



**PAVUS, a.s.**  
AUTHORISED BODY AO 216  
NOTIFIED BODY NB 1391  
Accredited Certification Body  
for Products 3041

**Branch:** FIRE TESTING  
LABORATORY IN VESELÍ  
NAD LUŽNICÍ  
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## CLASSIFICATION OF FIRE RESISTANCE

**The object of classification:** System for protecting of steel members in accordance with EN 13501-2+A1:2009: 7.4.6.5

**Classification report number:**

PK2-16-11-004-A-0

**Product name and type:** steel members with applied coating fire protection system:

**AITHON A90 H** (reactive coating)

- ∞ assessment method: Differential equation analysis (variable  $\lambda$  approach)
- ∞ range of DFT of the reactive coating:
  - I, H sections – (0.214 to 2.424) mm
  - rectangular hollow sections – (0.214 to 1.403) mm
  - circular hollow sections – (0.214 to 2.424) mm
- ∞ range of section factor: (60 to 434) m<sup>2</sup>
- ∞ sections I or H, rectangular and circular hollow sections

**Sponsor:**

Aithon Ricerche International Srl  
via Mazzini 68  
21020 Ternate (Varese)  
Italy

**Issuing organization:**

PAVUS, a.s.  
Authorised body AO 216  
Notified Body NB 1391  
Accredited Certification body for products 3041  
– Accreditation issued by Czech Accreditation Institute, Public Service Company  
– Certificate of Accreditation No 240/2011  
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Fire testing Laboratory Veselí nad Lužnicí  
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A.2 I, H sections

Fire resistance classification **R 15**

$A_m/V$ (m <sup>-1</sup> )	Design temperatures (°C)								
	350	400	450	500	550	600	650	700	750
	Thickness of fire protection material - active layer (mm) to maintain steel temperature below design temperature								
<b>60</b>	0.268	0.214	0.214	0.214	0.214	0.214	0.214	0.214	0.214
<b>80</b>	0.355	0.264	0.214	0.214	0.214	0.214	0.214	0.214	0.214
<b>100</b>	0.442	0.326	0.244	0.214	0.214	0.214	0.214	0.214	0.214
<b>120</b>	0.528	0.390	0.290	0.215	0.214	0.214	0.214	0.214	0.214
<b>140</b>	0.616	0.454	0.338	0.262	0.214	0.214	0.214	0.214	0.214
<b>160</b>	0.700	0.519	0.385	0.285	0.214	0.214	0.214	0.214	0.214
<b>180</b>	0.790	0.583	0.432	0.321	0.237	0.214	0.214	0.214	0.214
<b>200</b>	0.879	0.648	0.481	0.357	0.262	0.214	0.214	0.214	0.214
<b>220</b>	0.965	0.709	0.527	0.389	0.286	0.214	0.214	0.214	0.214
<b>240</b>	1.050	0.777	0.577	0.427	0.311	0.222	0.214	0.214	0.214
<b>260</b>	1.136	0.840	0.623	0.461	0.338	0.241	0.214	0.214	0.214
<b>280</b>	1.223	0.906	0.669	0.494	0.364	0.259	0.214	0.214	0.214
<b>300</b>	1.308	0.967	0.718	0.531	0.388	0.277	0.214	0.214	0.214
<b>320</b>	1.400	1.031	0.765	0.567	0.414	0.294	0.214	0.214	0.214
<b>340</b>	1.482	1.094	0.811	0.600	0.441	0.312	0.214	0.214	0.214
<b>360</b>	1.570	1.160	0.860	0.636	0.468	0.332	0.220	0.214	0.214
<b>380</b>	1.660	1.223	0.906	0.672	0.491	0.351	0.233	0.214	0.214
<b>400</b>	1.744	1.286	0.956	0.705	0.517	0.368	0.244	0.214	0.214
<b>420</b>	1.825	1.350	1.000	0.741	0.543	0.386	0.256	0.214	0.214
<b>434</b>	1.889	1.392	1.038	0.768	0.561	0.397	0.265	0.214	0.214

