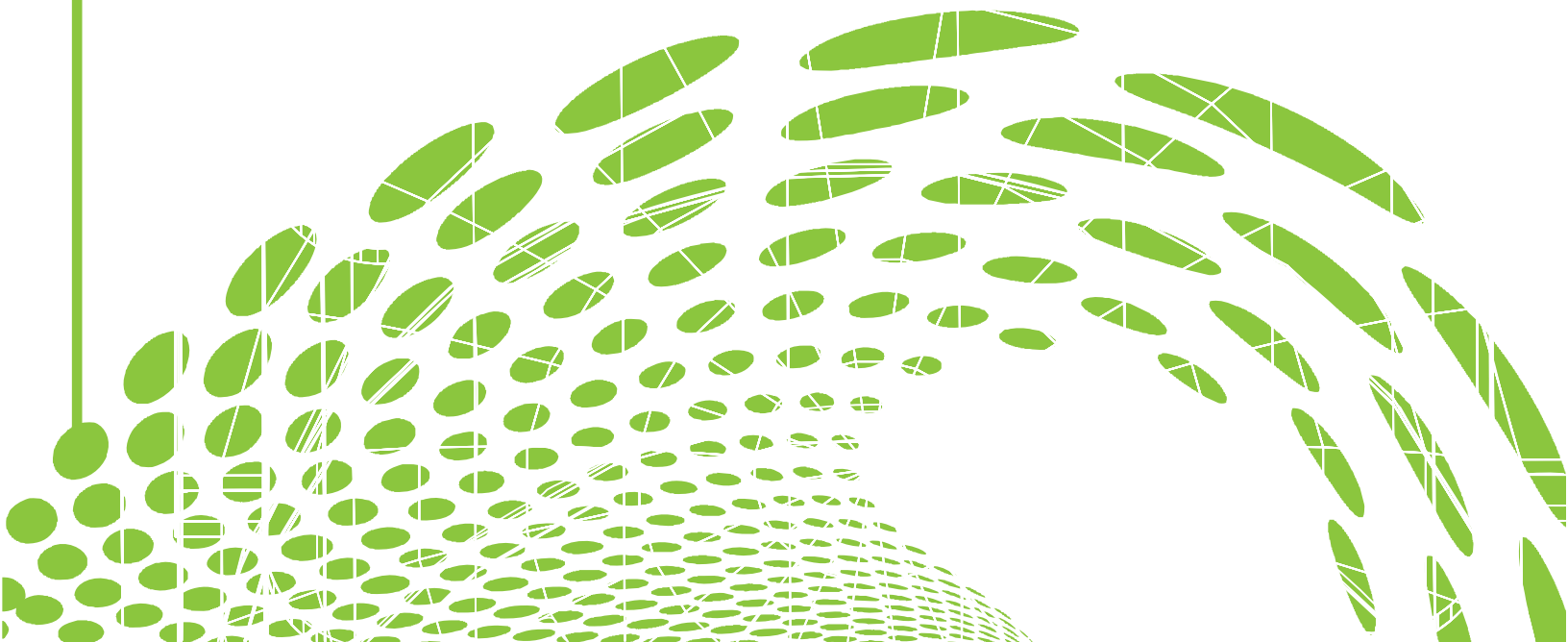
ASME STANDARDS TECHNOLOGY, LLC

STP-PT-096-1

ELEVATED TEMPERATURE MATERIAL PROPERTY COMPILATION FOR DESIGN-BY-ANALYSIS



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ELEVATED TEMPERATURE MATERIAL PROPERTY COMPILATION FOR DESIGN-BY-ANALYSIS

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Errata
to
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The following corrections have been made to the first revision of STP-PT-096:

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12	Table 4-2	Equation corrected by errata from $\log(\dot{\varepsilon}_0) = -C_{avg} - \frac{1}{T}\left(a_1 + a_2\log(\sigma) + a_3\log(\sigma)^2 + a_4\log(\sigma)^3\right)$ to $\log(\dot{\varepsilon}_0) = -C_{avg} - \frac{1}{T+460}\left(a_1 + a_2\log(\sigma) + a_3(\log(\sigma))^2 + a_4(\log(\sigma))^3\right)$
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109	Table 8-2	Equation corrected by errata; see change for Table 4-2
131	Table 9-1	Equation corrected by errata; see change for Table 4-1
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202	Table 12-1	Equation corrected by errata; see change for Table 4-1
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226	Table 13-1	Equation corrected by errata; see change for Table 4-1
227	Table 13-2	Equation corrected by errata; see change for Table 4-2
249	Table 14-1	Equation corrected by errata; see change for Table 4-1
250	Table 14-2	Equation corrected by errata; see change for Table 4-2
273	Table 15-1	Equation corrected by errata; see change for Table 4-1
274	Table 15-2	Equation corrected by errata; see change for Table 4-2
295	Table 16-1	Equation corrected by errata; see change for Table 4-1
296	Table 16-2	Equation corrected by errata; see change for Table 4-2
319	Table 17-1	Equation corrected by errata; see change for Table 4-1
320	Table 17-2	Equation corrected by errata; see change for Table 4-2
344	Table 18-1	Equation corrected by errata; see change for Table 4-1
345	Table 18-2	Equation corrected by errata; see change for Table 4-2
367	Table 19-1	Equation corrected by errata; see change for Table 4-1
368	Table 19-2	Equation corrected by errata; see change for Table 4-2
392	Table 20-1	Equation corrected by errata; see change for Table 4-1
393	Table 20-2	Equation corrected by errata; see change for Table 4-2
409	Table 21-1	Equation corrected by errata; see change for Table 4-1
410	Table 21-2	Equation corrected by errata; see change for Table 4-2
438	Table 22-1	Equation corrected by errata; see change for Table 4-1
439	Table 22-2	Equation corrected by errata; see change for Table 4-2
460	Table 23-1	Equation corrected by errata; see change for Table 4-1
461	Table 23-2	Equation corrected by errata; see change for Table 4-2
478	Table 24-1	Equation corrected by errata; see change for Table 4-1
479	Table 24-2	Equation corrected by errata; see change for Table 4-2
498	Table 25-1	Equation corrected by errata; see change for Table 4-1
499	Table 25-2	Equation corrected by errata; see change for Table 4-2
526	Table 26-1	Equation corrected by errata; see change for Table 4-1
527	Table 26-2	Equation corrected by errata; see change for Table 4-2
551	Table 27-1	Equation corrected by errata; see change for Table 4-1
552	Table 27-2	Equation corrected by errata; see change for Table 4-2
567	Table 28-1	Equation corrected by errata; see change for Table 4-1
584	Table 29-1	Equation corrected by errata; see change for Table 4-1
585	Table 29-2	Equation corrected by errata; see change for Table 4-2
604	Table 30-1	Equation corrected by errata; see change for Table 4-1
605	Table 30-2	Equation corrected by errata; see change for Table 4-2
623	Table 31-1	Equation corrected by errata; see change for Table 4-1
624	Table 31-2	Equation corrected by errata; see change for Table 4-2
642	Table 32-1	Equation corrected by errata; see change for Table 4-1
643	Table 32-2	Equation corrected by errata; see change for Table 4-2
668	Table 33-1	Equation corrected by errata; see change for Table 4-1
669	Table 33-2	Equation corrected by errata; see change for Table 4-2

TABLE OF CONTENTS

FOREWARD xxx
ABBREVIATIONS AND ACRONYMS xxxi
1 INTRODUCTION 1
2 EXECUTIVE SUMMARY 2
3 ANALYSIS 5
3.1 Compilation and Digitization of Material Properties 5
3.2 Physical Properties 5
3.3 Yield and Tensile Strength 6
3.4 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility) 6
3.5 Continuous Cycling Fatigue and Hold Time Fatigue Curves 6
4 GRADE 91, 9CR-1MO-V 8
4.1 Physical Properties 8
4.2 Yield and Tensile Strength 8
4.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility) 8
4.4 Continuous Cycling Fatigue and Hold Time Fatigue Curves 9
5 CARBON STEEL (SA-516/SA-299) AND SIMILAR 37
5.1 Physical Properties 37
5.2 Yield and Tensile Strength 37
5.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility) 37
5.4 Continuous Cycling Fatigue and Hold Time Fatigue Curves 38
6 CARBON STEEL (SA-508) AND SIMILAR 67
6.1 Physical Properties 67
6.2 Yield and Tensile Strength 67
6.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility) 67
6.4 Continuous Cycling Fatigue and Hold Time Fatigue Curves 68
7 CARBON STEEL (SA-533) AND SIMILAR 86
7.1 Physical Properties 86
7.2 Yield and Tensile Strength 86
7.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility) 86
7.4 Continuous Cycling Fatigue and Hold Time Fatigue Curves 87
8 C-1/2MO 105
8.1 Physical Properties 105
8.2 Yield and Tensile Strength 105
8.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility) 105
8.4 Continuous Cycling Fatigue and Hold Time Fatigue Curves 106
9 GRADE 11, 1.25CR-0.5MO-SI 129
9.1 Physical Properties 129
9.2 Yield and Tensile Strength 129
9.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility) 129
9.4 Continuous Cycling Fatigue Curves 130
10 GRADE 22 (2.25CR-1MO) 150

