Metals Procurement Standards

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Change Record

Revision	Affected Section(s)	Description of Change	Change Date
A	All	Initial Release	See PLM
B	Table 1	Added 6061-T651 is acceptable when 6061-T6 is specified.	See PLM
	Table 2	Added ASTM A582 for 303 SS bar.	



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1 Scope

This document provides standards to which common metals used in Blue Canyon Technologies (BCT) design shall be procured. Hardware drawings or bills off material (BOMs) should list specific standards and/or procurement direction for metals and other materials not included in this document.

2 Background

BCT utilizes metallic material allowables listed in Metallic Materials Properties Development and Standardization (MMPDS) to execute structural analysis. These allowables differ depending on alloy, temper, form, heat treatment, and procurement standard. BCT indicates alloy and temper on all metallic drawings. This document lists the procurement standard options for each alloy and temper to be utilized by suppliers.

3 Requirements

Suppliers shall procure metallic materials in accordance with the standards listed in this document.

If a form other than sheet, plate, or rod is used, the supplier shall notify BCT of the specific procurement standard prior to production. Additionally, procurement to a standard other than those listed in this document or outside of the limitations of these standards (i.e., outside of thickness range) shall be approved by BCT prior to purchase/production.

If procurement specifications are listed on the drawing or in the BOM, those take precedence over the requirements of this document.

4 Definitions

Allowable	Statistical design property used in structural analysis.
Alloy	Mixture of chemical elements of which at least one is a metal.
Temper	Process of improving the characteristics of a metal by heating it to a high temperature.

5 Acronyms and Abbreviations

AISI	American Iron and Steel Institute
AMS	Aerospace Material Specification
ASTM	American Society for Testing and Materials
BCT	Blue Canyon Technologies
BOM	Bill of Materials
MMPDS	Metallic Materials Properties Development and Standardization
PO	Purchase Order

Table 1: Aluminum Alloys

Material	Form	Thickness/Diameter (in.)	Procurement Standard
2024-T81	Sheet[1]	0.010-0.249	AMS 4268
	Extruded bar, rod, and shapes	0.050-4.500	AMS-QQ-A-200/3
5052-H32	Sheet and plate	0.017-2.000	AMS 4016
5052-H36	Sheet	0.006-0.162	ASTM B209
6061-T6[2]	Sheet	0.010-0.249	AMS 4027
	Drawn Tubing	0.025-0.500	AMS 4082 AMS 4083
	Rolled, drawn, or cold-finished bar, rod, and special shapes	≤8.000	AMS 4117
	Die forging	≤4.000	AMS 4127
	Hand forging	≤2.000-8.000	AMS 4127
	Extruded rod, bar, and shapes	≥0.250-6.500	AMS 4150
6061-T651	Plate	0.250-6.000	AMS 4027
	Rolled, drawn, or cold-finished bar, rod, and special shapes	0.500-8.000	AMS 4117
7050-T74	Die forging	≤2.000-6.000	AMS 4107
7050-T7451	Plate	0.250-8.000	AMS 4050
7075-T73	Sheet	0.040-0.249	AMS 4078
	Bar, rod, and shapes: rolled, drawn, or cold-finished[3]	0.375-3.000	AMS 4124
	Die forging	≤1.000-6.000	AMS 4141
	Hand forging	≤2.000-6.000	AMS-A-22771
	Extrusion (rod, bars, and shapes)	0.040-4.499	AMS 4617
7075-T7351	Plate	0.250-4.000	AMS 4078
	Bar, rod, and shapes: rolled, drawn, or cold-finished[3]	0.375-3.000	AMS 4124

[1] 2024-T3 sheet artificially aged to the required strength level. Properties may be different from MMPDS if formed or otherwise cold or hot worked, particularly in the annealed temper, prior to solution heat treatment.
[2] When 6061-T6 is specified, 6061-T651 is also acceptable.
[3] For rounds (rod) maximum diameter is 4 inches; for square hexagonal and octagonal bar, maximum size is 3.5 inches; for rectangular bar, maximum thickness is 3 inches with corresponding width of 6 inches; for rectangular bar less than 3 inches in thickness, maximum width is 10 inches.

