

MMPDS-11 Table of Contents

Chapter 5 - Titanium Alloys

Foreword	i
Explanation of Numerical Code	iii
Registered Trademarks	v
CHAPTER 5 TITANIUM	5-1
5.1 GENERAL	5-1
5.1.1 TITANIUM INDEX	5-1
5.1.2 MATERIAL PROPERTIES	5-1
5.1.2.1 Mechanical Properties	5-2
5.1.3 MANUFACTURING CONSIDERATIONS	5-4
5.1.4 ENVIRONMENTAL CONSIDERATIONS	5-4
5.1.5 OBSOLETE ALLOYS, TEMPERS, AND PRODUCT FORMS	5-5
5.2 UNALLOYED TITANIUM	5-7
5.2.1 COMMERCIALLY PURE TITANIUM	5-7
5.2.1.0 Comments and Properties	5-7
5.2.1.1 Annealed Condition	5-12
5.3 ALPHA AND NEAR-ALPHA TITANIUM ALLOYS	5-17
5.3.1 TI-5AL-2.5SN	5-17
5.3.1.0 Comments and Properties	5-17
5.3.1.1 Annealed Condition	5-23
5.3.2 TI-8AL-1MO-1V	5-32
5.3.2.0 Comments and Properties	5-32
5.3.2.1 Single-Annealed Condition	5-37
5.3.2.2 Duplex-Annealed Condition	5-40
5.3.3 Ti-6Al-2Sn-4Zr-2Mo	5-48
5.3.3.0 Comments and Properties	5-48
5.3.3.1 Single, Duplex, and Triplex Annealed	5-53
5.4 ALPHA-BETA TITANIUM ALLOYS	5-57
5.4.1 TI-6AL-4V	5-57
5.4.1.0 Comments and Properties	5-57
5.4.1.1 Annealed Condition	5-71
5.4.1.2 Solution-Treated and Aged Condition	5-104
5.4.2 TI-6AL-6V-2SN	5-122
5.4.2.0 Comments and Properties	5-122
5.4.2.1 Annealed Condition	5-128
5.4.2.2 Solution-Treated and Aged Condition	5-138
5.4.3 TI-4.5AL-3V-2FE-2MO	5-139
5.4.3.0 Comments and Properties	5-139
5.4.3.1 Annealed Condition	5-139
5.4.4 TI-4AL-2.5V-1.5FE	5-148

MMPDS-11
July 2016

5.4.4.0 Comments and Properties	5-148
5.4.4.1 Cold Rolled Sheet, Annealed Condition	5-154
5.4.4.2 Hot Rolled Sheet and Plate, Annealed Condition	5-162
5.5 BETA, NEAR-BETA, AND METASTABLE-BETA TITANIUM ALLOYS	5-171
5.5.1 TI-13V-11CR-3AL	5-171
5.5.1.0 Comments and Properties	5-171
5.5.1.1 Annealed Condition	5-175
5.5.1.2 Solution-Treated and Aged Condition	5-182
5.5.2 TI-15V-3CR-3SN-3AL (TI-15-3)	5-188
5.5.2.0 Comments	5-188
5.5.2.1 Solution-Treated and Aged (1000°F) Condition	5-191
5.5.3 TI-10V-2FE-3AL (TI-10-2-3)	5-192
5.5.3.0 Comments and Properties	5-192
5.5.3.1 Solution Treated and Aged (900° to 950°F) Condition	5-195
5.5.3.2 Solution Treated and Aged (950° to 1000°F) Condition	5-196
5.6 ELEMENT PROPERTIES	5-197
5.6.1 BEAMS	5-197
5.6.1.1 Simple Beams	5-197
REFERENCES	REF-1
11-APPENDICES	A-1
11-Appendix A - Glossary	A-1
A.1 Abbreviations	A-1
A.2 Symbols	A-5
A.3 Definitions	A-6
A.4 Conversion of U.S. Units of Measure Used in MMPDS to SI Units	A-17
11-Appendix B - Alloy Index	B-1
11-Appendix C - Specification Index	C-1
11-Appendix D - Testing Standards	D-1
11-Appendix E - Subject Index	E-1