

==== MATERIALS TECHNOLOGY ====

===== PUBLICATIONS =====

71 Chalk Hill, Watford WD19 4DA, UK. Tel: +44 1923 237910 Fax: +44 1923 211510 Internet: www.mat-tech.co.uk

THE NON-METALLURGICAL BAUXITE AND ALUMINA INDUSTRY WORLDWIDE

A MARKET / TECHNOLOGY REPORT

By Ted Dickson, *TAK Industrial Minerals*

ISBN 1 871677 62 9 (Published February 2011)

The report provides in-depth information on:

- Detailed information on production, consumption, imports and exports for non-metallurgical bauxite and alumina worldwide, including up-to-date statistical data presented in tables, and in-depth analysis of the current and potential markets
- Full listing of metallurgical and non-metallurgical bauxite and alumina mines and refineries worldwide, including annual quantities mined and processed, and location of mines and plants
- Market status and production levels for non-metallurgical bauxite (raw and calcined) for refractories, abrasives, chemicals, cement, etc.
- Market status and production levels for non-metallurgical alumina (calcined, fused, tabular, high purity) for refractories, abrasives, advanced and traditional ceramics, catalysts, absorbents, etc.
- Review of aluminium trihydrate (ATH) markets, including chemicals, flame retardants, fillers and additives, and potential for market development
- Specifications for commercially available non-metallurgical alumina and bauxite grades
- Trends in prices, both current and forecast
- Technical developments in non-metallurgical bauxite and alumina processing and products
- Profiles of major companies in the non-metallurgical bauxite and alumina sector, including current status and financial results
- Analysis of overall markets for non-metallurgical bauxite and alumina and the drivers that influence them
- Over 100 tables and charts

Now available - "*The Non-Metallurgical Bauxite and Alumina Industry Worldwide*", a new market report that analyses the current position and future prospects for this important industry and its end-user applications worldwide.

Over 200 pages long and featuring more than 100 tables and charts of statistical data, the report updates and extends information presented in previous editions and assesses the effects of the recent economic downturn and the recovery that is already well underway across the industry (with record sales for alumina in 2010). The report is written by Ted Dickson, an industrial minerals consultant who is an acknowledged expert in the bauxite and alumina industry.

Total production of bauxite in 2009 was 201 million tonnes, a decline of about 2% over record high levels in 2008 but still an increase of 29% since 2004 and an increase of 55% over the last decade. Total production of bauxite in 2010 is estimated to have been 215 million tonnes, with much of the growth due to strong demand in China. More than 95% of raw bauxite is for use in the production of aluminium, with the remaining amount used in non-metallurgical applications, equalling about 8.0 million tonnes in 2010 and about 7.0 million tonnes in 2009, down from a peak of around 10 million tonnes in 2008.

The non-metallurgical applications are primarily in the refractories, abrasives, cement and chemicals industries. These different consuming sectors have had mixed fortunes in recent years. Some, such as water treatment chemicals, which use alumina trihydrate (ATH), have remained quite stable whereas the refractories and abrasives sectors have experienced sharply reduced markets, although these are now recovering.

Growth in the markets for raw bauxite in direct non-metallurgical applications is expected to be 3-4% a year, in such products as slag conditioners, cement and alumina-based chemicals. In recent years there has been considerable concern about the availability and price of calcined bauxite – used in refractories and abrasives – a situation that has arisen because of restricted supply from China.

Refractory grade calcined bauxite growth is determined largely by growth in the steel industry and is expected to be about 4% a year over the period 2011-2012, providing world economies continue to recover. Abrasive grade calcined bauxite is largely used to make brown fused alumina (BFA), but it is also used in applications such as proppants. Growth rates for abrasive grade calcined bauxite are expected to be about 3-4% a year (with a slightly higher growth rates for China). Proppants will also experience good growth rates due to the very large growth in shale gas production requiring hydraulic fracturing of the rocks.

