

SOUTH HOLLAND METAL FINISHING

SPECIFICATIONS AND PROCESSES – OCTOBER 2018

South Holland Metal Finishing is IATF 16949:2016 accredited by NQA, and is accredited to ISO 17025 by the American Association for Laboratory Accreditation (A2LA Accredited Certificate #0975.01). Please visit www.shmf.com for certificate copies along with our scope of accreditation and the latest updates.

The following is a listing of finishes that we are capable of producing as of the date shown above. Those finishes where formal approval has been received from an issuing authority are listed; others do not require formal approval; still others could be approved should a Tier One supplier make the request. Please contact us for any specs or finishes you do not see listed below, as we may be able to process them.

(Listed Alphabetically)

ASTM

Specification	Title
A 164	Electrodeposited Zinc (obsolete--see ASTM B633)
B 117	Operation of Salt Spray Cabinet
B 633	Electrodeposited Zinc on Iron or Steel
B 841	Electrodeposited Zinc-Nickel Alloy
B 850	Relief of Hydrogen Embrittlement
F 1137	Phosphate & Oil (Grade 0 and 1 only)
F 1941	Electrodeposited Coatings

CATERPILLAR

Specification	Title
1E0106	Direct Hardening
1E0107	Direct Hardening after Machining
1E0397	Plating Zinc or Zinc Alloy
1E0475	Coating-Heavy Zinc-Iron Phosphate
1E1675	Coating –Fastener (A-F not G)
1E2257	Bake – Hydrogen Embrittlement Relief
1E2402	Oil-Corrosion Preventative

DELPHI/ NEXTEER

Contact us for information on individual approvals to these specifications

Specification	Title
33001800	Zinc Plating
33002583	Zinc Alloy Plating
DCM 5200	Zinc Plate, Hexavalent Free Coatings
DX 550100	Zinc Nickel Alloy
DX 551200 series	Zinc Plate, Hexavalent Free
DX 551300 series	Zinc Alloys Hexavalent Free
DX 551330	Zinc Nickel Alloy Black
DX 551331	Zinc Nickel Alloy Clear

FCA / CHRYSLER

Specification	Title
PS 1	Heat Treating – Quench and Temper
PS 79 (PS Plating)	Zinc Plating
PS 80	Zinc Phosphate Coating
PS 1207	Chromate Surface Treatments
PS 1604	Passivation of Stainless Steel
PS 1649	Finishing Clips for Corrosion Resistance
PS 4220 (PS Plating)	Zinc Plating over Spring Steel
PS 8814	Leach/Seal (trivalent or hexavalent)
PS 8955	Zinc Alloy Coatings (Zn-Ni)
PS 9500	Hydrogen Embrittlement Relief
PS 10509	Torque Modified Sealant for Zinc Plating
PS 10180	Zinc Nickel Alloy (Alternative is PS 12182)
PS 12182	Zinc Nickel Alloy
PS 50023	Hydrogen Embrittlement Relief
PS 50031	Zinc Nickel Alloy
PS 50034	Zinc Phosphating
PS 50036	Zinc Plating

Approvals for FCA/Chrysler are listed on the specifications.

FORD Standard Finishes

We are capable of applying the following Standard Fastener Finishes. No specific approval is required for the majority of these finishes.

Specification	Title
S2	Phosphate and 72 hour Oil
S8	Zinc Plate
S9	Bright Zinc Plate
S51	Zinc Plate dye Blue
S300	Plain with Lubricant
S304	Zinc Plate plus Clear Chromate
S309	Zinc Plate plus Chromate (trivalent only)
S421	Zinc Plate, Black Chromate, Lubricant
S430	Phosphate and Lubricant
S434	Zinc Plate, No Chromate
S437	Zinc, Trivalent Clear, TNT 15
S450	Zinc-Nickel Clear (ZinKlad 1000)
S450B	Zinc-Nickel Black (ZinKlad 1000B)

