



## FLUID FILM Liquid A

### 1. Description

One component oily liquid, solvent-free, lanolin based soft coating.

### 2. Color

Amber.

### 3. General usage

This non oxidizing rust retarding compound formulated as a liquid is used to form protective films in ballast tanks on ships, drilling platforms, dry docks, barges, rudder interiors, chain lockers, and any metal surface subjected to severe salt water corrosion and to corrosive marine atmospheres.

**FLUID FILM Liquid A** is easily applied by spray or floatation methods. It forms with water or air humidity a gel which adheres to metal surfaces and is not subject to discharge overboard during deballasting.

**FLUID FILM Liquid A** is also used as a penetrant and lubricant. It may be used to help descale tanks with heavy scale.

### 4. Principal characteristics

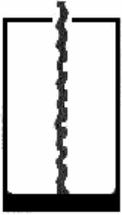
- contains highly polar lanolin and water displacing additives, which deposit the product below water films on the metal surfaces. This is essential for proper penetration and adhesion of the protective coating being applied;
- does not contain solvents, non toxic during application;
- requires minimum surface preparation;
- penetrates existing rust, displaces water, forms with water and/or air humidity a gel;
- adheres to and gives full protection to wet or dry surfaces;
- does not dry out, harden or crack;
- resists water washing yet can easily be removed when required;
- can be applied by air and airless spraying, brush, roller and floatation.

**FLUID FILM Liquid A** meets and surpasses the requirements of the United States Military Specification MIL-C-16173.

### 5. Technical data

Specific Gravity at 25 °C	0,905 - 0,915
Solid content	100 % (non volatile content)
Spreading rate for spray application	1 liter per 6 m <sup>2</sup>
for float application	1 liter per 2 m <sup>2</sup>
Water resistant	immediately after application
Flash point	
ASTM-D92 (Cleveland Open Cup)	> 157 °C (450 K)
Viscosity Ford Cup No. 4	30 to 45 sec. at 21 °C
Specific conductivity	<10 <sup>-9</sup> mho/cm at 1 Mhz

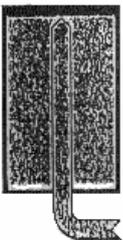
	<p>Effect on rubber (ASTM-D471 at 158 F, 70 hours)</p> <p>Toxicity (Tests performed by outside laboratory using standard methods)</p>	<p>None on neoprene, buna-n and most synthetics. Some swelling on natural rubber</p> <p>Oral : LD<sub>50</sub> greater than 3 g/kg. Skin irritation : non-irritating response</p> <p>Albino rabbits - 24 hrs contact of FLUID FILM on intact and abraded skin. Eye irritation : very slight response</p>
<p><b>6. Package</b></p>	<p>3,79 l can (1 US gallon)</p> <p>20 ltr pail</p> <p>208 ltr drum (55 US gallons)</p>	<p>non returnable</p>
<p><b>7. Shelflife/Stability</b></p>	<p>Indefinite. Will not change in original closed cans, pails and drums.</p>	
<p><b>8. Storage &amp; Transport</b></p>	<p>IMCO / UN / ADR / RID / RAR - not listed</p>	
<p><b>9. Instructions for use</b></p>	<p><u>Spray application</u></p> <p>Before <b>FLUID FILM Liquid A</b> rust preventing coating is applied, the tank should be free of water accumulations. Though FLUID FILM will displace moisture, the product will remain afloat, if there are pools along the tank bottom. <b>FLUID FILM Liquid A</b> can be sprayed on with ordinary liquid spraying equipment (air or airless). Do not use solvents or thinners. The product will not clog lines or nozzles. Estimate 1 l of <b>FLUID FILM Liquid A</b> for 6-10 m<sup>2</sup> depending on the surface roughness. Use a single coat double pass spraying technique providing a uniform thickness. Actual area to be covered should be carefully calculated keeping in mind internal structures may increase actual boundary surface area of tank up to 4 to 5 times.</p> <p>It is important when using <b>FLUID FILM Liquid A</b> for ballast water tank coating, especially when used by spray method, that regular and correct retreatment programs are set up in cooperation with manufacturers' local representative.</p> <p>When a thicker coat and therefore a longer life expectancy are desired, <b>FLUID FILM Liquid AR</b>, a semi-liquid, can be applied at 400-800 µm by spray method (see data sheet for FLUID FILM Liquid AR).</p> <p><u>Floation Application</u></p> <p><b>FLUID FILM Liquid A</b> is offered with complete confidence as a high grade, easy to apply, economical floatation coating for long term protection of ballast water tanks. The floatation method of protecting tanks requires additional material when compared with the spray application method, because sufficient material is necessary in order to form a uniform layer of FLUID FILM on the water surface to assure that the coating is in contact with all of the stiffeners, framing, longitudinals, reinforcing members and bulkheads.</p>	



1. Introduction



2. Ballasting



3. Floating



4. Deballasting



5. Fully coated surfaces

Actual floatation coating instructions are as follows :

- a. Remove loose scale by high pressure hose, machine washing, or other means.
- b. Muck and hose tank to remove rust, silt and other sediment. This will make more product available for protection of tank surfaces.
- c. To get proper dosage for floatation method use same dosage calculation as for spray method. To this dosage add enough additional **FLUID FILM Liquid A** to give a 10 mm (3/8") floating layer (10 l/m<sup>2</sup> or 20 gal/1 square foot) across the top of the water surface of the tank.
- d. Hose about 10 % of the required quantity of **FLUID FILM** into bottom of the tank, making sure that the product is distributed into all compartments of the tank.
- e. Fill the tank slowly with ballast water up to the suction bell.
- f. Add remainder of **FLUID FILM Liquid A** to tank. The product can be fed through a vent or sound pipe or manhole. Let the **FLUID FILM Liquid A** level itself or hose or pour in large tanks the product into all compartments.
- g. Start adding ballast water at a rate to raise the water level by no more than 15 cm (6") per minute.

