Element Materials Technology
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BS EN ISO 10077-1:2017

Calculation of: Door Cores

Thermal Performance of Windows, Doors & Shutters – Calculation of Thermal Transmittance

A Report To:
Falcon Timber Limited
The enterprise building, Tibury Docks, Tilbury, Essex RM18 7HL

Document Reference:
WIL 530474

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Element Materials Technology Wednesbury Limited
Registered in England & Wales
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CONCLUSIONS

Drawings of:

Manufacturer	Falcon Timber Limited
Product	Door Cores
Model	Strebord 44
	Strebord 54
	Stredor 44 Ply
	Stredor 54 Ply
	Stredor 44 MDF
	Stredor 54 MDF
	Duocore 38
	Duocore 44

Have been submitted for thermal performance calculation in accordance with BS EN ISO 10077-1:2017. By Christopher Bryan, a BFRC certified simulator (No. S154) of Element Materials Technology, a UKAS accredited Testing Laboratory (No. 0621)

At Unit 3 Wednesbury One, Black Country New Road, Wednesbury, WS10 7NZ.
Results and comments as detailed below:

Description	Up value W/(m^2.K)
Core 1 – Strebord 44	**2.0**
Core 2 – Strebord 54	**1.8**
Core 3 – Stredor 44 PLY	**2.0**
Core 4 – Stredor 54 PLY	**1.7**
Core 5 – Stredor 44 MDF	**2.0**
Core 6 – Stredor 54 MDF	**1.7**
Core 7 – Duocore 38	**2.0**
Core 8 – Duocore 44	**1.8**

No inferences can be made regarding performance against other requirements of this standard

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AUTHORISATION

Calculations performed by: Christopher Bryan, Senior Test Engineer

Report issued by: Christopher Bryan, Senior Test Engineer

Signed

Date 12th April 2023

For and on behalf of Element Materials Technology

Report authorised by: Mark Garfield, Door & Window Laboratory Manager

Signed

Date 12th April 2022

For and on behalf of Element Materials Technology

Report issued: 12 April 2023

UKAS TESTING 0621

NOTE.
Tests marked "Not UKAS Accredited" are not covered by the Laboratory UKAS accreditation schedule.

Tests marked NT were not tested
Tests marked NA are not applicable to the product on test.

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CALCULATION DETAILS

CLIENT DETAILS

Company name	Falcon Timber Limited
Address	The Enterprise Building Tilbury Docks Tilbury Essex RM18 7HL
Contact	James Baird

ORDER DETAILS

Order number	67651
Dated	03/03/2023

PRODUCT DETAILS

Product	Door Cores
Model	Strebord 44 Strebord 54 Stredor 44 Ply Stredor 54 Ply Stredor 44 MDF Stredor 54 MDF Duocore 38 Duocore 44
Manufacturer	Falcon Timber Limited
Material	Timber

CALCULATION DETAILS

Specification	BS EN ISO 10077-1:2017
Clauses	N/a
Calculation methods	BS EN ISO 10077-1:2017 Thermal performance of windows, doors & shutters – Calculation of thermal transmittance – Part 1: General BS EN ISO 10077-2:2017 Thermal performance of windows, doors & shutters – Calculation of thermal transmittance – Part 2: Numerical method for frames
Simulation software & spreadsheet versions used	Thermal transmittance models obtained by computer simulation using Therm Finite Element Simulator V5.2.14 provided by LBNL. Software validated in accordance with Annex D of BS EN ISO 10077-2:2017

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PROCEDURE

Introduction

This report should be read in conjunction with the Standard BS EN ISO 10077-1:2017 Thermal performance of windows, doors and shutters – Calculation of thermal transmittance – Part 1: General, BS EN ISO 10077-2:2017 performance of windows, doors and shutters – Calculation of thermal resistance – Part 2: Numerical method for frames

Drawings in DXF format were submitted for calculation of thermal transmittance in accordance with BS EN ISO 10077-1.

