

The Complete Technology Book on Aluminium and Aluminium Products

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Aluminium, the second most plentiful metallic element on the earth, became an economic competitor in engineering applications as recently as the end of 19th century. It was become a metal for its time. Aluminium possesses many characteristics that make it highly compatible with recycling. It is resistant to corrosion and it thus retains a high level of metal value after use, exposure, or storage. Once produced, it can be considered a permanent resource for recycling, preferably in to similar products. It is essentially a soft and weak metal which has to be strengthened by alloying with suitable elements. The elements which are added to aluminium in appreciable quantities to increase its strength and improve other properties are surprisingly limited to only four, namely, magnesium, silicon, copper and zinc. These are added singly or in combination. It is theoretically 100% recyclable without any loss of its natural qualities. It is the most widely used non ferrous metal. The applications of aluminium are grown in many fields for example; electric conductors, windows and building components, aircraft, foil packaging etc. It has a major role in packaging industry especially in pharmaceuticals. It includes different types of packaging; unit packaging, bunch wrapping, strip packaging, thermoformed unit packaging and sachets Aluminium alloys with a wide range of properties are used in engineering structures. Aluminium alloys are divided into two major categories; casting compositions and wrought compositions. Further differentiation for each category is based on the primary mechanism. The most commercially mined aluminium ore is bauxite, as it has the highest content of the base metal. The primary aluminium production process consists of three stages. First is mining of bauxite, followed by refining of bauxite to alumina and finally smelting of alumina to aluminium. India has the fifth largest bauxite reserves with deposits 5% of world deposits. Indian share in world aluminium capacity rests at about 3%; it will touch almost 13% to 15% of the growth rate.

This book basically deals with aluminium production, heat treatable and non heat treatable alloys, properties of cast aluminium alloys, testing of liquid & solidification contraction of aluminium alloys, trends in the improving economic use of aluminium, laboratory investigation of carbon anode consumption in the electrolytic production of aluminium, alumina extraction from a pennsylvania diaspore clay by an ammonium sulfate process, the recovery of alumina from its ores by a sulfuric acid process, initial softening in some aluminium base precipitation hardening alloys, basic properties of aluminium foil, how to select a flexible foil packaging laminate, printing on aluminium foil, designing aluminium foil packs etc.

The present book covers the need within the industrial and academic communities for up to date information about production of aluminium and extrusion process due to the ever increasing use of this technology. The book provides concepts in the different areas of extrusion

technology. It is hoped that its presentation will be very helpful to new entrepreneurs, technocrats, research scholars, libraries and existing units.

1. GENERAL INTRODUCTION

- Aluminium Production
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- Aluminium Alloys
- Heat-Treatable and Non-heat-Treatable Alloys
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- Engineered Products
- Finishes
- Mechanical Finishes
- Chemical Finishes
- Electrolytic Finishes
- Non-Electrolytic Coatings
- Product Classifications
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- Transportation
- Electrical Applications
- Consumer Durables
- Machinery and Equipment
- Other Applications

2. PROPERTIES OF CAST ALUMINIUM ALLOYS

201.0

4.6Cu-0.7Ag-0.35Mn-
0.35Mg-0.25Ti

- Commercial Names
- Specifications
- Chemical Composition
- Applications
- Mechanical Properties
- Mass Characteristics
- Thermal Properties
- Electrical Properties
- Fabrication Characteristics

204.0

4.6Cu-0.25Mg-0.17Fe-0.17Ti

- Commercial Name
- Applications
- Mechanical Properties

206.0, A206.0

4.5Cu-0.30Mn-0.25Mg-0.22Ti

- Specifications
- Chemical Composition
- Applications
- Mechanical Properties
- Mass Characteristics
- Thermal Properties

Electrical Properties
Chemical Properties
Fabrication Characteristics
208.0
4Cu-3Si
Commercial Names
Specifications
Chemical Composition
Applications
Mechanical Properties
Mass Characteristics
Thermal Properties
Electrical Properties
Fabrication Characteristics
238.0
10.0%Cu-4.0%Si-0.3%Mg
Commercial Names
Specifications
Applications
242.0
4Cu-2Ni-2.5Mg
Commercial Names
Specifications
Chemical Composition
Applications
Mechanical Properties
Mass Characteristics
Electrical Properties
Thermal Properties
Fabrication Characteristics
295.0
4.5Cu-1.1Si
Commercial Names
Specifications
Chemical Composition
Applications
Mechanical Properties
Mass Characteristics
Thermal Properties
Electrical Properties
Fabrication Characteristics
296.0
4.5Cu-2.5Si
Commercial Names
Specifications
Chemical Composition
Applications
Mechanical Properties
Mass Characteristics
Thermal Properties
Electrical Properties
Fabrication Characteristics
308.0

