



# SYNERGEN 501 – METAL PRESERVATION

ORIGINALLY DEVELOPED TO PRESERVE THE EXTERNAL SURFACE OF OCTG IN THE HARSH ENVIRONMENT OF THE NORTH SEA, SYNERGEN 501 IS A DURABLE SEMI-PERMANENT PRESERVATIVE COATING FOR ALL METALS. COMPRISING OF A COMPLEX MIXTURE OF LANOLINIC ESTER, TOUGHENING AIDS AND MOISTURE DISPLACING COMPOUNDS DISPERSED IN A SOLVENT CARRIER. ON APPLICATION THE SOLVENT CARRIER EVAPORATES TO LEAVE A DURABLE COATING WHICH FIRMS BUT NEVER HARDENS TO A SOLID STATE. THIS HEAVY DUTY PRESERVATIVE IS DESIGNED TO PROTECT BARE METAL AGAINST CORROSION, EVEN IN SEVERE CLIMATES, FOR EXTENDED PERIODS.

*NOTE: REFER TO SYNERGEN 718 DATA SHEET FOR INTERNAL PRESERVATION*

## FEATURES

- **EASY AND INEXPENSIVE TO APPLY**
- **LONG TERM PROTECTION, IN EXCESS OF TWO YEARS, WITH CORRECT PREPARATION AND APPLICATION.**
- **A HARD BRITTLE COATING IS NOT FORMED SO NO FLAKING AND GOOD RESISTANCE TO IMPACT DAMAGE.**
- **AS THE COATING NEVER FULLY HARDENS A DEGREE OF MOBILITY REMAINS ALLOWING THE COATING TO “SELF HEAL” IN CERTAIN CONDITIONS.**
- **IN MOST CASES, OCTG CAN BE RUN WITH THE COATING IN PLACE**
- **REMOVABLE**
- **SUITABLE FOR MOST CLIMATES**
- **ESTABLISHED TRACK RECORD OF PERFORMANCE**
- **SPECIFIED BY MAJOR E&P OIL COMPANIES**

## APPLICATIONS

WELL MAINTAINED STOCKS OF OCTG ARE ESSENTIAL GIVEN THE SEVERE FORCES APPLIED DURING OFFSHORE OPERATIONS. FAILURE OF A PIPE STRING IS EXPENSIVE PARTICULARLY IN COMPARISON TO THE RELATIVELY LOW COST OF PRESERVATION WITH A QUALITY COATING, SUCH AS SYNERGEN 501. FORMULATED TO PRESERVE THE EXTERNAL BARE METAL SURFACE OF OCTG, BOTH IN TRANSIT AND STORAGE, A FUNCTION IT HAS PERFORMED SUCCESSFULLY WORLDWIDE FOR OVER 30 YEARS. THE PROTECTION PROVIDED, WITH THE CORRECT SURFACE PREPARATION AND APPLICATION CAN EXCEED TWO YEARS, EVEN IN EXTREME ENVIRONMENTS.

FERROUS, NON-FERROUS AND LIGHT ALLOYS CAN ALL BE EFFECTIVELY PRESERVED AGAINST CORROSION OUTDOORS FOR EXTENDED PERIODS. THEREFORE, MOST BARE METAL ITEMS WHICH NEED TO BE TRANSPORTED OR STORED WILL BENEFIT FROM THE USE OF SYNERGEN 501. EXAMPLES INCLUDE:

- **TUBING**
- **CASING**
- **DRILL PIPE**
- **LINE PIPE**
- **FLANGES**
- **VALVES**

NEAT PRODUCT DATA	
PRODUCT REF / CODE NO.	SYNERGEN 501 TR / 22492
PACKAGING	STEEL OPEN TOP DRUM
PACK SIZE	160KG (NOMINALLY 185L)
PRODUCT APPEARANCE	SMOOTH BROWN THIXOTROPIC PASTE
FLASH POINT	40°C
AUTO IGNITION TEMPERATURE	240°C
SOLIDS CONTENT	48-51%
ECOLOGICAL INFORMATION	BIODEGRADABLE, NEGLIGIBLE ECOTOXICITY
SHELF LIFE	5 YEARS IN UNOPENED CONTAINERS

COATING DATA	
COATING APPEARANCE	TRANSLUCENT LIGHT BROWN
FLASH POINT	N/A TO CURED COATING
FILM THICKNESS	WET: 120-240 MICRONS DRY: 60-120 MICRONS
COVERAGE RATE	VARIES DEPENDING ON METHOD OF APPLICATION BUT FOR ESTIMATION 6M <sup>2</sup> PER L +10% CONTINGENCY
SALT SPRAY TEST ASTM B117	500 HRS PASS
LENGTH OF PROTECTION	OPTIMUM PERFORMANCE >2 YEARS



