

# Test standards for Reaction to fire

Birgit Östman

SP Träteknik / Wood technology

# Test standards for Reaction to fire

EN ISO 1182	Non-combustibility test
EN ISO 1716	Determination of the gross calorific value
EN 13823	Building products excluding floorings – Thermal attack by a single burning item (SBI) – Main test for most products
EN ISO 9239-1 :	Determination of the burning behaviour using a radiant heat source
EN ISO 11925-2	Ignitability when subjected to direct impingement of flame

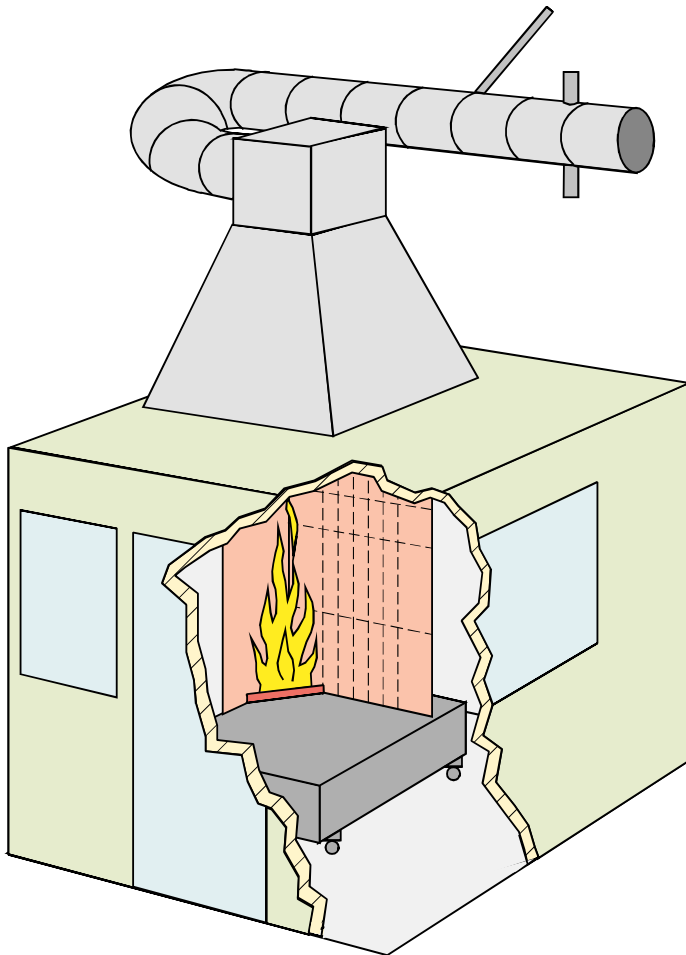
# Classification standard

EN 13501-1

Fire classification of construction products  
and building elements –

Part 1: Classification using test data from  
reaction to fire tests

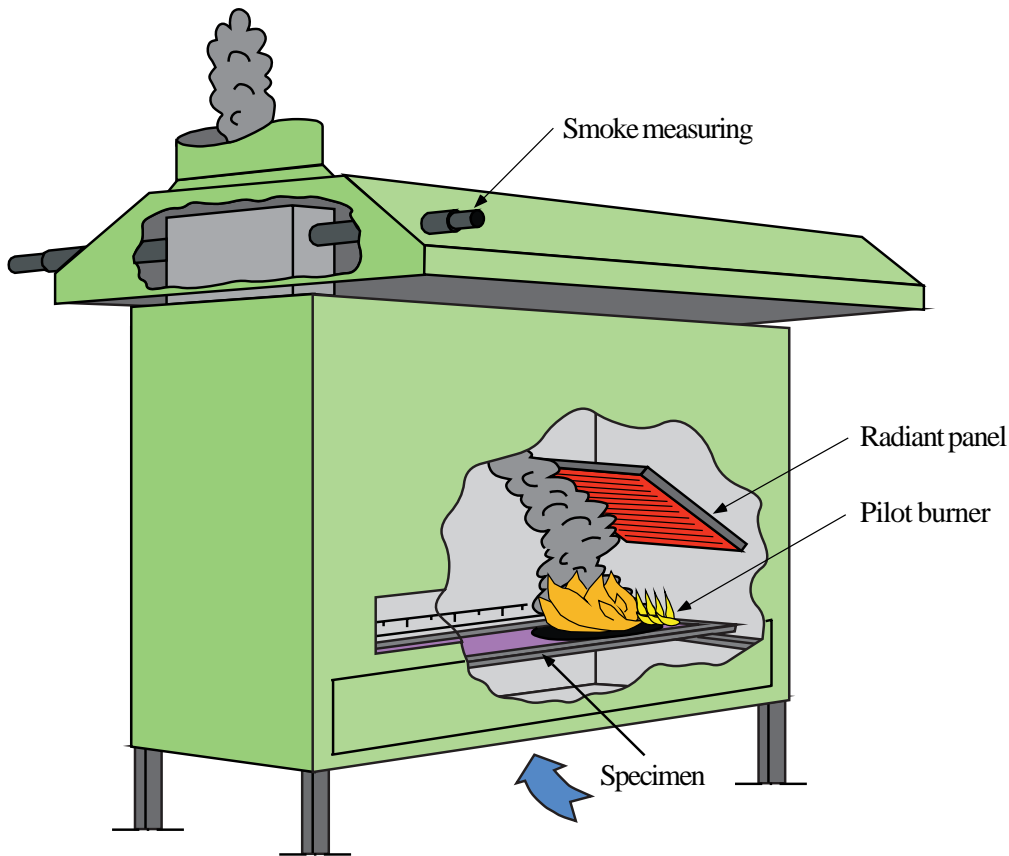
# SBI Single Burning Item test



**Sample size:**  
1,5 x 1,5 m (corner)

**Measured:**  
**Fire Growth Rate - FIGRA**  
**Total Heat Release during first 600 s**  
- THR600s  
**Lateral Flame Spread - LSF**  
**Smoke Growth Rate - SMOGRA**  
**Total Smoke Production during first 600 s**  
- TSP600s

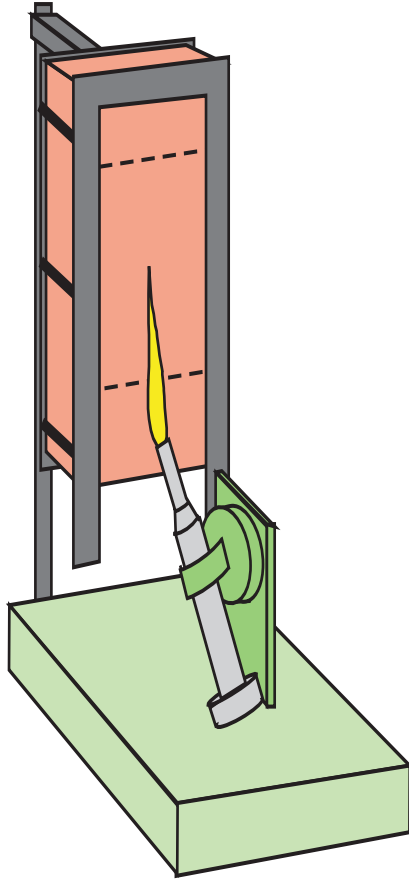
# RP Radiant Panel test (for floorings)



**Sample size:**  
1,05 x 0,23 m

**Measured:**  
**CHF** Critical Heat Flux  
**IoS** Integral of Smoke  
Obscuration

# Small flame test, EN ISO 11925-2 (basic screening test)



**Sample size:  
0,25 x 0,009 m**

**Measured:  
Flame spread  
within 20-60 s**