FORD Engineering Specification Finishes

Specification	Title
ESB M1P1 A	Zinc and Cadmium Plating
ESB M3P1 A	Phosphate Coatings, Zinc, Light
ESB M3P4-5 A	Phosphate Coatings, Plus Oil
ESB M3P6-9 A	Phosphate Coatings, on Iron/Steel
ESB M3P10 A	Phosphate Coatings, Zinc, Heavy
ESB M3P20 A (S2)	Phosphate and Lubricant
ESF M1P3-6 A	Zinc and Cadmium Plating
ESF M1P41 A	Zinc and Chromate Conv. Coating
ESS M1P45 A (S36)	Zinc and Chromate Conv. Coating (hexavalent)
WSA M21P28 A1 (Call for information)	
WSA M1P87 A, B	Zinc Nickel Plating over Ferrous Substrates
WSB M10P10 A1-5	Chromate Conversion Coatings
WSD M1P85 A 1-3	Zinc Plating over Ferrous Substrates.
WSD M3P35 A1, A3	Phosphate Coating, Zinc-Iron
WSD M13P7 A2	Lubricant Waxes
WSD M13P9 A1	Drive Torque Reducing Lubricant
WSD M21P17 B1-B5 (JS 500 or ZinKlad) (S 437)	Spec Finish: Zn, Class II Clear, and Lubricant
WSD M21P19 A7 (S 407)	Spec. Finish: Zinc and Dye
WSK M3P1 C	Phosphate Coatings, Zinc
WSS M21P51 (A1-A6) (S 450 and S 450B)	Zinc-Nickel Clear and Black (ZinKlad 1000 and 1000B)
WSS M21P52 (A1-A2,A4) (Zinklad)	Revised S-437 Zinc, Class II Clear, Lubricants

Approvals for Ford Specifications are done through the chemical source, MacDermid-Enthone as Approved Zinklاد Applicators. See MacDermids website <https://industrial.macdermidenthone.com/quality-performance-systems/zinklاد/zinklاد-approved-applicators>.

GENERAL MOTORS

Specification	Title
GMW 3044 MATSPEC APPROVED	Zinc with Trivalent Chromates
GMW 3179	Zinc Phosphate Coatings (except code B, G)
GMW 4205 MATSPEC APPROVED	Zinc Nickel Alloy with Black Coating
GMW 4700 MATSPEC APPROVED	Zinc Nickel Alloy (Type B)
GMW 16730 MATSEPC APPROVED	Zinc Nickel Alloy with Black Coating
GM 4252	Zinc or Cadmium (Obsolete)
GM 4342	Zinc (Obsolete)
GM 4345	Zinc Plating (not E/_/_ codes)
GM 4405	Passivation of Stainless Steel
GM 4435	Protective Finish – Phosphate Type
GM 6183	Zinc Plating/Organic (Clear Only)
GM 6280	Zinc Alloy Plating (see notes) ++

South Holland is on the GM Heat Treating MATSPEC

HARLEY DAVIDSON

Specification	Title
ES805-43250	Zinc Plating for Exposed Surfaces (obsolete)
ESPEC805-050	Zinc Plating for Exterior Use
ESPEC 805-055 Type I and II	Zinc Plating for Fasteners - Friction Modified
ESPEC 805-060 G, B, BHG	Zinc Nickel Alloy Plating

HEAT TREATING

Specification

Title

Neutral Hardening

English Grades 4 to 8
HRC 22 to 39 *

Metric Grade 4.6 to 10.9 *
HRC 24 to 39

* -- Call for information on Grade 12.9, we can run some steel grades.

Case Hardening

Total Case .002 to .011"
.05 to .28 mm
Effective Case HRC 50 at .006" max *

* -- Ability to develop effective case is dependent on steel grade used

Specification

Title

ASTM A 320

Alloy Steel Bolting Materials for Low-Temperature Service

ASTM A 325

Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength

ASTM A 490

Heat Treated Steel Structural Bolts, 150 ksi Minimum Tensile Strength

ASTM A 574

Alloy Steel Socket-Head Cap Screws

ASTM F 568

Carbon and Alloy Steel External Threaded Fasteners

ASTM F 912

Alloy Steel Socket Set Screws

ISO 898

Mechanical properties of fasteners made of carbon steel and Alloy steel

SAE J 81

Thread Rolling Screws

SAE J 429

Mechanical and Material Requirements for External Threaded Fasteners

SAE J 933

Mechanical and Quality Requirements for Tapping Screws

SAE J 995

Mechanical and Quality Requirements for Steel Nuts

SAE J 1199

Mechanical and Material Requirements for Metric External Threaded Fasteners

Stress Relieve

Most steel grades, no aluminum, brass, or copper.