10.1 Physical Properties 150
10.2 Yield and Tensile Strength 150
10.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility) 150
10.4 Continuous Cycling Fatigue Curves 151
11 GRADE 22V (2.25CR-1MO-V) 174
11.1 Physical Properties 174
11.2 Yield and Tensile Strength 174
11.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility) 174
11.4 Continuous Cycling Fatigue and Hold Time Fatigue Curves 175
12 5CR-0.5MO (GRADE 5) 200
12.1 Physical Properties 200
12.2 Yield and Tensile Strength 200
12.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility) 200
12.4 Continuous Cycling Fatigue and Hold Time Fatigue Curves 201
13 5CR-0.5MO-SI (GRADE 5A) 224
13.1 Physical Properties 224
13.2 Yield and Tensile Strength 224
13.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility) 224
13.4 Continuous Cycling Fatigue and Hold Time Fatigue Curves 225
14 GRADE 9, 9CR-1MO 247
14.1 Physical Properties 247
14.2 Yield and Tensile Strength 247
14.3 Creep Data (Creep Rupture, Minimum Creep rate, and Ductility) 247
14.4 Continuous Cycling Fatigue and Hold Time Curves 248
15 GRADE 92 (9CR-2W) 271
15.1 Physical Properties 271
15.2 Yield and Tensile Strength 271
15.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility) 271
15.4 Continuous Cycling and Hold Time Fatigue Data 272
16 TYPE 304H (AND 304) STAINLESS STEEL 293
16.1 Physical Properties 293
16.2 Yield and Tensile Strength 293
16.3 Creep data (Creep Rupture, Minimum Creep Rate, and Ductility) 293
16.4 Continuous Cycling Fatigue and Hold Time Fatigue Curves 294
17 TYPE 316H (AND 316) STAINLESS STEEL 317
17.1 Physical Properties 317
17.2 Yield and Tensile Strength 317
17.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility) 317
17.4 Continuous Cycling Fatigue and Hold Time Fatigue Curves 318
18 TYPE 347H (AND 347) STAINLESS STEEL 342
18.1 Physical Properties 342
18.2 Yield and Tensile Strength 342
18.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility) 342

18.4 Continuous Cycling Fatigue Curves....343
19 ALLOY 617, 52NI-22CR-13CO-9MO....364
19.1 Physical Properties....364
19.2 Yield and Tensile Strength....364
19.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility)....364
19.4 Continuous Cycling Fatigue and Hold Time Fatigue Curves....365
20 INCONEL 740H....390
20.1 Physical Properties....390
20.2 Yield and Tensile Strength....390
20.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility)....390
20.4 Continuous Cycling Fatigue Curves....391
21 ALLOY 800H, 33NI-42FE-21CR....406
21.1 Physical Properties....406
21.2 Yield and Tensile Strength....406
21.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility)....406
21.4 Continuous Cycling Fatigue and Hold Time Fatigue Curves....407
22 GRADE 12, 1CR-0.5MO....436
22.1 Physical Properties....436
22.2 Yield and Tensile Strength....436
22.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility)....436
22.4 Hold Time Fatigue Curves....437
23 GRADE 23....458
23.1 Physical Properties....458
23.2 Yield and Tensile Strength....458
23.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility)....458
23.4 Continuous Cycling Fatigue and Hold Time Fatigue Curves....459
24 GRADE 21 (3CR)....476
24.1 Physical Properties....476
24.2 Yield and Tensile Strength....476
24.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility)....476
24.4 Continuous Cycling Fatigue and Hold Time Fatigue Curves....477
25 TYPE 410 (13CR)/12CR....495
25.1 Physical Properties....495
25.2 Yield and Tensile Strength....495
25.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility)....495
25.4 Continuous Cycling Fatigue and Hold Time Fatigue Curves....496
26 321H 18CR-10NI-TI....524
26.1 Physical Properties....524
26.2 Yield and Tensile Strength....524
26.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility)....524
26.4 Continuous Cycling Fatigue and Hold Time Fatigue Curves....525
27 ALLOY 601....549
27.1 Physical Properties....549

27.2 Yield and Tensile Strength 549
27.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility) 549
27.4 Continuous Cycling Fatigue Curves 550
28 ALLOY 709 565
28.1 Physical Properties 565
28.2 Yield and Tensile Strength 565
28.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility) 565
28.4 Continuous Cycling Fatigue and Hold Time Fatigue Curves 566
29 B7 BOLTING, 1CR-0.3MO 582
29.1 Physical Properties 582
29.2 Yield and Tensile Strength 582
29.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility) 582
29.4 Continuous Cycling Fatigue and Hold Time Fatigue Curves 583
30 B16 BOLTING, 1CR-0.5MO-V 602
30.1 Physical Properties 602
30.2 Yield and Tensile Strength 602
30.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility) 602
30.4 Hold Time Fatigue Curves 603
31 B8 BOLTING, 18CR-8NI 621
31.1 Physical Properties 621
31.2 Yield and Tensile Strength 621
31.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility) 621
31.4 Continuous Cycling Fatigue and Hold Time Fatigue Curves 622
32 GRADE 660, 25NI-15CR-1MO-2TI-MN-AL-V 639
32.1 Physical Properties 639
32.2 Yield and Tensile Strength 639
32.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility) 639
32.4 Continuous Cycling Fatigue and Hold Time Fatigue Curves 640
33 INCONEL 718 BOLTING 666
33.1 Physical Properties 666
33.2 Yield and Tensile Strength 666
33.3 Creep Data (Creep Rupture, Minimum Creep Rate, and Ductility) 666
33.4 Continuous Cycling Fatigue and Hold Time Fatigue Curves 667
REFERENCES 687

LIST OF TABLES

Table 2-1: Clarification and Example Specification/Grade Combinations, Strength Ranges, and UNS Numbers Included in Data Collection Efforts 3
Table 4-1 : Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, Grade 91 11
Table 4-2 : Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, Grade 91 12

Table 5-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, CS (516/299) 39
Table 5-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, CS (516/299) 40
Table 6-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, CS (SA-508) 69
Table 6-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, CS (SA-508) 70
Table 7-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, SA-533 88
Table 7-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, SA-533 89
Table 8-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, C-1/2Mo 108
Table 8-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, C-1/2Mo 109
Table 9-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, Grade 11 131
Table 9-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, Grade 11 132
Table 10-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, Grade 22 152
Table 10-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, Grade 22 153
Table 11-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, Grade 22V 176
Table 11-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, Grade 22V 177
Table 12-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, Grade 5 202
Table 12-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, Grade 5 203
Table 13-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, 5Cr-0.5Mo-Si 226
Table 13-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, 5Cr-0.5Mo-Si 227
Table 14-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, Grade 9 249
Table 14-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, Grade 9 250
Table 15-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, Grade 92 273
Table 15-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, Grade 92 274
Table 16-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, 304H 295
Table 16-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, 304H 296
Table 17-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, 316H 319

Table 17-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, 316H 320
Table 18-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, 347H 344
Table 18-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, 347H 345
Table 19-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, Alloy 617 367
Table 19-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, Alloy 617 368
Table 20-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, 740H 392
Table 20-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, 740H 393
Table 21-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, Alloy 800H 409
Table 21-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, Alloy 800H 410
Table 22-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, Grade 12....438
Table 22-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, Grade 12....439
Table 23-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, Grade 23....460
Table 23-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, Grade 23....461
Table 24-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, Gr. 21 478
Table 24-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, Gr. 21 479
Table 25-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, Type 410/12Cr 498
Table 25-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, Type 410/12Cr 499
Table 26-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, 321H 526
Table 26-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, 321H 527
Table 27-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, Alloy 601 551
Table 27-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, Alloy 601 552
Table 28-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, Alloy 709 567
Table 29-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, B7 Bolting....584
Table 29-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, B7 Bolting....585
Table 30-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, B16 Bolting....604

Table 30-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, B16 Bolting.....605
Table 31-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, B8 Bolting.....623
Table 31-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, B8 Bolting.....624
Table 32-1: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Rupture) Criteria, Grade 660.....642
Table 32-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, Grade 660.....643
Table 33-1: Model Parameters, Larson-Miller Property Results, and Allowable Stresses (Rupture) Criteria, Inconel 718 668
Table 33-2: Model Parameters, Larson-Miller Property Results, and Allowable Stress (Strain Rate) Criteria, Inconel 718 669

LIST OF FIGURES

Figure 4-1: Grade 91 Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature.....13
Figure 4-2: Grade 91 Yield Strength Vs. Temperature, By Data Source, Including Trend Curves 14
Figure 4-3: Grade 91 Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves...15
Figure 4-4: Grade 91 Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Basis, By Data Source) 16
Figure 4-5: Grade 91 Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Basis, By Data Source).....17
Figure 4-6: Grade 91 Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression.....18
Figure 4-7: Grade 91 Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression.....19
Figure 4-8: Grade 91 Creep Rupture Isotherm Curves, Temperatures With High Concentration of Data Points.....20
Figure 4-9: Grade 91 Creep Rupture Isotherm Curves for Additional and Intermediate Temperatures21
Figure 4-10: Grade 91 Creep Strain Rate (MCR) Isotherm Curves, Temperatures with High Concentration of Data Points 22
Figure 4-11: Grade 91 Creep Strain Rate (MCR) Isotherm Curves for Additional and Intermediate Temperatures.....23
Figure 4-12: Grade 91 Creep Ductility (% Elongation) Vs. Rupture Time Isotherms 24
Figure 4-13: Calculated Allowable Stresses Based on Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (Grade 91) 25
Figure 4-14: Comparison of Current Grade 91 Allowable Stresses (Except Forgings) Vs. ASME II-D Appendix 1 Criteria Applied to Data 26
Figure 4-15: Short-Term Strain Vs. Time Data, up to 2,500 Hour Test Durations (Grade 91), 1 of 2.27
Figure 4-16: Short-Term Strain Vs. Time Data, Up to 2,500 Hour Test Durations (Grade 91), 2 of 228
Figure 4-17: Medium-Term Strain Vs. Time Data, 2,500 to 5,000 Hour Test Durations (Grade 91) ..29
Figure 4-18: Long-Term Strain Vs. Time Data, Up to 10,000 Hour Test Durations (Grade 91) 30
Figure 4-19: Long-Term Strain Vs. Time Data, In Excess of 10,000 Hour Test Durations (Grade 91)31

