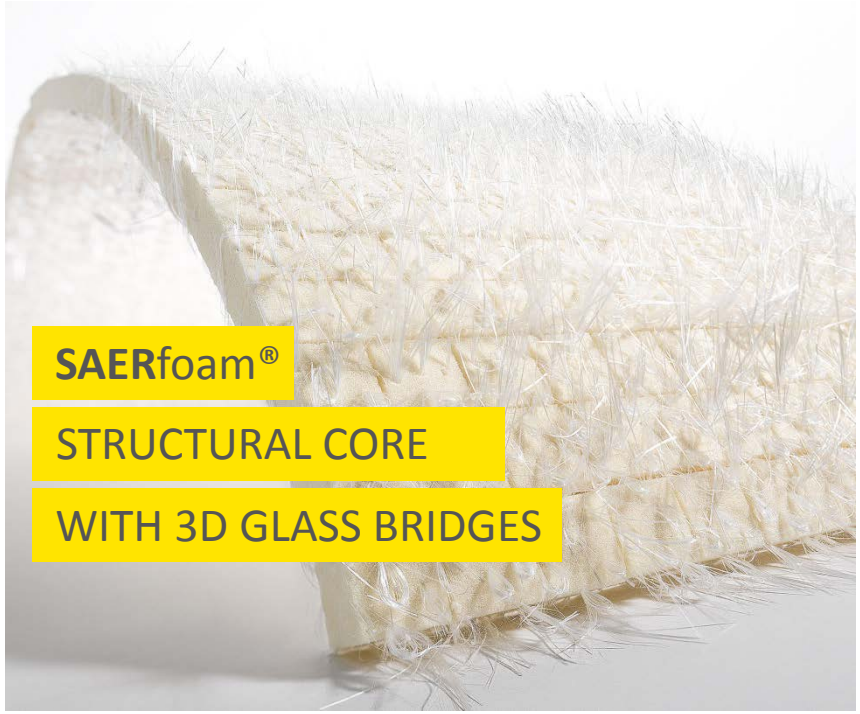
REINFORCING YOUR IDEAS

COMPOSITE PANEL - MECHANICAL PROPERTIES



Core Material

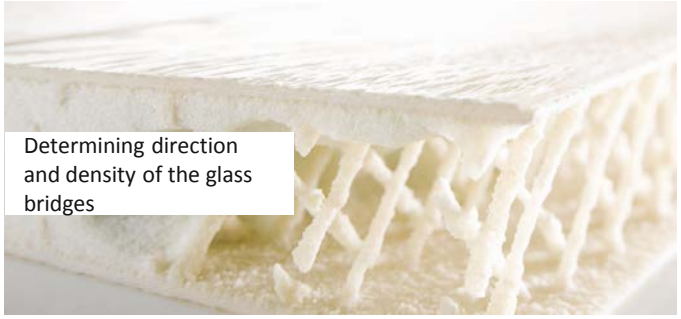
Choose hybrid core material made of ultralight foam combined with **3D glass reinforcements**. SAERfoam® is the innovative way to replace PVC, PET and balsa wood.



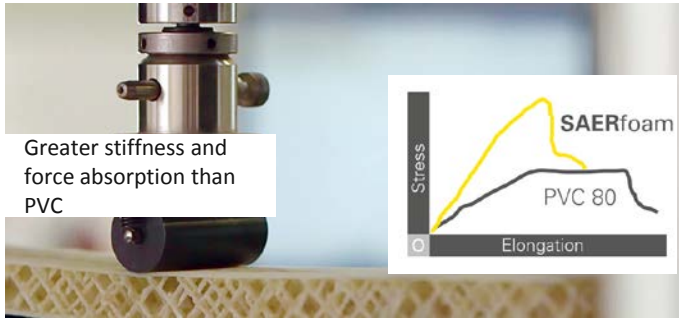
Benefits include highly individualized mechanical properties, lower weights and various other advantages throughout your production process.

