## Processing Parameter Guidelines and Minimum Results - Typical Results Are Higher

### Procedure: 9-50 (J1)

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<tbody>
<tr>
<td>100.09</td>
<td>300 SS</td>
<td>N/A</td>
<td>850 (65)</td>
<td>N/A</td>
<td>N/A</td>
<td>0.0006&quot;</td>
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<tr>
<td>100.10</td>
<td>403, 410, 414, 416, 420, 422 &amp; 440 SS</td>
<td>20 - 51</td>
<td>850 (65)</td>
<td>N/A</td>
<td>N/A</td>
<td>0.004&quot;</td>
</tr>
<tr>
<td>100.12</td>
<td>403, 410, 414, 416, 420, 422 &amp; 440 SS</td>
<td>20 - 51</td>
<td>850 (65)</td>
<td>N/A</td>
<td>N/A</td>
<td>0.003&quot;</td>
</tr>
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<td>100.13</td>
<td>403, 410, 414, 416, 420, 422 &amp; 440 SS</td>
<td>20 - 51</td>
<td>850 (65)</td>
<td>N/A</td>
<td>N/A</td>
<td>0.002&quot;</td>
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### The Nitriding Temperature Range of Austenitic Stainless Steel is 700 - 1090°F, 1100°F Maximum**

- **100.09**
  - AHT Spec. #: 300 SS
  - As Rec. Hdn. (HRC*): N/A
  - Minimum Nitrided Surface Hdn. HV1 (HRC*): 850 (65)
  - Depth of Compound Zone (White Layer): N/A
  - Eff. Case Depth: N/A
  - Total Case Depth Min.: 0.0006"

### The Nitriding Temperature Range of Martensitic Stainless Steel is 975 - 1060°F, 1100°F Maximum**

- **100.20**
  - AHT Spec. #: 403, 410, 414, 416, 420, 422 & 440 SS
  - As Rec. Hdn. (HRC*): 20 - 51
  - Minimum Nitrided Surface Hdn. HV1 (HRC*): 850 (65)
  - Depth of Compound Zone (White Layer): N/A
  - Eff. Case Depth: N/A
  - Total Case Depth Min.: 0.004"

### The Nitriding Temperature Range of Ferritic Stainless Steel is 975 - 1040°F, 1100°F Maximum**

- **100.30**
  - AHT Spec. #: 405, 409, 429, 430, 434, 436 & 446 SS
  - As Rec. Hdn. (HRC*): 20 - 30
  - Minimum Nitrided Surface Hdn. HV1 (HRC*): 850 (65)
  - Depth of Compound Zone (White Layer): N/A
  - Eff. Case Depth: N/A
  - Total Case Depth Min.: 0.009"

### The Nitriding Temperature Range of Nitralloys is 900 - 1000°F, 1040°F Maximum

- **110.1**
  - Material: NIT 135M
  - As Rec. Hdn. (HRC*): 26 - 30
  - Minimum Nitrided Surface Hdn. HV1 (HRC*): 850 (65)
  - Depth of Compound Zone (White Layer): 0.0003-0.0004" 0.006" 0.012"
  - Eff. Case Depth: N/A
  - Total Case Depth Min.: 0.017"

### The Nitriding Temperature Range of 1008, 1010, 1020 Low Carbon Steels is 900 - 1080°F, 1100°F Maximum**

- **120.1**
  - Material: 1008, 1010, 1020
  - As Rec. Hdn. (HRC*): 20 or less
  - Minimum Nitrided Surface Hdn. HV1 (HRC*): 30-45
  - Depth of Compound Zone (White Layer): 0.0003-0.0006" 0.006" N/A
  - Eff. Case Depth: N/A
  - Total Case Depth Min.: N/A

### The Nitriding Temperature Range of 4140, 4142, 4145, 4330, 4340 Medium Carbon Steels is 900 - 1000°F, 1050°F Maximum**

- **130.1**
  - Material: 4140, 4142, 4145, 4330, 4340 or similar
  - As Rec. Hdn. (HRC*): 28 - 34
  - Minimum Nitrided Surface Hdn. HV1 (HRC*): 513 (50)
  - Depth of Compound Zone (White Layer): 0.0003-0.0005" 0.006" N/A
  - Eff. Case Depth: N/A
  - Total Case Depth Min.: N/A

### The Nitriding Temperature Range of High Nickel Alloy Steel is 1000 - 1300°F, 1350°F Maximum

- **140.1**
  - Material: Inconel 718
  - As Rec. Hdn. (HRC*): 30 - 40
  - Minimum Nitrided Surface Hdn. HV1 (HRC*): 595 (55)
  - Depth of Compound Zone (White Layer): N/A
  - Eff. Case Depth: N/A
  - Total Case Depth Min.: 0.0005"

### The Nitriding Temperature Range of Medium Carbon Steels is 900 - 1025°F, 1050°F Maximum**

- **150.1**
  - Material: 1035, 1040 & 1045 etc.
  - As Rec. Hdn. (HRC*): 20-34
  - Minimum Nitrided Surface Hdn. HV1 (HRC*): 50 HRC File Hard min.
  - Depth of Compound Zone (White Layer): 0.0001" min. N/A
  - Eff. Case Depth: N/A
  - Total Case Depth Min.: 0.010" min.