**Do not allow FLUID FILM Liquid A to sit in a damp tank for a long period of time before starting placement procedure.**

- If turbulence occurs, filling rate should be slowed down until turbulence stops and product layer reforms. If tank construction has lightening holes, care should be taken to allow the **FLUID FILM Liquid A** to spread evenly, holding the water level at a depth in the tank to allow this distribution.
- h. Ensure the vessel is trimmed in such a manner that air venting is at the highest part of the tank, reducing possibilities of air locks when pressing up tanks.
  - i. Press the tank up without overflowing and allow to stand for at least **ONE HOUR**. This will give the overhead good protection and make **FLUID FILM Liquid A** react with water to form a gel. Once the coating has stiffened after a time of water contact, start deballasting again as slowly as possible. Make sure deballasting is stopped short of suction bell to prevent any of the product from going overboard.
  - j. Repeat the cycle g, h, and i at least **3 times** to ensure all **FLUID FILM Liquid A** is used up.
  - k. Tank should be carefully inspected to ensure all parts of the surface have been treated. Any areas which may have been missed due to air pockets or turbulence can be covered by direct application e.g. brush, roller or spray.

After some contact with **FLUID FILM Liquid A** it is not unusual that any remaining rust and scale that was not removed by initial hose down with water, falls down into the tank bottom. The reason for this is that **FLUID FILM Liquid A** penetrates such residues of rust and scale and loosens them from the tank surfaces whereafter they fall down requiring **FLUID FILM Liquid A** to be touched up on those surfaces.

Floating Application of Peaks, Deep and Side Tanks

While the spraying technique is relatively straight forward, the floating process can take several forms. One procedure, which has been found to be most successful for peaks, involves as usual the removing of all loose scale and mud lying on the tank bottom or shelf areas before filling the tank to a level just below the overhead frame work (about 90 % of the tank capacity). Approximately 75 % of the total calculated coating quantity is added to the surface of the water. Once **FLUID FILM Liquid A** has formed a continuous layer, the water level is gradually dropped at a rate of 4 centimeters per minute until the tank is 25 % full. At this point, the tank is slowly refilled to the original level and the remaining 25 % of the calculated coating quantity is added to the water surface. The tank is then pressed up so as to coat the tank top and overhead areas after which the water level is again gradually lowered. This will give an additional opportunity for the FLUID FILM to cover all tank areas.

In all float coating applications, deballasting is stopped just above the tank bottom if only one tank is to be coated. The purpose for this procedure is to prevent any ballast water and liquid coating from getting overboard. However, once the FLUID FILM coating has gelled and surplus of the unused coating become integrated into the coating by rolling action of the ship, there is no danger of discharging polluted ballast water.

**11. Airless spraying equipment**

Applied by :	Amount of coats	Average film thickness in $\mu\text{m}$ *)	Theoretical consumption in $\text{l/m}^2$	Theoretical spreading rate in $\text{m}^2/\text{l}$	Nozzle	
					$\varnothing$ mm	Mpa
Brush	1	80	0,08	12	-	-
Roller	1	80	0,08	12	-	-
Airspray	1	170	0,17	6	0,8	0,4
Airless	1	170	0,17	6	0,63	14
Floatation	-	500 - 1500	0,5 - 1,5	2 - 0,7	-	-

The durability of a coating system depends among other things on the film thickness. The film thickness should be selected according to the roughness of the steel surface, required durability and the corrosive environment. The choice of application method whereas will depend on the specific job to be done. In void spaces airless spray is normally the only possible method. In water ballast tanks spraying is also the preferable method as it allows better control over the application. Floatation is primarily recommended for ballast tanks with difficult access and when the cost of surface preparation and application is the major consideration.

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\*) The film thickness is indicated for rusted steel.

**12. Recommended substrate condition**

Ideally the steel surface should be free of loose rust and loose paint, and as dry as possible, before applying **FLUID FILM Liquid A**.

The preferred surface preparation is high-pressure water washing followed by hand scraping to remove any remaining rust scale. The tank should then be ventilated to make the surface as dry as practically possible.

However, as **FLUID FILM Liquid A** will displace water and gradually penetrate into the rust the coating itself can be used as a "rust descaler". The first application of **FLUID FILM Liquid A** will make much of the rust scale fall off during the first few months after the application. The tank should then be mucked out and cleaned and a new coat of **FLUID FILM Liquid A** applied.

**13. Safety precautions**

a. While **FLUID FILM Liquid A** is not a toxic material and does not contain solvents the spraymist is not harmless. When spraying use suitable gloves and dust respirators. (Safety Rules for Spraying **P.P.A. Code : 0 - 1, Safety Phrases - S 37/39**).

b. Ventilation should be provided in confined spaces to remove the spraymist and vapor-proof lighting should be used during the application.

c. **Before starting hot work (burning, welding etc.) on a FLUID FILM Liquid A coating thicker than 100 µm**, the coating material should be wiped back a distance of 1,5 m from where hot work is to be performed and from the deck area beneath the hot work.

The information and recommendations herein are believed to be accurate and reliable. However, since conditions of actual use are beyond our control, any recommendations or suggestions are made without warranty expressed or implied.