Figure 4-20: Grade 91 Continuous Cycling Fatigue (Grade 91), Including Room Temperature and Elevated Temperature Data....32
Figure 4-21: Grade 91 Hold Time Data (Creep Fatigue) For Grade 91, Temperatures of 932°F, 1000°F, 1076°F, & 1100°F....33
Figure 4-22: Grade 91 Hold Time Data (Creep Fatigue) for Grade 91, Temperature of 1022°F....34
Figure 4-23: Grade 91 Hold Time Data (Creep Fatigue) For Grade 91, Temperature of 1112°F....35
Figure 4-24: Grade 91 Hold Time Data (Creep Fatigue) For Grade 91, Temperature of 1157°F....36
Figure 5-1: CS (516/299) Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature....41
Figure 5-2: CS (516/299) Yield Strength Vs. Temperature, By Data Source, Including Trend Curves42
Figure 5-3:CS (516/299) Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves 43
Figure 5-4: CS (516/299) Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....44
Figure 5-5: CS (516/299) Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....45
Figure 5-6: CS (516/299) Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....46
Figure 5-7: CS (516/299) Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....47
Figure 5-8: CS (516/299) Creep Rupture Isotherm Curves, Temperatures with High Concentration of Data Points....48
Figure 5-9: CS (516/299) Creep Rupture Isotherm Curves for Additional and Intermediate Temperatures....49
Figure 5-10: CS (516/299) Creep Strain Rate (MCR) Isotherm Curves, 1 of 3....50
Figure 5-11: CS (516/299) Creep Strain Rate (MCR) Isotherm Curves, 2 of 3....51
Figure 5-12: CS (516/299) Creep Strain Rate (MCR) Isotherm Curves, 3 of 3....52
Figure 5-13: CS (516/299) Creep Ductility (% Elongation) Vs. Rupture Time Isotherms....53
Figure 5-14: Calculated Allowable Stresses Based on Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (CS (516/299))....54
Figure 5-15: Comparison of Current CS (516/299) Allowable Stresses (Except Forgings) Vs. ASME II-D Appendix 1 Criteria Applied to Data....55
Figure 5-16: Strain Vs. Time Data, up to 2,500 Hour Test Durations – CS (516/299), 1 of 7....56
Figure 5-17: Strain Vs. Time Data, up to 2,500 Hour Test Durations – CS (516/299), 2 of 7....57
Figure 5-18: Strain Vs. Time Data, up to 2,500 Hour Test Durations – CS (516/299), 3 of 7....58
Figure 5-19: Strain Vs. Time Data, up to 2,500 Hour Test Durations – CS (516/299), 4 of 7....59
Figure 5-20: Strain Vs. Time Data, up to 2,500 Hour Test Durations – CS (516/299), 5 of 7....60
Figure 5-21: Strain Vs. Time Data, up to 2,500 Hour Test Durations – CS (516/299), 6 of 7....61
Figure 5-22: Strain Vs. Time Data, up to 2,500 Hour Test Durations – CS (516/299), 7 of 7....62
Figure 5-23: CS (516/299) Continuous Cycling Fatigue, Elevated Temperature Data....63
Figure 5-24: CS (516/299) Hold Time Data (Creep Fatigue)....64
Figure 5-25: CS (516/299) Stress-Controlled Fatigue Data at Elevated Temperatures....65
Figure 6-1: CS (SA-508 & SA-533) Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature....71
Figure 6-2: CS (SA-508) Yield Strength Vs. Temperature, By Data Source, Including Trend Curves72
Figure 6-3: CS (SA-508) Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves73
Figure 6-4: CS (SA-508) Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....74
Figure 6-5: CS (SA-508) Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....75
Figure 6-6: CS (SA-508) Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....76

Figure 6-7: CS (SA-508) Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression 77
Figure 6-8: CS (SA-508) Creep Rupture Isotherm Curves, Temperatures with High Concentration of Data Points 78
Figure 6-9: CS (SA-508) Creep Strain Rate (MCR) Isotherm Curves 79
Figure 6-10: CS (SA-508) Creep Ductility (% Elongation) Vs. Rupture Time Isotherms 80
Figure 6-11: Calculated Allowable Stresses Based on Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (CS (SA-508)) 81
Figure 6-12: Comparison of Current CS (SA-508) Allowable Stresses Vs. ASME II-D Appendix 1 Criteria Applied to Data 82
Figure 6-13: Strain Vs. Time Data – CS (SA-508), 1 of 2 83
Figure 6-14: Strain Vs. Time Data – CS (SA-508), 2 of 2 84
Figure 6-15: CS (SA-508) Continuous Cycling Fatigue, Elevated Temperature Data 85
Figure 7-1: SA-533 (Q&T Mn-0.5Mo) Yield Strength Vs. Temperature, By Data Source, Including Trend Curves 90
Figure 7-2: SA-533 (Q&T Mn-0.5Mo) Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves 91
Figure 7-3: SA-533 (Q&T Mn-0.5Mo) Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source) 92
Figure 7-4: SA-533 (Q&T Mn-0.5Mo) Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source) 93
Figure 7-5: SA-533 (Q&T Mn-0.5Mo) Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression 94
Figure 7-6: SA-533 (Q&T Mn-0.5Mo) Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression 95
Figure 7-7: SA-533 (Q&T Mn-0.5Mo) Creep Rupture Isotherm Curves 96
Figure 7-8: SA-533 (Q&T Mn-0.5Mo) Creep Strain Rate (MCR) Isotherm Curves 97
Figure 7-9: SA-533 (Q&T Mn-0.5Mo) Creep Ductility (% Elongation) Vs. Rupture Time Isotherms 98
Figure 7-10: Calculated Allowable Stresses Based on Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (SA-533, Q&T Mn-0.5Mo) 99
Figure 7-11: Comparison of Current SA-533 (Q&T Mn-0.5Mo) Allowable Stresses Vs. ASME II-D Appendix 1 Criteria Applied to Data 100
Figure 7-12: Strain Vs. Time Data – SA-533 (Q&T Mn-0.5Mo and Similar), 1 of 2 101
Figure 7-13: Strain Vs. Time Data – SA-533 (Q&T Mn-0.5Mo and Similar), 2 of 2 102
Figure 7-14: SA-533 (Q&T Mn-0.5Mo and Similar) Continuous Cycling Fatigue, Elevated Temperature Data 103
Figure 7-15: SA-533 (Q&T Mn-0.5Mo and Similar) Hold Time Fatigue, Elevated Temperature Data 104
Figure 8-1: C-1/2Mo Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature 110
Figure 8-2: C-1/2Mo Yield Strength Vs. Temperature, By Data Source, Including Trend Curves 111
Figure 8-3: C-1/2Mo Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves 112
Figure 8-4: C-1/2Mo Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source) 113
Figure 8-5: C-1/2Mo Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source) 114
Figure 8-6: C-1/2Mo Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression 115
Figure 8-7: C-1/2Mo Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression 116
Figure 8-8: C-1/2Mo Creep Rupture Isotherm Curves, Temperatures With High Concentration of Data Points 117

