DNV·GL

Certificate No:
TAF0000081

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Structural Fire Protection

with type designation(s)
Chartek 7E - Hollow sections

Issued to
International Paint Limited
GATESHEAD TYNE AND WEAR, United Kingdom

is found to comply with
DNV GL offshore standards

Application :

Approved for use as a system for fire protection of structural steel hollow sections.

This Certificate is valid until **2021-04-10**.

Issued at **Høvik** on **2016-04-11**

for **DNV GL**

DNV GL local station: **Newcastle-upon-Tyne**

Approval Engineer: **Helge Bjørnarå**

Petter Langnes
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

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Job Id:
Certificate No: **TAF0000081**

Product description

Chartek 7E - Hollow sections
composed of a system for fire protection of structural steel elements, Hollow sections, consisting of an epoxy based intumescent coating system.

The materials are manufactured at the following locations:

- Akzo Nobel Coatings BV, Wapenveld, The Netherlands
- International Paint LLC, Houston, Texas, USA
- International Paint (Korea) Ltd., Haman, Korea

Application/Limitation

The thickness of Chartek 7E system to be applied to avoid temperatures to rise on the steel substrate less than 350°C, 400°C, 427°C, 450°C, 500°C, 538°C, 550°C, 600°C, 650°C, 700°C and 750°C for Hollow sections, are given in appendix table 1-11.

The protective coating is not defined as non-combustible and should not be used in accommodation or in enclosed areas.

Relative density of Chartek 7E is 1.0 g/cm^3.

The approval refers only to the fire resistance properties of the system.

The application of the protective coating is to be performed in accordance with the manufacturer's application manual. Alternative primers and topcoats may be used provided they have been tested and approved by the manufacture.

Each product is to be supplied with its manual for installation/application and maintenance.

Type Approval documentation

Certification in accordance with Class Programme DNVGL-CP-0338, October 2015.

Doc. No. Ch7Ewp_uk, Rev. 0, Chartek 7E - Application Manual dated 2015-08-07 from manufacturer.

Test reports No. 300466, Issue 1, dated 13-03-2015 from BRE Global Ltd., Watford, UK
Test reports No. 300467, Issue 2, dated 18-03-2015 from BRE Global Ltd., Watford, UK
Test reports No. 300468, Issue 1, dated 30-03-2015 from BRE Global Ltd., Watford, UK
Test reports No. 300464-1A, Issue 1, dated 11-05-2015 from BRE Global Ltd., Watford, UK
Test reports No. 300465-1A, Issue 1, dated 11-05-2015 from BRE Global Ltd., Watford, UK
Test reports No. P100228-1007, Issue 1, dated 10-08-2015 from BRE Global Ltd., Watford, UK
Test reports No. P100228-1006, Issue 1, dated 19-08-2015 from BRE Global Ltd., Watford, UK

Assessment report No. WF358830 dated 2 February 2016 from Exova Warringtonfire Warrington, UK.

Tests carried out

Tested according to BS 476: Part 20 and 21: 1987 with HC-curve according to ISO 834-3.

Marking of product

The product or packing is to be marked with name of manufacturer and type designation.

Periodical assessment

DNV GL's surveyor is to be given permission to perform Periodical Assessments at any time during the validity of this certificate and at least every second year. The arrangement is to be in accordance with procedure described in Class Programme DNVGL-CP-0338, Section 4.

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Table 1: Thickness of "Chartek 7E" system for fire protection of *Hollow sections* for a critical temperature rise of **350ºC:**

Hp/A	Fire resistance time in minutes, Thickness in mm				
[m^{-1}]	15	30	60	90	120
27					
30					
35					
40					
45					
50					
55					
60					
65					
70					
75					
80					
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175					
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Hp/A	Fire resistance time in minutes, Thickness in mm				
[m^{-1}]	15	30	60	90	120
200					
205					
210					
215					
220					
225					
230					
235					
240					
245					
250					
255					
260					
265					
270					
275					
280					
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The maximum thickness of protection material up to the required Hp/A [m^{-1}] shall be used.