STRUTTURA NON VALIDATA  
 CERTIFICAZIONE

Fire resistance classification **R 20**

$A_m/V$ (m <sup>-1</sup> )	Design temperatures (°C)								
	350	400	450	500	550	600	650	700	750
	Thickness of fire protection material - active layer (mm) to maintain steel temperature below design temperature								
60	0.361	0.272	0.214	0.214	0.214	0.214	0.214	0.214	0.214
80	0.479	0.360	0.273	0.214	0.214	0.214	0.214	0.214	0.214
100	0.597	0.449	0.340	0.261	0.214	0.214	0.214	0.214	0.214
120	0.714	0.538	0.405	0.308	0.236	0.214	0.214	0.214	0.214
140	0.835	0.626	0.473	0.362	0.276	0.214	0.214	0.214	0.214
160	0.953	0.713	0.539	0.410	0.313	0.238	0.214	0.214	0.214
180	1.071	0.800	0.607	0.463	0.354	0.267	0.214	0.214	0.214
200	1.187	0.890	0.675	0.512	0.390	0.294	0.216	0.214	0.214
220	1.308	0.979	0.742	0.565	0.430	0.324	0.238	0.214	0.214
240	1.425	1.065	0.805	0.614	0.470	0.354	0.259	0.214	0.214
260	1.545	1.153	0.873	0.666	0.506	0.383	0.280	0.214	0.214
280	1.660	1.243	0.942	0.716	0.545	0.410	0.300	0.214	0.214
300	1.780	1.331	1.006	0.768	0.585	0.442	0.323	0.214	0.214
320	1.890	1.417	1.072	0.818	0.624	0.470	0.344	0.228	0.214
340	2.012	1.508	1.140	0.868	0.663	0.497	0.366	0.241	0.214
360	2.125	1.592	1.207	0.920	0.700	0.528	0.385	0.256	0.214
380	2.243	1.682	1.273	0.970	0.740	0.558	0.406	0.270	0.214
400	2.357	1.770	1.338	1.022	0.779	0.587	0.429	0.284	0.214
420		1.856	1.408	1.072	0.814	0.615	0.452	0.300	0.214
434		1.941	1.454	1.106	0.843	0.635	0.466	0.309	0.214

Fire resistance classification **R 30**

$A_m/V$ (m <sup>-1</sup> )	Design temperatures (°C)								
	350	400	450	500	550	600	650	700	750
	Thickness of fire protection material - active layer (mm) to maintain steel temperature below design temperature								
60	0.552	0.421	0.329	0.262	0.214	0.214	0.214	0.214	0.214
80	0.733	0.561	0.438	0.347	0.276	0.218	0.214	0.214	0.214
100	0.916	0.697	0.546	0.431	0.344	0.273	0.214	0.214	0.214
120	1.094	0.839	0.653	0.515	0.408	0.326	0.256	0.214	0.214
140	1.279	0.976	0.761	0.600	0.478	0.380	0.297	0.224	0.214
160	1.458	1.118	0.871	0.685	0.545	0.433	0.341	0.253	0.214
180	1.645	1.256	0.977	0.772	0.612	0.485	0.381	0.286	0.214
200	1.820	1.393	1.085	0.856	0.679	0.541	0.424	0.320	0.214
220	2.000	1.531	1.194	0.941	0.748	0.592	0.467	0.351	0.214
240	2.178	1.667	1.300	1.025	0.815	0.648	0.508	0.383	0.222
260	2.362	1.809	1.407	1.111	0.884	0.700	0.551	0.416	0.248
280		1.940	1.515	1.195	0.952	0.755	0.594	0.447	0.267
300		2.080	1.623	1.282	1.019	0.808	0.635	0.480	0.280
320		2.212	1.727	1.363	1.086	0.862	0.677	0.513	0.291
340		2.350	1.836	1.450	1.153	0.914	0.719	0.543	0.306
360			1.940	1.536	1.218	0.968	0.763	0.577	0.330
380			2.050	1.615	1.288	1.020	0.804	0.608	0.352
400			2.156	1.700	1.356	1.075	0.846	0.642	0.369
420			2.260	1.785	1.420	1.128	0.887	0.673	0.383
434			2.333	1.845	1.467	1.167	0.918	0.695	0.390

