



Sheet Metal Lubricants for Corrosion Prevention, Cleaning, and Formability

1 Scope

1.1 Material Description. This specification details the requirements of all lubricant formulations for sheet metal surfaces. Lubricants are used for one or more reasons which include protecting sheet metal surfaces against corrosion and stains, reduce friction to enhance formability, clean metal surface, improve quality, and reduce scrap. The lubricants are classified as:

Mill Oil: Mill applied primarily for the corrosion protection of sheet metal.

Pre-Lube: Mill or press applied to enhance formability and to protect sheet metal.

Hotmelt: Semi-solid or solid film used to enhance formability.

Blankwash: Used to clean the coil/blank and enhances formability.

Drawing Compound: Press applied to enhance formability and protect metal parts during storage.

Treatments: Additional layers to enhance formability (removable in paint).

The lubricants can be oil based, liquid or solid, and/or synthetic or non-synthetic.

Acceptance criteria for performance and process requirements will be specified by each region.

1.2 Symbols. Not applicable.

1.3 Applicability. All lubricant formulations for sheet metal surfaces applied at mills or stamping plants.

1.4 Remarks. Lubricants are approved regionally. Additionally, if the lubricant is applied in one region and shipped to another region, both regions must approve the lubricant.

Lubricants must be compatible with current production cleaner, phosphate, nano ceramic conversion coatings, and electrodeposition primer (ELPO) applications. Chemicals that can contaminate these systems cannot be used. This includes but is not limited to silicone and lanolin. Compatibility tests are in 3.5.3 and 3.5.4.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW2	GMW3059	GMW15619	GMW16656
GMW8	GMW3399	GMW16056	GMW16772
GMW11	GMW14400	GMW16066	GMW17627
GMW3011	GMW15056	GMW16269	
GMW3032	GMW15192	GMW16546	

2.3 Additional References.

- Auto Steel Partnership (www.a-sp.org) search for the title A/SP Procedures for Testing Characteristics of Automotive Sheet Steel Lubricants.

3 Requirements

Before any testing is initiated the supplier or testing group should discuss the intent and details of the intended work with the Body Manufacturing Engineering. This can clarify requirements, reduce the chance that necessary work is omitted and potentially minimize the total quantity of testing required.

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3.1 Substrates. Lubricants must meet the requirements of this specification on metals and surface treatments approved to the following GMW standards and for all other sheet metal or metal parts shipped to GM facilities not currently GMW approved.

3.1.1 GMW2 Low Carbon Sheet Steel.

3.1.2 GMW3032 High Strength Sheet Steel 180 MPa through 700 MPa Yield Strengths.

3.1.3 GMW3399 Multi Phase and Ultra-High Strength Sheet Steel.

3.1.4 GMW15192 Aluminum Sheet for Body and Closure Panel Applications.

3.1.5 GMW14400 Pre-Coated or Uncoated Low Carbon, Heat-Treatable Boron Steel.

3.1.6 GMW15619 Tailor Rolled Blanks and Tubes Fabricated from Sheet Steel.

3.1.7 GMW16056 Bumper Quality Sheet Steel for Decorative Plating and Painting.

3.1.8 GMW16772 Laser Welded Blanks Fabricated from Sheet Steel.

3.1.9 GMW17627 Retained Austenite Bearing Advanced High Strength Sheet Steel.

3.2 Surface Treatments.

3.2.1 GMW8 Hot Dip Zinc Coatings for Sheet Steel.

3.2.2 GMW11 Electrogalvanized Coatings for Sheet Steel.

3.2.3 GMW15056 Thin Organic Precoatings.

3.2.4 GMW16066 Aluminized Sheet Steel.

3.3 Lubricant Coating Mass. Oil coating mass measurement methods are listed in Appendix A. In case of differences the Weigh-Strip-Weigh method results should be used. Coating mass levels by region are listed in:

3.3.1 Regions Other than GMNA. Process Specifications.

Note: The supplier shall work with the responsible GM engineer to comprehend this requirement.

3.3.2 GMNA. Coating levels are listed in Appendix A, Table A1 and Table A2 for Mill Oil, Pre-Lube, Blankwash, and Reoil.

3.4 Performance Requirements.

3.4.1 Coefficient of Friction. For engineering information, report the coefficient of friction using the drawbead simulator test or strip draw test according to the following:

3.4.1.1 Regions Other than GMNA. Process Specifications.

Note: The supplier shall work with the responsible GM engineer to comprehend this requirement.

3.4.1.2 GMNA. Auto Steel Partnership (www.a-sp.org) A/SP Procedures for Testing Characteristics of Automotive Sheet Steel Lubricants Section 2.

3.4.2 Corrosion Resistance. The lubricant shall meet the requirement per the following:

3.4.2.1 Regions Other than GMNA. Process Specifications.

Note: The supplier shall work with the responsible GM engineer to comprehend this requirement.

3.4.2.2 GMNA. Auto Steel Partnership (www.a-sp.org) A/SP Procedures for Testing Characteristics of Automotive Sheet Steel Lubricants Section 3.

3.5 Process Requirements.

3.5.1 Compatibility with Adhesives/Sealers. The lubricant must meet the requirements of GMW16269 for all regions.

3.5.2 Welding Compatibility. For the current requirements and equipment to determine welding compatibility, contact the Body Manufacturing Engineering Tribology Engineer. The lubricant shall perform at least equal to the currently approved control at coating mass up to 3 g/m².

3.5.3 Compatibility with Paint Cleaning and Pretreatment. The lubricant must meet the requirements of GMW16546 for all regions.

Note: Testing must be done at an approved lab with currently approved GM cleaner and phosphate chemicals. Phosphate crystal size, appearance, and coating weight are specified in GMW3011.

3.5.4 Compatibility with Electrodeposition Primer (ELPO). The lubricant must meet the requirements of GMW16656 for all regions.

Note: Testing must be done using an approved GM ELPO primer.