Figure 8-9: C-1/2Mo Creep Rupture Isotherm Curves for Additional and Intermediate Temperatures118
Figure 8-10: C-1/2Mo Creep Strain Rate (MCR) Isotherm Curves, Temperatures With High Concentration of Data Points 119
Figure 8-11: C-1/2Mo Creep Strain Rate (MCR) Isotherm Curves for Additional and Intermediate Temperatures.....120
Figure 8-12: C-1/2Mo Creep Ductility (% Elongation) Vs. Rupture Time Isotherms 121
Figure 8-13: Calculated Allowable Stresses Based on Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (C-1/2Mo) 122
Figure 8-14: Comparison of Current C-1/2Mo Allowable Stresses (SA-204 Grade B) Vs. ASME II-D Appendix 1 Criteria Applied to Data 123
Figure 8-15: Short-Term Strain Vs. Time Data, up to 1,000 Hour Test Durations (C-1/2Mo) 124
Figure 8-16: Long-Term Strain Vs. Time Data, in Excess of 1,000 Hour Test Durations (C-1/2Mo)125
Figure 8-17: C-1/2Mo Continuous Cycling Fatigue (C-1/2Mo), Including Room Temperature and Elevated Temperature Data.....126
Figure 8-18: C-1/2Mo Hold Time Data (Creep Fatigue) for C-1/2Mo, Temperatures of 650°F, 850°F, 1000°F, 1022°F 127
Figure 8-19: C-1/2Mo Hold Time Data (Creep Fatigue) for C-1/2Mo, Temperatures of 932°F and 950°F 128
Figure 9-1: Grade 11 Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature.....133
Figure 9-2: Grade 11 (All Heat Treatments) Yield Strength Vs. Temperature, By Data Source, Including Trend Curves.....134
Figure 9-3: Grade 11 (All Heat Treatments) Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves 135
Figure 9-4: Grade 11 (All Heat Treatments) Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis) 136
Figure 9-5: Grade 11 (All Heat Treatments) Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis) 137
Figure 9-6: Grade 11 (All Heat Treatments) Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression 138
Figure 9-7: Grade 11 (All Heat Treatments) Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression 139
Figure 9-8: Grade 11 Creep Rupture Isotherm Curves, Temperatures With High Concentration of Data Points.....140
Figure 9-9: Grade 11 Creep Rupture Isotherm Curves for Additional and Intermediate Temperatures141
Figure 9-10: Grade 11 Creep Strain Rate (MCR) Isotherm Curves.....142
Figure 9-11: Grade 11 Creep Ductility (% Elongation) Vs. Rupture Time Isotherms 143
Figure 9-12: Calculated Allowable Stresses Based on Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (Grade 11) 144
Figure 9-13: Comparison of Current Grade 11 Allowable Stresses Vs. ASME II-D Appendix 1 Criteria Applied to Data 145
Figure 9-14: Creep Strain Vs. Time Data, up to 3,000 Hour Test Durations (Grade 11) 146
Figure 9-15: Creep Strain Vs. Time Data, In Excess of 3,000 Hours (Grade 11) 147
Figure 9-16: Grade 11 Continuous Cycling Fatigue, Including Room Temperature and Elevated Temperature Data.....148
Figure 9-17: Grade 11 Continuous Cycling Fatigue, Including Room Temperature and Elevated Temperature Data.....149
Figure 10-1: Grade 22 Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature.....154
Figure 10-2: Grade 22 (All Heat Treatments) Yield Strength Vs. Temperature, By Data Source, Including Trend Curves 155

Figure 10-3: Grade 22 (All Heat Treatments) Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves 156
Figure 10-4: Grade 22 (All Heat Treatments) Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis) 157
Figure 10-5: Grade 22 (All Heat Treatments) Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis) 158
Figure 10-6: Grade 22 (All Heat Treatments) Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression 159
Figure 10-7: Grade 22 (All Heat Treatments) Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression 160
Figure 10-8: Grade 22 Creep Rupture Isotherm Curves, Temperatures With High Concentration of Data Points 161
Figure 10-9: Grade 22 Creep Rupture Isotherm Curves for Additional and Intermediate Temperatures 162
Figure 10-10: Grade 22 Creep Strain Rate (MCR) Isotherm Curves for Most Common Temperatures 163
Figure 10-11: Grade 22 Creep Strain Rate (MCR) Isotherm Curves for Additional/Intermediate Temperatures 164
Figure 10-12: Grade 22 Creep Ductility (% Elongation) Vs. Rupture Time Isotherms 165
Figure 10-13: Calculated Allowable Stresses Based On Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (Grade 22) 166
Figure 10-14: Comparison of Current Grade 22 Allowable Stresses Vs. ASME II-D Appendix 1 Criteria Applied to Data 167
Figure 10-15: Creep Strain Vs. Time Data, (Grade 22) 1 of 3 168
Figure 10-16: Creep Strain Vs. Time Data, (Grade 22) 2 of 3 169
Figure 10-17: Creep Strain Vs. Time Data, (Grade 22) 3 of 3 170
Figure 10-18: Grade 22 Continuous Cycling Fatigue, Including Room Temperature and Elevated Temperature Data 171
Figure 10-19: Grade 22 Hold Time Fatigue Data at Selected Elevated Temperatures, 1 of 2 172
Figure 10-20: Grade 22 Hold Time Fatigue Data at Selected Elevated Temperatures, 2 of 2 173
Figure 11-1: Grade 22V Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature 178
Figure 11-2: Grade 22V Yield Strength Vs. Temperature, By Data Source, Including Trend Curves 179
Figure 11-3: Grade 22V Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves 180
Figure 11-4: Grade 22V Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source) 181
Figure 11-5: Grade 22V Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source) 182
Figure 11-6: Grade 22V Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression 183
Figure 11-7: Grade 22V Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression 184
Figure 11-8: Grade 22V Creep Rupture Isotherm Curves, Temperatures With High Concentration of Data Points 185
Figure 11-9: Grade 22V Creep Rupture Isotherm Curves for Additional and Intermediate Temperatures 186
Figure 11-10: Grade 22V Creep Strain Rate (MCR) Isotherm Curves, Temperatures With High Concentration of Data Points 187
Figure 11-11: Grade 22V Creep Ductility (% Elongation) Vs. Rupture Time Isotherms 188
Figure 11-12: Calculated Allowable Stresses Based on Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (Grade 22V) 189
Figure 11-13: Comparison of Current Grade 22V Allowable Stresses (All Product Forms) Vs. ASME II-D Appendix 1 Criteria Applied to Data 190

Figure 11-14: Short-Term Strain Vs. Time Data, up to 1,000 Hour Test Durations (Grade 22V), 1 of 2 191
Figure 11-15: Short-Term Strain Vs. Time Data, up to 1,000 Hour Test Durations (Grade 22V), 2 of 2 192
Figure 11-16: Medium-Term Strain Vs. Time Data, 1,000 to 2,500 Hour Test Durations (Grade 22V), 1 of 2 193
Figure 11-17: Medium-Term Strain Vs. Time Data, up to 2,500 Hour Test Durations (Grade 22V), 2 of 2 194
Figure 11-18: Long-Term Strain Vs. Time Data, up to 5,000 Hour Test Durations (Grade 22V) 195
Figure 11-19: Long-Term Strain Vs. Time Data, up to 5,000 Hour Test Durations (Grade 22V) 196
Figure 11-20: Long-Term Strain Vs. Time Data, in Excess of 10,000 Hour Test Durations (Grade 22V) 197
Figure 11-21: Grade 22V Continuous Cycling Fatigue (Grade 22V), Including Elevated Temperature Data 198
Figure 11-22: Grade 22V Hold Time Data (Creep Fatigue) for Grade 22V, Temperature of 850°F .199
Figure 12-1: Grade 5 Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature.....204
Figure 12-2: Grade 5 (Annealed) Yield Strength Vs. Temperature, By Data Source, Including Trend Curves 205
Figure 12-3: Grade 5 (Annealed) Strength Vs. Temperature, By Data Source, Including Trend Curves 206
Figure 12-4: Grade 5 (N&T) Yield Strength Vs. Temperature, By Data Source, Including Trend Curves 207
Figure 12-5: Grade 5 (N&T) Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves 208
Figure 12-6: Grade 5 (Annealed) Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source).....209
Figure 12-7: Grade 5 (Annealed) Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source).....210
Figure 12-8: Grade 5 (N&T) Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source) 211
Figure 12-9: Grade 5 (N&T) Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source) 212
Figure 12-10: Grade 5 (Annealed) Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression 213
Figure 12-11: Grade 5 (Annealed) Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression 214
Figure 12-12: Grade 5 (N&T) Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression 215
Figure 12-13: Grade 5 (N&T) Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression 216
Figure 12-14: Grade 5 Creep Rupture Isotherm Curves 217
Figure 12-15: Grade 5 Creep Strain Rate (MCR) Isotherm Curves.....218
Figure 12-16: Grade 5 Creep Ductility (% Elongation) Vs. Rupture Time Isotherms 219
Figure 12-17: Calculated Allowable Stresses Based on Rupture Time and ASME II-D Appendix 1 Criteria (Grade 5).....220
Figure 12-18: Calculated Allowable Stresses Based on Creep Strain Rate and ASME II-D Appendix 1 Criteria (Grade 5).....221
Figure 12-19: Comparison of Current Grade 5 Allowable Stresses Vs. ASME II-D Appendix 1 Criteria Applied to Data 222

Figure 12-20: Selected Strain Vs. Time Data (Grade 5 at 1300°F), All Tests Terminated Prior to Rupture 223
Figure 13-1: 5Cr-0.5Mo-Si Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature 228
Figure 13-2: 5Cr-0.5Mo-Si (Annealed) Yield Strength Vs. Temperature, By Data Source, Including Trend Curves.....229
Figure 13-3: 5Cr-0.5Mo-Si (Annealed) Strength Vs. Temperature, By Data Source, Including Trend Curves 230
Figure 13-4: 5Cr-0.5Mo-Si (N&T) Yield Strength Vs. Temperature, By Data Source, Including Trend Curves 231
Figure 13-5: 5Cr-0.5Mo-Si (N&T) Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves 232
Figure 13-6: 5Cr-0.5Mo-Si (Annealed) Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source).....233
Figure 13-7: 5Cr-0.5Mo-Si (Annealed) Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source).....234
Figure 13-8: 5Cr-0.5Mo-Si (N&T) Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source).....235
Figure 13-9: 5Cr-0.5Mo-Si (N&T) Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source).....236
Figure 13-10: 5Cr-0.5Mo-Si (Annealed) Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression 237
Figure 13-11: 5Cr-0.5Mo-Si (Annealed) Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression 238
Figure 13-12: 5Cr-0.5Mo-Si (N&T) Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression 239
Figure 13-13: 5Cr-0.5Mo-Si (N&T) Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression 240
Figure 13-14: 5Cr-0.5Mo-Si Creep Rupture Isotherm Curves 241
Figure 13-15: 5Cr-0.5Mo-Si Creep Strain Rate (MCR) Isotherm Curves.....242
Figure 13-16: 5Cr-0.5Mo-Si Creep Ductility (% Elongation) Vs. Rupture Time Isotherms.....243
Figure 13-17: Calculated Allowable Stresses Based on Rupture Time and ASME II-D Appendix 1 Criteria (5Cr-0.5Mo-Si) 244
Figure 13-18: Calculated Allowable Stresses Based on Creep Strain Rate and ASME II-D Appendix 1 Criteria (5Cr-0.5Mo-Si) 245
Figure 13-19: Comparison of Current 5Cr-0.5Mo-Si Allowable Stresses Vs. ASME II-D Appendix 1 Criteria Applied to Data.....246
Figure 14-1: Grade 9 Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature.....251
Figure 14-2: Grade 9 Yield Strength Vs. Temperature, By Data Source, Including Trend Curves ...252
Figure 14-3: Grade 9 Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves.253
Figure 14-4: Grade 9 Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source).....254
Figure 14-5: Grade 9 Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source).....255
Figure 14-6: Grade 9 Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression.....256
Figure 14-7: Grade 9 Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression.....257
Figure 14-8: Grade 9 Creep Rupture Isotherm Curves, Most Common Test Temperatures 258
Figure 14-9: Grade 9 Creep Rupture Isotherm Curves, Additional Test Temperatures 259

