



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 applied primarily for the protection of sheet metal that also enhances formability.

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 or water 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.

VDA 230-213

2.2 GM Standards/Specifications.

B 040 1270	GMW15056
B 440 1271	GMW15192
GMW2	GMW15619
GMW8	GMW16056
GMW11	GMW16066
GMW3011	GMW16269
GMW3032	GMW16546
GMW3059	GMW16656
GMW3399	GMW16772
GMW14400	

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
- Process Specifications.
- TMC003 Material Safety Data Sheet guidance documents (available at www.gmsupplypower.com).
- USM E-12 (GME Department Internal Standards).

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 Tribology Engineer. This can clarify requirements, reduce the chance that necessary work is omitted and potentially minimize the total quantity of testing required.

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.

3.2 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 the Appendix A, Tables A1 and 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 and GME. 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.

3.4.1.3 GME. VDA 230-213.

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

3.4.2.1 Regions Other than GMNA and GME. 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.

3.4.2.3 GME. VDA 230-213 and Material Specifications B 040 1270, B 440 1271, and USM E-12. (**Note:** The supplier shall work with the responsible GM engineer to comprehend this requirement.)

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.

3.6 Waste Treatment. The material shall be compatible with current waste treatment processes so that total removal can be achieved. The supplier shall be responsible to make known the processing procedures for any component of the material for which waste treatability is in question.

4 Manufacturing Process

Not applicable.

5 Rules and Regulations

5.1 Legal Regulations. All materials must satisfy applicable laws, rules, regulations and recommendations valid in the country of usage.

5.2 Language. In the event of conflict between the English and domestic language, the English language shall take precedence.

5.3 Inspection and Rejection. Samples of components or materials released to a GM material specification shall be tested for conformity with the requirements of this material specification and