Total production of alumina in 2008 was about 83 million tonnes, of which about 6 million tonnes was for non-metallurgical applications. The situation changed considerably in 2009, with particular declines in sectors such as refractories in the early part of the year. A recovery in the European markets began in the third quarter of 2009, with double digit increases. On a worldwide basis, sales of non-metallurgical grades of alumina had completely recovered by the second quarter of 2010. By the third quarter of 2010, sales reached a record level of 1.53 million tonnes, exceeding the previous peak of 1.42 million tonnes achieved in the third quarter of 2008. Longer term growth rates for non-metallurgical alumina are likely to be on the order of 3% a year, although there may be higher growth rates in certain sectors, such as refractories and ceramics.

TABLE OF CONTENTS

1 EXECUTIVE SUMMARY

2 INTRODUCTION

3 NON-METALLURGICAL BAUXITE AND ALUMINA: MINING AND PROCESSING

- 3.1 Metallurgical grade bauxite and alumina
- 3.2 Non-metallurgical grade bauxite and alumina
 - 3.2.1 Calcined bauxite
 - 3.2.2 Brown fused alumina
 - 3.2.3 White fused alumina
 - 3.2.4 Calcined alumina
 - 3.2.5 Tabular alumina
 - 3.2.6 Activated alumina
 - 3.2.7 Aluminium hydroxide
 - 3.2.8 Product specifications - bauxite
 - 3.2.8.1 Raw bauxite
 - 3.2.8.2 Calcined bauxite
 - 3.2.8.3 Alumina grades
 - 3.2.8.3.1 Alumina trihydrate
 - 3.2.8.3.2 Calcined alumina
 - 3.2.8.3.3 Fused alumina
 - 3.2.8.3.4 Tabular alumina

4 NON-METALLURGICAL BAUXITE AND ALUMINA MARKETS

- 4.1 Non-metallurgical bauxite production by country / region
 - 4.1.1 China
 - 4.1.2 Guyana
 - 4.1.3 Brazil
 - 4.1.4 India
 - 4.1.5 Europe
 - 4.1.6 Rest of the world
- 4.2 Markets for non-metallurgical bauxite by product type
 - 4.2.1 Raw bauxite
 - 4.2.1.1 Portland cement
 - 4.2.1.2 Chemical grade bauxite
 - 4.2.1.3 Slag conditioner
 - 4.2.1.4 Calcium aluminate cement
 - 4.2.2 Calcined bauxite
- 4.3 Markets for non-metallurgical alumina
 - 4.3.1 Non-metallurgical alumina by country / region
 - 4.3.1.1 Europe
 - 4.3.1.2 North America
 - 4.3.1.3 China
 - 4.3.1.4 Australia
 - 4.3.1.5 Other Asian Countries
 - 4.3.1.6 Latin America
 - 4.3.2 Specialty alumina markets
 - 4.3.2.1 Tabular alumina
 - 4.3.2.2 Fused alumina
 - 4.3.2.3 Calcium aluminate cement (CAC)
 - 4.3.2.4 Alumina trihydrate
 - 4.3.2.5 Specialty calcines
 - 4.3.3 Markets for alumina by application
 - 4.3.3.1 Water treatment chemicals
 - 4.3.3.1.1 Europe
 - 4.3.3.1.2 North America
 - 4.3.3.1.3 Other countries

