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European Technical Assessment **ETA 21/ 0474** of 24/ 05/ 2021

English translation prepared by IETcc. Original version in Spanish language

General Part

Technical Assessment Body issuing the European Technical Assessment:

Instituto de Ciencias de la Construcción Eduardo Torroja (IETcc)

Trade name of the construction product

F62 PAINT S

Product family to which the construction product belongs

Fire Protective Reactive coating for structural steel

Manufacturer

ELMO, S.R.L.

CVia Matteotti 10, 31030 Spercenigo (TV). Italy

Manufacturing plant(s)

Plant 1.

This European Technical Assessment contains

13 pages including 1 Annex which form an integral part of this assessment.
Annex 2. Contain confidential information and is not included in the ETA when that assessment is publicly available.

This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of

European Assessment Document (EAD) nº 350402-00-1106 Reactive coating for Fire Protective of structural steel

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Specific parts

1 Technical description of the product

The F62 PAINTS product is reactive coating in water dispersion formulated for the fire protection of structural steel elements. The application is performed by spray or brush, and once the reactive coating is hardened, conforms a continuous rendering completely bonded to the support (steel with different kinds of primers). The final assembly contains the following components:

| Product | Trade name | Thickness (µm) | Consumption (kg/m ²) | Support | Environmental conditions |
|------------------------------------------|--------------------------|----------------|----------------------------------|---------|--------------------------|
| PRIMER (solvent based) | EPOXI 2/C | 45-65 | 0,10 - 0,15 | steel | ----- |
| | EPOXI 2/C rich in Zinc | 45-60 | 0,20 - 0,26 | steel | ----- |
| | ALKIDIC 1/C | 60-75 | 0,19 - 0,24 | steel | ----- |
| Reactive coating | F62 PAINT S | 214-1405 | 0,43 - 3,0 | ----- | Z2, Z1 |
| Top coat (solvent based) ¹ | Acrylic polyurethane 2/C | 45 -102 | 0,10 - 0,20 | ----- | Y |
| | Varnish Acrylic 1/C | 60-95 | 0,19 - 0,3 | ----- | Y |

The final assembled system is constituted by one PRIMER + F62 PAINT S + top coat of the above table only for the environmental conditioned type Y.

According to EAD 350402-00-1106 this ETA is assessed under use conditions: Option 3.

2 Specification of the intended use in accordance with the applicable European Assessment Document (hereinafter EAD).

2.1 Intended use(s)

The intended use of the F62 PAINT S coat reactive is the rendering of building load-bearing constructive elements to increase the fire resistance in case of fire, keeping the resistance, integrity and insulation (REI) of the building elements until the fire extinction or the building evacuation.

This Product fulfils the Basic works requirements n° 2 (Safety in case of fire), n° 3 (Hygiene, health and the environment) and n° 4 (Safety in use) of the of Regulation (EU) No 305/2011.

This product has a category of use related to environmental conditions:

- **Type Y:** Reactive coating system intended for use in internal and semi-exposed conditions. Semi exposed includes temperatures below zero, but no exposure to rain and limited expo-sure to UV (but UV is not assessed). When it is applied with top coat Polyurethane Acrylic de 2/C o varnish Acrylic de 1/C.
- **Type Z1:** Reactive coating system intended for use in internal conditions with humidity equal to or higher than 85 % RH, excluding temperatures below 0 °C. The reactive coating can be applied without top coat or with any one of the system.
- **Type Z2:** Reactive coat intended for internal conditions without high humidity² content, and excluding temperatures below 0 °C, In this case the reactive coat can be applied without top coat or with any top coat of the system.

Use category related to the element(s) intended to be protected:

- **Type 4:** Fire Protective Products to protect load-bearing steel elements. Beams and columns of open section and square hollow beams, both with 3 and 4 exposed faces. With a section factor of < 320 m⁻¹. Temperature ranges from 500 °C to 650 °C. R15, R30, R60 and R90.

¹ In Type Y environments, you must always check top coats with the manufacturer.

²These uses do not apply for internal humidity class 5 in accordance with EN ISO 13788.

2.2 Relevant general conditions for the use of the kit

The provisions made in this European Technical Assessment are based on an assumed working life of 10 years from installation in the works, according to EAD 350402-00-1106, provided that the conditions lay down for the installation, packaging, transport and storage as well as appropriate use, maintenance and repair are met. In this respect.

