



Cold Rolled Stainless Steel Strip and Sheet for Trim Applications

1 Scope

1.1 Material Description. The material described in this specification includes both ferritic and austenitic grades of stainless steel for use in automotive trim. Stainless steels are selected primarily for their resistance to cosmetic corrosion. This corrosion may come in multiple forms: General (surface becomes brown-appearing overall or in stained areas, and can be cleaned with polish), or Pitting (highly localized small spots, often surrounded by rust "bulls-eye", and cannot be permanently cleaned by polish). Also, intergranular corrosion may affect structural integrity with only minor visible change. Resistance to general corrosion is proportional to the percent chromium content. Resistance to pitting corrosion is proportional not only to chromium but also (more strongly) to percent molybdenum content. Intergranular corrosion only occurs in weld heat affected zones and is reduced when carbon content is reduced; thus, only "L" (low carbon) grade material may be used for welded applications. Stainless types that are titanium-stabilized for intergranular corrosion resistance will have visible dark spots/streaks and are not recommended for the cosmetic applications covered by this specification.

1.2 Symbols. Not applicable.

1.3 Applicability. Interior or exterior bright metal trim.

1.4 Remarks. Refer to Table 1 for material identification.

2 References

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

2.1 External Standards/Specifications.

AISI 3	ASTM E112	SAE 30301	SAE 51434
ASTM A370	EN 10088-2	SAE 30304	SAE 51436
ASTM A651	JIS G4305	SAE 51409	SAE J405
ASTM E18	SAE 30201	SAE 51430	SAE J409

2.2 GM Standards/Specifications.

GMW3059	GMW14458	GMW15283	GMW15613
GMW3161	GMW14872	GMW15284	GMW16854

2.3 Additional References.

- GM Visual Standard (Suppliers will work with the responsible GM engineer to comprehend this requirement.)

3 Requirements

3.1 Alloy Selection. Other equivalent regional stainless grades may be used as purchasing availability necessitates, as approved by GM Materials Engineering.

3.1.1 Pitting Resistance. When selecting the type of stainless steel for an application (or, if investigating other grades), consider the calculated Pitting Resistance Equivalent (PRE), a single reference number indicative of overall corrosion performance.

$$PRE = \%Cr + 3.3(\%Mo)$$

The minimum specified limits of those alloys referenced here show rankings in Table 2.

3.1.2 Appearance. The color of ferritic grades is slightly blue, and is slightly yellow for austenitic grades. Alloys should not be intermixed in appearance zones. Also, no stainless alloys will exactly match chrome flashed or nickel-chrome plated parts.

3.1.3 Exhaust Component Usage. While not notably helpful for salt corrosion resistance, the nickel present in austenitic alloys aids resistance when corrosive exhaust gas condensates are present. Types 304 or 316 ("L" if welded) are to be used, and only up to a service temperature of 200 °C. Above this temperature, objectionable yellowing will occur and chrome flashing (to 300 °C) or nickel chrome plating (to 400 °C) is required. Reference GMW15613.

Table 1: Material Identification Table ^{Note 1}

GMW15614 Type XXX Designation	Common Name	SAE Designation	Other Designations (UNS, ISO, EN, JIS, etc.)	Comments (Usage, Requirement, and Others)
Ferritic Stainless Steel Grades				
GMW15614 Type 434	434	SAE 51434	UNS S43400, ASTM A651, EN 10088-2-1.4113, (X6CrMo17-1), JIS G4305 SUS434	• Use if moderate resistance to pitting and rusting is required. • Use when roping control is not required. • Use when corrosion requirements are not severe.
GMW15614 Type 436	436	SAE 51436	UNS S43600, JIS G4305 SUS436L	• Similar corrosion resistance as Type 434 grade. • Use when roping control is required.
GMW15614 Type 436M (GMW15614 Type 436M1) (GMW15614 Type 436M2)	436M	-	-	• Improved corrosion resistance to Type 434 and Type 436. • Similar roping performance as Type 436. • Type 436 M1 and Type 436M2 ^{Note 2} are chemistry modified versions of Type 436 (SAE 51436).
GMW15614 Type 430	430	SAE 51430	UNS 43000, EN 10088-2-1.4016 (X6Cr17), JIS G4305 SUS 430	• Similar Chrome content to Type 434/436 grades, but no Molybdenum (Mo). • Corrosion resistance is poor comparative to Type 434/436 grades. • May only be used as a substrate for co-extruded coating, or restricted local/regional markets where corrosive environment is mild.
GMW15614 Type 409	409	SAE 51409	UNS S40900, DIN EN 10088-2 X2CrTi12 (1.4512), JIS G4305 SUS409	• Minimum Chromium (Cr) content of 10.5%. • Due to low Cr content, should not be considered for cosmetic applications. • For exhaust system applications, refer to GMW3161 specification.

GMW15614 Type XXX Designation	Common Name	SAE Designation	Other Designations (UNS, ISO, EN, JIS, etc.)	Comments (Usage, Requirement, and Others)
GMW15614 Type 444	444	-	UNS S44400, EN 10088-2- X2CrMoTi18-2 JIS G4305 SUS444	- Excellent corrosion resistance (especially pitting corrosion resistance); approximately equivalent to Type 316 but without added cost of Nickel (Ni). - Not suited for cosmetic applications due to its Titanium (Ti) content.
GMW15614 Type 201	201	SAE 30201	UNS S20100 EN 10088-2- X12CrMnNiN 17-7-5 (1.4372)	- Strong and ductile stainless grade. - Similar corrosion resistance to Types 434 and 436. - Used in automotive trim fabrication where increased ductility for deep drawing is required. - Use when moderate atmospheric corrosion resistance is required.
GMW15614 Type 301	301	SAE 30301	UNS S30100 EN 10088-2-1.4310 (X10CrNi18-8), JIS G4305 SUS 301	- Has greater formability than the ferritic grades and Type 201. - It is used for trim parts requiring deep drawing or stretching operations. - Use when increased atmospheric corrosion resistance is required.
GMW15614 Type 304L	304L	SAE 30304L	UNS S30403 EN 10088-2-1.4306 (X2CrNi19-11) JIS G4305 SUS304L	Used when corrosion environments are extreme, such as exhaust tips and assist steps.
GMW15614 Type 304	304	SAE 30304	UNS S30400 EN 10088-2-1.4301 (X2CrNi18-10) JIS G4305 SUS304	- This is a "non-L" type of 304 grade; it is to be used if a component is not to be welded. - Same usage as Type 304L.
GMW15614 Type 316L	316L	-	UNS S31603 EN 10088-2-1.4435 (X5CrNiMo17-12-2) JIS G4305 SUS316L	- Used when corrosion environments are extreme, such as exhaust tips and assist steps. - Relative to 304, this grade has additional resistance to crevice and pitting corrosion and less resistance to general corrosion.
GMW15614 Type 316	316	-	UNS S31600 EN10088-2-1.4401 (X2CrNiMo17-12-2) JIS G4305 SUS 316	- This is a "non-L" type of 316 grade; it is to be used if a component is not to be welded. - Same usage as Type 316L.
GMW15614 Type 317	317	-	UNS S31700 EN 10088-2 (X5CrNiMo17-13-3) JIS G4305 SUS317	- May be used for exterior trim applications, where corrosion performance is critical but slightly yellow appearance is acceptable. - Excellent corrosion resistance. - Excellent intergranular corrosion resistance.

Note 1: If part is made from buffed austenitic grades, chrome flashing is required for color matching due to heat tinting during the buffing operation.

Note 2: Deformation of 1% to 2% during forming will likely need to be polished to restore finish (section 3.3.1).