Figure 14-10: Grade 9 Creep Strain Rate (MCR) Isotherm Curves, First Lot of Temperatures.....260
Figure 14-11: Grade 9 Creep Strain Rate (MCR) Isotherm Curves, Second Lot of Temperatures 261
Figure 14-12: Grade 9 Creep Ductility (% Elongation) Vs. Rupture Time Isotherms 262
Figure 14-13: Calculated Allowable Stresses Based on Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (Grade 9) 263
Figure 14-14: Comparison of Current Grade 9 Allowable Stresses (Annealed) Vs. ASME II-D Appendix 1 Criteria Applied to Data 264
Figure 14-15: Short-Term Strain Vs. Time Data, up to 2,500 Hour Test Durations (Grade 9).....265
Figure 14-16: Medium-Term Strain Vs. Time Data, 2,500 to 5,000 Hour Test Durations (Grade 9) 266
Figure 14-17: Long-Term Strain Vs. Time Data, 5,000 to 10,000 Hour Test Durations (Grade 9) ...267
Figure 14-18: Long-Term Strain Vs. Time Data, In Excess of 10,000 Hour Test Durations (Grade 9)268
Figure 14-19: Grade 9 Continuous Cycling Fatigue Data, Including Elevated Temperature Data 269
Figure 14-20: Grade 9 Hold Time Data (Creep Fatigue) for Grade 9, Temperatures of 1000°F & 1099°F 270
Figure 15-1: Grade 92 Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature.....275
Figure 15-2: Grade 92 Yield Strength Vs. Temperature, By Data Source, Including Trend Curves..276
Figure 15-3: Grade 92 Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves277
Figure 15-4: Grade 92 Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source).....278
Figure 15-5: Grade 92 Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source).....279
Figure 15-6: Grade 92 Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression.....280
Figure 15-7: Grade 92 Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression.....281
Figure 15-8: Grade 92 Creep Rupture Isotherm Curves, Temperatures With High Concentration of Data Points.....282
Figure 15-9: Grade 92 Creep Rupture Isotherm Curves for Additional and Intermediate Temperatures283
Figure 15-10: Grade 92 Creep Strain Rate (MCR) Isotherm Curves, Temperatures With High Concentration of Data Points 284
Figure 15-11: Grade 92 Creep Ductility (% Elongation) Vs. Rupture Time Isotherms 285
Figure 15-12: Calculated Allowable Stresses Based on Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (Grade 92) 286
Figure 15-13: Comparison of Current Grade 92 Allowable Stresses (Except Forgings) Vs. ASME II-D Appendix 1 Criteria Applied to Data 287
Figure 15-14: Short-Term Strain Vs. Time Data, Up to 250 Hour Test Durations (Grade 92).....288
Figure 15-15: Medium-Term Strain Vs. Time Data, 250 to 5,000 Hour Test Durations (Grade 92) .289
Figure 15-16: Long-Term Strain Vs. Time Data, in Excess of 5,000 Hour Test Durations (Grade 92)290
Figure 15-17: Grade 92 Continuous Cycling High Temperature Fatigue Data for Grade 92.....291
Figure 15-18: Grade 92 Hold Time Data (Creep Fatigue) for Grade 92, Temperature of 600°F 292
Figure 16-1: 304H Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature.....297
Figure 16-2: 304H Yield Strength Vs. Temperature, By Data Source, Including Trend Curves 298
Figure 16-3: 304H Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves 299
Figure 16-4: 304H Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source).....300
Figure 16-5: 304H Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source).....301
Figure 16-6: 304H Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression.....302

Figure 16-7: 304H Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....303
Figure 16-8: 304H Creep Rupture Isotherm Curves, Temperatures With High Concentration of Data Points....304
Figure 16-9: 304H Creep Rupture Isotherm Curves for Additional and Intermediate Temperatures 305
Figure 16-10: 304H Creep Strain Rate (MCR) Isotherm Curves, Temperatures with High Concentration of Data Points....306
Figure 16-11: 304H Creep Ductility (% Elongation) Vs. Rupture Time Isotherms....307
Figure 16-12: Calculated Allowable Stresses Based on Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (304H)....308
Figure 16-13: Comparison of Current 304H Allowable Stresses Vs. ASME II-D Appendix 1 Criteria Applied to Data; Note That These Curves Reflect Properties Regressed to Non-H Grades of 304 (I.E., Less Than 0.04 WT% Carbon)....309
Figure 16-14: Strain Vs. Time Data at Multiple Temperatures From NRIM 4B (304H)....310
Figure 16-15: Strain Vs. Time Data at 1099°F From NSMH (304H)....311
Figure 16-16: Continuous Cycling Fatigue (304H), Including Room Temperature and Elevated Temperature Data....312
Figure 16-17: Hold Time Data (Creep Fatigue) for 304H, Temperature of 1022°F....313
Figure 16-18: Hold Time Data (Creep Fatigue) for 304H, Temperature of 1100°F - 1112°F....314
Figure 16-19: Hold Time Data (Creep Fatigue) for 304H, Temperature of 1200-1202°F....315
Figure 17-1: 316H Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature....321
Figure 17-2: 316H Yield Strength Vs. Temperature, By Data Source, Including Trend Curves....322
Figure 17-3: 316H Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves....323
Figure 17-4: 316H Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....324
Figure 17-5: 316H Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....325
Figure 17-6: 316H Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....326
Figure 17-7: 316H Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....327
Figure 17-8: 316H Creep Rupture Isotherm Curves, Temperatures With High Concentration of Data Points....328
Figure 17-9: 316H Creep Rupture Isotherm Curves for Additional and Intermediate Temperatures 329
Figure 17-10: 316H Creep Strain Rate (MCR) Isotherm Curves, Temperatures With High Concentration of Data Points....330
Figure 17-11: 316H Creep Strain Rate (MCR) Isotherm Curves for Additional and Intermediate Temperatures....331
Figure 17-12: 316H Creep Ductility (% Elongation) Vs. Rupture Time Isotherms....332
Figure 17-13: Calculated Allowable Stresses Based on Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (316H)....333
Figure 17-14: Comparison of Current 316H Allowable Stresses (Except Forgings) Vs. ASME II-D Appendix 1 Criteria Applied to Data; Note That These Curves Reflect Properties Regressed to Non-H-Grades of 316 (I.E., Less Than 0.04 WT% Carbon)....334
Figure 17-15: Short-Term Strain Vs. Time Data, up to 2,500 Hour Test Durations (316H)....335
Figure 17-16: Medium-Term Strain Vs. Time Data, 2,500 to 19,000 Hour Test Durations (316H)....336
Figure 17-17: Long-Term Strain Vs. Time Data, 19,000+ Hour Test Durations (316H)....337
Figure 17-18: Continuous Cycling Fatigue (316H), Including Room Temperature and Elevated Temperature Data....338
Figure 17-19: Hold Time Data (Creep Fatigue) for 316H, Temperature of 1050°F....339