Instruction

The calculations were conducted on the 6th March 2023 on behalf of Falcon Timber Limited.

Calculation method

Simulations were carried out in accordance with BS EN ISO 10077-1:2017 using aa simulated core size of 1000mm and varying thickness as per the test specimen.

The reference surface temperature conditions for the computing modelling is 20°C internal and 0°C external.

The surface resistances used for the external surface were R_{se} = 0.04 m^2.K/W, for a normal internal surface were R_{si} = 0.13 m^2.K/W

Values used for the design thermal conductivity of materials in the simulation were taken from Table 3 of BS EN ISO 10456:2007 unless specified otherwise and are listed in Annex B of this report.

As such the result contained in this report is partly derived from tabulated values and should be considered indicative and not definitive.

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CONCLUSIONS

Evaluation against objective	The sectional drawings of the cores as provided by the client were subjected to thermal performance calculations in accordance with BS EN ISO 10077-1:2017
Observations & comments	

LIMITATIONS

Limitations	The results relate only to the behaviour of the specimens of the element of construction under the particular conditions of the calculation. They are not intended to be the sole criteria for assessing the potential performance of the element in use, nor do they reflect the actual behaviour in use.
Uncertainty of Measurement	The uncertainties of measurements calculated for a confidence level of 95% throughout these tests are within the limits of these tolerances. The user and the simulation software have been validated in accordance with Annex I of BS EN ISO 10077-2:2017, giving the following accuracies: ▪ Thermal transmittance ± 5% ▪ Linear thermal transmittance ± 5%

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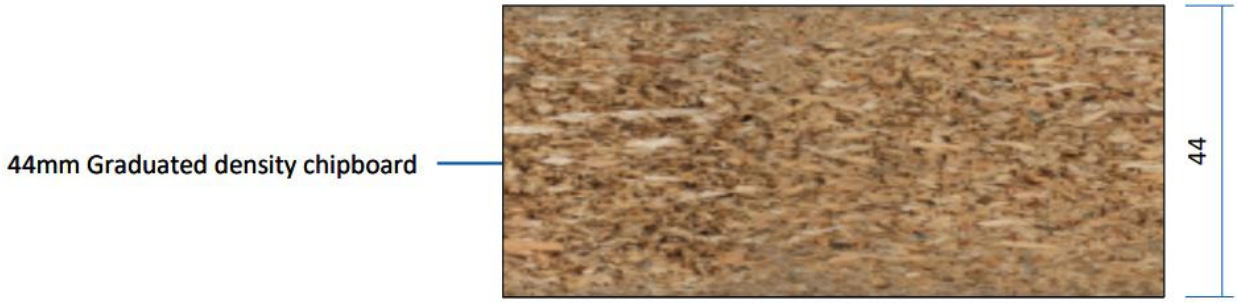
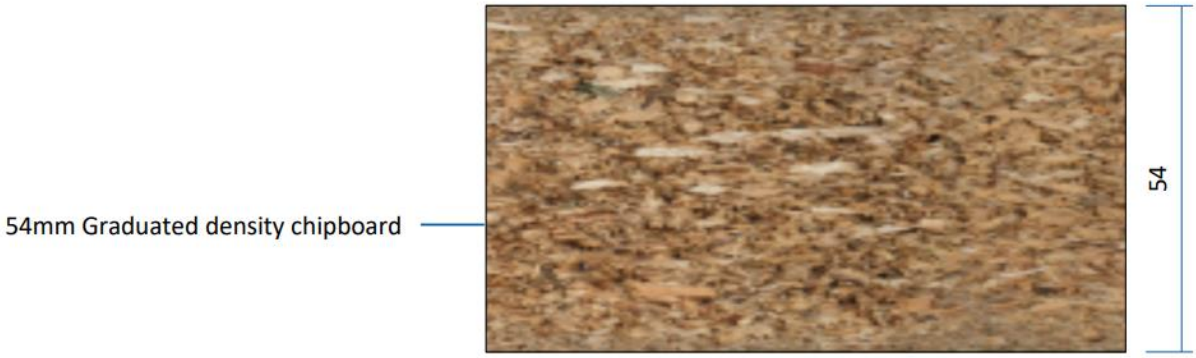
ANNEX A: DOORSET DRAWINGS