Hp/A = Ratio between Heat perimeter and cross sectional Area of the section, [m^{-1}]

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Table 2: Thickness of "Chartek 7E" system for fire protection of *Hollow sections* for a critical temperature rise of **400ºC:**

Hp/A	Fire resistance time in minutes, Thickness in mm				
[m^{-1}]	15	30	60	90	120
27					
30					
35					
40					
45					
50					
55					
60					
65					
70					
75					
80					
85					
90					
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170					
175					
180					
185					
190					
195					

Hp/A	Fire resistance time in minutes, Thickness in mm				
[m^{-1}]	15	30	60	90	120
200					
205					
210					
215					
220					
225					
230					
235					
240					
245					
250					
255					
260					
265					
270					
275					
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The maximum thickness of protection material up to the required Hp/A [m^{-1}] shall be used.

Hp/A = Ratio between Heat perimeter and cross sectional Area of the section, [m^{-1}]

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Table 3: Thickness of "Chartek 7E" system for fire protection of Hollow sections for a critical temperature rise of **427ºC:**

Hp/A	Fire resistance time in minutes, Thickness in mm				
[m^{-1}]	15	30	60	90	120
27					
30					
35					
40					
45					
50					
55					
60					
65					
70					
75					
80					
85					
90					
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145					
150					
155					
160					
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170					
175					
180					
185					
190					
195					

Hp/A	Fire resistance time in minutes, Thickness in mm				
[m^{-1}]	15	30	60	90	120
200					
205					
210					
215					
220					
225					
230					
235					
240					
245					
250					
255					
260					
265					
270					
275					
280					
285					
290					
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The maximum thickness of protection material up to the required Hp/A [m^{-1}] shall be used.

Hp/A = Ratio between Heat perimeter and cross sectional Area of the section, [m^{-1}]

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Table 4: Thickness of "Chartek 7E" system for fire protection of Hollow sections for a critical temperature rise of **450ºC:**

Hp/A	Fire resistance time in minutes, Thickness in mm				
[m^{-1}]	15	30	60	90	120
27					
30					
35					
40					
45					
50					
55					
60					
65					
70					
75					
80					
85					
90					
95					
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145					
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155					
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170					
175					
180					
185					
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Hp/A	Fire resistance time in minutes, Thickness in mm				
[m^{-1}]	15	30	60	90	120
200					
205					
210					
215					
220					
225					
230					
235					
240					
245					
250					
255					
260					
265					
270					
275					
280					
285					
290					
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300					
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The maximum thickness of protection material up to the required Hp/A [m^{-1}] shall be used.

Hp/A = Ratio between Heat perimeter and cross sectional Area of the section, [m^{-1}]

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Table 5: Thickness of "Chartek 7E" system for fire protection of Hollow sections for a critical temperature rise of **500ºC:**

Hp/A	Fire resistance time in minutes, Thickness in mm				
[m^{-1}]	15	30	60	90	120
27					
30					
35					
40					
45					
50					
55					
60					
65					
70					
75					
80					
85					
90					
95					
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170					
175					
180					
185					
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Hp/A	Fire resistance time in minutes, Thickness in mm				
[m^{-1}]	15	30	60	90	120
200					
205					
210					
215					
220					
225					
230					
235					
240					
245					
250					
255					
260					
265					
270					
275					
280					
285					
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The maximum thickness of protection material up to the required Hp/A [m^{-1}] shall be used.

Hp/A = Ratio between Heat perimeter and cross sectional Area of the section, [m^{-1}]

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Table 6: Thickness of "Chartek 7E" system for fire protection of Hollow sections for a critical temperature rise of **538ºC:**

Hp/A	Fire resistance time in minutes, Thickness in mm				
[m^{-1}]	15	30	60	90	120
27					
30					
35					
40					
45					
50					
55					
60					
65					
70					
75					
80					
85					
90					
95					
100					
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145					
150					
155					
160					
165					
170					
175					
180					
185					
190					
195					

Hp/A	Fire resistance time in minutes, Thickness in mm				
[m^{-1}]	15	30	60	90	120
200					
205					
210					
215					
220					
225					
230					
235					
240					
245					
250					
255					
260					
265					
270					
275					
280					
285					
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The maximum thickness of protection material up to the required Hp/A [m^{-1}] shall be used.