Table 2: Steel Alloys

Material	Form	Condition	Thickness/ Diameter (in.)	Procurement Standard
17-4 PH	Sheet, strip, and plate	H1150	≤4.000	AMS 5604
	Forging, tubing, and rings	H1150	<8.000	AMS 5643/H1150
	Bar	H1150	<8.000	AMS 5643/H1150
15-5 PH	Rolled and/or forged bar	H1150	≤12	AMS 5659
	Rolled and/or forged bar	H1025	≤10-12	AMS 5659
	Plate	H1025	0.187-4.000	AMS 5862
AISI 301	Sheet, strip, and plate	Solution heat treated	---	AMS 5901
	Sheet and strip	1/4 hard	≤0.187	AMS 5517
	Sheet and strip	1/2 hard	≤0.187	AMS 5518
	Sheet and strip	3/4 hard	≤0.187	AMS 5902
	Sheet and strip	Full hard	≤0.187	AMS 5519
AISI 302	Sheet, strip, and plate	Solution heat treated	---	AMS 5516
	Sheet and strip	1/4 hard	≤0.187	AMS 5903
	Sheet and strip	1/2 hard	≤0.187	AMS 5904
	Sheet and strip	3/4 hard	≤0.187	AMS 5905
	Sheet and strip	Full hard	≤0.187	AMS 5906
AISI 303	Sheet, strip, and plate			ASTM A895
	Billets and bars for forging			ASTM A314
	Bar			ASTM A582
AISI 304	Sheet, strip, and plate	Solution heat treated	---	AMS 5513
	Sheet and strip	1/4 hard	≤0.187	AMS 5910
	Sheet and strip	1/2 hard	≤0.187	AMS 5911
	Sheet and strip	3/4 hard	≤0.187	AMS 5912
	Sheet and strip	Full hard	≤0.187	AMS 5913
AISI 304L	Sheet, strip, and plate			ASTM A240
	Bar			ASTM A276
AISI 316	Sheet, strip, and plate			ASTM A240
	Bar			ASTM A276
AISI 316L	Sheet and strip	1/4 hard	≤0.187	AMS 5907
	Sheet, strip, and plate	Solution heat treated	---	AMS 5524
AISI 416				AMS 5610 ASTM A582



Material	Form	Condition	Thickness/ Diameter (in.)	Procurement Standard
A286	Sheet, strip, and plate	Solution treated and aged at 1800F	>0.004	AMS 5525
	Bar	Solution treated and aged at 1800F	≤2.499	AMS 5731
	Bar	Solution treated and aged at 1800F	2.500-5.000	AMS 5732
	Bar	Solution treated and aged at 1650F	≤2.499	AMS 5734
	Bar	Solution treated and aged at 1650F	2.500-5.000	AMS 5737
Custom 455	Tubing (welded)	H950	0.020-0.062 >0.062	AMS 5578
	Bar	H950	≤4.000-6.000	AMS 5617
	Bar	H1000	≤8.000	AMS 5617

Table 3: Titanium Alloys

Material	Form	Condition	Thickness/Diameter (in.)	Procurement Standard
6AL-4V	Sheet	Annealed	≤0.1874	AMS 4911 AMS 6945
	Plate	Annealed	0.1875-4.000	AMS 4911 AMS 6945
	Sheet, strip, and plate	Solution treated and aged	≤0.1874-2.000	AMS 4904
	Bar[4]	Annealed	<0.500-6.000	AMS 4928 AMS 6931
	Rectangular bar[4]	Solution treated and aged	≤0.500-4.000	AMS 4965 AMS 4967
	Round, square, and hexagon bar[4]	Solution treated and aged	≤0.500-4.000	AMS 4965 AMS 4967
	Rectangular bar[4]	Solution treated and aged	≤0.500-4.000	AMS 6930
	Round, square, and hexagon bar[4]	Solution treated and aged	≤0.500-3.000	AMS 6930
	Extrusion	Annealed	≤2.000-3.000	AMS 4935
	Extrusion	Solution treated and aged	≤0.500-3.000	AMS 4934
	Die forging	Alpha-beta processed, annealed	≤2.000-6.000	AMS 4928 AMS 6931
	Die forging	Alpha-beta or beta processed, annealed	≤2.000-6.000	AMS 4920
	Investment casting	HIP and annealed	<0.500-4.000	AMS 4992

Table 4: Nickel Alloys

Material	Form	Condition	Thickness/Diameter (in.)	Procurement Standard
Inconel 625	Sheet and plate	Annealed	≤0.062-1.000	AMS 5599
	Bar	Annealed	0.500-3.999	AMS 5666

[4] Bar cut from plate does not meet minimum design values in MMPDS.