Fire resistance classification **R 45**

$A_m/V$ (m <sup>-1</sup> )	Design temperatures (°C)								
	350	400	450	500	550	600	650	700	750
	Thickness of fire protection material - active layer (mm) to maintain steel temperature below design temperature								
60	0.848	0.664	0.531	0.431	0.355	0.290	0.240	0.214	0.214
80	1.125	0.881	0.703	0.573	0.470	0.386	0.317	0.246	0.214
100	1.408	1.100	0.881	0.715	0.587	0.482	0.395	0.316	0.214
120	1.683	1.319	1.057	0.859	0.708	0.578	0.474	0.375	0.270
140	1.970	1.538	1.232	1.000	0.820	0.674	0.553	0.442	0.295
160	2.244	1.758	1.406	1.143	0.937	0.771	0.632	0.507	0.348
180		1.973	1.580	1.285	1.054	0.867	0.709	0.568	0.385
200		2.190	1.754	1.424	1.168	0.963	0.788	0.631	0.423
220		2.411	1.925	1.569	1.285	1.058	0.868	0.696	0.471
240			2.100	1.707	1.400	1.152	0.946	0.758	0.498
260			2.273	1.850	1.518	1.248	1.025	0.824	0.555
280				1.992	1.633	1.342	1.100	0.886	0.587
300				2.127	1.747	1.439	1.181	0.948	0.631
320				2.273	1.864	1.531	1.260	1.010	0.673
340				2.410	1.977	1.627	1.337	1.074	0.708
360					2.092	1.721	1.417	1.139	0.759
380					2.208	1.814	1.494	1.200	0.791
400					2.318	1.908	1.569	1.263	0.838
420						2.008	1.647	1.327	0.876
434						2.069	1.700	1.371	0.900

Fire resistance classification **R 60**

$A_m/V$ (m <sup>-1</sup> )	Design temperatures (°C)								
	350	400	450	500	550	600	650	700	750
	Thickness of fire protection material - active layer (mm) to maintain steel temperature below design temperature								
60	1.156	0.917	0.748	0.617	0.514	0.432	0.361	0.295	0.214
80	1.538	1.222	0.996	0.823	0.686	0.575	0.481	0.393	0.287
100	1.920	1.527	1.245	1.027	0.858	0.718	0.600	0.492	0.364
120	2.300	1.833	1.489	1.232	1.027	0.861	0.721	0.591	0.417
140		2.136	1.736	1.437	1.196	1.004	0.841	0.690	0.487
160			1.985	1.638	1.367	1.146	0.959	0.789	0.562
180			2.227	1.843	1.539	1.287	1.081	0.888	0.622
200				2.046	1.706	1.432	1.200	0.986	0.690
220				2.250	1.875	1.572	1.319	1.085	0.764
240					2.046	1.712	1.437	1.183	0.827
260					2.215	1.856	1.556	1.282	0.891
280					2.383	2.000	1.675	1.381	0.965
300						2.138	1.794	1.480	1.031
320						2.277	1.913	1.573	1.094
340						2.418	2.029	1.671	1.167
360							2.146	1.769	1.236
380							2.267	1.867	1.294
400							2.383	1.964	1.369
420								2.064	1.440
434								2.127	1.483