4.3.3.2 Aluminium fluoride

4.3.3.2.1 Europe

4.3.3.2.2 Zeolites

4.3.3.3 Flame retardants/fillers

4.3.3.4 Calcined alumina markets

4.3.3.4.1 Refractories

4.3.3.4.2 Abrasives

4.3.3.2.3 Ceramics

4.3.3.5 Catalysts

4.4 Trade patterns

4.5 Pricing trends

4.5.1 Bauxite

4.5.2 Alumina

4.5.2.1 Feedstock prices

4.5.2.2 Specialty alumina prices

5 COMPANY PROFILES

ACE Refractories
Albemarle Corp / Martinswerk
Alcoa Inc
Almatis Inc
AluChem Inc
Ashapura Minechem Ltd
Bosai Minerals
Carborundum Universal Ltd (CUMI)
Chalco
China Mineral Processing
China Minmetals
Cimentos Molins SA
Çimsa Çimento Sanayi ve Ticaret AŞ
Dadco Alumina & Chemicals Ltd
Elfusa Geral De Eletrofusao Ltda
Elmin SA
First Bauxite Corp
Gorka Cement Sp zoo
Gramercy Alumina LLC
Great Wall Aluminium Corp
Guangxi Pingguo Mineral Co
Henan YiLong High & New Materials Co Ltd
Kerneos
MAL Zrt
Mineração Curimbaba
Motim Co Ltd
Nabaltec AG
National Aluminium Co (Nalco)
Rio Tinto Alcan Inc
Rusal
S & B Industrial Minerals
Saint-Gobain SA
Sanmenxia Mingzhu Group
Shanxi Fangshan Foreign Trade Co
Shanxi QinXin
Sherwin Alumina Co LP
Taiyuan Twin Tower Aluminum Oxide Co Ltd
Treibacher Schleifmittel GmbH
Union Corp
Washington Mills Electro Minerals
Zhengzhou Dengfeng Smelting Materials Ltd

6 SUMMARY AND FORECASTS

7 APPENDIX

- 7.1 Trade (import/export) tables
- 7.2 Product specifications

ORDER FORM

THE NON-METALLURGICAL BAUXITE AND ALUMINA INDUSTRY WORLDWIDE
(third edition, published February 2011)

(Payment in full must be received before publications are sent. Please tick or cross appropriate boxes)

- Please send me **THE NON-METALLURGICAL BAUXITE AND ALUMINA INDUSTRY WORLDWIDE: A MARKET / TECHNOLOGY REPORT** at Euro €2600 or (US)\$3500 or £2200
- Please send me extra copies of **THE NON-METALLURGICAL BAUXITE AND ALUMINA INDUSTRY WORLDWIDE: A MARKET/TECHNOLOGY REPORT** at the reduced price of Euro €520 or (US)\$700 or £440 (*NOTE: One copy of the report must be purchased at the full price*)
- Please send the report as: Electronic version (pdf file on a CD) Printed paper version
(*NOTE: If you select both versions, one will be charged at full price and the other at the extra copy rate*)
- A cheque is enclosed (payable to "Materials Technology Publications")
- Please send me a pro-forma invoice (*NOTE: This includes details of how to pay by bank transfer*)
- Please debit my credit card: Visa MasterCard American Express

Card Number.....Expiry Date.....

Cardholder.....Signature.....

(Please note that credit card orders are processed at the UK Pound Sterling rate)

SIGNATURE _____ NAME _____ DATE _____

COMPANY NAME _____

ADDRESS _____

_____ POST CODE _____ COUNTRY _____

TELEPHONE _____ FAX _____ E-MAIL _____

VAT (also known as TVA / IVA / Ust) NUMBER (EU COUNTRIES ONLY) _____

(Our VAT Number GB 490 2566 39)

Please return this form by fax or post to:

MATERIALS TECHNOLOGY PUBLICATIONS

71 CHALK HILL

WATFORD WD19 4DA

ENGLAND, UK

FAX: +44 1923 211510

(Tel: +44 1923 237910; E-mail: info@mat-tech.co.uk; Internet: www.mat-tech.co.uk)