The indications given on the working life cannot be interpreted as a guarantee given neither by the product manufacturer nor by EOTA nor by the Technical Assessment Body issuing this ETA, but are regarded only as a means for choosing the right product in relation to the expected economically reasonable working life of the works.

Application on site. The suitability of use of this product can only be assumed if this is applied according to the manufacturer's instructions, which are part of the MTD to this ETA placed at IETcc.

Particularly, it is recommended to consider:

- The application has to be carried out by skilled labor.
- It can only be used the components of the Product indicated in this ETA.
- It is necessary to control the thickness of the applied product during application.
- The support to protect must be clean, dry and without dust or grease in order not to affect the adherence of F62 PAINT S.
- The application must be performed by spray or brush. All these characteristics are included in the machines technical specifications and instructions of use.
- The hardened product will not present cracks, according to the test performed in this evaluation.
- Before the application of F62 PAINT S or any primer, it is recommended to read their MSDS.
- Surface preparation: The surface must be blasted to a Sa2½ degree (ISO 8501-1), cleaned and degreased. Roughness must be at least 25-50 microns. The application of the primers must be immediately after surface preparation in order to avoid any contamination.
- The EAD is not designed to cover the application of rendering over any existing coating (e.g. 'old' existing paint) or rendering. It is therefore assumed that any existing coating or rendering must be completely removed before the application. If it could not be removed, it would be necessary to consult the manufacturer.
- Protection materials. In these special cases, it is needed to check it with manufacturer.

Application limitations due to certain environments

- During the application and drying time, the product has to be protected against the water rain. With strong winds, high temperatures and any climate agent that can produce a quick dry of the reactive coating, F62 PAINT S will be applied in several layers with lower thicknesses each one to reduce the formation of cracks.

Incompatibility with other Fire protection materials

- For these special cases, it is needed to check it with the manufacturer.

Manufacturer's responsibilities. It is responsibility of the manufacturer of the product to ensure that the information of application of the product is communicated correctly to the manufacturer's applicators.

Recommendations of use, maintenance and repair. It is recommended to carry out yearly control inspections to check the state of the product (damages, cracks, cleanliness, etc.). The repair procedure will be carried out by:

- complete disposal of the damaged product,
- preparation of the support (cleanliness),
- new application of F62 PAINT S, sprayed or manually according to the reparation size. The material preparation and its application will be performed as indicated above.

Further application details are laid down in the MTD placed at IETcc.

3 Performance of the product and references to the methods used for its assessment

The assessment of the fitness of the F62 PAINT S for the intended use regard to the Basic works requirements n° 2, 3 and 4 was performed in compliance with the “European Assessment Document (EAD) n° 350402-00-1106 Reactive coating for Fire Protective of structural steel.

3.1 Safety in case of fire (BWR 2)

Reaction to fire. According to EN 13501-1. Classification F.

Fire resistance. The tests were performed according to the standards EN 13381-8.

| Support | Primer | Reactive coating | Thickness (µm) Reactive coating | Top Coat | Classification |
|---------|--------------------------------------------------|------------------|------------------------------------|----------|----------------|
| Steel | EPOXI 2/C rich in zinc EPOXI 2/C, ALKIDIC 1/C | F62 PAINT S | 214-1405 | ----- | R 15 at R 90 |

3.2 Hygiene, health and environment (BWR 3)

Emission of dangerous substances. According to the manufacturer's declaration taking account of EOTA TR 034, the product installed does not contain and release any dangerous substance.

The semi-volatile organic compounds (SVOC) and volatile organic compounds (VOC) are not determined in accordance with EN 16516.

3.3 Safety and accessibility in use (BWR 4)

Adhesion. Pass.

Durability

Corrosion. Pass. The reactive coat has no adverse effect on the primer and the reactive coating system does not produce corrosion to the substrate.

Compatibility with primers The different primers do not affect the properties of the reactive coating adhesion and thermal efficiency: Pass³.