A.3 Rectangular hollow sections

Fire resistance classification **R 15**

$A_m/V$ (m <sup>-1</sup> )	Design temperatures (°C)								
	350	400	450	500	550	600	650	700	750
	Thickness of fire protection material - active layer (mm) to maintain steel temperature below design temperature								
60	0.297	0.225	0.214	0.214	0.214	0.214	0.214	0.214	0.214
80	0.394	0.294	0.224	0.214	0.214	0.214	0.214	0.214	0.214
100	0.492	0.370	0.279	0.214	0.214	0.214	0.214	0.214	0.214
120	0.590	0.442	0.333	0.253	0.214	0.214	0.214	0.214	0.214
140	0.688	0.513	0.386	0.291	0.218	0.214	0.214	0.214	0.214
160	0.787	0.588	0.444	0.334	0.250	0.214	0.214	0.214	0.214
180	0.885	0.662	0.495	0.376	0.279	0.214	0.214	0.214	0.214
200	0.983	0.735	0.553	0.415	0.308	0.223	0.214	0.214	0.214
220	1.081	0.805	0.604	0.458	0.340	0.247	0.214	0.214	0.214
240	1.179	0.880	0.663	0.497	0.372	0.269	0.214	0.214	0.214
260	1.277	0.953	0.717	0.539	0.400	0.289	0.214	0.214	0.214
280	1.375	1.025	0.771	0.581	0.432	0.312	0.214	0.214	0.214
300		1.094	0.824	0.622	0.464	0.334	0.223	0.214	0.214
320		1.169	0.881	0.663	0.491	0.356	0.240	0.214	0.214
340		1.243	0.933	0.704	0.523	0.377	0.253	0.214	0.214
360		1.315	0.989	0.743	0.555	0.400	0.268	0.214	0.214
380		1.386	1.041	0.787	0.583	0.422	0.284	0.214	0.214
400			1.094	0.825	0.615	0.444	0.297	0.214	0.214
420			1.153	0.867	0.646	0.468	0.312	0.214	0.214
434			1.188	0.895	0.668	0.481	0.324	0.214	0.214

SIMULAZIONE  
 NON VALIDO  
 CERTIFICAZIONE

Fire resistance classification **R 20**

$A_m/V$ (m <sup>-1</sup> )	Design temperatures (°C)								
	350	400	450	500	550	600	650	700	750
	Thickness of fire protection material - active layer (mm) to maintain steel temperature below design temperature								
60	0.405	0.308	0.240	0.214	0.214	0.214	0.214	0.214	0.214
80	0.542	0.410	0.315	0.247	0.214	0.214	0.214	0.214	0.214
100	0.674	0.512	0.393	0.304	0.237	0.214	0.214	0.214	0.214
120	0.810	0.614	0.472	0.366	0.282	0.214	0.214	0.214	0.214
140	0.944	0.716	0.551	0.426	0.328	0.250	0.214	0.214	0.214
160	1.076	0.818	0.628	0.486	0.375	0.285	0.214	0.214	0.214
180	1.214	0.916	0.704	0.546	0.421	0.320	0.235	0.214	0.214
200	1.346	1.018	0.784	0.603	0.467	0.356	0.261	0.214	0.214
220		1.119	0.861	0.667	0.512	0.390	0.287	0.214	0.214
240		1.220	0.940	0.727	0.560	0.426	0.313	0.214	0.214
260		1.321	1.017	0.785	0.603	0.461	0.339	0.223	0.214
280			1.094	0.848	0.652	0.495	0.363	0.240	0.214
300			1.171	0.905	0.697	0.531	0.390	0.258	0.214
320			1.250	0.967	0.744	0.566	0.417	0.275	0.214
340			1.327	1.026	0.792	0.600	0.442	0.293	0.214
360			1.400	1.084	0.836	0.637	0.469	0.313	0.214
380				1.147	0.882	0.670	0.494	0.328	0.214
400				1.206	0.930	0.704	0.518	0.344	0.214
420				1.263	0.975	0.742	0.544	0.362	0.214
434				1.307	1.006	0.765	0.563	0.375	0.214

