



NAFFCO PSV-C-2

SPRAY-APPLIED FIRE RESISTIVE MATERIAL FOR STEEL STRUCTURE

TECHNICAL DATA SHEET

- **Water-based.**
- **Interior/Exterior* Application.**
- ANSI/UL 263 (ASTM E119)
- D997, N871 and Y745.
(Refer to the UL certificate for minimum required thickness)
- Fire resistance rating: R15 - R240.



* Subjected to appropriate weather conditions.

PRODUCT TYPE - CEMENTITIOUS PAINT

NAFFCO PSV-C-2 Spray-Applied Fire Resistive Material is used in building construction to have excellent adhesion on steel substrates and to provide fire rating up to 4 hours.

NAFFCO PSV-C-2 is formulated with materials such as cement, vermiculite, fibre (asbestos-free) and some other organic and inorganic materials, where it does not only show the characteristic of steel strength of concrete, but also the toughness and the flexibility of the cross-stitched network of fibre.

The physical properties are significantly better than similar products available in the market. During its burning in the fire, no toxic smoke is produced. After the burning, the burned coating remains as strong and intact as it was before the burning, and it will not be destroyed by the windstorm occurred in fire accidents.

CHARACTERISTIC

1. EXCELLENT PHYSICAL PROPERTIES

NAFFCO PSV-C-2 is light but tough. The impact resistance, compressive strength and bending durability are significantly higher than the similar products available in the market. Due to its inclusion of tough and strong anti-deflection fibre, no peeling occurs under heavy blows. The physical properties are maintained even after 3 hours of burning in the fire, no chalking or loosen occurs after burning. It can resist the windstorm in the scene of fire accident and thus ensure its fire protection capability.

2. NO ASBESTOS CONTENT

The test done by the Union Chemical Laboratory of Industrial Technology Research Institute shows that the NAFFCO PSV-C-2 does not contain any asbestos at all.

3. PROHIBITION OF OXIDATION

The components of NAFFCO PSV-C-2 can prohibit the oxidation of iron, no corrosion to the steel substrates will occur under direct contact.

4. EASY APPLICATION, LOW POLLUTION

Add water and stir well. NAFFCO PSV-C-2 can be sprayed immediately. It has good fluidity and optimum viscosity. On top of NAFFCO PSV-C-2, different types of protective and decorative coatings can be applied (Optional). The protective/decorative topcoat does not only provide a pleasant and colourful appearance but also protect the NAFFCO PSV-C-2 from the direct contact with atmospheric pollution, thus extending the warranty period.

5. BEST QUALITY, STABLE SUPPLY

NAFFCO PSV-C-2 Spray-applied Fire Resistive Material is classified and audited by Underwriters Laboratories Inc. Together with “Follow-up Service” by U.S. Underwriters Laboratories Inc. The Annual production of up to 1 million bags are done by using automatic equipments. The quality and supply of NAFFCO PSV-C-2 is better than other domestic and foreign products.

6. FIRE TESTING CERTIFICATION

NAFFCO PSV-C-2 has successfully passed the test of ANSI/UL 263 (ASTM E119) which is “Fire Test of Building Construction and Materials” by Underwriters Laboratories Inc. It has the capability of protecting exterior and interior structural steel beams, columns and floor units for up to 4 hours, and is registered as Design No. D997, N871 and Y745. It is categorised as a Fire Protection Coating for Structural Steel in General Building Construction in the Fire.

PHYSICAL PROPERTIES DATA

1.	Colour (after curing)	:	Greyish white
2.	Dry Density (ASTM E605)	:	27/29 PCF (Min. Ind./Avg.)
3.	Compressive Strength (ASTM E761)	:	Min. Avg. 5,000 PSF
4.	Cohesion/Adhesion (ASTM E736)	:	Min. Avg. 500 PSF
5.	Deflection (ASTM E759)	:	Pass
6.	Impact Resistance (ASTM E760)	:	Pass
7.	Anti-Corrosion (ASTM E937)	:	0.00 gm/mm ²
8.	Air Erosion (ASTM E859)	:	0.000 gm/ft ²
9.	Flame Spread (ASTM E84)	:	0 (over-coating of 1 coat of Clear Paint still be zero)
10.	Smoke Development (ASTM E84)	:	0 (over-coating of 1 coat of Clear Paint still be zero)
11.	Combustion Characteristic (ASTM E136)	:	Non Combustible
12.	Sound Absorption (ASTM C423)	:	NRC = 0.60 at 25 mm
13.	No Sagging (One Coat)	:	> 15 mm each coat (Normal Operation)
14.	pH Value (Stir with water)	:	Around 12
15.	Packaging	:	14 kg per bag