# Test methods used for determining the European reaction to fire classes of combustible building products

Test method	Construction products excl. floorings, i. e. wall and ceiling linings	Floorings	Main fire properties measured and used for the classification
Small flame test EN ISO 11925-2	X	X	Flame spread within 60 or 20 s.
Single Burning Item test, SBI EN 13823	X	-	- FIGRA, Fire Growth Rate; - SMOGRA, Smoke Growth Rate; - Flaming droplets or particles
Radiant panel test EN ISO 9239-1	-	X	- Critical heat flux; - Smoke production

# Reaction to fire classes for building products (excl. floorings)

Main class	Smoke class	Burning droplets class	Requirements according to			FIGRA	
			Non comb	SBI	Small flame		
<b>A1</b>	–	–	x	–	–	–	<b>Non combustible</b>
<b>A2</b>	<b>s1 - s3</b>	<b>d0 - d2</b>	x	x	–	≤ 120	- “ -
<b>B</b>	<b>s1 - s3</b>	<b>d0 - d2</b>	–	x	x	≤ 120	
<b>C</b>	<b>s1 - s3</b>	<b>d0 - d2</b>	–	x	x	≤ 250	
<b>D</b>	<b>s1 - s3</b>	<b>d0 - d2</b>	–	x	x	≤ 750	
<b>E</b>	–	<b>- or d2</b>	–	–	x	–	
<b>F</b>	–	–	–	–	–	–	<b>No performance determined</b>



# Reaction to fire classes for floorings

Main class	Smoke class	Requirements according to			Critical flux kW/m <sup>2</sup>	
		Non comb	RP	Small flame		
<b>A1<sub>fl</sub></b>	–	x	–	–	–	<b>Non combustible</b>
<b>A2<sub>fl</sub></b>	<b>s1 – s2</b>	x	x	–	≤ 120	- “ -
<b>B<sub>fl</sub></b>	<b>s1 – s2</b>	–	x	x	≤ 120	
<b>C<sub>fl</sub></b>	<b>s1 – s2</b>	–	x	x	≤ 250	
<b>D<sub>fl</sub></b>	<b>s1 – s2</b>	–	x	x	≤ 750	
<b>E<sub>fl</sub></b>	–	–	–	x	–	
<b>F<sub>fl</sub></b>	–	–	–	–	–	<b>No performance determined</b>