## PREPARATION FOR COATING

ANY BARRIER COATING SERVES TO PREVENT THE ESTABLISHMENT OF CORROSION CELLS BY PREVENTING MOISTURE FROM CONTACT WITH THE METAL SURFACE. IN ORDER TO GAIN MAXIMUM PERFORMANCE FROM SYNERGEN 501 IT IS THEREFORE IMPORTANT TO ENSURE THAT THE SURFACE IS CLEAN, DRY AND FREE FROM ACTIVE CORROSION CELLS BEFORE COATING COMMENCES. ADHESION CAN BE IMPAIRED IF THE COATING IS APPLIED ON TOP OF AN EXSISTING COATING SUCH AS "MILL VARNISH" WHICH MAY LATER CAUSE HANDLING PROBLEMS. IDEALLY THE FULL REMOVAL OF OLD COATINGS IS OUR RECOMMENDATION BUT IF LEFT INPLACE THEN PHYSICAL DISRUPTION TO THE SURFACE, I.E. POWER WIRE BRUSHING, TO CREATE A KEY IS ESSENTIAL AND MAY REDUCE THIS CONCERN.




THE IDEAL PREPARATION PROCEDURE WE RECOMMEND INVOLVES BLASTING THE TUBE TO A NEAR-WHITE METAL STATE WITH A METALLIC ABRASIVE (REPRESENTED BY THE SCANDINAVIAN STANDARD SA 2.5 FINISH ISO 8501: LATEST EDITION). SATISFACTORY RESULTS ARE ACHIEVABLE USING SA 2. AN EVEN SHARP PROFILE SHOULD BE PRODUCED, TYPICALLY 40µ TO 75µ IS IDEAL.

THE TUBULAR SHOULD THEN PASS TO COATING WITH THE MINIMUM OF DELAY (4 HOURS MAXIMUM DEPENDING UPON AMBIENT CONDITIONS OF HUMIDITY AND TEMPERATURE CHANGE). IT SHOULD BE RECOGNISED THAT NEWLY EXPOSED “WHITE” STEEL IS LIABLE TO RAPID RE-OXIDATION.

IT IS RECOGNISED THAT UNDER FIELD CONDITIONS SUCH PREPARATION IS NOT ALWAYS POSSIBLE. TECHNIQUES INVOLVING WIRE BRUSHING AND WATER BLASTING ARE SOMETIMES EMPLOYED. IN THESE CASES, IT IS VITAL THAT NOT ONLY LOOSE SCALE BUT ALSO TRACES OF OILY, GREASY AND WAXY SOILS ARE REMOVED IF THE PREMIUM PERFORMANCE OF SYNERGEN 501 IS TO BE REALISED. THIS IS BECAUSE THOSE RESIDUES MAY CONTAIN ACTIVE HYDRATED CORROSION CELLS WHICH ARE MERELY COVERED OVER BY THE BRUSHING ACTION AND THEN BECOME REACTIVATED UNDERNEATH THE COATING.

THE USE OF WIRE BRUSHING TECHNIQUES WILL BE GREATLY ENHANCED BY EITHER SOLVENT CLEANING OR STEAM CLEANING PRIOR TO THE MECHANICAL PROCESS. IF WATER IS EMPLOYED IN THIS CONTEXT, THEN A BRIEF DEWATERING WASH-OVER WITH SYNERGEN 718 WILL RENDER THE SURFACE FIT FOR FINAL COATING.

ISO - SA 2.5 Very thorough blast cleaning				
When viewed without magnification, the surface shall be free from visible oil, grease and dirt and shall be free from millscale, rust, paint coatings and foreign matter. Any remaining traces of contamination shall show only as slight stains in the form of spots or stripes				
Cleaning method	Description	Swedish / ISO	SSP C	NACE
Abrasive blast	Near white metal / very thorough clean	SA 2.5 ISO 8501 :Latest Edition	SP 10	2
				
Example of surface prepared to SA 2.5				

## COATING APPLICATION

AS WITH ALL NON-AQUEOUS COATINGS, SYNERGEN 501 SHOULD NOT BE APPLIED WHEN THE STEEL TEMPERATURE IS LESS THAN 3°C ABOVE DEW POINT. THIS AVOIDS CONCERNS RELATING TO MOISTURE BEING PRESENT ON THE SURFACE DUE TO CONDENSATION. A VARIETY OF APPLICATION TECHNIQUES IS POSSIBLE AND EFFECTIVE. AIRLESS SPRAYING IS IDEAL BUT IMMERSION, PAINT ROLLING AND BRUSH HAVE ALSO BEEN SUCCESSFULLY EMPLOYED UNDER FIELD CONDITIONS.