COMPOSITE PANEL - MECHANICAL PROPERTIES

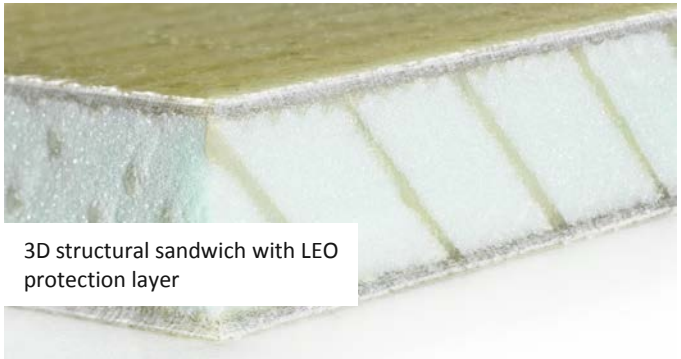
Core Material



Determining direction and density of the glass bridges



Greater stiffness and force absorption than PVC



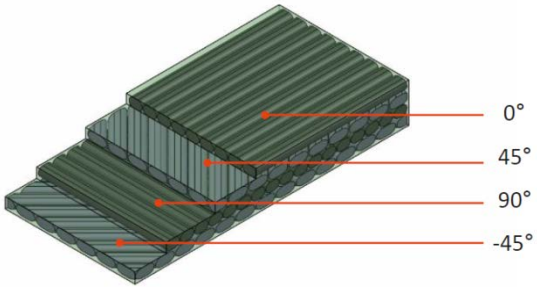
3D structural sandwich with LEO protection layer

Time savings thanks to ready-made kits

COMPOSITE PANEL - MECHANICAL PROPERTIES

Skins

Which is just an organized stack of multiple unidirectional plies in various directions, impregnated with resin.



All nessesary datas for FEM calculation available.

Data is based on laminates produced **by Vacuum Infusion Technology and tests performed in a DNV-GL certified laboratory at SAERTEX**

DNV·GL

Statement

Approval No. GL-LZ 2612 HH - 2

In recognition of a successful inspection carried out by DNV GL

SAERTEX GmbH & Co. KG

Brochterbecker Damm 52
48369 Saerbeck
Germany

is approved as laboratory for technical competence in the field of

Mechanical and Analytical Testing

The certification covers the specific tests and types of tests listed in the annex. This laboratory meets the requirements of the rules of DNV GL for Non-metallic Materials.
A laboratory inspection was carried at 2016-01-12 and 2016-01-13. All facilities and the qualification of the personnel in charge of the above mentionec company was found in good order.

This statement consists of this page and a one-page annex which are integral part of the approval.

This statement is valid until 2019-02-28

Hamburg, 2016-02-28

DNV GL

Guido Michalek

Joachim Rehbein

REINFORCING YOUR IDEAS

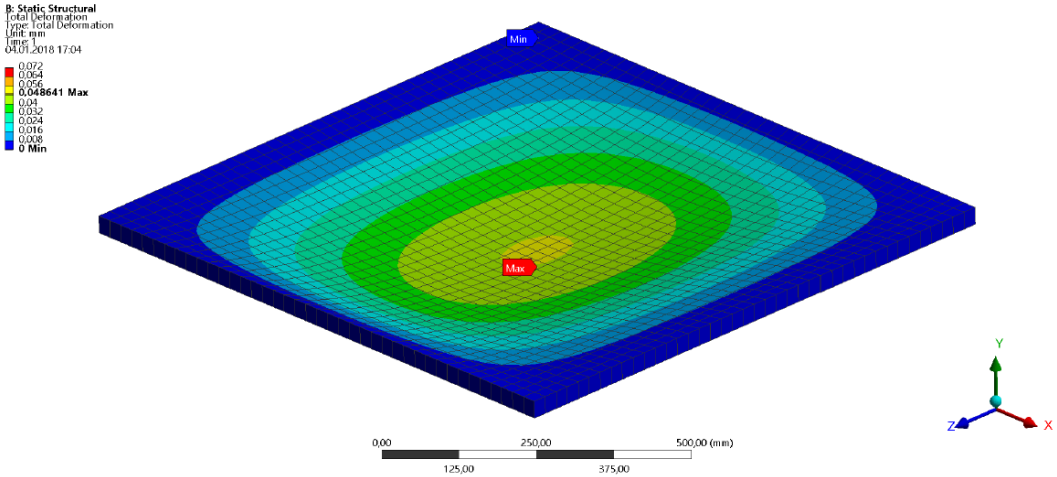
COMPOSITE PANEL - MECHANICAL PROPERTIES

Skins

Highly modern technology, comprehensive knowledge, many years of experience, passion for materials and the understanding that we need to keep the big picture in mind, even when we're focusing on the details – these characteristics guarantee you the best possible success as you plan or optimise your products.