Hp/A = Ratio between Heat perimeter and cross sectional Area of the section, [m^{-1}]

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Table 7: Thickness of "Chartek 7E" system for fire protection of Hollow sections for a critical temperature rise of **550ºC:**

Hp/A	Fire resistance time in minutes, Thickness in mm				
[m^{-1}]	15	30	60	90	120
27					
30					
35					
40					
45					
50					
55					
60					
65					
70					
75					
80					
85					
90					
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170					
175					
180					
185					
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Hp/A	Fire resistance time in minutes, Thickness in mm				
[m^{-1}]	15	30	60	90	120
200					
205					
210					
215					
220					
225					
230					
235					
240					
245					
250					
255					
260					
265					
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275					
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The maximum thickness of protection material up to the required Hp/A [m^{-1}] shall be used.

Hp/A = Ratio between Heat perimeter and cross sectional Area of the section, [m^{-1}]

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Table 8: Thickness of "Chartek 7E" system for fire protection of Hollow sections for a critical temperature rise of **600ºC:**

Hp/A	Fire resistance time in minutes, Thickness in mm				
[m^{-1}]	15	30	60	90	120
27					
30					
35					
40					
45					
50					
55					
60					
65					
70					
75					
80					
85					
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Hp/A	Fire resistance time in minutes, Thickness in mm				
[m^{-1}]	15	30	60	90	120
200					
205					
210					
215					
220					
225					
230					
235					
240					
245					
250					
255					
260					
265					
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The maximum thickness of protection material up to the required Hp/A [m^{-1}] shall be used.

Hp/A = Ratio between Heat perimeter and cross sectional Area of the section, [m^{-1}]

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Table 9: Thickness of "Chartek 7E" system for fire protection of Hollow sections for a critical temperature rise of **650ºC:**

Hp/A	Fire resistance time in minutes, Thickness in mm				
[m^{-1}]	15	30	60	90	120
27					
30					
35					
40					
45					
50					
55					
60					
65					
70					
75					
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85					
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Hp/A	Fire resistance time in minutes, Thickness in mm				
[m^{-1}]	15	30	60	90	120
200					
205					
210					
215					
220					
225					
230					
235					
240					
245					
250					
255					
260					
265					
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The maximum thickness of protection material up to the required Hp/A [m^{-1}] shall be used.

Hp/A = Ratio between Heat perimeter and cross sectional Area of the section, [m^{-1}]

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Table 10: Thickness of "Chartek 7E" system for fire protection of Hollow sections for a critical temperature rise of **700ºC:**

Hp/A	Fire resistance time in minutes, Thickness in mm				
[m^{-1}]	15	30	60	90	120
27					
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50					
55					
60					
65					
70					
75					
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85					
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Hp/A	Fire resistance time in minutes, Thickness in mm				
[m^{-1}]	15	30	60	90	120
200					
205					
210					
215					
220					
225					
230					
235					
240					
245					
250					
255					
260					
265					
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The maximum thickness of protection material up to the required Hp/A [m^{-1}] shall be used.

Hp/A = Ratio between Heat perimeter and cross sectional Area of the section, [m^{-1}]

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Table 11: Thickness of "Chartek 7E" system for fire protection of Hollow sections for a critical temperature rise of **750ºC:**

Hp/A	Fire resistance time in minutes, Thickness in mm				
[m^{-1}]	15	30	60	90	120
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60					
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Hp/A	Fire resistance time in minutes, Thickness in mm				
[m^{-1}]	15	30	60	90	120
200					
205					
210					
215					
220					
225					
230					
235					
240					
245					
250					
255					
260					
265					
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The maximum thickness of protection material up to the required Hp/A [m^{-1}] shall be used.

Hp/A = Ratio between Heat perimeter and cross sectional Area of the section, [m^{-1}]