Figure 17-20: Hold Time Data (Creep Fatigue) for 316H, Temperature of 1100°F.....339
Figure 17-21: Hold Time Data (Creep Fatigue) for 316H, Temperature of 1112°F.....340
Figure 17-22: Hold Time Data (Creep Fatigue) for 316H, Temperature of 1200°F.....341
Figure 18-1: 347H Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) with Temperature 346
Figure 18-2: 347H Yield Strength Vs. Temperature, By Data Source, Including Trend Curves 347
Figure 18-3: 347H Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves 348
Figure 18-4: 347H Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source).....349
Figure 18-5: 347H Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source).....350
Figure 18-6: 347H Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression.....351
Figure 18-7: 347H Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression.....352
Figure 18-8: 347H Creep Rupture Isotherm Curves, Temperatures With High Concentration of Data Points.....353
Figure 18-9: 347H Creep Rupture Isotherm Curves, Additional and Intermediate Temperatures 354
Figure 18-10: 347H Creep Strain Rate (MCR) Isotherm Curves 355
Figure 18-11: 347H Creep Ductility (% Elongation) Vs. Rupture Time Isotherms, Most Common Test Temperatures.....356
Figure 18-12: 347H Creep Ductility (% Elongation) Vs. Rupture Time Isotherms, Additional and Intermediate Test Temperature 357
Figure 18-13: Calculated Allowable Stresses Based on Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (347H) 358
Figure 18-14: Comparison of Current 347H Allowable Stresses Vs. ASME II-D Appendix 1 Criteria Applied to Data; Note That These Curves Reflect Properties Regressed to Non-H Grades of 347 (I.E, Less Than 0.04 WT% Carbon) 359
Figure 18-15: Creep Strain Vs. Time Data, up to 2,000 Hour Test Durations (347H).....360
Figure 18-16: Creep Strain Vs. Data, in Excess of 2,000 Hour Test Durations (374H).....361
Figure 18-17: 347H Continuous Cycling Fatigue Strain Range Vs. Cycles to Failure 362
Figure 19-1: Alloy 617 Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature.....369
Figure 19-2: Alloy 617 Yield Strength Vs. Temperature, By Data Source, Including Trend Curves 370
Figure 19-3: Alloy 617 Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves371
Figure 19-4: Alloy 617 Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source).....372
Figure 19-5: Alloy 617 Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source).....373
Figure 19-6: Alloy 617 Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression.....374
Figure 19-7: Alloy 617 Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression.....375
Figure 19-8: Alloy 617 Creep Rupture Isotherm Curves, Most Common Temperatures.....376
Figure 19-9: Alloy 617 Creep Rupture Isotherm Curves, Intermediate Temperatures.....377
Figure 19-10: Alloy 617 Creep Strain Rate (MCR) Isotherm Curves, Most Common Temperatures378
Figure 19-11: Alloy 617 Creep Strain Rate (MCR) Isotherm Curves, Intermediate Temperatures ...379
Figure 19-12: Alloy 617 Creep Ductility (% Elongation) Vs. Rupture Time Isotherms 380
Figure 19-13: Calculated Allowable Stresses Based on Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (Alloy 617).....381

Figure 19-14: Comparison of Current Alloy 617 Allowable Stresses (Annealed) Vs. ASME II-D Appendix 1 Criteria Applied to Data 382
Figure 19-15: Short-Term Strain Vs. Time Data, up to 1,000 Hour Test Durations (Alloy 617).....383
Figure 19-16: Short-Term Strain Vs. Time Data, In Excess of 1,000 Hour Test Durations (Alloy 617)384
Figure 19-17: Alloy 617 Continuous Cycling Fatigue, Including Room Temperature and Elevated Temperature Data....385
Figure 19-18: Alloy 617 Hold Time Data (Creep Fatigue) for Alloy 617, Temperatures of 1472°F, 1652°F, 1750-60°F, & 1832°F....386
Figure 19-19: Alloy 617 Hold Time Data (Creep Fatigue) for Alloy 617, Temperature of 1292°F ..387
Figure 19-20: Alloy 617 Hold Time Data (Creep Fatigue) for Alloy 617, Temperature of 1562°F ..388
Figure 19-21: Alloy 617 Hold Time Data (Creep Fatigue) For Alloy 617, Temperature of 1742°F..389
Figure 20-1: 740 Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature....394
Figure 20-2: 740H Yield Strength Vs. Temperature, By Data Source, Including Trend Curves 395
Figure 20-3: 740H Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves 396
Figure 20-4: 740H Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....397
Figure 20-5: 740H Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....398
Figure 20-6: 740H Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....399
Figure 20-7: 740H Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....400
Figure 20-8: 740H Creep Rupture Isotherm Curves....401
Figure 20-9: 740H Creep Strain Rate (MCR) Isotherm Curves 402
Figure 20-10: 740H Creep Ductility (% Elongation) Vs. Rupture Time Isotherms 403
Figure 20-11: Calculated Allowable Stresses Based on Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (740H) 404
Figure 20-12: Comparison of Current 740H Allowable Stresses Vs. ASME II-D Appendix 1 Criteria Applied to Data 405
Figure 21-1: Alloy 800H Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature 411
Figure 21-2: Alloy 800H Yield Strength Vs. Temperature, By Data Source, Including Trend Curves412
Figure 21-3: Alloy 800H Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves413
Figure 21-4: Alloy 800H Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....414
Figure 21-5: Alloy 800H Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source) 415
Figure 21-6: Alloy 800H Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....416
Figure 21-7: Alloy 800H Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression 417
Figure 21-8: Alloy 800H Creep Rupture Isotherm Curves, First Lot of Temperatures....418
Figure 21-9: Alloy 800H Creep Rupture Isotherm Curves, Second Lot of Temperatures 419
Figure 21-10: Alloy 800H Creep Strain Rate (MCR) Isotherm Curves, First Lot of Temperatures ..420
Figure 21-11: Alloy 800H Creep Strain Rate (MCR) Isotherm Curves, Second Lot of Temperatures421
Figure 21-12: Alloy 800H Creep Ductility (% Elongation) Vs. Rupture Time Isotherms 422
Figure 21-13: Calculated Allowable Stresses Based on Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (Alloy 800H) 423
Figure 21-14: Comparison of Current Alloy 800H Allowable Stresses (Annealed) Vs. ASME II-D Appendix 1 Criteria Applied to Data 424

Figure 21-15: Short-Term Strain Vs. Time Data, up to 2,500 Hour Test Durations (Alloy 800H), 1 of 2 425
Figure 21-16: Short-Term Strain Vs. Time Data, up to 2,500 Hour test Durations (Alloy 800H), 2 of 2 426
Figure 21-17: Medium-Term Strain Vs. Time Data, 2,500 to 5,000 Hour Test Durations (Alloy 800H) 427
Figure 21-18: Long-Term Strain Vs. Time Data, 5,000 to 10,000 Hour Test Durations (Alloy 800H) 428
Figure 21-19: Long-Term Strain Vs. Time Data, 10,000 to 100,000 Hour Test Durations (Alloy 800H) 429
Figure 21-20: Long-Term Strain Vs. Time Data, 10,000 to 100,000 Hour Test Durations (Alloy 800H) 430
Figure 21-21: Alloy 800H Continuous Cycling Fatigue Including Room Temperature and Elevated Temperature Data.....431
Figure 21-22: Alloy 800H Hold Time Data (Creep Fatigue) for Alloy 800H, Temperatures of 1000°F, 1292°F, 1400°F, and 1472°F 432
Figure 21-23: Alloy 800H Hold Time Data (Creep Fatigue) for Alloy 800H, Temperature of 1112°F 433
Figure 21-24: Alloy 800H Hold Time Data (Creep Fatigue) For Alloy 800H, Temperature of 1200°F 434
Figure 21-25: Alloy 800H Hold Time Data (Creep Fatigue) for Alloy 800H, Temperature of 1526°F 435
Figure 22-1: Grade 12 Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature.....440
Figure 22-2: Grade 12 Yield Strength Vs. Temperature, By Data Source, Including Trend Curves..441
Figure 22-3: Grade 12 Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves 442
Figure 22-4: Grade 12 Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source).....443
Figure 22-5: Grade 12 Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source).....444
Figure 22-6: Grade 12 Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression.....445
Figure 22-7: Grade 12 Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression.....446
Figure 22-8: Grade 12 Creep Rupture Isotherm Curves, Temperatures With High Concentration of Data Points.....447
Figure 22-9: Grade 12 Creep Rupture Isotherm Curves for Additional and Intermediate Temperatures 448
Figure 22-10: Grade 12 Creep Strain Rate (MCR) Isotherm Curves, Temperatures With High Concentration of Data Points 449
Figure 22-11: Grade 12 Creep Ductility (% Elongation) Vs. Rupture Time Isotherms 450
Figure 22-12: Calculated Allowable Stresses Based on Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (Grade 12) 451
Figure 22-13: Comparison of Current Grade 12 Allowable Stresses Vs. ASME II-D Appendix 1 Criteria Applied to Data 452
Figure 22-14: Short-Term Strain Vs. Time data, up to 1,000 Hour Test Durations (Grade 12).....453
Figure 22-15: Medium-Term Strain Vs. Time Data, 1,000 to 25,000 Hour Test Durations (Grade 12) 454
Figure 22-16: Long-Term Strain Vs. Time Data, in Excess of 25,000 Hour Test Durations (Grade 12) 455
Figure 22-17: Continuous Cycling Fatigue Strain Range Data (Creep Fatigue) for Grade 12, Temperature of 70°F, 392°F, 572°F, and 752°F.....456

