

MATERIAL MANUAL

FIRST ISSUED 3-20-47	MATERIAL SPECIFICATION ELECTRO-MOTIVE DIVISION GENERAL MOTORS CORPORATION LA GRANGE, ILLINOIS	SPECIFICATION NO EMS 56		
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NAME: HOT ROLLED SHEET STEEL, COMMERCIAL QUALITY, PICKLED				

REQUIREMENTS :

The sheet or strip supplier is responsible for meeting requirements 1 through 4. The manufacturing organization (see Section 5) is responsible for meeting requirements 5 and 6.

1. Standards and Practices :

Steel to conform to all requirements of the latest revision of the Steel Products Manual, published by the Iron and Steel Society of AIME, for commercial quality hot rolled sheet steel.

2. Chemical Composition :

Carbon - - - - 0.15% Maximum*

* In the case of sheet steel supplied for brazing applications, carbon content shall be 0.04 to 0.15%. In such instances, the carbon content requirement shall be shown on the engineering drawing. (See also Drafting Instructions.)

3. Bend Test :

A test specimen taken from the material shall be capable of being bent flat on itself, in any direction, at room temperature, without cracking.

4. Surface Treatment :

Sheets are to have oxide and mill scale removed from the surface by pickling in an acid bath. After pickling, all acid is to be removed from the steel surface and one of the following methods of corrosion protection shall be employed, as required in the purchase order.

a. A coating of rust preventative oil shall be applied to both surfaces.

Section 4 (Cont.):

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- b. The steel surfaces shall remain dry. The steel sheets shall be suitably protected against corrosion during storage and shipment. Inside storage is recommended.

5. Authorization of Surface Condition :

The decision to specify and obtain steel in the pickled and oiled condition or the pickled dry condition, shall be the **responsibility of the manufacturing organization** (internal GMLG or supplier) which is producing the actual parts and assemblies from the sheet steel. (See General Information - paragraph b).

6. Existing Engineering Drawings :

Some existing GMLG engineering drawings, explicitly require a pickled and oiled condition or a pickled dry condition. In such instances, these designations are to be superseded by the requirements stated in Section 5 of this specification.

GENERAL INFORMATION :

- a. This specification covers hot rolled sheet steel, suitable for ordinary purposes which has been pickled to remove surface oxides. Painting, protection of tooling and sheet surfaces, and applications where mill scale could be harmful to function, are reasons for using this material. No physical tests other than bend testing are required.
- b. EMS 56 previously covered pickled and oiled material and was for a long time adequate for what were predominately "in house" operations. Today however, sheet metal components and assemblies are produced by a wide variety of sources, including GMLG, which utilize their own manufacturing processes. Therefore, EMS 56 now allows for the steel to be supplied in either the pickled and oiled or pickled dry surface conditions. This is done to allow the particular manufacturing organization the freedom to select the condition best suited to its shop operations.

The responsibility for selecting and obtaining the proper surface condition shall be with the supplier (or GMLG) manufacturing organization which is producing the actual components and assemblies from the sheet steel. The term

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GENERAL INFORMATION (Cont.)

"manufacturing organization" is here meant to include the functions necessary in selecting and ordering the proper surface condition for the steel. Note that GMLG engineering drawings will no longer specify oiled or dry, except as described in Section 6. Therefore, this requirement must be expressed by the particular manufacturer, through other suitable documentation.

- c. Commercial quality sheet steel is not made or tested to specified mechanical properties limits. Typical data for this material are shown below. Note that the range of possible values for each of the various properties tends to be broad.

Tensile Strength	52 KSI
Yield Strength	38 KSI
Elongation in 2"	34 %
Hardness	55 HRB

Normally expected minima are about 25 to 30 % lower than these typical values.

DRAFTING INFORMATION :

All sheet and strip will be known as sheet, for GMLG purposes. Sheet and strip are supplied up to and including 3/16" in thickness. Thicknesses greater than 3/16" are classified as plate or bar and are covered by MS 4361 (Index No. 0008). See Material Specifications Index Number 0000, Sheet 4, for GMLG treatment of gauge sizes.

Where use of this material is specified, it shall be designated as:

MATERIAL: EMS 56 HR SHEET STEEL COMM. QUAL. PICKLED

or where space is limited, EMS 56 HRSS COM Q P

In applications which require brazing, add this note to the material description:

Restricted carbon content: 0.04 to 0.15%

NOTE: These specifications were developed without considering whether patents may or may not be involved. In all cases therefore, the supplier

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shall be required to assume patent liability.