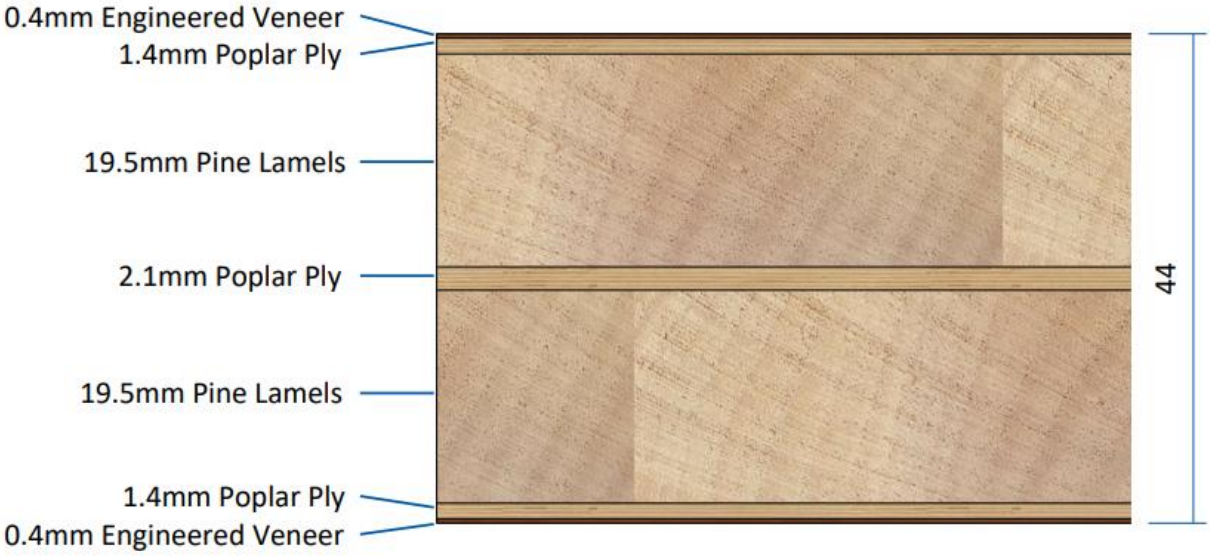
Core 1 – Strebord 44



Core 2 – Strebord 54



Core 3 – Stredor 44 Ply