### The Nitriding Temperature Range of Hot Work Tool Steels is 970 - 1040°F, 1060°F Maximum

- **160.1**
  - Material: H-Series
  - As Rec. Hdn. (HRC*): 44 - 50
  - Minimum Nitrided Surface Hdn. HV1 (HRC*): 697 (60)
  - Depth of Compound Zone (White Layer): 0.0002-0.0004" N/A
  - Eff. Case Depth: N/A
  - Total Case Depth Min.: 0.008" min.

### The Nitriding Temperature Range of Tool Steels (A, D & CPM Series) is 900 - 930°F, 950°F Maximum

- **170.1**
  - Material: A, D & CPM Series
  - As Rec. Hdn. (HRC*): 60 - 65
  - Minimum Nitrided Surface Hdn. HV1 (HRC*): 697 (60)
  - Depth of Compound Zone (White Layer): 0.0000-0.0002" N/A
  - Eff. Case Depth: N/A
  - Total Case Depth Min.: 0.004" min.
### ULTRAGLOW® ION NITRIDING SPECIFICATIONS PROCEDURES MANUAL
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<tr>
<td>180.1</td>
<td>Ti &amp; α Alloys</td>
<td>N/A 700 HV0.01@0.0005&quot;</td>
<td>0.00005-0.00015&quot;</td>
<td>N/A</td>
<td>0.001&quot; min.</td>
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<td>180.2</td>
<td>α &amp; β Ti Alloys</td>
<td>N/A 700 HV0.01@0.0005&quot;</td>
<td>0.00005-0.00015&quot;</td>
<td>N/A</td>
<td>0.001&quot; min.</td>
<td></td>
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<tr>
<td>190.1</td>
<td>P Series</td>
<td>28 - 32 595 (55)</td>
<td>0.0002-0.0004&quot;</td>
<td>0.010&quot; min.</td>
<td>0.015&quot; min.</td>
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The Nitriding Temperature Range of Titanium and Titanium Alloys is 1295 - 1705°F, 1705°F Maximum

| 200.1       | 17-4PH | 30 - 40 697 (60) | 0.0000-0.0002" | 0.002" min. | N/A |
| 200.2       | 15-4Mo | 30 - 40 697 (60) | 0.0000-0.0002" | 0.004" min. | N/A |
| 200.3       | A286  | 25 - 45 697 (60) | 0.0000-0.0001" | 0.002" min. | N/A |

The Nitriding Temperature Range of Mold Steels is 930 - 980°F, 1010°F Maximum

| 210.1       | F-22 | 20 or less 595 (55) | 0.0001-0.0002" | 0.006" | 0.008" |

The Nitriding Temperature Range of Cast Materials for Forming Tools - Part A is 900 - 975°F, 1000°F Maximum

| 220.1       | Cast Mat Unalloyed Irons & Steels (Gray) | 20 - 40 513 (55) | 0.0004" min. | N/A | 0.004" |
| 220.2       | Ductile & Nodular | 20 - 40 513 (55) | 0.0002" min. | N/A | 0.004" |

The Nitriding Temperature Range of Alloy Steels for High-Temperature Service is 890 - 975°F, 1100°F Maximum

| 230.1       | Alloys Cast Iron & Steel (GM 190) | 22 - 35 595 (55) | 0.0002" min. | 0.004" | 0.010" |

The Nitriding Temperature Range of Cast Materials for Forming Tools - Part B is 900 - 975°F, 1000°F Maximum

| 240.1       | NAK 55 & 80 | 40 - 44 595 (55) | 0.0000-0.0002" | 0.005" | 0.012" |
| 240.2       | 1018, 1010, 1045 or similar not pre-hardened | 40 - 44 595 (55) | 0.0000-0.0002" | 0.003" | 0.006" |

The Nitriding Temperature Range of Tools Steels (A, D & CPM Series) is 840 - 900°F, 930°F Maximum

| 250.1       | M-2 | 55 - 60 865 (66) | 0.0000-0.0002" | 0.004" | 0.005" |
| 250.2       | 55 - 60 865 (66) | 0.0000-0.0001" | 0.003" | 0.004" |
| 250.3       | 62 - 65 865 (66) | 0.0000-0.0000" | 0.001" | 0.002" |

The Nitriding Temperature Range of Hot Work Die Steels is 930 - 970°F, 1050°F Maximum

| 260.1       | Finkl FX | 35 - 39 595 (55) | 0.0002-0.0005" | - | 0.020" |
| 260.2       | Finkl WF | 35 - 39 697 (60) | 0.0002-0.0005" | - | 0.010" |
| 260.3       | 30 - 35 595 (55) | 0.0002-0.0004" | - | 0.015" |

UltraGlow® II Oxide Treatment for Steels

| 270.1       | 4140, 4145, 4330, 4340 or similar | 28 - 34 50 HRC File Hard | 0.0003" min. | N/A | N/A |
| 270.2       | 1018, 1010, 1045 or similar not pre-hardened | 20 or less 50 HRC File Hard | 0.0003" min. | N/A | N/A |
| 270.3       | Stainless Steel | Refer to AHT 100 & 200 for proper UltraGlow® process |
| 270.4       | Mold Steels, P20 etc. | Refer to AHT 190 & 240 for proper UltraGlow® process |

*Equivalent HRC, typical

**Hardness should be measured with a light load portable hardness tester

***S-Phase, also referred to as supersaturated austenite, improved corrosion resistance

Note: Advanced Heat Treat Corp. can assign an AHT spec. # to your precise customer specifications