HANDBOOK OF
MATERIALS MANAGEMENT
SECOND EDITION

P. GOPALAKRISHNAN
Ex. U.N. Advisor on Materials Management
Former Professor of Materials Management
Administrative Staff College of India Hyderabad
(Consultant J.N. Materials Management)

ABID HALEEM
Professor
Department of Mechanical Engineering
Faculty of Engineering and Technology
Jamia Millia Islamia
New Delhi

PHI Learning Private Limited
Delhi-110092
2015
Contents

Section 1
MATERIALS MANAGEMENT CONCEPTS

1. Integrated Materials Management .................................................. 3–8
   Scope of Materials Management ................................................. 3
   Materials Management—Some Aspects ........................................ 3
   Objectives of Materials Management ......................................... 6
   Approach and Organisational Chart ........................................... 6
   Organisational Interfaces ......................................................... 8

2. Supply Chain Management ......................................................... 9–15
   Supply Chain Management and Materials Management—A to Z Aspects ........................................... 9
   Concept of SCM .................................................................. 9
   Effectiveness of SCM ............................................................ 10
   SCM and Vendor Managed Inventory Issues ........................... 10
   Global SCM ....................................................................... 11
   Benefits of Outsourcing in SCM ............................................. 11
   Challenges of Outsourcing in SCM ....................................... 12
   Concerns of Supply Chain Managers ..................................... 12
   SCM Details ......................................................................... 13
   Enterprise Resource Planning (ERP) Parameters ................... 13
   SCM—Training A to Z ......................................................... 14
3. **Business Logistics**.............................................................................................................. 16–25
   - Concept of Logistics  16
   - Physical Distribution  16
   - Logistics—Steps and Techniques  17
   - Logistics—Relevance  18
   - Road Mode  18
   - Rail Mode Traffic  20
   - Air Mode and Role of ATC  21
   - Training in Business Logistics  21
   - Shipping—A to Z Issues  22
   - Containerisation  24
   - Logistics Crisis Management  24

4. **Role of Top Management and Materials Management**................................................... 26–27
   - Corporate Goals  26
   - SWOT Analysis  26

5. **User Interface of Materials Management**........................................................................ 28–33
   - Role of Materials Management  28
   - Organisation of Materials Management  28
   - Decentralised Organisation—A to Z  29
   - Materials Management—Interfaces with other Departments  30
   - Materials Management User Exchanges—A to Z  31
   - User—Materials Management—A to Z Issues  32

6. **Financial Interface of Materials Management**.................................................................. 34–37
   - Role of Finance—A to Z Role  34
   - Inflation and Materials Management  36
   - Materials Budget  36
   - Budgetary Control  36

7. **Forecasting and Materials Management**........................................................................ 38–54
   - Uses of Forecasts  38
   - Accuracy of Forecasts  39
   - 7S Approach and SWOT  39
   - Forecasting—A to Z  39
   - Time Series and Trend  41
   - Moving Average  42
   - Exponential Smoothing  42
   - Input-Output Index  43
   - Correlation-Regression  43
   - Regression Examples  45
   - Forecasting by Trend  46
   - Exponential Smoothing  47
Uncertainties 50
Dynamic Programming 50
Bull Whip Effect 53

8. Materials Intelligence ................................................................................................. 55–61
Introduction 55
Materials Intelligence Concept 56
Materials Intelligence Objectives—A to Z 56
Internal Information—A to Z Aspects 57
External Information—A to Z Aspects 58
Intelligence Techniques—A to Z 60

Decision Making and Budgeting 62
Decision 62
Programmed and Non-programmed Decisions 62
Bill of Materials (BOM) 63
BOM—Guidelines 64
Budgeting Forum 65
Budgetary Control—Concepts A to Z 66
Performance Budget 67

10. Production Planning and Control (PPC) .................................................................. 68–79
Production Planning and Control and Materials Management 68
Scheduling A to Z 69
Flow Charts 70
Optimum Lot Size 71
Job Production 73
Techniques of PPC 73
Line of Balance (LOB) and Gant Chart 74
Bill of Material (BOM) Material Resource Planning Schedule (MRPS) 75
Level Scheduling 75
Process Planning: What/Why/How 76
Process Type Plant Layout 76
Computer Aided Process Planning (CAPP) 78

11. Manufacturing Strategies and Materials Management ........................................... 80–86
Manufacturing Strategies 80
Strategic Decision Making Aspects 80
Strategic Reorientation 81
Technological Innovation 82
Design and Development 82
Process Engineering 83
Technology and Labour Unions 83
Reconditioning Strategy 84
Repair and Replacement 85
Insulation Monitoring 85
Level Monitoring 86
Speed Monitoring 86
Temperature Monitoring 86

SECTION II
IDENTIFICATION OF MATERIALS

12. Identification by Codification ................................................. 89–96
   Advantages of Codification 89
   Variety Reduction 90
   Brisch and Kodak Systems 91
   Check Digit for Cataloguing 91
   Codification—Methodology Properties 92
   Benefits of Codes 93
   National and International Codification 94
   Design of Codification Digits 94
   Codification Structure 95
   Significance of Digits 95
   Problem Areas 96

