



# **Metallic Materials Properties Development and Standardization (MMPDS)**

# **MMPDS-15**

## **CHAPTER 6**

## **HEAT-RESISTANT ALLOYS**

**July 2020**

### **Scientific Source:**

Metallic Materials design data acceptable to Government  
procuring or certification agencies.

***A joint effort of government, industrial,  
educational, and international aerospace  
organizations.***

**MMPDS-15**

Copyright 2020 Battelle Memorial Institute. All rights reserved. Unauthorized  
duplication or distribution may violate the Copyright Laws of the United States and of  
other jurisdictions.

*Except as expressly provided below, the copyrighted work contained herein may not be copied, modified, adapted, translated, included in derivative works or transferred to a third party. The information may be subject to export control laws and regulations of the United States. The user represents and warrants that the information will not be exported, transferred, sublicensed, copied, shared, disclosed, or used in any way except in compliance with all applicable export control laws and regulations of the United States.*

*The owner of this copy of the Handbook is hereby granted a limited license to make copies of no more than 10 individual pages of the Handbook (but specifically not including multiple sections or volumes) from this copy at a time for the sole purpose of attaching as reference and supporting information to a document authored by the owner.*

*The user of this Handbook assumes the responsibility for the selection of material properties from it to meet their requirements. The information contained herein is provided as-is without warranty. There are no warranties of any kind, either express or implied, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.*

## MMPDS-15 CHAPTER 6

<b>CHAPTER 6 – HEAT-RESISTANT ALLOYS</b> .....	6-1
<b>6.1 GENERAL</b> .....	6-1
6.1.1 MATERIAL PROPERTIES .....	6-1
6.1.2 OBSOLETE ALLOYS, TEMPERS, AND PRODUCT FORMS.....	6-3
<b>6.2 IRON-CHROMIUM-NICKEL-BASE ALLOYS</b> .....	6-5
6.2.0 GENERAL COMMENTS .....	6-5
6.2.1 A-286 .....	6-5
6.2.2 N-155 ALLOY .....	6-17
<b>6.3 NICKEL-BASE ALLOYS</b> .....	6-21
6.3.0 GENERAL COMMENTS .....	6-21
6.3.1 HASTELLOY X .....	6-23
6.3.2 INCONEL 600 .....	6-29
6.3.3 INCONEL 625 .....	6-36
6.3.4 INCONEL 706 .....	6-48
6.3.5 718 ALLOY .....	6-56
6.3.6 INCONEL X-750 .....	6-100
6.3.7 RENÉ 41 .....	6-107
6.3.8 WASPALOY .....	6-130
6.3.9 230 ALLOY .....	6-137
6.3.10 HR-120 ALLOY .....	6-150
6.3.11 HAYNES 282 ALLOY .....	6-156
<b>6.4 COBALT-BASE ALLOYS</b> .....	6-171
6.4.0 GENERAL COMMENTS .....	6-171
6.4.1 L-605 (25 alloy) .....	6-172
6.4.2 188 ALLOY .....	6-195
<b>REFERENCES</b> .....	6-211
<b>APPENDICES</b> .....	A-1
APPENDIX A .....	A-1
A.0 GLOSSARY .....	A-1
A.1 ABBREVIATIONS .....	A-1
A.2 SYMBOLS.....	A-6

## MMPDS-15 CHAPTER 6

A.3 DEFINITIONS.....	A-6
A.4 CONVERSION OF U.S. UNITS OF MEASURE USED IN MMPDS TO SI UNITS .....	A-17
APPENDIX B .....	B-1
B.0 ALLOY INDEX.....	B-1
APPENDIX C .....	C-1
C.0 SPECIFICATION INDEX.....	C-1
C.1 CROSS REFERENCE OF CANCELED MIL SPECIFICATIONS.....	C-14
APPENDIX D .....	D-1
D.0 TESTING STANDARDS .....	D-1
APPENDIX E .....	E-1
E.0 SUBJECT INDEX .....	E-1