SOME OF THE 100+ TABLES FEATURED IN THE REPORT

- ♦ Metallurgical and non-metallurgical bauxite capacity by country
- ♦ Metallurgical and non-metallurgical bauxite capacity by plant
- ♦ Metallurgical and non-metallurgical alumina capacity by country
- ♦ Metallurgical and non-metallurgical alumina capacity by plant
- ♦ Worldwide production of bauxite
- ♦ Production capacity of main producers of raw non-metallurgical bauxite grades
- ♦ China: Metallurgical and non-metallurgical bauxite capacity
- ♦ Guyana: Annual production of bauxite by type
- ♦ Guyana: Exports of bauxite by type
- ♦ Typical specifications for Guyanese bauxite (%)
- ♦ Cement production by country
- ♦ Plant capacities of largest calcium aluminate cement producers
- ♦ Brown fused alumina capacity by country
- ♦ Production of alumina (metallurgical and non-metallurgical) by region
- ♦ Quarterly production of non-metallurgical alumina worldwide
- ♦ China: Production capacities for metallurgical and non-metallurgical alumina plants
- ♦ Capacities of tabular alumina plants worldwide
- ♦ Capacity of major brown fused alumina producers in China
- ♦ Alumina trihydrate demand
- ♦ Plant capacity of major aluminium fluoride producers
- ♦ Calcined alumina demand
- ♦ Crude steel production by region/country
- ♦ Artificial corundum: top importing and exporting countries
- ♦ Alumina trihydrate: top importing and exporting countries
- ♦ Brazil: Imports and exports of alumina trihydrate
- ♦ Canada: Imports and exports of alumina trihydrate
- ♦ Norway: Imports and exports of alumina trihydrate
- ♦ Turkey: Imports and exports of alumina trihydrate
- ♦ Russia: Imports and exports of alumina trihydrate
- ♦ Australia: Imports and exports of alumina trihydrate
- ♦ China: Imports and exports of alumina trihydrate
- ♦ Mexico: Imports and exports of alumina trihydrate
- ♦ USA: Imports and exports of alumina trihydrate
- ♦ EU countries: Imports and exports of alumina trihydrate
- ♦ Austria: Imports of artificial corundum
- ♦ Slovenia: Imports and exports of artificial corundum
- ♦ Czech Republic: Imports and exports of artificial corundum
- ♦ Germany: Imports and exports of artificial corundum
- ♦ Hungary: Imports and exports of artificial corundum
- ♦ France: Imports of artificial corundum
- ♦ UK: Imports and exports of artificial corundum
- ♦ Italy: Imports and exports of artificial corundum
- ♦ Spain: Imports of artificial corundum
- ♦ Poland: Imports of artificial corundum
- ♦ Netherlands: Imports and exports of artificial corundum
- ♦ Belgium: Imports and exports of artificial corundum

ABOUT THE AUTHOR

Ted Dickson has over 34 years experience in the industrial minerals industry. He spent more than twelve years on the editorial staff of Industrial Minerals magazine, working at both the London and New York offices, latterly as American Editor. He then spent five years with a mining company, Cluff Resources, primarily assessing opportunities for the company to diversify into industrial minerals. For the past 19 years, Ted Dickson has been working as an independent consultant, running TAK Industrial Minerals, which specialises in the markets for industrial minerals and includes, amongst its specialist activities, the production of dedicated reports and appraisals for individual clients within the minerals sector, as well multiclient studies on a range of industrial minerals, including alumina and bauxite. In recent years, he has carried out a number of detailed studies of the bauxite and alumina markets for private clients

Ted Dickson has also authored a number of technical and marketing papers on bauxite and alumina, including *Non-Metallurgical Alumina Markets – Recession and Beyond*, which was presented at the 16th Bauxite and Alumina Seminar, Miami, Florida, USA, in 2010, and *Tabular Alumina and Activated Alumina*, which appeared in *Bauxite & Alumina*, published by Industrial Minerals Information Ltd. He is also the author of the previous editions of this market report.

Established in 1985, Materials Technology Publications specialises in the publication of market reports within the area of industrial materials. Each report analyses the current and future prospects for specific industries and provides pertinent statistical data on production, growth rates, imports, exports, etc. Key companies are identified and their performances compared. The impact of advances in production methods and materials technology is also assessed.