Fire resistance classification **R 30**

$A_m/V$ (m <sup>-1</sup> )	Design temperatures (°C)								
	350	400	450	500	550	600	650	700	750
	Thickness of fire protection material - active layer (mm) to maintain steel temperature below design temperature								
60	0.632	0.489	0.387	0.308	0.249	0.214	0.214	0.214	0.214
80	0.841	0.653	0.513	0.408	0.328	0.263	0.214	0.214	0.214
100	1.050	0.813	0.642	0.510	0.408	0.326	0.256	0.214	0.214
120	1.260	0.977	0.769	0.612	0.490	0.390	0.307	0.229	0.214
140		1.139	0.896	0.714	0.573	0.456	0.358	0.264	0.214
160		1.300	1.025	0.815	0.653	0.520	0.409	0.308	0.214
180			1.153	0.917	0.733	0.584	0.459	0.344	0.214
200			1.278	1.019	0.815	0.648	0.511	0.382	0.215
220				1.121	0.896	0.714	0.561	0.422	0.248
240				1.222	0.978	0.779	0.612	0.459	0.269
260				1.324	1.057	0.844	0.663	0.500	0.283
280					1.140	0.905	0.714	0.536	0.295
300					1.218	0.973	0.765	0.576	0.321
320					1.300	1.035	0.813	0.616	0.350
340					1.381	1.100	0.865	0.652	0.369
360						1.163	0.914	0.690	0.386
380						1.229	0.967	0.729	0.400
400						1.294	1.016	0.768	0.427
420						1.356	1.068	0.805	0.450
434						1.400	1.100	0.833	0.465







A.4 Circular hollow sections

Fire resistance classification **R 15**

$A_m/V$ (m <sup>-1</sup> )	Design temperatures (°C)								
	350	400	450	500	550	600	650	700	750
	<b>Thickness of fire protection material - active layer (mm) to maintain steel temperature below design temperature</b>								
60	0.371	0.283	0.219	0.214	0.214	0.214	0.214	0.214	0.214
80	0.492	0.376	0.290	0.225	0.214	0.214	0.214	0.214	0.214
100	0.615	0.469	0.363	0.280	0.214	0.214	0.214	0.214	0.214
120	0.738	0.563	0.433	0.335	0.257	0.214	0.214	0.214	0.214
140	0.859	0.655	0.503	0.389	0.297	0.221	0.214	0.214	0.214
160	0.979	0.748	0.577	0.445	0.340	0.253	0.214	0.214	0.214
180	1.100	0.841	0.648	0.498	0.382	0.284	0.214	0.214	0.214
200	1.227	0.935	0.719	0.556	0.424	0.315	0.219	0.214	0.214
220	1.346	1.028	0.788	0.610	0.467	0.347	0.241	0.214	0.214
240	1.467	1.119	0.861	0.666	0.509	0.379	0.261	0.214	0.214
260	1.591	1.213	0.933	0.720	0.552	0.408	0.283	0.214	0.214
280	1.710	1.300	1.005	0.776	0.594	0.440	0.305	0.214	0.214
300	1.830	1.393	1.078	0.830	0.636	0.473	0.328	0.214	0.214
320	1.950	1.486	1.147	0.886	0.678	0.508	0.348	0.214	0.214
340	2.067	1.583	1.219	0.940	0.720	0.534	0.371	0.214	0.214
360	2.189	1.673	1.288	0.995	0.763	0.564	0.393	0.214	0.214
380	2.313	1.764	1.360	1.050	0.808	0.596	0.414	0.225	0.214
400		1.855	1.431	1.106	0.845	0.628	0.437	0.236	0.214
420		1.944	1.500	1.159	0.886	0.658	0.458	0.245	0.214
434		2.011	1.550	1.194	0.916	0.683	0.472	0.265	0.214

