# Fundamentals of Die Casting Design

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‘We are like dwarfs sitting on the shoulders of giants”

from The Metalogicon by John in 1159

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# NOMENCLATURE

| | |
|---|---|
| $\bar{R}$ | Universal gas constant, see equation (2.36), page 18 |
| $\ell$ | Units length., see equation (2.11), page 14 |
| $\rho$ | Density of the fluid, see equation (2.55), page 22 |
| $B$ | bulk modulus, see equation (2.62), page 22 |
| $B_f$ | Body force, see equation (2.19), page 15 |
| $c$ | Speed of sound, see equation (2.55), page 22 |
| $C_p$ | Specific pressure heat, see equation (2.33), page 17 |
| $C_v$ | Specific volume heat, see equation (2.32), page 17 |
| $E_U$ | Internal energy, see equation (2.13), page 15 |
| $E_u$ | Internal Energy per unit mass, see equation (2.16), page 15 |
| $E_i$ | System energy at state i, see equation (2.12), page 14 |
| $H$ | Enthalpy, see equation (2.28), page 17 |
| $h$ | Specific enthalpy, see equation (2.28), page 17 |
| $k$ | the ratio of the specific heats, see equation (2.34), page 18 |
| $M$ | Mach number, see equation (2.64), page 23 |
| $n$ | The poletropic coefficient, see equation (2.60), page 22 |
| $P$ | Pressure, see equation (2.57), page 22 |

$q$ Energy per unit mass, see equation (2.16), page 15

$Q_{12}$ The energy transferred to the system between state 1 and state 2, see equation (2.12), page 14

$R$ Specific gas constant, see equation (2.37), page 18

$S$ Entropy of the system, see equation (2.23), page 16

$U$ velocity , see equation (2.14), page 15

$w$ Work per unit mass, see equation (2.16), page 15

$W_{12}$ The work done by the system between state 1 and state 2, see equation (2.12), page 14

# The Book Change Log

## *Version 0.1.4*

### Nov 27, 2012 (1.9M 269 pages)

- Additional discussion on the economics chapter on.

## *Version 0.1.3*

### Nov 8, 2012 (1.9M 265 pages)

- Improvements to some of the figures of dimensional analysis chapter (utilizing blender).

- Add an analysis of the minimum cost ordering supply. The minimum cost ordering refers to the analysis dealing with the minimum cost achieved by finding the optimum number of ordering.

## *Version 0.1.2*

### April 1, 2009 (1.9M 263 pages)

- Irene Tan provided many English corrections to the dimensional analysis chapter.

## *Version 0.1.1*

### Feb 8, 2009 (1.9M 261 pages)

- Add Steve Spurgeon (from Dynacast England) corrections to $pQ^2$ diagram.