Behaviour under different environmental conditions.

| Reactive coating | Top coat | Environmental conditions | Results ³ |
|------------------|--------------------------|--------------------------|----------------------|
| F62 PAINT S | ----- | Z2 | Apt |
| | ----- | Z1 | Apt |
| | Polyurethane acrylic 2/C | Y | Apt |
| | Varnish acrylic 1/C | Y | Apt |

Resistance to chemical. NPA

3.4 Identification of components

The characteristics of the components of this product show the following values, which are within the respective requirements and tolerances stated in the Manufacture Technical Dossier (MTD).

| Components | Description | Fingerprint | Colour | Density ⁴ | Dry content (105°C, 1h) (%) |
|--------------------------|----------------------|-------------|--------|----------------------|-----------------------------|
| F62 PAINT S | Reactive coating | IETcc | White | 1,40 ± 0,03 | 71 |
| EPOXI 2/C | Epoxi 2 component | ----- | Grey | 1,35 -1,40 | A: 85 // B:70 |
| Epoxi 2/c rich in Zn | Epoxi 2/c rich in Zn | ----- | Grey | 2,0 - 2.5 | A: 87 // B:48 |
| Alkydic 1/C | Alkydic | ----- | Grey | 1,25 -1,50 | 83 |
| Polyurethane acrylic 2/C | Polyurethane acrylic | ----- | White | 1,21 -1,30 | ----- |
| Varnish acrylic 1/C | Acrylic | ----- | White | 1,10 -1,40 | ----- |

³ The averages time to achievement of critical Steel temperature (t500) determined in the insulation efficiency tests with the different primers and top coats are not less than 85% of the average time t500 (time to reach a steel temperature of 500°C) of the reference system. No single results of exposed specimens were less than 80 % of the mean time t_{500} of the initial test.

⁴ EN ISO 2811, 23°C, HR% 50; kg/l

4 Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base

4.1 System of assessment and verification of constancy of performance

The European Commission according to mandate Construct 98/311, Annex 3 (taking into account decision 1999/454/EC of the Commission) on the procedure of attestation of conformity for the procedure of attestation of conformity (Annex III of EU Regulation 305/2011) has laid down for this type of material:

| Product | Intended uses | Level or Classes | System |
|-------------|------------------------------------------------------------------------|------------------|--------|
| F62 PAINT S | Rendering intended for Fire Resisting Application of building elements | Any | 1 |

The system 1 provides:

Tasks for the manufacturer: factory production control and further testing of samples taken at the factory by the manufacturer in accordance with the “Control Plan”.

Tasks for the notified body: initial type-testing of the product, initial inspection of factory and of factory production control and two annual surveillances, assessment and approval of factory production control of the manufacturer.

5 Technical details necessary for the implementation of the AVCP system, as provided for the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan which is deposited at IETcc⁵.

5.1 Tasks for the manufacturer

Factory production control. The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall ensure that the product is in conformity with this ETA.

The manufacturer may only use components stated in the technical documentation of this ETA including Control Plan. The incoming raw materials are subjected to verifications by the manufacturer before acceptance.

The factory production control shall be in accordance with the Control Plan⁶ which is part of the Technical Documentation of this ETA. The Control Plan has been agreed between the manufacturer and the IETcc and is laid down in the context of the factory production control system operated by the manufacturer and deposited at the IETcc. The results of factory production control shall be recorded and evaluated in accordance with the provisions of the Control Plan. The documentation shall be kept for at least five years. In the next table are enclosed the controls and the minimum frequency performed by the manufacturer.

| Property | Frequency |
|--------------------------------------------|---------------------------------|
| Raw Material | Every delivery |
| Char depth (expansion ratio) | Batch |
| Sag resistance | Batch |
| Insulation efficiency | 10 Batch / 1 per month at least |
| Viscosity | Batch |
| Incoming material | Every delivery |
| Curing | Batch |
| Pigment dispersion (fineness of the grind) | Batch |
| Non-volatile content | Batch |

⁵ The Control Plan is a confidential part of the ETA and only handed over to the notified certification body involved in the assessment and verification of constancy of performance.

⁶ The control plan is a confidential part of this European Technical Assessment and only handed over to the notified body involved in the procedure of attestation of conformity.

Further information concerning tests, frequencies and tolerances are included in the test's plan, which is part of the MTD to this ETA placed at IETcc.

Other tasks of manufacturer. The manufacturer shall, on the basis of a contract, involve a body which is notified for the tasks referred to in section 4 in order to undertake the actions laid down in this clause. For this purpose, the control plan shall be handed over by the manufacturer to the notified bodies involved.

The manufacturer shall make a declaration of conformity, stating that this product is in conformity with the provisions of this ETA.

5.2 Tasks for the Notified body

Initial type-testing of the product. The initial type-testing have been carried out by the IETcc to issue this ETA which corresponds to EAD "Reactive coatings for fire protection of steel elements". The initial type-testing of this ETA have been carried out by the IETcc on samples from the current production. The IETcc has assessed the results of these tests in accordance to this EAD.

