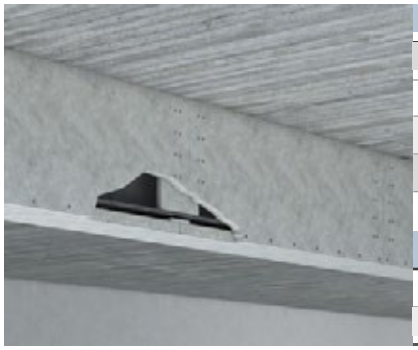
4. Steel beam and steel column cladding

4.3 HC curve (tunnel/industrial application)

Aestuver® T – Beam/column cladding – 350–750 °C* (design temperatures)



Component	
Fire protection	
Temperature stress HC curve	EN 1363-2 (HC curve, tunnel/industrial application)
Assessment Report: 2018-Efectis-R001547	R 30, R 60, R 90, R 120, R150, R180, R210
Design temperature	
EN 13381-4	350 °C, 400 °C, 450 °C, 500 °C, 550 °C, 600 °C, 700 °C, 750 °C
Building material	
Building material class (EN 13501-1)	A1
Material (European standard)	ETA-15/0531

Cladding thickness according to section factor Am/V (m^{-1})

Fire resistance class	Minimum cladding thickness in mm			
	30	40	50	60
Design temperature: 350 °C				
R	≤ 345.4	–	–	–
R 60	≤ 70	≤ 240	≤ 345.4	–
R 90	– ≤ 70		≤ 200	≤ 345.4
R 120	–	–	≤ 70	≤ 170
R 150	–	–	–	≤ 70
R 180	–	–	–	–
R 210	–	–	–	–
Design temperature: 400 °C				
R 30	≤ 345.4	–	–	–
R 60	≤ 90	≤ 345.5	–	
R 90	≤ 50	≤ 100	≤ 310	≤ 345.4
R 120	– ≤ 50		≤ 100	≤ 270
R 150	–	–	≤ 60	≤ 100
R 180	–	–	–	≤ 60
R 210	–	–	–	≤ 45.9
Design temperature: 450 °C				
R	≤ 345.4	–	–	–
R 60	≤ 120	≤ 345.5	–	
R 90	≤ 70	≤ 130	≤ 345.4	–
R 120	≤ 45.9	≤ 70	≤ 140	≤ 345.4
R 150	– ≤ 50		≤ 80	≤ 140
R 180	–	–	≤ 50	≤ 80
R 210	–	–	≤ 45.9	≤ 60
Design temperature: 500 °C				
R 30	≤ 345.4	≤ 345.4	≤ 345.4	≤ 345.4
R 60	≤ 150	≤ 345.5	≤ 345.4	≤ 345.4
R 90	≤ 80	≤ 160	≤ 345.4	–
R	≤ 50	≤ 90	≤ 170	≤ 345.4
R 150	– ≤ 60		≤ 100	≤ 180
R 180	– ≤ 50		≤ 70	≤ 110
R 210	–	–	≤ 50	≤ 80

Cladding thickness according to section factor Am/V (m^{-1})

Fire resistance class	Minimum cladding thickness in mm			
	30	40	50	60
Design temperature: 550 °C				
R	≤ 345.4	≤ 345.4	≤ 345.4	≤ 345.4
R 60	≤ 180	≤ 345.5	≤ 345.4	≤ 345.4
R 90	≤ 100	≤ 200	≤ 345.4	≤ 345.4
R 120	≤ 70	≤ 110	≤ 220	≤ 345.4
R 150	≤ 50	≤ 80	≤ 120	≤ 230
R 180	– ≤ 60		≤ 80	≤ 130
R 210	– ≤ 45.9		≤ 60	≤ 90
Design temperature: 600 °C				
R	≤ 345.4	≤ 345.4	≤ 345.4	≤ 345.4
R 60	≤ 210	≤ 345.5	≤ 345.4	≤ 345.4
R 90	≤ 110	≤ 240	≤ 345.4	≤ 345.4
R 120	≤ 80	≤ 130	≤ 260	≤ 345.4
R 150	≤ 60	≤ 90	≤ 150	≤ 280
R 180	≤ 50	≤ 80	≤ 120	≤ 190
R 210	– ≤ 50		≤ 80	≤ 110
Design temperature: 650 °C				
R	≤ 345.4	≤ 345.4	≤ 345.4	≤ 345.4
R 60	≤ 240	≤ 345.5	≤ 345.4	≤ 345.4
R 90	≤ 130	≤ 280	≤ 345.4	≤ 345.4
R 120	≤ 90	≤ 150	≤ 310	≤ 345.4
R 150	≤ 70	≤ 100	≤ 170	≤ 330
R 180	≤ 50	≤ 80	≤ 120	≤ 190
R 210	≤ 45.9	≤ 60	≤ 50	≤ 130
Design temperature: 700 °C				
R 30	≤ 345.4	≤ 345.4	≤ 345.4	≤ 345.4
R 60	≤ 270	≤ 345.5	≤ 345.4	≤ 345.4
R 90	≤ 150	≤ 320	≤ 345.4	≤ 330
R 120	≤ 100	≤ 170	≤ 345.4	≤ 345.4
R 150	≤ 70	≤ 120	≤ 190	≤ 345.4
R 180	≤ 60	≤ 90	≤ 130	≤ 220
R 210	≤ 50	≤ 70	≤ 100	≤ 150

* Design temperature 750°C on request