Figure 23-1: Grade 23 Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature....462
Figure 23-2: Grade 23 Yield Strength Vs. Temperature, By Data Source....463
Figure 23-3: Grade 23 Tensile Strength Vs. Temperature, By Data Source....464
Figure 23-4: Grade 23 Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....465
Figure 23-5: Grade 23 Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....466
Figure 23-6: Grade 23 Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....467
Figure 23-7: Grade 23 Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....468
Figure 23-8: Grade 23 Creep Rupture Isotherm Curves....469
Figure 23-9: Grade 23 Creep Strain Rate (MCR) Isotherm Curves....470
Figure 23-10: Grade 23 Creep Ductility (% Elongation) Vs. Rupture Time Isotherms....471
Figure 23-11: Calculated Allowable Stresses Based on Rupture Time and ASME II-D Appendix 1 Criteria (Grade 23)....472
Figure 23-12: Calculated Allowable Stresses Based on Creep Strain Rate and ASME II-D Appendix 1 Criteria (Grade 23)....473
Figure 23-13: Comparison of ASME II-D Appendix 1 Criteria Applied to Grade 23 Data....474
Figure 24-1: 3Cr Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature....480
Figure 24-2: 3Cr Yield Strength Vs. Temperature, By Data Source, Including Trend Curves....481
Figure 24-3: 3Cr Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves....482
Figure 24-4: 3Cr Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....483
Figure 24-5: 3Cr Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....484
Figure 24-6: 3Cr Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....485
Figure 24-7: 3Cr Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....486
Figure 24-8: 3Cr Creep Rupture Isotherm Curves, Temperatures With High Concentration of Data Points....487
Figure 24-9: 3Cr Creep Rupture Isotherm Curves for Additional and Intermediate Temperatures....488
Figure 24-10: 3Cr Creep Strain Rate (MCR) Isotherm Curves, Temperatures With High Concentration of Data Points....489
Figure 24-11: 3Cr Creep Strain Rate (MCR) Isotherm Curves for Additional and Intermediate Temperatures....490
Figure 24-12: 3Cr Creep Ductility (% Elongation) Vs. Rupture Time Isotherms....491
Figure 24-13: Calculated Allowable Stresses Based on Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (3Cr)....492
Figure 24-14: Comparison of Current 316H Allowable Stresses (Except Forgings) Vs. ASME II-D Appendix 1 Criteria Applied to Data....493
Figure 24-15: Short-Term Strain Vs. Time Data, (3Cr)....494
Figure 25-1: Type 410/12Cr Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature....500
Figure 25-2: Type 410/12Cr Yield Strength Vs. Temperature, By Data Source, Including Trend Curves....501
Figure 25-3: Type 410/12Cr Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves....502

Figure 25-4: Type 410/12Cr Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source) 503
Figure 25-5: Type 410/12Cr Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source) 504
Figure 25-6: Type 410/12Cr Yield Strength Ratios Vs. Temperature, All Combined data, With Polynomial Regression 505
Figure 25-7: Type 410/12Cr Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression 506
Figure 25-8: Type 410/12Cr Creep Rupture Isotherm Curves, Temperatures With High Concentration of Data Points.....507
Figure 25-9: Type 410/12Cr Creep Rupture Isotherm Curves for Additional and Intermediate Temperatures.....508
Figure 25-10: Type 410/12Cr Creep Strain Rate (MCR) Isotherm Curves, Temperatures With High Concentration of Data Points 509
Figure 25-11: Type 410/12Cr Creep Strain Rate (MCR) Isotherm Curves for Additional and Intermediate Temperatures 510
Figure 25-12: Type 410/12Cr Creep Ductility (% Elongation) Vs. Rupture Time Isotherms.....511
Figure 25-13: Calculated Allowable Stresses Based on Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (Type 410/12Cr).....512
Figure 25-14: Comparison of Current Type 410 Allowable Stresses (Plate & Forgings) Vs. ASME II-D Appendix 1 Criteria Applied to Data 513
Figure 25-15: Short-Term Strain Vs. Time Data, up to 2,500 Hour Test Durations (Type 410/12Cr), 1 of 2 514
Figure 25-16: Short-Term Strain Vs. Time Data, up to 2,500 Hour Test Durations (Type 410/12Cr), 2 of 2 515
Figure 25-17: Medium-Term Strain Vs. Time Data, 2,500 to 5,000 Hour Test Durations (Type 410/12Cr) 516
Figure 25-18: Long-Term Strain Vs. Time Data, up to 10,000 Hour Test Durations (Type 410/12Cr) 517
Figure 25-19: Long-Term Strain Vs. Time Data, 10,000 to 100,000 Hour Test Durations (Type 410/12Cr) 518
Figure 25-20: Long-Term Strain Vs. Time Data, in Excess of 100,000 Hour Test Durations (Type 410/12Cr) 519
Figure 25-21: Type 410/12Cr Continuous Cycling Fatigue (Type 410/12Cr), Including Room Temperature and Elevated Temperature Data.....520
Figure 25-22: Type 410/12Cr Continuous Cycling Fatigue Stress Amplitude Vs. Cycles to Failure Data 521
Figure 25-23: Type 410/12Cr Hold Time Data (Creep Fatigue) for Type 410/12Cr, Temperature of 950°F.....522
Figure 25-24: Type 410/12Cr Hold Time Data (Creep Fatigue) for Type 410/12Cr, Temperature of 1202°F.....523
Figure 26-1: 321H Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature.....528
Figure 26-2: 321H Yield Strength Vs. Temperature, By Data Source, Including Trend Curves 529
Figure 26-3: 321H Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves 530
Figure 26-4: 321H Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source).....531
Figure 26-5: 321H Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source).....532
Figure 26-6: 321H Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression.....533

Figure 26-7: 321H Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....534
Figure 26-8: 321H Creep Rupture Isotherm Curves, Temperatures With High Concentration of Data Points....535
Figure 26-9: 321H Creep Rupture Isotherm Curves for Additional and Intermediate Temperatures 536
Figure 26-10: 321H Creep Strain Rate (MCR) Isotherm Curves, Temperatures With High Concentration of Data Points....537
Figure 26-11: 321H Creep Strain Rate (MCR) Isotherm Curves for Additional and Intermediate Temperatures....538
Figure 26-12: 321H Creep Ductility (% Elongation) Vs. Rupture Time Isotherms....539
Figure 26-13: Calculated Allowable Stresses Based on Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (321H)....540
Figure 26-14: Comparison of Current 321H Allowable Stresses (Except Forgings) Vs. ASME II-D Appendix 1 Criteria Applied to Data....541
Figure 26-15: Short-Term Strain Vs. Time Data, up to 1,000 Hours (321H)....542
Figure 26-16: Short-Term Strain Vs. Time Data, 1,000 to 5,000 Hours (321H)....543
Figure 26-17: Short-Term Strain Vs. Time Data, 5,000 to 20,000 Hours (321H)....544
Figure 26-18: Short-Term Strain Vs. Time Data, in Excess of 20,000 Hours (321H)....545
Figure 26-19: Continuous Cycling Fatigue (321H), Including Room Temperature and Elevated Temperature Data....546
Figure 26-20: Hold Time Data (Creep Fatigue) for 321H, Temperatures of 1112°F....547
Figure 27-1: Alloy 601 Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature....553
Figure 27-2: Alloy 601 Yield Strength Vs. Temperature, By Data Source, Including Trend Curves 554
Figure 27-3: Alloy 601 Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves 555
Figure 27-4: Alloy 601 Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....556
Figure 27-5: Alloy 601 Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....557
Figure 27-6: Alloy 601 Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....558
Figure 27-7: Alloy 601 Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....559
Figure 27-8: Alloy 601 Creep Rupture Isotherm Curves....560
Figure 27-9: Alloy 601 Creep Strain Rate (MCR) Isotherm Curves....561
Figure 27-10: Alloy 601 Creep Ductility (% Elongation) Vs. Rupture Time Isotherms....562
Figure 27-11: Calculated Allowable Stresses Based on Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (Alloy 601)....563
Figure 27-12: Comparison of Current Alloy 601 Allowable Stresses Vs. ASME II-D Appendix 1 Criteria Applied to Data....564
Figure 28-1: Alloy 709 Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature....568
Figure 28-2: Alloy 709 Yield Strength Vs. Temperature, By Data Source, Including Trend Curves 569
Figure 28-3: Alloy 709 Tensile Strength Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....570
Figure 28-4: Alloy 709 Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....571
Figure 28-5: Alloy 709 Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....572

Figure 28-6: Alloy 709 Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....573
Figure 28-7: Alloy 709 Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....574
Figure 28-8: Alloy 709 Creep Rupture Isotherm Curves....575
Figure 28-9: Calculated Allowable Stresses Based on Rupture ASME II-D Appendix 1 Criteria (Alloy 709)....576
Figure 28-10: Presentation of Alloy 709 Data with ASME II-D Appendix 1 Criteria Applied....577
Figure 28-11: All Strain Vs. Time Data, Alloy 709....578
Figure 28-12: Alloy 709 Continuous Cycling Fatigue (Alloy 709) Elevated Temperature Data....579
Figure 28-13: Alloy 709 Hold Time Data (Creep Fatigue) for Alloy 709 at 1022°F, 1202°F, and 1382°F....580
Figure 29-1: B7 Bolting Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature....586
Figure 29-2: B7 Bolting Yield Strength Vs. Temperature, By Data Source, Including Trend Curves587
Figure 29-3: B7 Bolting Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves....588
Figure 29-4: B7 Bolting Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....589
Figure 29-5: B7 Bolting Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....590
Figure 29-6: B7 Bolting Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....591
Figure 29-7: B7 Bolting Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....592
Figure 29-8: B7 Bolting Creep Rupture Isotherm Curves, All Temperatures....593
Figure 29-9: B7 Bolting Creep Strain Rate (MCR) Isotherm Curves, All Temperatures....594
Figure 29-10: B7 Bolting Creep Ductility (% Elongation) Vs. Rupture Time Isotherms....595
Figure 29-11: Calculated Allowable Stresses Based on Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (B7 Bolting)....596
Figure 29-12: Comparison of Current B7 Bolting Allowable Stresses (2.5" < T < 4") Vs. ASME II-D Appendix 1 Criteria Applied to Data....597
Figure 29-13: B7 Bolting Continuous Cycling Fatigue (B7 Bolting), Including Room Temperature Data....598
Figure 29-14: B7 Bolting Continuous Cycling Fatigue (B7 Bolting), Including Room Temperature Data....599
Figure 29-15: B7 Bolting Hold Time Fatigue (B7 Bolting), Including Room Temperature Data (86°F)....600
Figure 29-16: B7 Bolting Hold Time Fatigue (B7 Bolting), Including Elevated Temperature Data (390°F)....601
Figure 30-1: B16 Bolting Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature....606
Figure 30-2: B16 Bolting Yield Strength Vs. Temperature, By Data Source, Including Trend Curves....607
Figure 30-3: B16 Bolting Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves....608
Figure 30-4: B16 Bolting Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....609
Figure 30-5: B16 Bolting Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....610

