THE CURIMBABA GROUP
Past, Present & Future

Oilfield Minerals & Markets Forum
Houston 2015
MAIN TOPICS

• Brief History of the Curimbaba Group
• Main products and markets of the companies of the Group
• Focusing on Ceramic Proppants: Raw Materials and Processing
• Actual product lines
• Technology & Development
BRIEF HISTORY

MANUFACTURING PLANT IN THE 70’s
BRIEF HISTORY

1940
Benedito Curimbaba invests in Bauxite and Potash Rock Deposits

1950
Benedito Moreira Curimbaba Mining Co. Foundation

1961
Mineração Curimbaba foundation for bauxite extraction and processing

1973
Campo do Meio Unit Acquisition

1980s
National and International Consolidation

2007
Curimbaba Social, Cultural and Charitable Institution

2015
Curimbaba Group
>2,000 employees
>5,000 indirect jobs
THE CURIMBABA GROUP
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CORPORATE STRUCTURE

Holding
Oxicur Participações S/A, Alopar Participações e Comércio S/A

Surface Finishing
Transportation
Fused Oxides
Proppants business oil & gas
Silicon Carbide
Agribusiness
Quarry

Olga
Alcace
Elfusa
Mineração Curimbaba
Sublime
Yoorin
Brita Caldas

USEM
Sintex North America

Sintex International
Electro
Tarumã
Espigão
The Group is specialized in ore extraction and beneficiation focusing on the following markets:

- Oil & Gas
- Refractory & Abrasive Industries
- Chemical & Ceramic Industries
- Steel & Foundry Industries
- Asphalt Paving & Housing
- Agrobusiness
- Transportation & Logistics
• ELFUSA is the World Market Leader for the Group;
• Produces fused oxides which is the basic raw material for the refractory and the abrasive industries;
• It uses the Mineração Curimbababa bauxite to produce its brown aluminum oxides.
USEM is located in Pittsburgh, PA, and crushes and sizes brown fused aluminum oxide; The abrasive and refractory industries in the North America are served by USEM professional staff which also sells and distributes products manufactured by Elfusa and Mineração Curimbaba.
• Electro Abrasives was acquired in 2008 and is located in Buffalo, NY;
• Crushes and sizes macro and micro grits of black silicon carbide, green silicon carbide and boron carbide;
• Primary products include bonded & coated abrasives, wire saws, refractories, technical ceramics, break pads, foundries and lapidaries.
CARBIDES

- Sublime Technologies is located 120 miles from Johannesburg and it is a joint venture of the Curimbaba Group;
- Sublime produces silicon carbide for refractory, abrasive, and metallurgical applications;
- It serves the domestic industry and oversea markets including Europe and the US.
Yoorin - Fertilizer Plant

Tarumã - Specialized in the environmental management and agribusiness.

Espigão - High Quality Coffee Farm.
SURFACE TREATMENT

- Olga S.A. is the largest manufacturer of products for mechanical surface treatment in Latin America and it is the Brazilian market leader in its segment;
- Olga holds a vast portfolio of polishing compounds and buffing wheels.
Brita Caldas supplies gravel and ecological sand for the Brazilian construction market;

It provides solutions for medium and large projects involving asphalt, paving and concrete;

Brita Caldas is located in Caldas, Brazil at the same site of the mining company.
• Alcace is the freight company responsible to transport the products of Mineração Curimbaba, Elfusa, Yoorin and Olga in the Brazilian domestic market;

• The company fleet is spread among São Paulo, Rio de Janeiro and Minas Gerais states.
PROPPANTS

MINERAÇÃO CURIMBABA
Manufacturing Plant
Poços de Caldas, MG, Brazil

SINTEX NORTH AMERICA
Sole distributor for Curimbaba proppants in the United States, Canada and Mexico

SINTEX INTERNATIONAL
Distributor for Curimbaba proppants in Europe, Africa, Asia, Middle East and Latin America
THE PROPPANT MARKET

CERAMIC PROPPANT
✧ 5-10% of the market

RESIN COATED PROPPANT
✧ 5-10% of the market

FRAC SAND
✧ 80-90% of the market
CURIMBABA’S PROPPANTS

CERAMIC PROPPANTS

• HIGH STRENGTH PROPPANT → SINTERBALL BAUXITE
• INTERMEDIATE STRENGTH PROPPANT → SINTERLITE BAUXITE
• LOW DENSITY PROPPANT

