EXCALIBUR
MACHINE & SHEET METAL
COLORADO SPRINGS

Engineering Specification: Surface Coating and Protection

Specification #	Revision	Date	Author	Pages
EXCAL-SPEC-001	C	12-1-20	L Williams	4

1. Scope

This engineering specification defines requirements for all surface coatings and surface protectants used on parts for Excalibur Machine & Sheet Metal.

2. Responsibility

Engineering is responsible for the maintenance and updating of this document.

3. Specifications/Appearance

3.1.1.1. All Anodize shall comply with AMS A 8625 latest revision unless otherwise noted on PO or in this specification. Coating shall be continuous, smooth, adherent, uniform in appearance, free from powdery areas, loose films, breaks, scratches, and other defects which will reduce the serviceability of anodized parts or assemblies. Slight discoloration from dripping or rundown of the sealing solution from designed crevices in a component shall be allowed.

3.1. Hard Anodic Coatings
- 3.1.1. Type III Thickness Requirements
  - 3.1.1.1. 0.0005” – 0.0045”
  - 3.1.1.2. Not to exceed 0.0028” anywhere on part

3.2. Sulfuric Acid Anodize
- 3.2.1. Type IIB Thickness Requirements
  - 3.2.1.1. 0.00002” – 0.0007”
  - 3.2.1.2. Not to exceed 0.0011” anywhere on part
- 3.2.2. Type II Thickness Requirements
  - 3.2.2.1. 0.00007” – 0.0010”
  - 3.2.2.2. Not to exceed 0.0012” anywhere on part

3.3. Chromic Acid Anodize
- 3.3.1. Type IB Thickness Requirements
  - 3.3.1.1. 0.00002” – 0.0007”
  - 3.3.1.2. Not to exceed 0.0009” anywhere on part

Chromic Acid Anodize (continued)

3.3.2. Type I Thickness Requirements

3.3.2.1. 0.00002" – 0.0007"

3.3.2.2. Not to exceed 0.0009" anywhere on part

3.4. Chemical Conversion (Chem Film) MIL-DTL-5541

3.5.1 Type I -Compositions containing hexavalent chromium. Color Yellow.

3.5.2 Type II- Compositions containing no hexavalent chromium. Color Clear.

3.5.3 Class 1A- for maximum protection against corrosion.

3.5.4 Class 3- for protection against corrosion where low electrical resistance is required.

3.5.1-.4 If coating is not specified, class 1A is recommended.

3.5.1-.4 Product coating color may very from colorless to iridescent yellow, brown, gray or blue.

3.6 Electroless Nickle - MIL-C-26074, AMS-2405

3.6.1 Class

3.6.1.1 Class 1- As plated no subsequent heat treat. A bake for hydrogen embrittlement is not considered a heat treat.

3.6.1.2 Class 2-Heat treated to obtain required hardness. May be used on all metals not affected by heating to 500 degrees and above.

3.6.1.3 Class 3-Aluminum alloys nonheat-treatable, beryllium alloys processed to improve adhesion of the nickel deposit.

3.6.1.4 Class 4-Aluminum alloys, heat-treatable, processed to improve adhesion of the nickel deposit.

3.6 Electroless Nickle - MIL-C-26074, AMS-2405 (Continued)

3.62 Grades

3.6.2.1 Grade A- 0.0010-inch minimum thickness.

3.6.2.2 Grade B- 0.0005-inch minimum thickness.

3.6.2.3 Grade C- 0.0015-inch minimum thickness.

3.7 Electroless Zinc ASTM B633

3.7.1 Thickness

3.7.1.1 Fe/Zn 25 SC 4 (very severe) 25 micron

3.7.1.2 Fe/Zn 12 SC 3 (severe) 12 micron

3.7.1.3 Fe/Zn 8 SC 2 (moderate) 8 micron

3.7.1.4 Fe/Zn 5 SC 1 (mild) 5 micron

3.7.2 Corrosion resistance

3.7.2.1 Type I-As plated, without supplementary treatments.

3.7.2.1 Type II- With colored chromate coatings.

3.7.2.1 Type III- With colorless chromate coating.

3.7.2.1 Type IV- With phosphate coating.

3.7.2.1 Type V- With colorless passivate.

3.7.2.1 Type VI- With colored passivate.

3.8 All primer and paint shall comply with MIL-F-18264 as applicable and shall be tested per FED-STD-141 as applicable.

3.9 Primer

3.9.1 MIL-PRF-23377 Thickness Requirements per coat 0.0006" – 0.0009"

3.9.1.1 Not to exceed 0.0012" anywhere on part

3.9.1.2 Color requirements in accordance with MIL-PRF-23377

3.9.1.3 As necessary holes may be masked after first coat to prevent over collection of primer in holes

3.10 Topcoat

3.10.1 MIL-PRF-85285 Thickness Requirements per coat 0.0017" – 0.0023"

3.10.1.1 Color requirements in accordance with SAE-AMS-STD-595 when applicable or customer requirements via PO or print

3.10.1.2 As necessary holes may be masked after first coat to prevent over collection of paint in holes

3.11 Solid Film Lubricant

3.11.1 MIL-PRF-46010 Thickness Requirements 0.00032"-0.0005"

3.11.1.1 Minimum .0002, maximum 0.0007" anywhere on part

3.11.1.2 Color requirements in accordance with MIL-PRF-46010

3.12 All solid film lubricant shall comply with and be tested per MIL-PRF-46010

3.13 All holes shall meet print requirements upon completion of all coatings. It is the responsibility of the coating vendor to ensure these requirements are met.

3.14 All PO and print requirements are to be met with an order of precedence being the PO then the print.

3.15 Coating vendor shall be responsible for shipping all parts back in a manner that will prevent any/all damage from occurring to any part.