Initial inspection of factory and production control. The IETcc has checked that, in accordance with the MTD, factory conditions and production control allow the manufacturer to ensure the consistency and homogeneity of the manufactured product and its traceability, to assure the final characteristics of the product.

Continuous surveillance, assessment and approval of Factory Production Control. The Notified body shall visit the factory at least twice a year. Surveillance of the manufacturing process shall include:

- Inspection of the documentation of factory production control, to ensure continuing compliance with the provisions of the ETA,
- Identification of changes by comparing data obtained during the initial inspection or during the last visit.

In cases where the provisions of the European Technical Assessment and its "Control Plan" are no longer fulfilled the certification body (IETcc) shall withdraw the certificate of conformity.

Issued in Madrid on 24 May 2021

By



Director

on behalf of Instituto de Ciencias de la Construcción Eduardo Torroja (IETcc – CSIC)

Annex I. Fire resistance tests. This Annex relates to the use of F62 PAINT S for the fire protection of 'H' or 'I' shaped steel beam and column sections and tubular beam of square section. The precise scope is given in the following tables which show the total dry film thickness of F62 PAINTS (excluding primer and top coat) required to provide classifications of R15 to R90 for various design temperatures and section factors. The product is approved on the basis of:

- Assessment testing in accordance with the principles of EN 13381-8.
- A design appraisal against this ETA adopting the numerical regression analysis defined in Annex E of EN 13381-8:2013 is used for results R15 and R30.
- A design appraisal against this ETA adopting the graphics methods in Annex E.2 of EN 13381-8:2013 is used for R-60, R-90 and tubular sections.

The data presented in the tables in this annex refers to beams and columns of open section and beams of close section square. The data shown is applicable to steel sections blast cleaned to ISO 8501-1 SA21/2 or equivalent and primed with the compatible primers and top coats listed in this ETA. Based on the test data the total dry film thickness of primer and top coat together should not exceed the maximum tested.

The data applies also to other shaped steel open sections that have re-entrant details such as type "U", "L" and "T". F62 PAINT S has been exposed to the slowing heating regime defined in Annex A of EN 13381-8 and has satisfied the requirements.

OPEN SECTION BEAMS and COLUMNS

| Section factor up to (m ⁻¹) | Beams. Fire Resistance Classification | | | 500°C |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------|-----|------|-------|
| | R15 | R30 | R60 | R90 |
| ≤65 | 214 | 214 | 528 | 747 |
| 70 | 214 | 214 | 528 | 879 |
| 75 | 214 | 214 | 528 | 1011 |
| 80 | 214 | 214 | 528 | 1142 |
| 85 | 214 | 214 | 528 | 1274 |
| 90 | 214 | 214 | 528 | 1405 |
| 95 | 214 | 214 | 528 | |
| 100 | 214 | 214 | 528 | |
| 110 | 214 | 214 | 548 | |
| 120 | 214 | 214 | 599 | |
| 130 | 214 | 214 | 648 | |
| 140 | 214 | 214 | 694 | |
| 150 | 214 | 214 | 739 | |
| 160 | 214 | 214 | 785 | |
| 170 | 214 | 214 | 830 | |
| 180 | 214 | 214 | 876 | |
| 190 | 214 | 214 | 922 | |
| 200 | 214 | 214 | 947 | |
| 210 | 214 | 214 | 1063 | |
| 220 | 214 | 214 | 1091 | |
| 230 | 214 | 214 | 1118 | |
| 240 | 214 | 214 | 1146 | |
| 250 | 214 | 214 | 1174 | |
| 260 | 214 | 216 | 1202 | |
| 270 | 214 | 368 | 1230 | |
| 280 | 214 | 373 | 1258 | |
| 290 | 214 | 378 | 1286 | |
| 300 | 214 | 383 | 1314 | |
| 310 | 214 | 388 | 1342 | |
| 320 | 214 | 392 | 1370 | |
| | Minimum thickness (µm) required of the protection to keep the temperature of the support under 500 °C | | | |

Note: The cursive values are extrapolated values.