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| 16. Application Method | : | Spray or Manual Trowel |
| 17. Appropriate Substrates | : | Steel or Concrete |
| 18. Curing Time (20°C/50% RH) | : | Rough Dry : 2~6 hrs.
Reach 50 % Strength : 5~7 days
Reach 70 % Strength : 10~12 days
Reach 98 % Strength : > 28 days |
| 19. Shelf Life (Normal Environment) | : | At least one year |

(Note 1) - Dry Density according to ASTM E605 test refers to the curing equilibrium state, but not the absolute curing stage. Under normal circumstance, NAFFCO PSV-C-2 reach curing equilibrium state when the water absorption is below 15%.

(Note 2) - The actual consumption of NAFFCO PSV-C-2 will vary according to the wastage, and the wastage depends upon the application of environment and work.

PREPARATION

- 1. Appropriate Substrates:** Steel and Concrete.
- 2. Substrate Preparation:** The substrate must be cleaned and dried. All sludge, rust/oil, and any other material which can affect the good adhesion condition must be removed. NAFFCO PSV-C-2 can be applied directly to the steel surface and galvanized steel surface which has no primer or has anti-corrosive primer.
- 3. Metal Lath:** NAFFCO PSV-C-2 Fire Protection Coating passed all fire tests without any addition of reinforced mesh to strengthen its stick-ability. The use and existence of reinforced mesh can reduce the occurrence of peeling off.
- 4. Type of Metal Laths:** According to the chapter of “Coating Materials” and its relevant Design Number in the U.S. UL Fire Resistance Directory, there are at least two different types of Metal Lath which can be chosen for use:
 - (1)** Metal Lath - Diamond mesh of galvanized or painted steel with Unit weight of 3.4 lbs/yd². When an H-section is enclosed as Boxed-Design, the diamond mesh of galvanized or painted steel with unit weight of 3.4 lbs/yd² (1.85 kg/m²) should be selected to enclose the H-section in a tubular column, then NAFFCO PSV-C-2 should be coated to the required thickness according to the obtained rating.

(2) Metal Lath - Diamond mesh of galvanized or painted steel with Unit weight of 1.7 lbs/yd². It is also reinforced on the steel surface which is normally used in building's structural steel beams and columns for interior and exterior environment. According to the chapter of "Coating Materials" in the U.S. UL Fire Resistance Directory, the requirements are as below:

- (i) When the steel section is coated with anti-corrosive primer or other coating, the test average adhesion is < 80% or individual adhesion is < 50%. The diamond mesh of galvanized or painted steel with unit weight more than 1.7 lbs/yd² (0.922 kg/m²) must be filled for reinforcement.
- (ii) If the flange width or web depth of the Column is > 16 inches or the flange width of the Beam is > 12 inches, then diamond mesh of galvanized or painted steel with unit weight of 1.7 lbs/yd² (0.922 kg/m²) should be used to cover at least 25% of the flange width or web depth. The minimum width of the metal lath must not be smaller than 3-½ inch.

5. Types of Anti-corrosive Primer: The steel substrates used in all the fire tests for NAFFCO PSV-C-2 are blasted steel plates without an over-coating of any anti-corrosive primers. Nevertheless, in the steel structures of actual building construction, anti-corrosive primers are sprayed to meet the requirements of anti-corrosion performance in the steel sections. NAFFCO PSV-C-2 (Interior) Fire Protection Coating was tested according to ASTM E736 Adhesion Test Standard against various anti-corrosive primer. Except the Red Lead Primer which cannot meet the requirements of adhesion performance, except this, rest of the various anti-corrosive primers can completely be adhered to the NAFFCO PSV-C-2 Fire Protection Coating. If the surface of the steel sections is over-coated with complete coating system (i.e. various topcoats), then the diamond mesh of galvanized or painted steel with unit weight of 1.7 lbs/yd² (0.922 kg/m²) should be used to fully strengthen the adhesion.

LIMITATION OF APPLICATION

1. The lowest environmental and substrate surface temperature must be above 4°C, such temperatures should be exceeded 24 hours before and after the application of NAFFCO PSV-C-2.
2. The lowest environmental and substrate surface temperature must be below 40°C for NAFFCO PSV-C-2.
3. The surface temperature of substrates must be 2°C higher than the Dew point Temperature.

FIRE PROTECTION COATINGS & MATERIALS SECTION
PASSIVE FIRE (PF) DIVISION, R&D DEPARTMENT
NAFFCO Flow Control.

In case of any questions please contact our technical support team.
For full product documentation and other information please visit our website www.naffco.com

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