• SPECIALTIES
  SINTERLOCK
  SINTERBLAST

SUPERLITE
EXTRALITE
RAW MATERIALS RESOURCES

- **OVER 300 million tons OF BAUXITE FOR PROPPANTS**
- Over 280,000 tons of Refractory Clay
- Over 500 Million tons of Potassium Rocks
- Over 500,000 m³ of Ornamental Rocks
- Over 20 Million tons of Limestone
- Over 5 Million tons of Quartz
PROPPANT RAW MATERIALS

- OVER 300 Million tons OF BAUXITE FOR PROPPANTS

WIDE RANGE OF BAUXITE QUALITIES

45-95% $\text{Al}_2\text{O}_3$
BLENDING OF BAUXITES IS THE FIRST PROCESS STEP AND IS SPECIFIC FOR EACH KIND OF PROPPANT
MINES & BAUXITE EXTRACTION

BAUXITE MINE LOCATED IN BRAZIL

EXTRACTION AND TRANSPORTATION
EXTRACTION MINE PLAN
THE MANUFACTURING PLANT

LOCATION: POÇOS DE CALDAS/MG - BRAZIL
TOTAL PRODUCTION CAPACITY: 300,000 tpa PROPPANTS
PROCESS FLOW

- Field Research
- Raw Material Extraction
- Ore Receipt
- Ore
- Pelletized Ore
- Milled Ore
- Sized Ore
- Raw Material
- Blending

Legends:
- Process
- Sampling Points
- Proppant A
- Proppant B
- Proppant C

- Drying
- Dried Ore
- Pelletizing
- Pelletized Ore
- Milling
- Milled Ore
- Intermediate Screening
- Sized Ore
PROPPANTS PRODUCTION FLOWCHART

- Raw material Extraction
- Feeder-box
- Dust Collector
- Rotary Dryer
- Dryed Bauxite Silo
- Mills
- Dust Collector
- Intermediate Sieves
- Rotary Dryer
- Rotary Kiln
- Final Sieves
- Rotary Cooler
- Pelletizers
- Pellets Silo
- Crushing
- Packing
SINTERBALL BAUXITE

• High alumina bauxite based High Strength Proppant manufactured by Mineração Curimbaba;
• Successful application till 20,000 psi and 500°F;
• Introduced in the market in 1988;
• Over 1 billion pounds pumped worldwide;
• Available mesh sizes: 8/16, 12/20, 16/30, 20/40, 30/50 and 40/80.
SINTERLITE BAUXITE

- Intermediate Strength Proppant bauxite based, manufactured by Mineração Curimbaba;
- Successful application up to 12,500 psi;
- Established in the market in 1999 and since 2006 in the US market;
- More than 1 billion pounds pumped worldwide;
- Available mesh sizes: 8/16, 12/20, 16/30, 20/40, 30/50 and 40/80.
• Bauxite based LWP proppants;
• Successful application up to 10,000 psi;
• Available in the market since 2007;
• Available mesh sizes: 8/16, 12/20, 16/30, 20/40, 30/50 and 40/80.
THE LOCK PROPPANTS

- Patented technology (US 2007/0084602 A1) for FLOWBACK control;
- Special mix of spherical and angular particles;
- Mechanical blocking of particle movement;
- Customized product tailored for each fracture conditions:
  - Spherical particles: HSP / ISP / LWP;
  - Angular particles: Size and percentage.
SINTERBLAST

• #100 Mesh angular high strength bauxite proppant manufactured by Mineração Curimbaba;
• It reduces tortuosity by abrasion of perf tunnels and near wellbore fractures;
• Stronger, more angular, more abrasive and higher conductivity than sand.
TECHNOLOGY & INNOVATION

- Fully equipped Lab to perform testing in compliance with and exceeding ISO 13503-2 and 13503-5 guidelines.

- Pilot plant for Research & Development of proppants and products for other markets.
THE AUTOMATION ERA

• Automation system of the pelletization process;
• Automated rotary kilns for sintering process through high temperature cameras;
• New sizing classification process (under development);
• Automated bagging system.
Environment, Health & Safety Policy

Curimbaba Group conducts its business in a responsible manner, promoting conditions conducive to environmental stewardship and promoting social development.
THANKS!

For more information:

www.curimbaba.com.br