STILL UNDER CERTIFICATION  
 NON VALIDO  
 CERTIFICAZIONE

**Fire resistance classification R 20**

$A_m/V$ (m <sup>-1</sup> )	Design temperatures (°C)								
	350	400	450	500	550	600	650	700	750
	Thickness of fire protection material - active layer (mm) to maintain steel temperature below design temperature								
60	0.515	0.398	0.314	0.251	0.214	0.214	0.214	0.214	0.214
80	0.686	0.532	0.417	0.331	0.262	0.214	0.214	0.214	0.214
100	0.859	0.665	0.521	0.411	0.325	0.254	0.214	0.214	0.214
120	1.028	0.796	0.625	0.494	0.389	0.302	0.228	0.214	0.214
140	1.194	0.929	0.729	0.576	0.454	0.354	0.265	0.214	0.214
160	1.364	1.058	0.832	0.658	0.518	0.402	0.302	0.214	0.214
180	1.538	1.189	0.936	0.739	0.583	0.452	0.340	0.230	0.214
200	1.709	1.320	1.040	0.820	0.647	0.503	0.379	0.255	0.214
220	1.873	1.450	1.142	0.900	0.711	0.553	0.416	0.281	0.214
240	2.044	1.585	1.247	0.983	0.775	0.603	0.454	0.309	0.214
260	2.212	1.717	1.347	1.065	0.840	0.652	0.491	0.333	0.214
280	2.375	1.845	1.450	1.147	0.905	0.704	0.530	0.359	0.214
300		1.973	1.554	1.229	0.968	0.752	0.566	0.388	0.214
320		2.100	1.654	1.307	1.032	0.800	0.604	0.412	0.214
340		2.233	1.756	1.388	1.095	0.855	0.640	0.438	0.214
360		2.363	1.858	1.471	1.161	0.900	0.679	0.462	0.214
380			1.964	1.550	1.224	0.953	0.718	0.489	0.214
400			2.060	1.631	1.288	1.000	0.752	0.515	0.214
420			2.160	1.715	1.353	1.050	0.790	0.542	0.214
434			2.233	1.767	1.394	1.088	0.816	0.559	0.214

**Fire resistance classification R 30**

$A_m/V$ (m <sup>-1</sup> )	Design temperatures (°C)								
	350	400	450	500	550	600	650	700	750
	Thickness of fire protection material - active layer (mm) to maintain steel temperature below design temperature								
60	0.825	0.653	0.524	0.426	0.347	0.280	0.224	0.214	0.214
80	1.095	0.869	0.697	0.566	0.460	0.372	0.296	0.224	0.214
100	1.369	1.082	0.871	0.706	0.574	0.465	0.370	0.278	0.214
120	1.642	1.300	1.045	0.848	0.689	0.557	0.445	0.337	0.214
140	1.910	1.514	1.216	0.988	0.803	0.650	0.518	0.394	0.232
160	2.189	1.731	1.389	1.129	0.916	0.742	0.592	0.450	0.267
180		1.945	1.563	1.268	1.030	0.833	0.666	0.506	0.288
200		2.160	1.736	1.406	1.148	0.925	0.739	0.563	0.321
220		2.370	1.908	1.550	1.258	1.018	0.812	0.619	0.358
240			2.082	1.687	1.372	1.110	0.887	0.677	0.383
260			2.250	1.829	1.488	1.200	0.959	0.732	0.407
280			2.420	1.967	1.600	1.294	1.033	0.789	0.450
300				2.100	1.714	1.388	1.105	0.844	0.477
320				2.245	1.823	1.480	1.178	0.900	0.500
340				2.380	1.938	1.567	1.253	0.956	0.543
360					2.050	1.662	1.325	1.012	0.571
380					2.164	1.754	1.400	1.067	0.595
400					2.273	1.842	1.471	1.127	0.633
420					2.390	1.933	1.543	1.183	0.664
434						2.000	1.593	1.223	0.680