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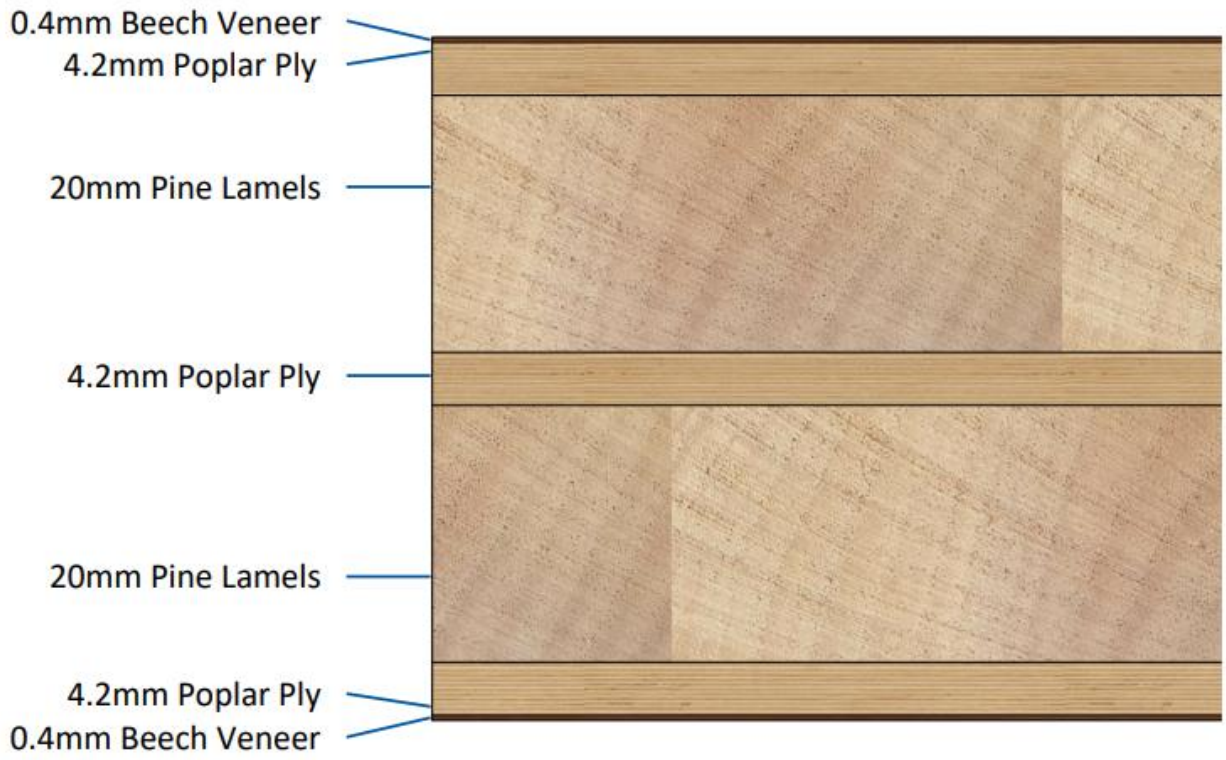
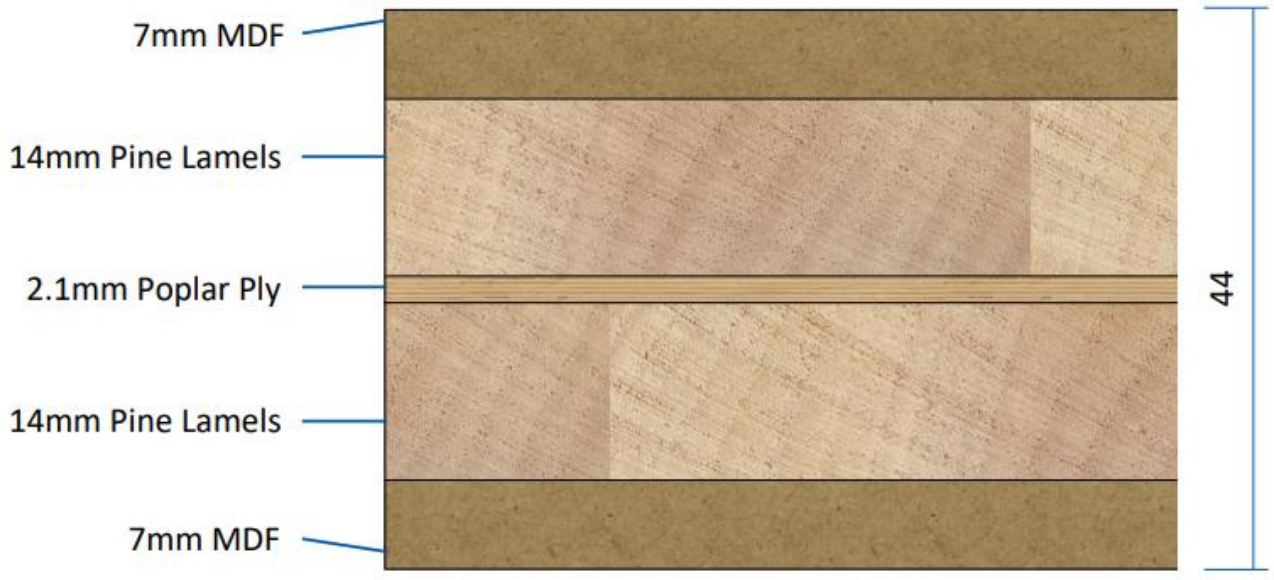
Core 4 – Stredor 54 Ply