THE DURATION OF PROTECTION ACHIEVED WITH ANY BARRIER COATING DEPENDS, TO A LARGE EXTENT, UPON PHYSICAL THICKNESS OF THAT BARRIER AND GOOD SURFACE PREPARATION. THE SURFACE MICRO-PROFILES OF PREPARED TUBE VARIES QUITE WIDELY DEPENDENT UPON AGE AND METHOD OF PREPARATION AND MAY BE BETWEEN 30µ AND 80µ TYPICALLY.

WE RECOMMEND THAT A MINIMUM COATING THICKNESS OF 60µ DRY FILM THICKNESS AND AN IDEAL THICKNESS OF 90µ D.F.T. (OVER MICRO-PROFILE) BE EMPLOYED. THESE THICKNESSES TRANSLATE AS 120µ AND 180µ WET FILM THICKNESS RESPECTIVELY. THE USE OF A “COMB” TYPE W.F.T. GAUGE IS RECOMMENDED IN QA SINCE THIS INVARIABLY MEASURES THICKNESS “OVER PROFILE”. IN TROPICAL CLIMATES THE RAPID LOSS OF THE CARRIER SOLVENT MAY REDUCE THE W.F.T. READING AND ACCEPTABLE D.F.T. COATINGS CAN BE ACHIEVED WITH W.F.T. READINGS AS LOW AS 70µ. D.F.T. CAN BE MEASURED USING A DIGITAL D.F.T. GAUGE SUCH AS THE ELCOMETER 456 FITTED WITH THE ULTRA/SCAN PROBE AND SNAP ON CAP. THE USE OF THE CAP IS IMPORTANT AS IT SPREADS THE LOAD AND AVOIDS THE PROBE POINT SINKING WHICH COULD POTENTIALLY PRODUCE AN INCORRECT READING.



THE DRYING TIME OF THE COATING VARIES IN RESPONSE TO AMBIENT TEMPERATURE AND VENTILATION. TOUCH DRYNESS MAY BE ACHIEVED WITHIN ONE TO TWO HOURS BUT FULL MECHANICAL STRENGTH MAY NOT DEVELOP FOR SEVERAL FURTHER HOURS. THE COATING SHOULD NOT BE EXPOSED TO DIRECT RAINFALL OR WATER IMPINGEMENT UNTIL THE COATING IS DRY.

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## SYNERGEN 501 REMOVAL

WHERE IT IS NECESSARY OR DESIRABLE TO REMOVE THE COATING PRIOR TO SERVICE, E.G. IF THE COATING HAS BECOME HEAVILY CONTAMINATED WITH PARTICULATES OR IF A STRONG CEMENT/STEEL BOND IS REQUIRED IN CASING OR PRIOR TO WELDING IF USED TO PRESERVE LINE PIPE, THEN SEVERAL TECHNIQUES MAY BE EMPLOYED.

FOR EFFECTIVE REMOVAL THE USE OF A SOLVENT CLEANER LIKE AGMASOL PS40 OR AGMASOL PS IS RECOMMENDED. IF NOT READILY AVAILABLE THEN A LOW ODOUR HYDROCARBON SOLVENT (KEROSENE OR DEODORIZE KEROSENE), WHITE SPIRIT, OR SIMILAR WILL ALL PROVE VERY EFFECTIVE. THE SOLVENT CLEANER SHOULD BE APPLIED TO THE SURFACE BY BRUSH, WIPING OR HAND SPRAY AND ALLOWED A SHORT TIME TO SOAK IN ORDER TO SOFTEN THE COATING. ONCE SOFTENED THE COATING CAN BE REMOVED BY FURTHER USE OF THE SOLVENT CLEANER, AIDED BY BRUSHING OR WIPING TO PROVIDE SOME MECHANICAL ASSISTANCE. EQUALLY, STEAM CLEANING WITH THE AID OF LOCALLY AVAILABLE SOLVENTS, SUCH AS KEROSENE, IS EFFECTIVE IF THE "DROP POINT" OF THE COATING CAN BE REACHED BY THE STEAM GENERATOR, NOMINALLY 75 DEGREES C.

**ATTENTION** TO LOCAL REGULATIONS AND CONDITIONS CONCERNING THE USE OF DISPOSAL OF SOLVENTS IN FIELD SITUATIONS IS AN IMPORTANT CONSIDERATION IN ASSESSING REMOVAL TECHNIQUE.

### HEALTH AND SAFETY

SEE SEPARATE SAFETY DATA SHEET