

Contents

1 Materials – testing – further treatment and properties

Forms of supply – Specification – The tensile test –
Hardness testing – The impact test – Tests on sheet metal –
Work-hardening – High-speed steel – Alloy steels
Non-ferrous material developments – Alloy cast irons 1

2 Primary and contributory processes

Welding – Fusion welding – Oxy-acetylene welding –
Electric-arc welding – Special arc-welding processes –
Resistance welding – Oxy-acetylene cutting – Horizontal
forging and heading – Precision investment casting –
Other precision casting methods – Die casting 59

3 Contributory processes

Presswork – Blanking and piercing – Bending – Drawing –
Coining and forming – Extrusion – The moulding of
plastics – Sintered metal component production 109

4 Metal cutting and machining

Cutting action – Machineability – Sintered-carbide tools –
Diamond turning and boring – Ceramic tools – Electro-
erosion machining – Ultrasonic machining – Electrochemical
machining – Chemical milling – Surface texture 168

5 Measurement and inspection

The standard of length – Measurement and comparison of
length – Plane, angular and linear examination – Comparison
of heights and parallelism – Angular and division testing –
The toolmaker's microscope – Inspection and control on
the machine 236

6 Further consideration of the lathe and the milling machine

The toolroom lathe – The relieving lathe – Screwcutting –
The milling machine 289

7 Capstan and turret lathes. The copy-turning lathe	
Capstan lathe–Combination turret lathe–Bar (or hexagon) turret lathe–Machine details–Tools and equipment–Planning the work of capstan and turret lathes–The copy-turning lathe	334
8 Miscellaneous machine-tool processes	
Jig-boring–Broaching–Toolmaking and die-sinking machines–Centreless grinding	373
9 Jigs and fixtures	
General design principles–Drilling jigs–Milling fixtures–Turning and boring fixtures–Assembly fixtures–Air-operated fixtures	423
10 Screwthread production and measurement	
Screwthread production–Thread shapes and accuracy–Screwthread inspection–Screwthread limits and tolerances	461
11 Spur gears and their production	
Gear forms–Gear cutting–Gear-cutting processes–Measurement and testing of gears	507
12 Automatic machining	
Hopper feed–Automatic turning–Transfer machining	546
13 The numerical control of machine tools	
Control of the NC machine tool–Drive systems and measuring systems for the displacement of slides–NC machine tools and NC equipment–Optimisation of output–Programming	592
Conclusion	652

Appendices

- | | |
|--|-----|
| 1 British Standard specification for steel castings for general engineering purposes | 653 |
| 2 ISO metric screwthreads: coarse-pitch series | 660 |
| 3 Approximate actual sizes of gear teeth | 664 |
| 4 Determination of approximate correction factor for addenda of gear teeth to avoid interference | 665 |

Index	669
--------------	-----