| Section factor up to (m ⁻¹) | Beams. Fire Resistance Classification | | | 550°C |
|--------------------------------------------------------------------------------------------------------------|---------------------------------------|-----|------|-------|
| | R15 | R30 | R60 | R90 |
| ≤65 | 214 | 214 | 410 | 486 |
| 70 | 214 | 214 | 410 | 557 |
| 75 | 214 | 214 | 410 | 629 |
| 80 | 214 | 214 | 410 | 700 |
| 85 | 214 | 214 | 410 | 771 |
| 90 | 214 | 214 | 410 | 801 |
| 95 | 214 | 214 | 410 | 801 |
| 100 | 214 | 214 | 410 | 801 |
| 110 | 214 | 214 | 428 | 830 |
| 120 | 214 | 214 | 474 | 903 |
| 130 | 214 | 214 | 520 | 1414 |
| 140 | 214 | 214 | 562 | |
| 150 | 214 | 214 | 610 | |
| 160 | 214 | 214 | 656 | |
| 170 | 214 | 214 | 699 | |
| 180 | 214 | 214 | 741 | |
| 190 | 214 | 214 | 784 | |
| 200 | 214 | 214 | 826 | |
| 210 | 214 | 214 | 869 | |
| 220 | 214 | 214 | 911 | |
| 230 | 214 | 214 | 1016 | |
| 240 | 214 | 214 | 1043 | |
| 250 | 214 | 214 | 1070 | |
| 260 | 214 | 214 | 1098 | |
| 270 | 214 | 214 | 1125 | |
| 280 | 214 | 214 | 1152 | |
| 290 | 214 | 214 | 1180 | |
| 300 | 214 | 214 | 1207 | |
| 310 | 214 | 214 | 1234 | |
| 320 | 214 | 214 | 1262 | |
| Minimum thickness (µm) required of the protection to keep the temperature of the support under 550 °C | | | | |

| Section factor up to (m ⁻¹) | Beams. Fire Resistance Classification | | | 600°C |
|-----------------------------------------|---------------------------------------|-----|------|-------|
| | R15 | R30 | R60 | R90 |
| ≤ 65 | 214 | 214 | 214 | 486 |
| 70 | 214 | 214 | 214 | 557 |
| 75 | 214 | 214 | 214 | 629 |
| 80 | 214 | 214 | 214 | 700 |
| 85 | 214 | 214 | 214 | 727 |
| 90 | 214 | 214 | 214 | 745 |
| 95 | 214 | 214 | 214 | 764 |
| 100 | 214 | 214 | 214 | 782 |
| 110 | 214 | 214 | 214 | 848 |
| 120 | 214 | 214 | 223 | 944 |
| 130 | 214 | 214 | 356 | 1040 |
| 140 | 214 | 214 | 437 | 1137 |
| 150 | 214 | 214 | 467 | 1233 |
| 160 | 214 | 214 | 497 | 1325 |
| 170 | 214 | 214 | 527 | 1408 |
| 180 | 214 | 214 | 557 | |
| 190 | 214 | 214 | 587 | |
| 200 | 214 | 214 | 617 | |
| 210 | 214 | 214 | 673 | |
| 220 | 214 | 214 | 769 | |
| 230 | 214 | 214 | 865 | |
| 240 | 214 | 214 | 926 | |
| 250 | 214 | 214 | 984 | |
| 260 | 214 | 214 | 1012 | |
| 270 | 214 | 214 | 1040 | |
| 280 | 214 | 214 | 1068 | |
| 290 | 214 | 214 | 1097 | |
| 300 | 214 | 214 | 1125 | |
| 310 | 214 | 214 | 1153 | |
| 320 | 214 | 214 | 1181 | |