Figure 30-6: B16 Bolting Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....611
Figure 30-7: B16 Bolting Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....612
Figure 30-8: B16 Bolting Creep Rupture Isotherm Curves, All Temperatures....613
Figure 30-9: B16 Bolting Creep Strain Rate (MCR) Isotherm Curves, All Temperatures....614
Figure 30-10: B16 Bolting Creep Ductility (% Elongation) Vs. Rupture Time Isotherms....615
Figure 30-11: Calculated Allowable Stresses Based on Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (B16 Bolting)....616
Figure 30-12: Comparison of Current B16 Bolting Allowable Stresses (2.5" < T < 4") Vs. ASME II-D Appendix 1 Criteria Applied to Data....617
Figure 30-13: Short-Term Strain Vs. Time Data, up to 2,500 Hour Test Durations (B16 Bolting)....618
Figure 30-14: Long-Term Strain Vs. Time Data, in Excess of 2,500 Hour Test Durations (B16 Bolting)....619
Figure 30-15: B16 Bolting Hold Time Data (Creep Fatigue) for B16 Bolting, Temperature of 1022°F....620
Figure 31-1: B8 Bolting Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature....625
Figure 31-2: B8 Bolting Yield Strength Vs. Temperature, By Data Source, Including Trend Curves626
Figure 31-3: B8 Bolting Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves....627
Figure 31-4: B8 Bolting Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....628
Figure 31-5: B8 Bolting Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....629
Figure 31-6: B8 Bolting Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....630
Figure 31-7: B8 Bolting Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....631
Figure 31-8: B8 Bolting Creep Rupture Isotherm Curves, All Temperatures....632
Figure 31-9: B8 Bolting Creep Strain Rate (MCR) Isotherm Curves, All Temperatures....633
Figure 31-10: B8 Bolting Creep Ductility (% Elongation) Vs. Rupture Time Isotherms....634
Figure 31-11: Calculated Allowable Stresses Based on Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (B8 Bolting)....635
Figure 31-12: Comparison of Current B8 Bolting Allowable Stresses (.75" < T < 1") Vs. ASME II-D Appendix 1 Criteria Applied to Data....636
Figure 31-13: B8 Bolting Continuous Cycling Fatigue (B8 Bolting) Including Elevated Temperature Data....637
Figure 31-14: B8 Bolting Hold Time Fatigue (B8 Bolting) Including Elevated Temperature Data (752°F, 1100°F)....638
Figure 32-1: Grade 660 Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature....644
Figure 32-2: Grade 660 Yield Strength Vs. Temperature, By Data Source, Including Trend Curves645
Figure 32-3: Grade 660 Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves....646
Figure 32-4: Grade 660 Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....647
Figure 32-5: Grade 660 Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....648
Figure 32-6: Grade 660 Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....649

Figure 32-7: Grade 660 Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....650
Figure 32-8: Grade 660 Creep Rupture Isotherm Curves, Temperatures With High Concentration of Data Points....651
Figure 32-9: Grade 660 Creep Rupture Isotherm Curves for Additional and Intermediate Temperatures....652
Figure 32-10: Grade 660 Creep Strain Rate (MCR) Isotherm Curves, Temperatures With High Concentration of Data Points....653
Figure 32-11: Grade 660 Creep Strain Rate (MCR) Isotherm Curves for Additional and Intermediate Temperatures....654
Figure 32-12: Grade 660 Creep Ductility (% Elongation) Vs. Rupture Time Isotherms....655
Figure 32-13: Calculated Allowable Stresses Based on Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (Grade 660)....656
Figure 32-14: Comparison of Current Grade 660 Allowable Stresses (Bar) Vs. ASME II-D Appendix 1 Criteria Applied to Data....657
Figure 32-15: Short-Term Strain Vs. Time Data, up to 2,500 Hour Test Durations (Grade 660), 1 of 2....658
Figure 32-16: Short-Term Strain Vs. Time Data, up to 2,500 Hour Test Durations (Grade 660), 2 of 2....659
Figure 32-17: Medium-Term Strain Vs. Time Data, 2,500 to 5,000 Hour Test Durations (Grade 660)....660
Figure 32-18: Long-Term Strain Vs. Time Data, 5,000 to 10,000 Hour Test Durations (Grade 660)661
Figure 32-19: Long-Term Strain Vs. Time Data, 10,000 to 50,000 Hour Test Durations (Grade 660)....662
Figure 32-20: Long-Term Strain Vs. Time Data, In Excess of 50,000 Hour Test Durations (Grade 660)....663
Figure 32-21: Grade 660 Continuous Cycling Fatigue (Grade 660), Including Room Temperature and Elevated Temperature Data....664
Figure 32-22: Grade 660 Hold Time Data (Creep Fatigue) for Grade 660, Temperature of 1200°F .665
Figure 33-1: Inconel 718 Modulus (E_y), Thermal Conductivity (k), Thermal Diffusivity (TD), & Thermal Expansion (α) With Temperature....670
Figure 33-2: Inconel 718 Yield Strength Vs. Temperature, By Data Source, Including Trend Curves671
Figure 33-3: Inconel 718 Tensile Strength Vs. Temperature, By Data Source, Including Trend Curves....672
Figure 33-4: Inconel 718 Yield Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....673
Figure 33-5: Inconel 718 Tensile Strength Ratios Vs. Temperature (Calculated on a Heat-By-Heat Basis, By Data Source)....674
Figure 33-6: Inconel 718 Yield Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....675
Figure 33-7: Inconel 718 Tensile Strength Ratios Vs. Temperature, All Combined Data, With Polynomial Regression....676
Figure 33-8: Inconel 718 Creep Rupture Isotherm Curves....677
Figure 33-9: Inconel 718 Creep Strain Rate (MCR) Isotherm Curves....678
Figure 33-10: Inconel 718 Creep Ductility (% Elongation) Vs. Rupture Time Isotherms....679
Figure 33-11: Calculated Allowable Stresses Based on Rupture and Creep Strain Rate and ASME II-D Appendix 1 Criteria (Inconel 718)....680
Figure 33-12: Comparison of Current Inconel 718 Allowable Stresses Vs. ASME II-D Appendix 1 Criteria Applied to Data....681
Figure 33-13: Creep Strain Data for Inconel 718....682
Figure 33-14: Inconel 718 Continuous Cycling Fatigue Cycles to Failure Vs. Stress....683

Figure 33-15: Inconel 718 Continuous Cycling Fatigue Cycles to Failure Vs. Calculated Elastic Strain 684
Figure 33-16: Inconel 718 Hold Time Fatigue, Temperature of 1112°F.....685

FOREWORD

The goal of this publication is to organize and compile high-temperature material property data for select alloys, to be used in the ASME Boiler and Pressure Vessel Code. The authors acknowledge, with deep appreciation, the activities of ASME staff and volunteers who have provided valuable technical input, advice, and assistance with review of, commenting on, and editing of, this document.

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ABBREVIATIONS AND ACRONYMS

API – American Petroleum Institute
ASME – American Society of Mechanical Engineers
ASTM – American Society for Testing and Materials
BPVC – Boiler and Pressure Vessel Code
DBA – Design-By-Analysis
ECCC – European Collaborative Creep Committee
EPRI – Electric Power Research Institute
ISO – International Standards Organization
LM – Larson-Miller
LMP – Larson-Miller Parameter
MPC – Materials Properties Council
NASA – National Aeronautics and Space Administration
NIMS – National Institute of Material Science (Japanese)
NRIM – National Research Institute (Japanese)
NSMH – Nuclear Systems Materials Handbook
N&T – Normalized and Tempered
PRG – Peer Review Group
Q&T – Quenched and Tempered
STP – Standards Technology Publication
WRC – Welding Research Council

1 INTRODUCTION

E^2G | The Equity Engineering Group, Inc. was contracted by ASME Standards Technology, LLC (ASME ST-LLC) to compile high-temperature material property data for select alloys, to be used in the ASME Boiler and Pressure Vessel Code (BPVC). It is expected that the properties compiled in this project will be used to support continued and expanded use of elevated temperature design-by-analysis (DBA), to support initiatives such as advanced ultra-supercritical fossil power generation and Gen IV high-temperature nuclear reactor, among other applications. The data collected as part of this project will be utilized in Sections I, III, and VIII of the BPVC. During the course of this project, periodic milestones were shared with ASME for distribution and review by the project's Peer Review Group (PRG).

In 2012, ASME developed a materials properties database in support of the BPVC's development and maintenance. E^2G was contracted to update and modify this material property database for various materials. The goal of this project was to collect, interpret, qualify, analyze, and prepare elevated temperature material properties for various materials relevant to the BPVC. This unified effort is intended to ensure a baseline consistency between different parts of the BPVC and to leverage funds and resources to the maximum extent through avoidance of duplicate efforts.