Our consulting and calculation services help you bring your products to the market more quickly. You benefit from optimised material selection and utilisation, and lower manufacturing and development costs. Improve your product quality and strengthen your competitive position through innovative and optimised material usage. Get to know your product better – right from the start.

Total Deformation



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Hohe Brücke 1
D - 20459 Hamburg
Germany

Tel. Office: +49 40 228 680 980
Tel. Mobile: +49 171 47 14 23 0

E-Mail: axel.reinsch@ar-engineers.de
Homepage: www.ar-engineers.de

AXEL REINSCH
Dipl.-Ing. (FH) / Owner

REINFORCING YOUR IDEAS

COMPOSITE PANEL - LOGISTICS

Density of available Datas

Raw Material
- coated Fabric
- Fabric
- **Foam**
- Resin

Raw Material
- coated Fabric
- **Fabric**
- Foam
- Resin

Raw Material
- **coated Fabric**
- **Fabric**
-Foam (e.g. Balsa)
-Resin
(e.g. Phenolic, EP, PFA …)

Raw Materials
- **coated Fabric**
- **Fabric**
- **Foam**
- **VE Resin**
- **Gelcoat**

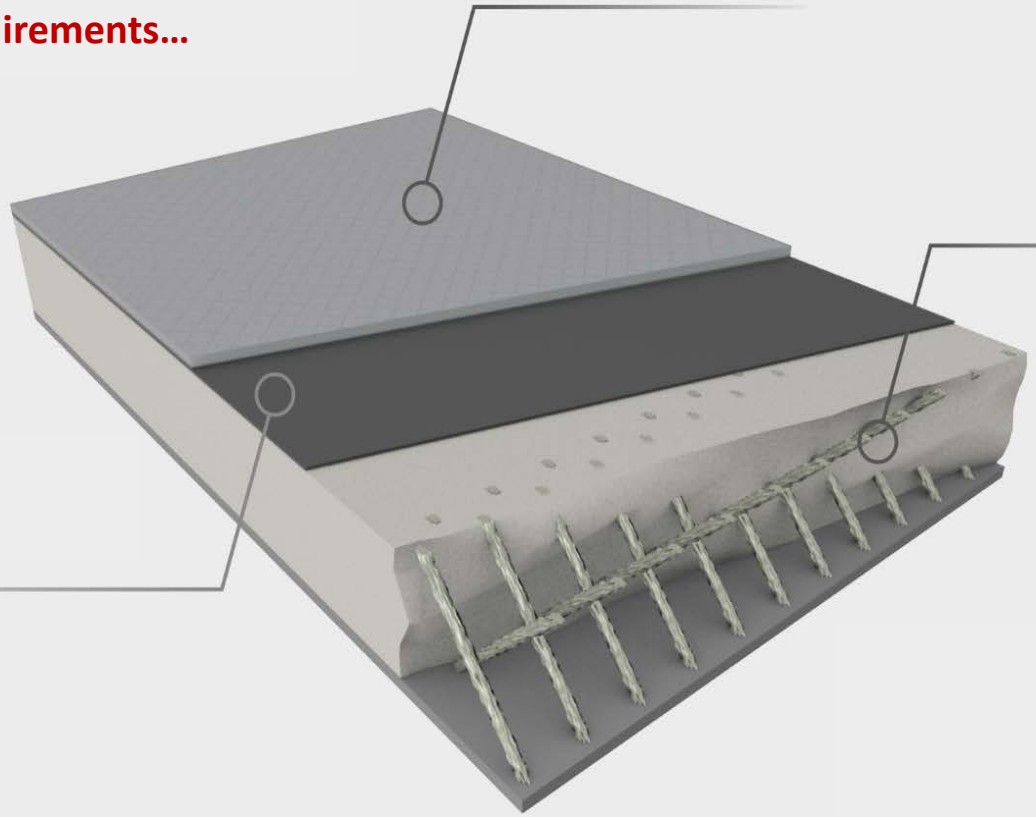
Finished panels
Prototyping

SAERTEX „Package“

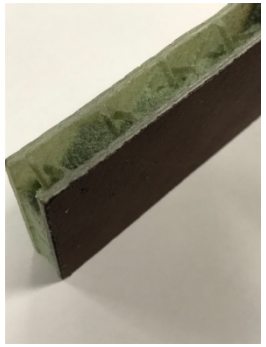
SUMMARY

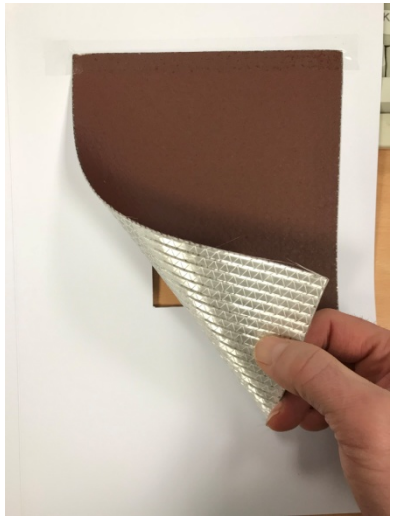
Let´s combine our forces and

talk about your requirements…

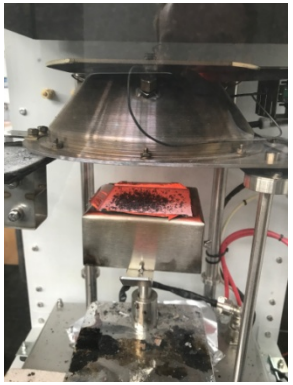


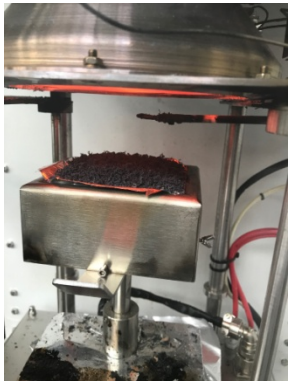
COMPOSITE PANEL - POSSIBILITIES

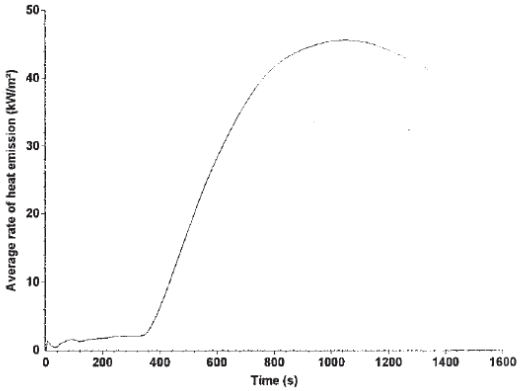




Fire Protection



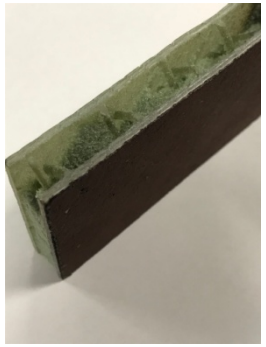


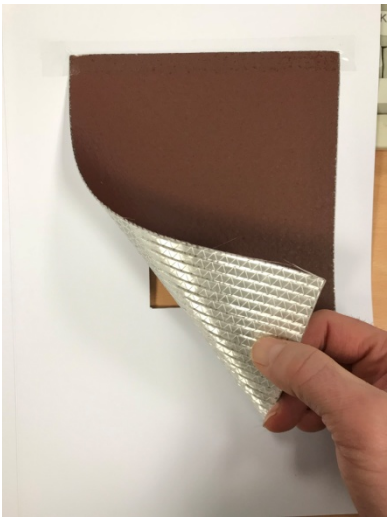


MAHRE: 46 kW/m²

REINFORCING YOUR IDEAS

COMPOSITE PANEL - POSSIBILITIES

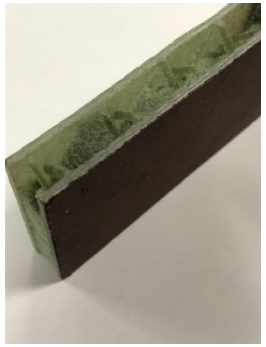




Fire Protection

Gas	Nr. / *No.*	50 kW	25 KW flaming	25 KW non flaming	Soll
CO	2	762,70	254,27	111,93	1450 ppm
	3	869,70	248,81	206,94	
Mittel / *Average*		**816,20**	**251,54**	**159,43**	
HF	2	0,00	0,29	0,00	600 ppm
	3	0,00	0,82	0,00	
Mittel / *Average*		**0,00**	**0,55**	**0,00**	
HCl	2	0,00	0,00	0,00	600 ppm
	3	0,00	0,00	0,00	
Mittel / *Average*		**0,00**	**0,00**	**0,00**	
HCN	2	47,64	19,96	8,16	140 ppm
	3	58,77	16,95	24,70	
Mittel / *Average*		**53,21**	**18,46**	**16,43**	
