



BALL STUD CORROSION PROTECTIVE COATING, ZINC/ALUMINUM BASECOAT, SPRAY APPLIED, MODIFIED LUBRICATED SEALER, TEMPER EMBRITTLEMENT AVOIDANCE **WSS-M21P36-A4**

BALL STUD CORROSION PROTECTIVE COATING, ZINC/ALUMINUM BASECOAT, SPRAY APPLIED, SEALER, TEMPER EMBRITTLEMENT AVOIDANCE **WSS-M21P36-A5**

BALL STUD CORROSION PROTECTIVE COATING, ZINC/ALUMINUM BASECOAT, SPRAY APPLIED, LUBRICATED SEALER, TEMPER EMBRITTLEMENT AVOIDANCE **WSS-M21P36-A6**

BALL STUD CORROSION PROTECTIVE COATING, ZINC/ALUMINUM BASECOAT, MODIFIED LUBRICATED SEALER **WSS-M21P36-A7**

BALL STUD CORROSION PROTECTIVE COATING, ZINC/ALUMINUM BASECOAT, SEALER **WSS-M21P36-A8**

BALL STUD CORROSION PROTECTIVE COATING, ZINC/ALUMINUM BASECOAT, LUBRICATED SEALER **WSS-M21P36-A9**

1. SCOPE

The materials defined by these specifications are corrosion protective coatings over steel that are heat converted from an aqueous dispersion of zinc and aluminum flakes, and oxides. These coatings are top-coated with sealers or topcoats to provide lubricity for consistent torque-tension control and to enhance corrosion protection. In both liquid and dry film, they are free of chromium, nickel, lead, and cadmium.

2. APPLICATION

These specifications were released originally as a water based corrosion protection coating for suspension and steering heat treated/hardened ball joint studs where sacrificial corrosion protection, galvanic corrosion protection, controlled coating thickness (thread fill) and controlled coefficient of friction (rubber seal) are important considerations. The pretreatment and coating process shall not induce conditions resulting in hydrogen embrittlement, temper embrittlement or loss of mechanical properties. These coatings will provide good bimetallic corrosion resistance when in contact with aluminum. They should not be applied to parts in contact with uncoated copper, magnesium or stainless steel.

2.1 LIMITATIONS

A4/A5/A6 – Cure temperature must be in the range of 245-265 °C.

A7/A8/A9 – Coating parts with hardnesses higher than Property Class 10.9 is not allowed. Coating case hardened parts may temper the case hardness. The case hardness loss should be measured and reviewed by Ford Product Engineering prior to application.

Date	Action	Revisions	Rev 05
2013 08 13	Revised	See summary of revisions	C. Mracna, NA
2013 02 08	Revised	See summary of revisions	C. Mracna, NA
2012 02 28	Revised/Activated	Added suffixes A7/A8/A9	C. Mracna, NA

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3. REQUIREMENTS

3.1 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS

Material suppliers and part producers must conform to the Company's Standard Requirements For Production Materials (WSS-M99P1111-A).

3.2 APPEARANCE

The coating shall be uniform in color, roughness, and free from discontinuities.

3.3 CORROSION TESTING

(ASTM B 117, CETP 00.00-L-467, ASTM D 610)

3.3.1 Parts shall pass the number of salt spray hours / cyclic corrosion weeks per Table 1.

3.3.2 Parts shall show no single ferrous corrosion spot larger than 1.5 mm in diameter or exceed ASTM D 610, grade 8.

3.4 COATING THICKNESS AND COATING WEIGHT (MASS)

(ASTM B 568/ISO 3497, ASTM B 499/ISO 2178)

The coating thickness and minimum coating weight are given in Table 1. The coating thickness can be measured on flat surfaces using a magnetic induction thickness instrument (ASTM B 499/ISO 2178) or by calibrated X-ray fluorescence spectroscopy (ASTM B 568/ISO 3497), and should be based on an average of at least ten measurements. Alternatively, the thickness of the basecoat can be determined using a weight-strip-weigh method. Details of this method are available from the coating manufacturer.

3.5 THREAD ACCEPTANCE REQUIREMENTS

(WA900, WE900, WX100)

For thread acceptance requirements see Ford Worldwide Fastener Standards WA900, WE900 and WX100.

3.6 CLEANING

(SAE J444)

Prior to coating, the parts shall be free of oil, scale, oxides and foreign materials. The cleaning process shall have no detrimental effect on the substrate, including freedom from embrittlement. All heat treated or threaded parts must be alkaline degreased.

Alternative cleaning techniques, such as alkaline cleaning followed by a phosphate may be used. Dry honing (glass bead) may be required for some parts. Exception must be noted in the applicators control plans and approved by the coating manufacturer and end user.

3.7 ADHESION

The coating shall withstand normal handling, storage, and installation without flaking or peeling or other loss of adhesion.