

# Tooling for Die Casting

## 13 Checklist for Die Casting Die Specifications To be used in consultation with your Die Caster

### Part 1 – New Die Casting Dies: Items to be Addressed

In the case of new die casting dies, all of the items in Part 1, below, should be reviewed. Note, in the case of tooling to be transferred to, or “inherited” by a die caster, the items asterisked (\*) in Part 1 should be addressed, plus the items noted in Part 2 on the next page.

<b>Type of New Die</b>	<input type="checkbox"/> Prototype Die Casting Die
	<input type="checkbox"/> Production Die Casting Die
<b>Cavity Steel*</b>	<input type="checkbox"/> H13 <input type="checkbox"/> Premium Grade H13 <input type="checkbox"/> Superior Grade H13 <input type="checkbox"/> Other Tool Steel: _____ NADCA No. 229 Certification Required: <input type="checkbox"/> Yes <input type="checkbox"/> No
<b>Cavity Steel Heat Treat*</b>	<input type="checkbox"/> Hardness Required: <input type="checkbox"/> Toughness Required: _____ ft.-lbs NADCA No. 229 Certification Required: <input type="checkbox"/> Yes <input type="checkbox"/> No
<b>Cored Holes*</b>	<input type="checkbox"/> All Holes Cored <input type="checkbox"/> Cored Holes As Noted On Print <input type="checkbox"/> No Cored Holes
<b>Die Operation for Part Features*</b>	<input type="checkbox"/> Mechanical Movement <input type="checkbox"/> Hydraulic Movement <input type="checkbox"/> Features To Be Achieved By Secondary Operations
<b>Estimated Part Volume</b>	Monthly: _____ Annual: _____ Expected Product Life: _____
<b>Casting Alloy*</b>	<input type="checkbox"/> Aluminum <input type="checkbox"/> Copper <input type="checkbox"/> Magnesium <input type="checkbox"/> Zinc <input type="checkbox"/> ZA: <input type="checkbox"/> ZA-8 <input type="checkbox"/> ZA-12 <input type="checkbox"/> ZA-27
<b>Casting Weight</b>	Estimated Casting Weight: _____
<b>As-cast Part Finish*</b>	<input type="checkbox"/> Mechanical Grade (Functional Finish) <input type="checkbox"/> Painting Grade <input type="checkbox"/> Highest Quality (Cosmetic Finish) For Plating, Etc.
<b>Class of Die</b>	<input type="checkbox"/> Unit Die <input type="checkbox"/> Single Cavity <input type="checkbox"/> Conventional Die <input type="checkbox"/> Multiple Cavity <input type="checkbox"/> Multiple Cavity - Family Die
<b>Cast-In Date Insert*</b>	<input type="checkbox"/> In Die Cavity <input type="checkbox"/> Other Requirements: _____ <input type="checkbox"/> Not Required
<b>Cast-In Part Number*</b>	<input type="checkbox"/> In Die Cavity <input type="checkbox"/> Other Requirements: _____ <input type="checkbox"/> Not Required

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### Checklist

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This two-part specification checklist is intended for use in consultation with your die caster prior to estimation of new die design and construction, or prior to die casting production using “inherited” tooling. It should be used in combination with checklists C-8-1 and C-8-2 in Commercial Practices, Section 8.

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## Checklist

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### Part 2 — New Die Casting Dies: Items to be Addressed (Continued)