$NO\text{-}NO_2$	2	0,00	0,00	0,00	350 ppm
	3	0,00	0,00	0,00	
Mittel / *Average*		**0,00**	**0,00**	**0,00**	
SO_2	2	0,00	0,00	0,00	120 ppm
	3	0,00	0,00	0,00	
Mittel / *Average*		**0,00**	**0,00**	**0,00**	
HBR	2	1,83	1,51	0,74	600 ppm
	3	1,33	0,49	0,68	
Mittel / *Average*		**1,58**	**1,00**	**0,71**	

COMPOSITE PANEL - POSSIBILITIES



Fire Protection

IMO FTP Code Part 11

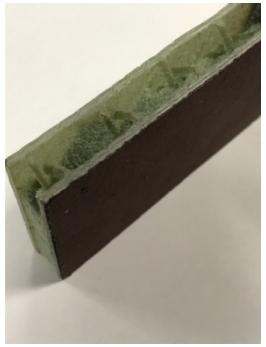
Small scale funace test with temperature and load as defined in IMO Res. A.754(18)

Test results, summary:

Product ID	Average temp. on unexposed side (ΔT=140°C) exceeded after: (min)	Average temp. *rise* on unexposed side after 60 min. (° C)	Peak temp. rise on backside after 60 min
SAERfoam LEO 8020	n.e	109	114
SAERfoam LEO 6020	*n.e*	70	72

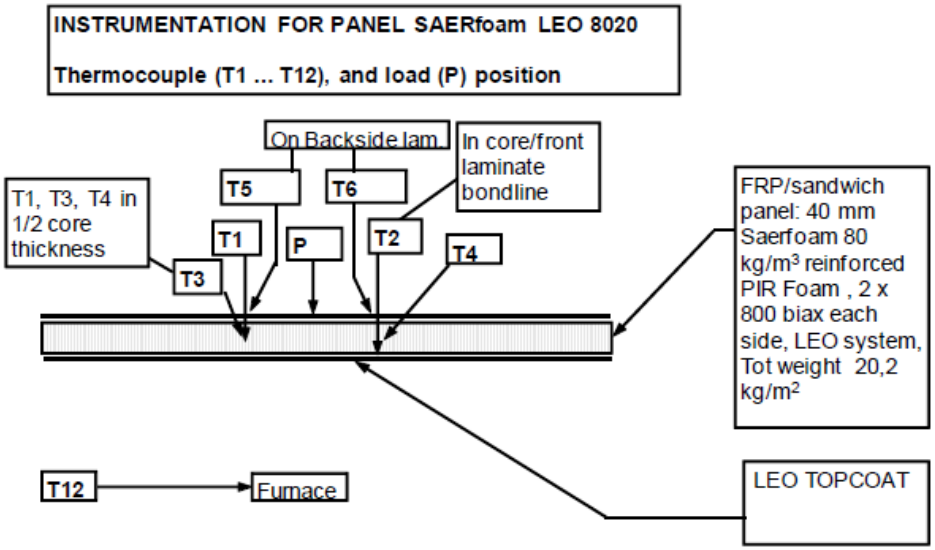
n.e *not exceeded during test*

COMPOSITE PANEL - POSSIBILITIES



Fire Protection

IMO FTP Code Part 11

Small scale funace test with temperature and load as defined in IMO Res. A.754(18)

- **Test assembly and Instrumentation, "SAERfoam LEO 8020"**