

CHAR 21

Waterborne intumescent coating for fire protection of steel and concrete structures.

CHAR 21 is a very low VOC, waterborne, high performance intumescent coating providing a very effective fire barrier thanks to high active solids content, char strength and the use of nanofillers. Fast development of a stable, low heat transfer char provides effective and long term protection to flammable and non-flammable substrates.

CHAR 21 is used for fire protection of steel structures, concrete and reinforced concrete structures, concrete and masonry partitioning walls and in other application fields. In structural resistance-to-fire applications it provides protection against fire for up to 3 hours.

CHAR 21 has superior environmentally friendly features, assessed by EN 16000 tests for indoor emissions, ISO 89011-2 tests for VOC content and several attestations according to LEED, BREEAM, CAM, French VOC and more.

Intumescence means "swelling while charring". Special chemicals in the coating react in excess of 200°C generating a low-density expanded char up to 100 times thicker than the original dry film. This char provides a very effective barrier to heat transfer protecting the substrate.

Structural resistance to fire plays a key role in fire safety. In commercial and industrial facilities, hotels, airports, supermarkets, schools, hospitals, cinemas, theatres, multistorey parkings, any large building, the use of intumescent coatings extends the resistance of structures in the event of fire preserving lives and property, allowing people evacuation and the safe operation of the fire brigade.



CHAR 21

DENSITY: 1.3 ± 0,05 kg/dm³ at 20°C

SOLIDS CONTENT:

78% ±5%w/w - 67% ±5%v/v

COLOUR: white

STANDARD PACKING: 20kg plastic drums

SHELF LIFE: 12 months

in original packing and proper environment

SPREADING RATE: 0,55 ± 0,05mm

dry film thickness with 1kg/m² wet (theoretical)

APPLICATION: Normally by airless spray.

For small surfaces or retouching by roller or brush

WET THICKNESS PER COAT:

Airless spray: max 1000 µm (750 µm DFT)

Brush or roller: max 500 µm (300 µm DFT)

THINNING: Not recommended

If necessary with water max 5%

DRYING TIME *

8 hours - touch / 24 hours - complete

MIN APPLICATION TEMPERATURE +5°C

MAX APPLICATION TEMPERATURE +45°C

(*) @ +20°C and 60% RH. Drying time depends on DFT, temperature, relative humidity.

TEST, ASSESSMENT AND CLASSIFICATION REPORTS INCLUDE:

PR-01-02-093	PAVUS
PV-08-2-008	PAVUS
1953T09	AFITI LICOF
26959/A	TECNALIA
0115926	HBRC EGYPT
28229691/2 001	TUV RHEINLAND
28229694-28229693	TUV RHEINLAND
CSI 2123 FR	CSI
CSI 2124 FR	CSI
CSI 2140 FR	CSI
CSI 2141 FR	CSI
CSI2171FR	CSI
CSI2172FR	CSI
UG001	Tomas Bell-Wright
CSI2478FR	CSI
CSI2478FR	CSI
11032204	GFC Chimica

USE AND APPLICATION

Proper substrate preparation is requested depending on conditions including cleaning, degreasing and removal of loose particles. Steel surfaces are normally sandblasted SA 2½ then a proper anticorrosive primer is applied. Spray application is performed in at least two coats, crossing wet on wet, with airless systems.

A typical application of 1,5 mm dry = 2,7 kg/m² wet is made in two coats of about 1

mm wet thickness. Suitable equipment is an airless spray piston pump with minimum compression rate = 40:1, minimum pressure 150 bar (e.g. GRACO MARK V or WAGNER ProSpray PS34), Reverse-A-Clean self-cleaning tips, nozzle diameter 19/21/23 mils, flexible feeding pipe 3/8" of maximum length 30m. Average volumetric flow rate in common airless spray applications ranges from 3 to 6 l/min. Gun, line and feed filters should be removed.

Application can also be done by brush or roller with long single strokes, not overworking.

Application by brush/roller requires more coats than airless spray.

Proper environmental condition must be kept during application and drying.

RECOMMENDED PRIMERS AND TOPCOATS

Eposol Primer 100: 2K epoxy for steel, stainless steel, aluminium and non-ferrous metals.

Primer 036: fast drying modified phenolic alkyd primer for steel and zinc coated steel.

Wall Primer 3500: for concrete and renderings.

Numerous other commercially available primers have been tested and proved compatible. A list is available from our technical service.

According to the principles of **ETAG 018** (point 5.0.4., assessment by families), and our tests CHAR 21 is compatible with all alkyd and epoxy primers. According to the compatibility report Pr-07-2.094n direct application on zinc coated steel is also possible.

Topcoating can be useful in any environment to improve aesthetic and reduce dirt pick-up. Intumescent coatings are not suitable for use in the presence of condensing moisture or rain, therefore in moist environments and when exposed outdoors a topcoat is necessary and it must have proper characteristics of water barrier.

Interior environments according to **ETAG 018** classes Z1 and Z2 do not generally require any topcoat. Semi-exposed environments according to **ETAG 018** class Y require our **IDROSOL** acrylic waterborne topcoat.

Outdoor fully exposed environments according to **ETAG 018** class X or C3 corrosion class according to **ISO 12944** require our **PURETHAN** solventborne 2K polyurethane topcoat and its application must be particularly accurate.

CHAR 21 also provides an effective barrier to CO₂ as an effective anti-carbonation sealant (test report 104/L, GFC Chimica, according to EN 1062-6 and EN 1504-2). 1300 µm dry film provides Sd_{CO2} of 450 m. At the minimum thickness reported in CHAR 21 fire loading tables it provides Sd_{CO2} = 67 m.

CERTIFICATIONS AND APPROVALS

CHAR 21 comes with European certification and numerous type approvals in Europe and other countries. Performance for fire protection of **constructional steel** is certified according to **EN 13381-4** and **EN 13501-2**. For **reinforced concrete** and **pre-stressed reinforced concrete structures**, test and assessment reports are available according to **EN 13381-3** both for beams/columns and for slabs/walls up to R120.

Application for **compartment walls** is supported by classification according to **EN 13501-2** (fire tests according to **EN 1364-1**) for walls in masonry bricks with rendering (EI120), **concrete blocks** without rendering (up to EI 180), **drywall** (EI60).

With application on wood CHAR 21 imparts reaction-to-fire class B-s2, d0 on all wood substrates including MDF. In application on non-flame retarded XPS it gives a C reaction-to-fire class.

DISCLAIMER: Though based on the results of long term testing and experience the information given here is informative only. We cannot accept any liability for use of this information and the product unless a proper check has been done of the specific application, verified by the end-user. Accurate preliminary testing and definition of an application protocol and system is highly advisable to obtain full advantage of this product.

