# Table of Contents

**Introduction**
An overview of the Troubleshooting Guide .................................. iii

**Chapter 1: Basic Procedures for Controlling Defects**
Some of the major operational practices required to reduce or eliminate defects .............................................. 1

**Chapter 2: Surface Defects**
Those commonly known as Cold Flows or Non-Fills ......................... 3

**Chapter 3: Laminations**
Defects from layers of metal forming during the process ....................... 7

**Chapter 4: Gas Porosity**
Internal porosity resulting from trapped gases of various kinds .......... 9

**Chapter 5: Blisters**
Surface manifestation of trapped gases ........................................ 11

**Chapter 6: Flow Porosity**
Surface or internal porosity arising from poor pressure conditions .......... 13

**Chapter 7: Shrink Porosity**
Porosity from volume changes as the metal changes state .................. 15

**Chapter 8: Heat Sinks**
Surface depressions resulting from shrinkage porosity ....................... 19

**Chapter 9: Leakers**
Porous sections of the casting .................................................. 21

**Chapter 10: Cracks**
Both visible and not-very-visible cracks in the casting ....................... 23

**Chapter 11: Inclusions**
Foreign material that may cause machining problems ...................... 27
Chapter 12: Solder
Buildup of cast material on the die, causing damage to the casting surface 29

Chapter 13: Carbon Buildup
Deposits other than cast material on the die, causing damage to the casting surface 31

Chapter 14: Erosion, Cavitation
Removal of die steel with subsequent deformation of the casting 33

Chapter 15: Outgassing
Gas escaping from the casting during painting or finishing operations, causing defective surface finish 35

Chapter 16: Edge Porosity
Porosity at the gates 37

Chapter 17: Bending, Warping
Deformation of the casting sometime after its formation in the die cavity 39

Chapter 18: Flash
Excessive cast material extending from a parting line, often accompanied by dimensional deviation 41

Chapter 19: Stained Castings
Discolored castings 43

Chapter 20: Waves and Lakes
Decorative castings with small imperfections visible only under reflective light 45

Chapter 21: Drags
Surface area of the casting is broken by metal stuck to the die 47

Chapter 22: Deformation from Ejector Pins
Casting is deformed by ejector pins 49

Chapter 23: Excessive Flux
Excessive corrosion or porosity from excessive flux 51

© Copyright 2003. All rights reserved.
No part of this guide may be reproduced by any means without written permission from the publisher.