| Minimum thickness (μm) required of the protection to keep the temperature of the support under 600 °C | | | | |
|--------------------------------------------------------------------------------------------------------------------|---------------------------------------|-----|------|-------|
| Section factor up to (m^{-1}) | Beams. Fire Resistance Classification | | | 650°C |
| | R15 | R30 | R60 | R90 |
| ≤ 65 | 214 | 214 | 214 | 486 |
| 70 | 214 | 214 | 214 | 557 |
| 75 | 214 | 214 | 214 | 629 |
| 80 | 214 | 214 | 214 | 700 |
| 85 | 214 | 214 | 214 | 705 |
| 90 | 214 | 214 | 214 | 709 |
| 95 | 214 | 214 | 214 | 714 |
| 100 | 214 | 214 | 214 | 718 |
| 110 | 214 | 214 | 214 | 748 |
| 120 | 214 | 214 | 214 | 779 |
| 130 | 214 | 214 | 239 | 815 |
| 140 | 214 | 214 | 279 | 866 |
| 150 | 214 | 214 | 319 | 916 |
| 160 | 214 | 214 | 358 | 967 |
| 170 | 214 | 214 | 398 | 1017 |
| 180 | 214 | 214 | 445 | 1068 |
| 190 | 214 | 214 | 504 | 1118 |
| 200 | 214 | 214 | 563 | 1169 |
| 210 | 214 | 214 | 621 | 1219 |
| 220 | 214 | 214 | 680 | 1270 |
| 230 | 214 | 214 | 739 | 1323 |
| 240 | 214 | 214 | 797 | 1381 |
| 250 | 214 | 214 | 856 | 1438 |
| 260 | 214 | 214 | 910 | |
| 270 | 214 | 214 | 945 | |
| 280 | 214 | 214 | 949 | |
| 290 | 214 | 214 | 949 | |
| 300 | 214 | 214 | 949 | |
| 310 | 214 | 214 | 1013 | |
| 320 | 214 | 214 | 1039 | |
| Minimum thickness (μm) required of the protection to keep the temperature of the support under 650 °C | | | | |

| Section factor up to (m^{-1}) | Columns. Fire Resistance Classification | | | 500°C |
|------------------------------------------|-----------------------------------------|-----|------|-------|
| | R15 | R30 | R60 | R90 |
| ≤65 | 221 | 221 | 618 | 747 |
| 70 | 221 | 221 | 636 | 879 |
| 75 | 221 | 221 | 654 | 1011 |
| 80 | 221 | 221 | 671 | 1142 |
| 85 | 221 | 221 | 689 | 1274 |
| 90 | 221 | 221 | 707 | 1405 |
| 95 | 221 | 221 | 725 | |
| 100 | 221 | 226 | 743 | |
| 110 | 221 | 238 | 779 | |
| 120 | 221 | 249 | 811 | |
| 130 | 221 | 260 | 839 | |
| 140 | 221 | 270 | 867 | |
| 150 | 221 | 279 | 895 | |
| 160 | 221 | 289 | 923 | |
| 170 | 221 | 297 | 951 | |
| 180 | 221 | 306 | 979 | |
| 190 | 221 | 314 | 1007 | |
| 200 | 221 | 322 | 1035 | |
| 210 | 221 | 329 | 1063 | |
| 220 | 221 | 336 | 1091 | |
| 230 | 221 | 343 | 1118 | |
| 240 | 221 | 350 | 1146 | |
| 250 | 221 | 356 | 1174 | |
| 260 | 221 | 362 | 1202 | |
| 270 | 221 | 368 | 1230 | |
| 280 | 221 | 374 | 1258 | |
| 290 | 221 | 380 | 1286 | |
| 300 | 221 | 385 | 1314 | |
| 310 | 221 | 390 | 1342 | |
| 320 | 221 | 395 | 1370 | |

| Minimum thickness (μm) required of the protection to keep the temperature of the support under 500 °C | | | | |
|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|------|-------|
| Section factor up to (m^{-1}) | Columns. Fire Resistance Classification | | | 550°C |
| | R15 | R30 | R60 | R90 |
| ≤65 | 221 | 221 | 547 | 486 |
| 70 | 221 | 221 | 562 | 557 |
| 75 | 221 | 221 | 576 | 629 |
| 80 | 221 | 221 | 591 | 700 |
| 85 | 221 | 221 | 606 | 771 |
| 90 | 221 | 221 | 621 | 843 |
| 95 | 221 | 221 | 635 | 914 |
| 100 | 221 | 221 | 650 | 986 |
| 110 | 221 | 221 | 679 | 1129 |
| 120 | 221 | 221 | 709 | 1271 |
| 130 | 221 | 221 | 738 | 1414 |
| 140 | 221 | 221 | 768 | |
| 150 | 221 | 221 | 797 | |
| 160 | 221 | 221 | 825 | |
| 170 | 221 | 221 | 852 | |
| 180 | 221 | 221 | 879 | |
| 190 | 221 | 221 | 907 | |
| 200 | 221 | 221 | 934 | |
| 210 | 221 | 221 | 961 | |
| 220 | 221 | 221 | 989 | |
| 230 | 221 | 221 | 1016 | |
| 240 | 221 | 221 | 1043 | |
| 250 | 221 | 221 | 1070 | |
| 260 | 221 | 221 | 1098 | |
| 270 | 221 | 221 | 1125 | |
| 280 | 221 | 221 | 1152 | |
| 290 | 221 | 221 | 1180 | |
| 300 | 221 | 221 | 1207 | |
| 310 | 221 | 221 | 1234 | |
| 320 | 221 | 221 | 1262 | |
| Minimum thickness (μm) required of the protection to keep the temperature of the support under 550 °C | | | | |

