TECHNICAL DATA SHEET

FLUID FILM Liquid AR

Replaces data sheet 210.1 09I1998

1. Description

One component soft gel, solvent-free, lanolin based coating.

2. Color

Amber, other colors on special order.

3. General usage

Anti-corrosive coating for long term protection of permanent salt water ballast tanks - preferable for in-service tanks - in all types of vessels, drill water tanks, cofferdams, floating docks, caissons, void spaces and deck equipment.

4. Principal characteristics

- solvent-free for higher safety;
- highly economical as easily applied, saves labor, time, equipment and material costs;
- can be applied with normal high performance airless equipment (> 22 : 1 pump ratio) in one coating process up to 800 µm. Can also be applied by air spraying, roller and by brush;
- has a great affinity for ferrous metals, old rusty steel and old well adhering coatings ;
- outstanding fresh and salt water resistance immediately after application;
- self-healing in case of mechanical scoring or similar damage;
- highly flexible and readily compensating for metal expansion, contraction and flexing;
- non-toxic but should not be used in tanks carrying potable water.

FLUID FILM Liquid AR meets and exceeds the corrosion performance requirements of the United States Military Specification MIL-C-16173 and has the US National Stock Number 8030-01-381-7311.

5. Technical data

Specific Gravity	0,910 - 0,920		
Solid content	100 % (non volatile content)		
Recommended film thickness	400 µm up to 800 µm, depending on the required corrosion protection and on the thickness of the unremoved rust scale.		
Spreading rate	1 liter per 2 m² for a coating thickness of 500 microns		
Water resistant	immediately after application		
Flash point ASTM-D92 (Cleveland Open Cup)	157 °C (315 °F)		
Viscosity	RPM	Stokes	Poise
Brookfield HBF (21 °C) Spindle No. 5	5	1969	1792

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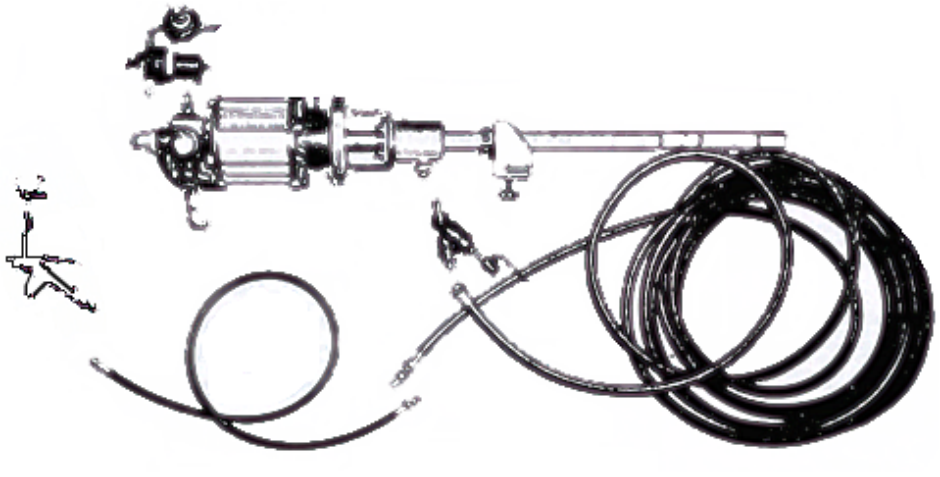
6. Package	20 ltr pail non returnable 208 ltr drum (55 US gallons)
7. Shelflife/Stability	Indefinite. Will not change in original pails and drums.
8. Storage & Transport	IMCO / UN / ADR / RID / RAR - not listed
9. Approvals	Lloyd's Register of Shipping Germanischer Lloyd
10. Instructions for use	a. **FLUID FILM Liquid AR** can be applied at temperatures between -10 °C (263 K) and +40 °C (313 K). For application at low temperature the viscosity of the product may be adjusted for sprayability by warming up to not more than 40 °C. A temperature of 20 °C is normally sufficient for airless spraying. b. If this soft gel is to be transferred from the original container into a spraying device, it is desirable to break the gel's thixotropy by mechanical agitation. The agitation will convert the product to a more liquid consistency and make spraying feasible. c. Due to the fact that **FLUID FILM Liquid AR** is to be applied in a single coat, special care has to be taken on the backsides of bulbs, stiffeners, edges, openings etc. Precoating by brush is not obligatory. d. During application the coat thickness has to be controlled to prevent under- or overcoating. e. Do not add any thinners. f. When using in closed rooms (tanks, void spaces etc.) ventilation of sufficient capacity has to be assured during spraying application for oil-mist removal.
11. Airless spraying equipment	For application of the thixotropic **FLUID FILM Liquid AR** the use of special airless drum pumps (>22 : 1 pump ratio), preferably ALEMITE-STEWART WARNER VERSATAL PUMP, 7896 or WIWA Wagner Type 18000 is recommended. For adapting conventional airless pumps for **FLUID FILM Liquid AR** application the suction hose should be dismantled, the pump directly mounted on drum and immersed in the FLUID FILM: One to four 20 m lengths of material hose 1/2" usually are used, depending upon the distance of application area from the pump. Use as few lengths of material hose as possible. Usually for application of large tank surfaces the nozzle orifice (rotoclean type) is 0.025 type 163 - 725 (70° fan angle) or 0.027 type 163 - 727 (70 ° fan angle). The use of alternative nozzle sizes depends on the viscosity of **FLUID FILM Liquid AR** during application, the pump ratio and capacity.



ALEMITE - STEWART WARNER Versatal Pump, 7896

12. Technical data for use

Applied by :	Amount of coats	Average film thickness in µm	Theoretical consumption in l/m²	Theoretical spreading rate in m²/l	Nozzle ø mm	Nozzle Mpa
Brush	1	50	0,05	20	-	-
Roller	1	50	0,05	20	-	-
Airspray	1	200	0,2	5	1,5	0,4
Airless	1	400 - 800	0,4 - 0,8	2,5 - 1,25	0,63	14

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. We recommend for ballast water tanks a preferred value over 400 µm for rusted IN-SERVICE construction.

Tank capacities used as a basis for calculation of surface areas and quantity required will not always correspond to the surface area to be coated. Multiplication factor recommendations, however, as well as job site assistance and instruction can be provided by manufacturers' local representative.

13. 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 AR**.

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 possible.

However, as **FLUID FILM Liquid AR** will displace water and gradually penetrate into the thick rust the coating itself can be used as a "rust descaler". After 6-12 months tanks treated with **FLUID FILM Liquid AR** can be readily scraped and mucked out, then **FLUID FILM Liquid AR** can be re-applied, with approximately 4-5 years service.

The use of additional cathodic protection by sacrificial anodes in tanks coated with **FLUID FILM Liquid AR** is considered an unnecessary expense and redundant to the purpose and function of the coating.

14. Safety precautions

a. While **FLUID FILM Liquid AR** 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 or vapor-proof lighting should be used during the application.

c. Before starting hot work (burning welding etc.) on **FLUID FILM LIQUID AR** 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.