Core 5 – Stredor 44 MDF



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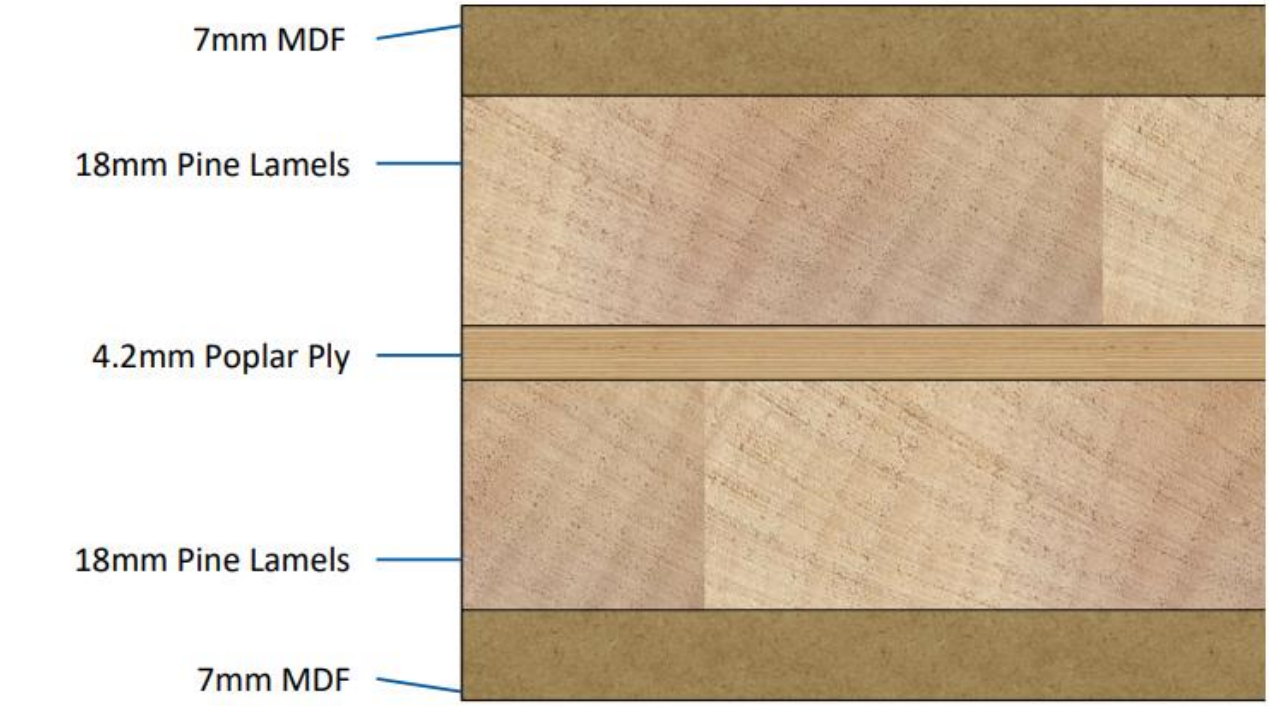
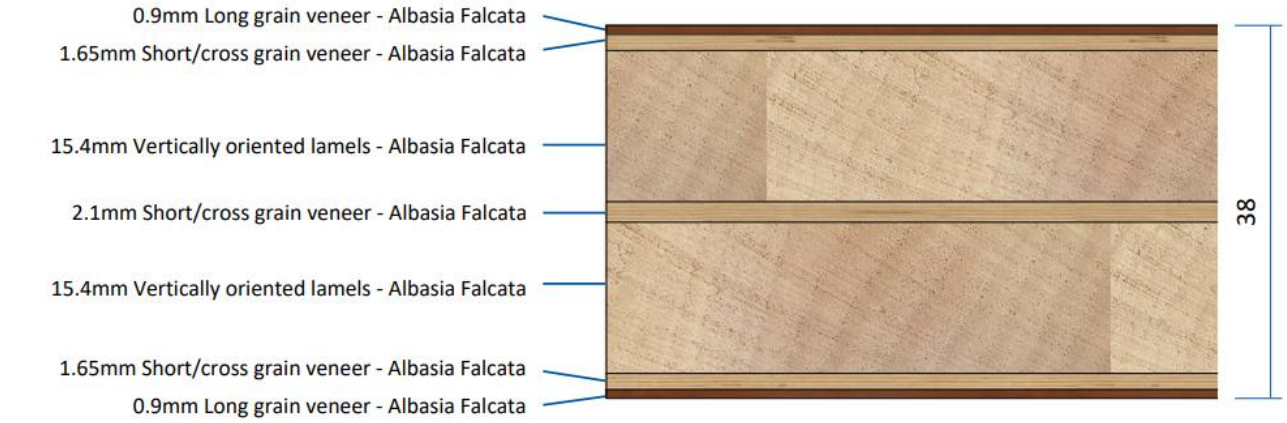
Core 6 – Stredor 54 MDF



