

## Customer Order Worksheet Instructions and Frequently asked Questions

### Tool & Die Work Sheet - Black

1. Please use 1 sheet per Alloy per hardness. Example: A2 for 60 - 62 R/C and A2 for 58 - 60 R/C are two different orders.
2. **If parts are Welded** - Please check 1 of the following boxes: Does not require Annealing or please anneal first.
3. The first group of Tool Steel Choices is for Hot Work Steels only. Please see the following table for an explanation of the 6 Hot Work hardening processes. Nadca is the North American Die Casting Association. [www.diecasting.org](http://www.diecasting.org).

Process	Typical Use	Die Builder Responsibility	Heat Treat Process	Reports Required	Tests Required
Nadca Class 1	Critical Use	<ol style="list-style-type: none"> <li>1. Attach Charpy Impact coupon to work piece per Nadca instructions.</li> <li>2. Drill a Thermo-couple hole per Nadca instructions.</li> <li>3. Qualify Steel prior to Heat Treat per Nadca instruc-</li> </ol>	Heat Treat per Steel Supplier & Nadca specs. This requires proper Austenizing temperature, and a 50°F per minute minimum cooling rate and a double temper.	Heat-Treater to supply Furnace Charts and a Certification.	Charpy impact coupon sent to qualified lab by Die Builder.
Nadca Class 2	Typical Nadca Die Cast usage	<ol style="list-style-type: none"> <li>1. Qualify Steel prior to Heat Treat per Nadca Instructions.</li> <li>2. Drill a Thermo-couple hole per per Nadca Instructions.</li> </ol>	Heat Treat per Steel Supplier & Nadca specs. This requires proper Austenizing temperature, and a 50°F per minute minimum cooling rate and a double temper.	Heat-Treater to supply Furnace Charts and a Certification.	None
Nadca Class 2 No Certs or Charts	Typical Nadca Die Cast usage	<ol style="list-style-type: none"> <li>1. Qualify Steel prior to Heat Treat per Nadca instructions.</li> <li>2. Drill a Thermo-couple hole per Nadca instructions.</li> </ol>	Heat Treat per Steel Supplier & Nadca specs. This requires proper Austenizing temperature, and a 50°F per minute minimum cooling rate and a double temper.	None	None
Ford AMTD- DC2010	Ford Die Cast specification	<ol style="list-style-type: none"> <li>1. Attach TWO oversized Charpy Impact coupons to work piece per Ford instructions.</li> <li>2. Drill a Thermo-couple hole per Ford Instructions.</li> <li>3. Qualify Steel prior to Heat Treat per Ford Instructions.</li> </ol>	Same as Nadca except quench rates are faster.	Heat-Treater to supply Furnace Charts and a Certification	Coupon to be tested by Ford qualified Lab.
GM DC- 9999-1	General Motors Die Cast specification	<ol style="list-style-type: none"> <li>1. Attach Charpy Impact coupons to work piece per GM instructions.</li> <li>2. Drill a Thermo-couple hole per GM Instructions.</li> <li>3. Qualify Steel prior to Heat Treat per GM instructions.</li> </ol>	Faster quench rates and typically higher austenizing temperatures.	Furnace charts and a certification.	Coupon to be tested by GM qualified Lab.
Not Aluminum Die Cast	Misc. Plastic, Extrusion or forging applications.	None	Quench speeds not critical.	None	None

### Generic Tool Steel FAQ's

1. If you mark that parts will be Edm'd or Coated after Heat Treat, we will try to go to secondary hardness on D2 steels or give A2 & S7 Steels a double temper. This helps avoid cracking issues during the subsequent processing of these steels.
2. Straightening: **Therm-Tech does NOT automatically straighten any parts since we charge for this.** You, the customer, must request this to be done. Therm-Tech feels it can successfully straighten any part with in .001" per inch of length. 28 inch long = straight within .028".