

Project				Job no.	
Calcs for				Start page no./Revision 1	
Calcs by TT	Calcs date 24/01/2024	Checked by	Checked date	Approved by	Approved date

SCI TEDDS MODULES



Steel Knowledge

SCI P424 - Method for Extending Fire Test Results for Loaded Walls & Floors

SCI P424 – Fire Resistance of Light Steel Framing (available at <https://portal.steel-sci.com/shop.html>) provides guidance on how light steel framed buildings should be designed and detailed to provide fire resistance in accordance with the Building Regulations. The publication contains procedures to show how loaded fire test results for walls and floors may be extended to other design cases which have the same build-up. This module assists the user in performing these procedures, in accordance with Appendix A or Appendix B of this publication, as appropriate.

CALCULATION DETAILS

Calculation Version: **1.0.02**

Project Name:	Demo	Test Standard:	BS EN 1365-1
Client:	SCI Tedds Modules	Analysis Date & Time:	24/01/2024 - 11:01
Design Reference:	Design Sample	Prepared By:	ABC
Test Reference:	Test Sample	Checked By:	DEF

CALCULATION SUMMARY

Loaded Member Type:	Wall;
Analysis Method:	Critical Temperature;
Utilisation Factor:	0.955;
Fire Design Check:	PASS;

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USER INPUTS

FIRE TEST DATA

Steel Nominal Yield Strength	$f_{y,test} = 450 \text{ N/mm}^2$
Steel Thickness	$t_{test} = 1.2 \text{ mm}$
Steel Section Height	$h_{test} = 100 \text{ mm}$
Steel Section Width	$b_{test} = 50 \text{ mm}$
Wall Height	$L_{test} = 2700.00 \text{ mm}$
Total Board Thickness	$d_{test} = 30 \text{ mm}$
Fire Test Duration	$T_{test} = 95 \text{ min}$
Buckling Resistance in Normal Conditions	$N_{b,Rd,test} = 41.50 \text{ kN}$
Fire Test Axial Load	$N_{test} = 13.00 \text{ kN}$

THERMOCOUPLE DATA AT FIRE RESISTANCE PERIOD

Thermocouple Data Set 1

Exposed Flange Temperature	$\theta_{1,exposed} = 570 \text{ }^\circ\text{C}$
Unexposed Flange Temperature	$\theta_{1,unexposed} = 414 \text{ }^\circ\text{C}$

Thermocouple Data Set 2

Exposed Flange Temperature	$\theta_{2,exposed} = 570 \text{ }^\circ\text{C}$
Unexposed Flange Temperature	$\theta_{2,unexposed} = 414 \text{ }^\circ\text{C}$

Thermocouple Data Set 3 (Optional)

Exposed Flange Temperature	$\theta_{3,exposed} = 0 \text{ }^\circ\text{C}$
Unexposed Flange Temperature	$\theta_{3,unexposed} = 0 \text{ }^\circ\text{C}$

FIRE DESIGN DATA

Steel Nominal Yield Strength	$f_y = 450 \text{ N/mm}^2$
Steel Thickness	$t_1 = 1.5 \text{ mm}$
Steel Section Height	$h = 100 \text{ mm}$
Steel Section Width	$b = 50 \text{ mm}$
Wall Height	$L_1 = 2400.00 \text{ mm}$
Total Board Thickness	$d_1 = 30 \text{ mm}$
Fire Resistance Period	$T_1 = 90 \text{ min}$
Buckling Resistance in Normal Conditions	$N_{b,Rd} = 67.00 \text{ kN}$
Design Axial Load in Fire	$N_{Ed,fi} = 25.00 \text{ kN}$

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ANALYSIS RESULTS

Analysis Method	Critical Temperature
Modification Factor k_1	$k_1 = 0.80$
Modification Factor k_2	$k_2 = 1.00$
Reference Temperature	$\theta_{ref} = 518 \text{ }^\circ\text{C}$
Steel Strength Reduction Factor	SRF = 0.49
Design Buckling Resistance in Fire	$N_{b,Rd,fi} = 26.19 \text{ kN}$
Utilisation Factor	$UF_{fi} = N_{Ed,fi} / N_{b,Rd,fi} = 0.95$
Fire Design Check	PASS

Contact:

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