Core 7 – Duocore 38



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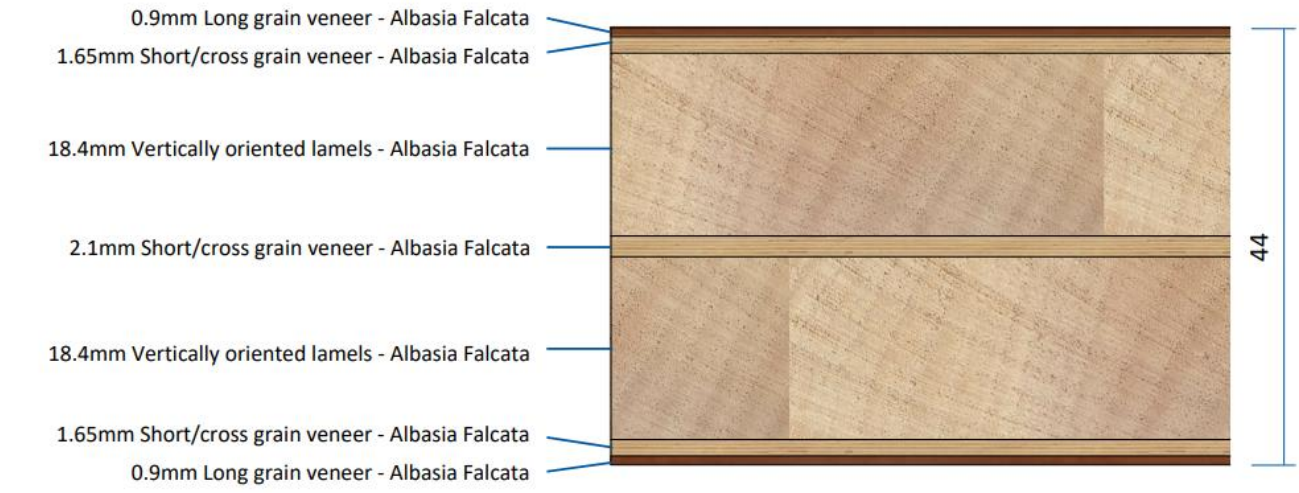
Core 8 – Duocore 44



