

Material Information



Carbon Steel ASTM A1011

Introduction

Carbon Steel ASTM A1011 refers to hot-rolled steel sheet and strip supplied in accordance with ASTM A1011/A1011M. The specification covers several categories of steel, including commercial steel, drawing steel, structural steel, high-strength low-alloy steel, high-strength low-alloy steel with improved formability, and ultra-high-strength steel. Because A1011 covers multiple steel grades and designations, the specific chemical composition and mechanical properties depend on the selected grade and type. It is widely used for sheet metal fabrication where hot-rolled steel, scalable material selection, and application-specific strength or formability are required.

Advantages

A wide range of grades and designations under ASTM A1011 allows material selection based on different requirements for formability, strength, and structural performance. Depending on the selected grade, A1011 material can provide good forming characteristics, higher strength, or improved formability while remaining suitable for conventional hot-rolled sheet metal fabrication processes. The specification also includes requirements for chemical composition and, for applicable grades, mechanical properties and bending performance.

Disadvantages

ASTM A1011 does not define one single set of material properties because it covers multiple steel categories and grades. As a result, formability, strength, weldability, and other characteristics can vary significantly depending on the specified grade and type. Hot-rolled surfaces can also require additional finishing or surface treatment when a smoother or more decorative appearance is required. Like other carbon steel products, corrosion protection may be necessary for parts exposed to moisture or corrosive environments.

Tolerance

We offer tolerances as tight as $\pm 0.005"$. Tighter tolerances are available upon manual review.

Recommendation

The broad range of grades covered by ASTM A1011 makes it suitable for sheet metal fabricated parts used in automotive, construction, industrial equipment, agricultural machinery, structural assemblies, and general manufacturing applications. It is particularly appropriate when a hot-rolled steel sheet is required, and the material grade can be selected according to the desired balance of strength, formability, and structural performance.

Material Specifications (For reference only.)	
Tensile strength	310 to 450MPa
Yield strength	205 to 345MPa
Elongation at Break	25% to 30%

Attention

ASTM A1011 is a material specification rather than a single steel grade, so the exact grade, type, and applicable requirements should be identified on the drawing or purchase specification before fabrication. Forming parameters should be selected according to the selected grade because the available A1011 materials range from commercial and drawing steels to structural, HSLA, and ultra-high-strength grades. For applications requiring specific mechanical performance, the selected grade should be verified against the applicable yield strength, tensile strength, elongation, and bending requirements. Corrosion protection should also be considered for parts used in outdoor, humid, or corrosive environments.

Applications

3DSPRO finds people using Carbon Steel ASTM A1011 to make functional parts and prototypes in the following industries and applications.

Automotive and transportation:

Brackets, panels, supports, guards, structural components, and other fabricated parts where hot-rolled steel and application-specific strength or formability are required.

Construction and structural fabrication:

Structural panels, supports, frames, brackets, plates, and other fabricated components using structural or high-strength grades covered by ASTM A1011.

Industrial and agricultural equipment:

Machine components, equipment housings, guards, mounting parts, frames, brackets, and other fabricated components where different A1011 grades can be selected according to strength and forming requirements.

General sheet metal fabrication:

Panels, covers, enclosures, brackets, supports, formed components, and other hot-rolled sheet metal parts requiring a material supplied to an ASTM A1011/A1011M specification.