| Section factor up to (m^{-1}) | Columns. Fire Resistance Classification | | | 600°C |
|------------------------------------------|-----------------------------------------|-----|------|-------|
| | R15 | R30 | R60 | R90 |
| ≤ 65 | 221 | 221 | 511 | 486 |
| 70 | 221 | 221 | 520 | 557 |
| 75 | 221 | 221 | 529 | 629 |
| 80 | 221 | 221 | 537 | 700 |
| 85 | 221 | 221 | 546 | 727 |
| 90 | 221 | 221 | 555 | 745 |
| 95 | 221 | 221 | 563 | 764 |
| 100 | 221 | 221 | 572 | 782 |
| 110 | 221 | 221 | 590 | 848 |
| 120 | 221 | 221 | 612 | 944 |
| 130 | 221 | 221 | 641 | 1040 |
| 140 | 221 | 221 | 670 | 1137 |
| 150 | 221 | 221 | 699 | 1233 |
| 160 | 221 | 221 | 728 | 1325 |
| 170 | 221 | 221 | 757 | 1408 |
| 180 | 221 | 221 | 786 | |
| 190 | 221 | 221 | 814 | |
| 200 | 221 | 221 | 842 | |
| 210 | 221 | 221 | 871 | |
| 220 | 221 | 221 | 899 | |
| 230 | 221 | 221 | 927 | |
| 240 | 221 | 221 | 955 | |
| 250 | 221 | 221 | 984 | |
| 260 | 221 | 221 | 1012 | |
| 270 | 221 | 221 | 1040 | |
| 280 | 221 | 221 | 1068 | |
| 290 | 221 | 221 | 1097 | |
| 300 | 221 | 221 | 1125 | |
| 310 | 221 | 221 | 1153 | |
| 320 | 221 | 221 | 1181 | |

| Minimum thickness (μm) required of the protection to keep the temperature of the support under 600 °C | | | | |
|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|------|-------|
| Section factor up to (m^{-1}) | Columns. Fire Resistance Classification | | | 650°C |
| | R15 | R30 | R60 | R90 |
| ≤ 65 | 221 | 221 | 361 | 486 |
| 70 | 221 | 221 | 370 | 557 |
| 75 | 221 | 221 | 379 | 629 |
| 80 | 221 | 221 | 387 | 700 |
| 85 | 221 | 221 | 396 | 705 |
| 90 | 221 | 221 | 404 | 709 |
| 95 | 221 | 221 | 413 | 714 |
| 100 | 221 | 221 | 421 | 718 |
| 110 | 221 | 221 | 438 | 748 |
| 120 | 221 | 221 | 455 | 779 |
| 130 | 221 | 221 | 472 | 815 |
| 140 | 221 | 221 | 489 | 866 |
| 150 | 221 | 221 | 506 | 916 |
| 160 | 221 | 221 | 523 | 967 |
| 170 | 221 | 221 | 540 | 1017 |
| 180 | 221 | 221 | 557 | 1068 |
| 190 | 221 | 221 | 574 | 1118 |
| 200 | 221 | 221 | 591 | 1169 |
| 210 | 221 | 221 | 648 | 1219 |
| 220 | 221 | 221 | 743 | 1270 |
| 230 | 221 | 221 | 810 | 1323 |
| 240 | 221 | 221 | 836 | 1381 |
| 250 | 221 | 221 | 861 | 1438 |
| 260 | 221 | 221 | 886 | |
| 270 | 221 | 221 | 912 | |
| 280 | 221 | 221 | 937 | |
| 290 | 221 | 221 | 962 | |
| 300 | 221 | 221 | 988 | |
| 310 | 221 | 221 | 1013 | |
| 320 | 221 | 221 | 1039 | |
| Minimum thickness (μm) required of the protection to keep the temperature of the support under 650 °C | | | | |

The evaluation results within which the product can be used are:

- Section Factor between 65 m^{-1} and below or equal to 320 m^{-1} .
- Protection thicknesses assessed between 214 – 1405 microns for steel beams.
- Protection thicknesses assessed between 221 – 1405 microns for steel columns.
- Critical temperature of 500°C- 650°C.