   Bar Codes Aspects—A to Z 97
   Bar Code Terminology—A to Z 98
   Types of Scanners Readers 100
   Non-Contact Readers 103
   Bar Code Applications 103

   A to Z Benefits of Standardisation 106
   Simplification and Standardisation 107
   Process of Standardisation 108
   Items to be Standardisation 108
   Methods of Standardisation 109
   Road Blocks 109
   Standardisation in India 109
   Concept of Standardisation 110
   Preferred Number Series 111
   Variety Reduction Examples 112
   Standardisation and A to Z Benefits 113
   Standards and Quality 154
   Professional Approach 114
   Guidelines and Controls of Standards—A to Z 115
15. **Radio Frequency Identification (RFID)** ................................................................. 118–123
   
   Introduction 118  
   RFID v/s Barcoding 119  
   Major Benefits of RFID Technologies 119  
   Transformation of Supply Chain through RFID—Major Issues 120  
   Tracking Management 121  
   Warehouse Management 122  
   Yard Management 122  

**SECTION III**  
**INVENTORY MANAGEMENT**  

16. **Inventory Fundamentals** ...................................................................................... 127–134  

   Significance of Inventory 127  
   Inventory Goals—A to Z 127  
   Transaction Motive 130  
   Precaution 130  
   Speculative Motive 131  
   Decoupling Concept 131  
   Organisation of Inventory 131  
   Concept of Operating Cycle 132  
   Levels of Inventory 132  

17. **ABC Analysis—The I Step** ...................................................................................... 135–141  

   What is ABC Analysis 135  
   A to Z Benefits of ABC Analysis 135  
   ABC Example 139  
   Limitations of ABC Analysis 141  

18. **Multi Unit Selective Inventory Control—Three Dimension (MUSIC–3D)** .......... 142–147  

   80/20 Rule Examples 142  
   Limitations of ABC Analysis 142  
   XYZ Analysis 143  
   HML Analysis 143  
   FSN Movement Analysis 144  
   VEIN/VED Criticality Criteria 144  
   GOLF/SDE/SOS Availability 144  
   Cost Criticality Availability—A to Z Benefits 145  
   MUSIC–3D—Cost Reduction 145  
   MUSIC–3D—A to Z Benefits 147  

19. **RBI Guidelines on Inventories** ............................................................................. 148–151  

   Tandon Committee—A to Z Issues 148  
   Implications to Users 151
20. **Economic Order Quantity (EOQ)** ................................................................. 152–159
    - Classification of Inventory—A to Z ......................................................... 152
    - Arriving Optimum Inventory ................................................................. 154
    - Assumptions for EOQ ............................................................................. 155
    - Derivation of EOQ ................................................................................... 156
    - Inventory versus Sales ........................................................................... 156
    - Sensitivity and Staggering ....................................................................... 157
    - Inputs for EOQ ........................................................................................ 157
    - Implementing EOQ .................................................................................. 159

21. **Practical P&Q Inventory Models** ............................................................. 160–163
    - Practical Systems—A to Z Aspects .......................................................... 160
    - Periodic Review System/(Desired Inventory Level) DIL ......................... 162
    - Comparison of Q and P Systems .............................................................. 163
    - System/Optional Replenishment System .................................................. 163

22. **Material Requirement Planning (MRP)** .................................................. 164–170
    - Material Requirement Planning ............................................................... 164
    - MRP Inputs and Outputs—A to Z ............................................................. 164
    - Production Planning ................................................................................ 166
    - Bill of Materials (BOM) ......................................................................... 166
    - Gozinto Matrix ....................................................................................... 167
    - Advantages of Bill of Materials (BOM) ..................................................... 167
    - Use of Past Consumption Data ................................................................. 167
    - Gantt Chart .............................................................................................. 168
    - Line of Balance Technique (LOB) ............................................................ 168
    - Theory of Constraints ............................................................................. 170

23. **Inventory under Uncertainty** .................................................................. 171–175
    - Classification of Inventory Problems ...................................................... 171
    - Uncertainty in Inventory ........................................................................ 171
    - Rationality Principle ................................................................................ 173
    - Minimax Principle ................................................................................... 173
    - Maximax Principle ................................................................................... 174
    - Principle of Optimum .............................................................................. 174
    - Regret Principle ...................................................................................... 174

24. **Just-in-Time (JIT)** ..................................................................................... 176–197
    - JIT Principles ........................................................................................... 176
    - Zero Inventory/ZIN System ..................................................................... 177
    - The Philosophy of JIT .............................................................................. 177
    - JIT Basic Tenets—A to Z .......................................................................... 179
    - Vendor-Managed Inventory (VMI) ............................................................. 182
    - JIT’s Key Elements .................................................................................. 182
    - Kanban Control ....................................................................................... 184
Handbook Of Materials Management

Publisher: PHI Learning
ISBN: 9788120348011
Author: P. Gopalakrishnan, Abid Haleem

Type the URL: http://www.kopykitab.com/product/7573

Get this eBook