<b>Cast-In Logo, Lettering*</b>	<input type="checkbox"/> In Die Cavity Include: _____	<input type="checkbox"/> Other _____
	<input type="checkbox"/> Customer Logo	<input type="checkbox"/> Cavity No.
	<input type="checkbox"/> Supplier Logo	<input type="checkbox"/> Revision No.
	<input type="checkbox"/> Recycling Logo	
<b>Die Layout</b>	<input type="checkbox"/> Customer to Approve Layout	
	<input type="checkbox"/> Approval by Die Caster	
<b>First-Piece Approval</b>	<input type="checkbox"/> Customer Approval Before Production Run Required	
	<input type="checkbox"/> Run on Die Caster Approval	
<b>Gages*</b>	<input type="checkbox"/> Customer to Supply Special Gages	
	<input type="checkbox"/> Die Caster to Supply Special Gages	
<b>Trim Die</b>	<input type="checkbox"/> Mechanical Movement	
	<input type="checkbox"/> Hydraulic Movement	
	<input type="checkbox"/> Features To Be Achieved By Secondary Operations	
<b>Machining Fixtures</b>	<input type="checkbox"/> No Secondary machining required	
	<input type="checkbox"/> Machining required, no special fixtures	
	<input type="checkbox"/> Special machining fixtures required, customer to supply	
	<input type="checkbox"/> Special machining fixtures required, die caster to supply	
<b>Special Items</b>	Special Items to be included in the tooling package: _____ _____	

### Part 3 — Inherited Die Casting Dies: Additional Items to be Addressed

In the case of inherited tooling, not the asterisked items (\*) in Part 1, plus the items below.

Note that with transferred, or "inherited," tooling for die casting production the existing die casting die, the trim die, and, if required, the secondary machining fixtures, must be available for review and evaluation to determine whether the dies and fixtures are capable of producing to specifications and the extent of maintenance and/or rework required before the onset of production. This would include any adaptations of the die caster's equipment to accommodate production using the inherited dies. Final production estimates will be based on this review.

<b>Inherited Die</b>	<input type="checkbox"/> Die Casting Die Available for Evaluation
	<input type="checkbox"/> Die to be Available for Evaluation (date): _____
<b>Inherited Trim Die</b>	<input type="checkbox"/> Trim Die Not Required
	<input type="checkbox"/> Trim Die Available for Evaluation
	<input type="checkbox"/> Trim Die to be Available for Evaluation (date): _____
<b>Inherited Machining Fixtures</b>	<input type="checkbox"/> Special Machining Fixtures Not Required
	<input type="checkbox"/> Machining Fixtures Available for Evaluation
	<input type="checkbox"/> Machining Fixtures to be Available for Evaluation (date): _____
<b>Actual Casting Weight</b>	Weight of Actual Casting: _____
<b>Size of Die</b>	Size of Casting Die (for equipment limitations): _____
<b>Weight of Die</b>	Weight of Casting Die (for crane limitations): _____
<b>Availability of Die Design</b>	<input type="checkbox"/> Yes
	<input type="checkbox"/> No

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# Tooling for Die Casting

## 14 Guidelines to Increase Die Life

### Before the start of tooling

- 1) *Redesign of part to reduce or eliminate sharp internal corners or features that will promote early cracking of the tool steel.*
- 2) *Use of special tool steels in areas where high wear is expected (increases tool costs).*
- 3) *Insert area's of cavity blocks for more economical replacement (may increase tool costs) after tool wear has occurred.*
- 4) *Do a surface treatment (shot blasting) to the tool steel to help reduce heat checking and cracking (adds to tool cost). Note: This will add a surface texture to the die cast part.*
- 5) *Add a vibratory, shot blast or deburring operation to the part to help extend tool life (added part cost).*
- 6) *Add a machining operation to remove heat checking and/or cracking in areas that are critical on the part (adds to part cost).*
- 7) *Reclaim the surface hardness, if possible, when it drops from the 40's HRC to the high 30's HRC.*

### Die Life Checklist

Class	Part Consideration
<b>A</b>	Critical to Function & Cosmetic
<b>B</b>	Cosmetic, No Function
<b>C</b>	Critical to Function
<b>D</b>	Not Critical but Functional
<b>E</b>	No Function

  

Class	Estimated Die Life/Shots
<b>1</b>	Less than 10,000
<b>2</b>	10,000 to 25,000
<b>3</b>	25,000 to 50,000
<b>4</b>	50,000 to 100,000
<b>5</b>	More than 100,000

*Using the above we will develop and itemize the areas of concern of a sample part.*

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**T-2-2-09**  
**Guideline**

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