In the same way, the evaluation results are only applicable to:

- “I” H, U and “H” section profiles, angles and T sections.
- Other grades of steel in accordance to EN 10025-1.
- Columns and beams with 3 or 4 faces exposed.
- Beams with a web maximum length of 600 mm for R 60.

CLOSE TUBULAR SECTION SQUARE

| Section factor up to (m ⁻¹) | Beams. Fire Resistance Classification | | | |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|--------|-------|-------|
| | R 15 | | | |
| | 500 °C | 550 °C | 600°C | 650°C |
| ≤80 | 304 | 304 | 304 | 304 |
| 85 | 304 | 304 | 304 | 304 |
| 90 | 304 | 304 | 304 | 304 |
| 95 | 304 | 304 | 304 | 304 |
| 100 | 304 | 304 | 304 | 304 |
| 110 | 304 | 304 | 304 | 304 |
| 120 | 304 | 304 | 304 | 304 |
| 130 | 304 | 304 | 304 | 304 |
| 140 | 304 | 304 | 304 | 304 |
| 150 | 304 | 304 | 304 | 304 |
| 160 | 304 | 304 | 304 | 304 |
| 170 | 304 | 304 | 304 | 304 |
| 180 | 304 | 304 | 304 | 304 |
| 190 | 304 | 304 | 304 | 304 |
| 200 | 304 | 304 | 304 | 304 |
| 210 | 304 | 304 | 304 | 304 |
| 220 | 304 | 304 | 304 | 304 |
| 230 | 304 | 304 | 304 | 304 |
| 240 | 304 | 304 | 304 | 304 |
| 250 | 304 | 304 | 304 | 304 |
| 260 | 310 | 304 | 304 | 304 |
| 270 | 324 | 304 | 304 | 304 |
| 280 | 337 | 304 | 304 | 304 |
| 290 | 350 | 304 | 304 | 304 |
| 300 | 363 | 304 | 304 | 304 |
| 310 | 376 | 304 | 304 | 304 |
| 320 | 381 | 304 | 304 | 304 |
| | Minimum thickness (µm) required of the protection to keep the temperature of the support under the critical temperature | | | |

| Section factor up to (m ⁻¹) | Beams. Fire Resistance Classification | | | |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|--------|-------|-------|
| | R 30 | | | |
| | 500 °C | 550 °C | 600°C | 650°C |
| ≤80 | 314 | 310 | 304 | 304 |
| 85 | 332 | 310 | 304 | 304 |
| 90 | 350 | 310 | 304 | 304 |
| 95 | 368 | 310 | 304 | 304 |
| 100 | 386 | 310 | 304 | 304 |
| 110 | 421 | 323 | 304 | 304 |
| 120 | 457 | 348 | 304 | 304 |
| 130 | 493 | 374 | 304 | 304 |
| 140 | 529 | 399 | 304 | 304 |
| 150 | 564 | 425 | 304 | 304 |
| 160 | 600 | 450 | 320 | 304 |
| 170 | 625 | 475 | 341 | 304 |
| 180 | 650 | 501 | 361 | 304 |
| 190 | 674 | 526 | 381 | 304 |
| 200 | 699 | 552 | 401 | 304 |
| 210 | 724 | 577 | 422 | 304 |
| 220 | 749 | 603 | 442 | 304 |
| 230 | 774 | 638 | 462 | 316 |
| 240 | 798 | 673 | 482 | 339 |
| 250 | 823 | 708 | 503 | 362 |
| 260 | 848 | 743 | 523 | 385 |
| 270 | 873 | 778 | 543 | 408 |
| 280 | 898 | 813 | 564 | 432 |
| 290 | 922 | 848 | 584 | 455 |
| 300 | 947 | 883 | 606 | 478 |
| 310 | 959 | 915 | 635 | 501 |
| 320 | ----- | 930 | 646 | 510 |
| | Minimum thickness (µm) required of the protection to keep the temperature of the support under the critical temperature | | | |

Note: The cursive values are extrapolated values

The evaluation results within which the product can be used are:

- Section Factor between 65 m^{-1} and below or equal to 320 m^{-1} .
- Protection thicknesses assessed between 310 –959 microns for tubular steel beams.
- Critical temperature of 500° - 650°C .

In the same way, the evaluation results are only applicable to:

- Rectangular or square tubular section profiles.
- Other grades of steel in accordance to EN 10025-1.
- Beams with 3 or 4 faces exposed.