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ANNEX B: SOURCE DATA

Materials used

Design thermal conductivity of materials used in the simulation

Material		Conductivity (W/ m.K)	Emissivity	Source
Particle bored 600kg/m3 *Strebored core*		0.14	0.9	ISO 10456:2007 Table 3
Plywood 700kg/m3 *Engineered and beach Veneer Ply*		0.17	0.9	ISO 10456:2007 Table 3
Plywood 500kg/m3 *Poplar ply*		0.13	0.9	ISO 10456:2007 Table 3
Timber 500kg/m3 *Pine Lamels*		0.13	0.9	ISO 10456:2007 Table 3
MDF 500kg/m3 *MDF panels*		0.13	0.9	ISO 10456:2007 Table 3
Plywood 300kg/m3 *Albasia Falcata Ply Veneer*		0.09	0.9	ISO 10456:2007 Table 3
Timber 450kg/m3 *Albasia Falcata*		0.30	0.9	ISO 10456:2007 Table 3

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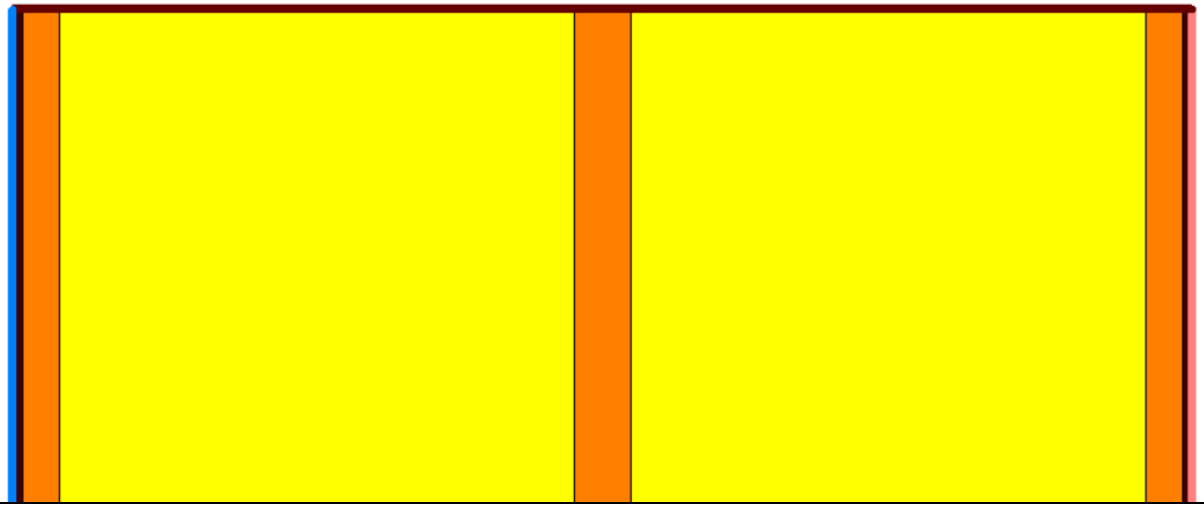
ANNEX C: THERM MODELS