5.5Si-4.5Cu

Commercial Names

Specifications

Chemical Composition

Applications

Mechanical Properties

Mass Characteristics

Thermal Properties

Electrical Properties

Fabrication Characteristics

319.0

6Si-3.5Cu

Commercial Names

Specifications

Chemical Composition

Applications

Mechanical Properties

Mass Characteristics

Thermal Properties

Electrical Properties

Fabrication Characteristics

332.0

9.5%Si-3.0%Cu-1.0%Mg

Commercial Names

Specifications

Applications

Mechanical Properties

336.0

12Si-2.5Ni-1Mg-1Cu

Commercial Names

Specifications

Chemical Composition

Applications

Mechanical Properties

Mass Characteristics

Thermal Properties

Electrical Properties

Fabrication Characteristics

339.0

12.0%Si-1.0%Ni-1.0%Mg-2.25%Cu

Commercial Names

Applications

354.0

9Si-1.8Cu-0.5Mg

Commercial Name

Specifications

Chemical Composition

Applications

Mechanical Properties

Mass Characteristics

Thermal Properties

Fabrication Characteristics

355.0, C355.0

5Si-1.3Cu-0.5Mg

Specifications

Chemical Composition

Applications

Mechanical Properties

Mass Characteristics

Thermal Properties

Electrical Properties

Fabrication Characteristics

356.0, A356.0

7Si-0.3Mg

Specifications

Chemical Composition

Applications

Mechanical Properties

Mass Characteristics

Thermal Properties

Electrical Properties

Radiation Effect on Properties

Fabrication Characteristics

357.0, A357.0

7Si-0.5Mg

Specifications

Chemical Composition

Applications

Mechanical properties

Mass Characteristics

Thermal Properties

Fabrication Characteristics

359.0

9Si-0.6Mg

Specifications

Chemical Composition

Applications

Mechanical Properties

Mass Characteristics

Thermal Properties

Fabrication Characteristics

360.0, A360.0

9.5Si-0.5Mg

Specifications

Chemical Composition

Applications

Mechanical Properties

Mass Characteristics

Thermal Properties

Electrical Properties

Fabrication Characteristics

380.0, A380.0 8.5Si-3.5Cu

Specifications

Chemical Composition

Applications

Mechanical Properties

Mass Characteristics
Thermal Properties
Electrical Properties
Fabrication Characteristics

383.0

10.5Si-2.5 Cu

Specifications
Chemical Composition
Applications

Mechanical Properties

Mass Characteristics
Thermal Properties
Electrical Properties
Fabrication Characteristics

384.0, A384.0

11.2Si-3.8Cu

Specifications
Chemical Composition
Applications

Mechanical Properties

Mass Characteristics
Thermal Properties
Electrical Properties
Fabrication Characteristics

390.0, A390.0

17.0Si-4.5Cu-0.6Mg

Specifications
Chemical Composition
Applications

Mechanical Properties

Mass Characteristics
Thermal Properties
Electrical Properties
Fabrication Characteristics

413.0, A413.0

12Si

Commercial Names
Specifications
Chemical Composition
Applications

Mechanical Properties

Mass characteristics
Thermal Properties
Electrical Properties
Fabrication Characteristics

443.0, A443.0, B443.0, C443.0

5.2Si

Commercial Names
Specifications
Chemical Composition
Applications

Mechanical Properties

Mass Characteristics

Thermal Properties
Electrical Properties
Fabrication Characteristics
514.0
4Mg
Commercial Names
Specifications
Chemical Composition
Applications
Mechanical Properties
Mass characteristics
Thermal properties
Electrical properties
Fabrication Characteristics
518.0
8Mg
Commercial Names
Specifications
Chemical Composition
Applications
Mechanical Properties
Mass characteristics
Thermal Properties
Electrical Properties
520
10Mg
Commercial Names
Specifications
Chemical Composition
Applications
Mechanical Properties
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Thermal Properties
Electrical Properties
Fabrication Characteristics
535.0, A535.0, B535.0
7Mg
Commercial Names
Specifications
Chemical Composition
Applications
Mechanical Properties
Mass Characteristics
Thermal Properties
Electrical Properties
Chemical Properties
Fabrication Characteristics
712.0
5.8Zn-0.6Mg-0.5Cr-0.2Ti
Commercial Names
Specifications
Chemical Composition
Applications

Mechanical Properties
Mass Characteristics
Thermal Properties
Electrical Properties
Fabrication Characteristics

713.0

7.5Zn-0.7Cu-0.35Mg

Commercial Names

Specifications

Chemical Composition

Applications

Mechanical Properties

Mass Characteristics

Thermal Properties

Electrical Properties

Chemical Properties

Fabrication Characteristics

771.0

7Zn-0.9Mg-0.13Cr

Commercial Names

Specifications

Chemical Composition

Applications

Mechanical Properties

Mass Characteristics

Thermal Properties

Electrical Properties

Fabrication Characteristics

850.0

6.2Sn-1Cu-1Ni

Commercial Names

Specifications

Chemical Composition

Applications

Mechanical Properties

Mass Characteristics

Thermal Properties

Electrical Properties

Fabrication Characteristics

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Phosphate
Recycling Operations
Digestionâ€™Modification
Reduction
Hydrolysisâ€™Calcination
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Our Detailed Project report aims at providing all the critical data required by any entrepreneur vying to venture into Project. While expanding a current business or while venturing into new business, entrepreneurs are often faced with the dilemma of zeroing in on a suitable product/line.

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