South Holland operates in accordance with AIAG CQI-9, and has been audited or reviewed by representatives from Ford, GM, FCA/Chrysler, and many others. We can provide heat treating to Caterpillar, Bosch, Delphi, ISO, John Deere, SAE, Toyota, Volvo, and ZF Lemforder specifications. We are on the General Motors Approved Heat Treaters List for neutral and case hardening, on the Chrysler PS-1 list for heat treating, and the Ford WHTX-1 list of approved heat treat vendors.

JAPANESE SPECIFICATIONS

(A code number [MFZn-2KH, as an example] is needed to properly quote from most Japanese specifications)

Specification	Title
Honda HES D-2003	Electroplating (Zinc and Zinc alloys)
Mazda MES CG 310B	Plating (Zinc and Zinc alloys)
Mazda MES CG 510B	Coating for Coefficient of Friction
Nissan NES M 4040	Zinc Plating and Chromate Films
Nissan NES M 4060	Electroplated Zinc Nickel Alloy
Toyota TSH 6500G	Electroplated Zinc Coating
Toyota TSH 6524G	Electroplated Zinc (Hex Chrome Free)
Toyota TSH 6530G	Electroplated Zinc-Nickel (Hex Chrome Free)
Toyota TSH 6532G	Electroplated Zinc-Nickel High Alloy

JOHN DEERE

Specification	Title
JDS 117 & JDM 117X1	Electroplated Zinc Coatings (Obsolete replaced by JDM F 15)
JDM F 10	Phosphate/Oil Protective Coatings (code A only)
JDM F 15	Electroplated Coatings for Fasteners
JDM F 21	Zinc Nickel alloys
JDM F 23	Electroplated Zinc Coatings for Non-Fastener Parts
JDM F 26	Zinc Nickel coatings for Bolted Joints
JD KK102 (basecoat only)	Zinc Nickel black with dip/spin topcoat. (SHMF applies the zinc nickel base coat only, we recommend SWD for the topcoat)

MILITARY AND GOVERNMENT

Specification	Title
QQ-P-35	Passivation of Stainless Steel (not all methods)
QQ-Z-325	Zinc Plating (Obsolete)
MIL-STD-171	Finishing of Metal and Wood Surfaces (call for info)
MIL-P-16232e	Phosphate Coatings (Type Z only)

TESLA

Specification	Title
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TM 0009F-M
TM 0026M-F

Electrodeposited Zinc Based Anti-Corrosion Coatings
Property Requirements of Fasteners (Heat Treating)

VARIOUS SERVICES

BARREL: Zinc, Zinc-Nickel, Zn-Phosphate

South Holland does not apply rack electroplating

Automated Vision Camera Sorting

ZinKlad 96, MGL, 250, 1000, 1000B, EXP, BHG

TNT Sealers 8,12,15,18 Black TnT 15

V9-MD Wax

Copper Stripping

Passivate Stainless (300 series only)

Dyes: Red, Blue, Green

Dura* Zinc 500 (Black and Clear)

Trivalent Passivates : Yellow, Black, Clear

Packaging, Labeling

Zinc and Zinc Nickel Plating on Nylon Insert nuts *(due to the limited potential for cleaning these parts they must come in without scale)*

- South Holland Metal Finishing is pleased to offer MacDermid proprietary topcoats.
- South Holland has eliminated cadmium and hexavalent chromium from all processes in 2018. Suitable substitutes are available, contact us for details.
- Torque Tension Testing to JDM F15, ISO 16047, SAE/USCAR 10, 11 and others.
- We can supply quotations for Zinc, Zinc Nickel Alloy, and Phosphate based finishes specified by: Arvin Meritor, Akebono, Autoliv, Bendix, Bobcat, Bosch, Briggs and Stratton, Dana, DaimlerBenz, Delco Moraine, DuetscheNorm, Gates, General Electric, Goodyear, Harley Davidson, Heil, Honeywell, Hyundai-Kia, Jacobson, Jaguar, JI Case, Kawasaki, Kenworth, Key Safety, Mack, Navistar, Peterbuilt, Rockwell, Square D, Takata, Tecumseh, Triumph, TRW, Valeo, VDA, Volvo, VW, Whirlpool, Zero Motorcycles, ZF Lemforter, **and many others.**

All job shops must be adaptable to new finishes. Should you have a finish which is not listed above we would be happy to discuss the requirements for applying the finish for you. Please contact us for information at 708-235-0842.

Don Troy

Technical Director