Strebored 44 and 54 cores

Stredor 44 and 54 PLY



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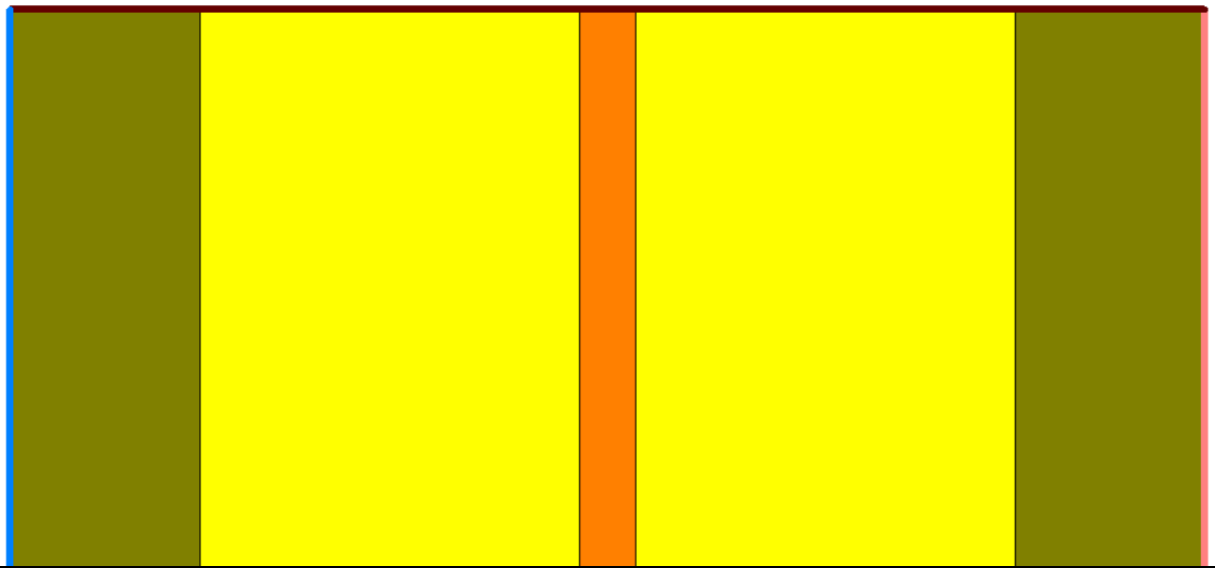
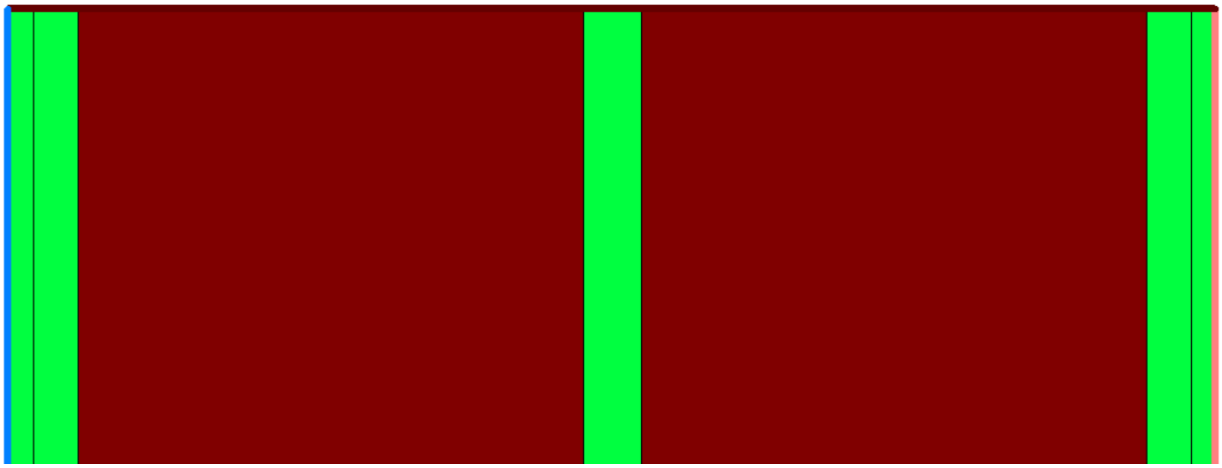
Stredor 44 and 54 MDF



Duocore 38 and 44



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REVISION HISTORY

This issue of the report replaces all previous issues that are now withdrawn.

Issue No :	**Re - Issue Date :**
Revised By:	**Approved By:**
Reason for Revision:	

Issue No :	**Re - Issue Date :**
Revised By:	**Approved By:**
Reason for Revision:	

END OF REPORT