SUBJECT: ZINC – NICKEL ELECTROPLATED FINISH

1.0 SCOPE & PURPOSE. This Material & Process Specification establishes the requirements for the zinc-nickel electroplating with Type A chromate conversion coating.

2.0 SOURCE REFERENCE. AGCO's Hesston engineering standards committee is responsible for the content of this specification. The following sources were used as reference

ASTM B841
Vendor supplied information

3.0 MATERIALS AND PROCESSES. The coating shall be essentially an acid ammonium free zinc-nickel finish applied by electrodeposition.

3.1 Application of zinc-nickel electroplating shall conform to ASTM B841 Standard Specification for Electrodeposited Coatings for Zinc Nickel Alloy Deposits

3.2 All cleaning and material preparation prior to plating shall conform to ASTM B841 unless otherwise specified.

4.0 APPEARANCE. Workmanship and appearance must conform to requirements in ASTM B841.

5.0 GENERAL GUIDELINES FOR HYDROGEN EMBRITTLEMENT RELIEF.

5.1 Parts with hardness > 49 HRC should not be selected for this coating due to potential adhesion issues.

5.2 Parts with hardness > 49 HRC should specify standard acid zinc plating with post heat treatment bake of 16 hours at 375 – 400° F for hydrogen embrittlement relief.

5.3 Parts with hardness > 31 HRC or tensile strength > 1000 Mpa must be baked for hydrogen embrittlement relief.

5.3.1 A hardness of 32 – 40 HRC requires 4 hours bake at 375 – 400°F (minimum).

5.3.2 A hardness of 40 – 49 HRC requires 8 hours bake at 375 – 400°F (minimum).

5.4 Baking for hydrogen embrittlement relief should begin as soon as possible but not longer than 3 hours after plating.

5.5 All electroplated parts made from steel having an ultimate tensile strength of 1000 Mpa / 145,000 psi or greater and have been machined, ground, cold formed or cold straightened must be stress relieved at a minimum 190° C (374° F) for 3 hours or more before cleaning or electroplating.

6.0 COATING THICKNESS. Zinc–Nickel electroplating shall have 8 µm /.0003 inch minimum thickness on all significant surfaces. Significant surfaces will not be identified on AGCO drawings. However, significant surfaces may be defined as any surface that is normally visable, directly or by reflection and which is essential to the appearance or serviceability of the part when assembled in the normal position or which can be the source of corrosion infiltration which would deface the adjoining surfaces of the assembled parts. Surfaces that are not readily controlled, such as threads, small holes, deep recesses, inside bases of angles and other similar surfaces may be exempt from the minimum thickness requirements.

7.0 PLATING CALLOUTS ON PRINTS. The plating note on prints requiring the zinc-nickel electroplated finish will read:

PLATE PER M&PS 705 100 288

8.0 CORROSION RESISTANCE. Zinc-Nickel electroplating and passivate coating conforming to this specification must pass the following NSST hours per ASTM B117.

240 hours to white corrosion (minimum)

720 hours to red corrosion (minimum)