CV of Khalil M Khaji

Name: Khalil M Khaji

Contact: +91 9480539552

E-mail Address: khajikm@hotmail.com

Education: Master of Engineering (Metallurgical Engineering)
Indian Institute of Science, Bangalore, 1973 March

Work Experience

- Working in primary aluminium industry since January 1974
- Manufacture of pre bake carbon anodes for aluminium production
- Aluminium production by electrolytic process
- Have hands on experience in construction, commissioning, operating and stabilization of prebake carbon anode plants (Paste Plants, Baking Furnaces and Rodding Plants)
- Have thorough understanding of manufacture and quality of raw materials required for carbon anodes, carbon anode quality and carbon anode performance in high kA pots: 460, 400, 350, 300 kA…
- Have resolved numerous process and production problems at every stage of carbon anode manufacturing (green, baked and sealed anodes manufacturing) and optimized anode performance in pots.

  Aluminium Smelter Plants where worked:

  - EMAL (unit of EGA), UAE (1.38 million mt/y capacity smelter), 415 kA and 460 kA pots
  - ALBA, Bahrain: 350 kA pots 0.9 million mt/y capacity smelter)
  - NALCO, India: 220 kA pots (0.5 million mt/y capacity smelter)
  - BALCO, VEDANTA India: 100 kA pots and 350 kA pots (1.38 million mt/y capacity smelters)

Fields of work

- Manufacture of pre bake carbon anodes for aluminium production by electrolytic process
- Anode quality control and optimization
- Start up, commissioning and stabilization of Carbon Anode Plants(anode paste plants, anode baking furnaces and anode rodding plants)
- Cost savings by process optimization and improvements

- Research and Development work
- Developing human resources by imparting technical skills and by transferring technology of carbon anodes manufacturing

Optimization and Developmental Work

- Reduced the carbon anode consumption from 420 kg C/mt Al to 406 kg C/mt Al by optimizing the processes in carbon anode manufacturing in carbon plants. It has saved every year US $ 7 million /year to the Company (870,000 mt AL/y smelting capacity). This savings is a recurring savings every year.

- Reduced the SO_2 emissions from carbon plants by optimizing the baking processes. This saved US $ 11 million to the Company one time.

- Optimized the combustion process during carbon anode baking by developing time-temperature programmes for heating of the carbon anodes and by balancing baking process parameters to achieve complete combustion of fuel (pitch volatiles released from anodes and natural gas injected into baking furnaces) thereby achieving lowest level of emissions and natural gas (energy) consumption.

- Developed green anode recipe at EMAL which has brought about a savings of US $ 3.7 million every year by preventing the anodes breakage in pots and US $ 4 million every year by reducing the net carbon consumption from 418 kg C/mt Al to 410 kg C/mt Al. This savings is a recurring savings every year.

- Established sound Process Control and Improvements principles to ensure on sustained basis production of quality carbon anodes and for their optimum performance in high kA pots

- Initiated practices and measures that reduced the cost of carbon anodes production and the cost of net carbon consumption, to be as a bench mark

- Initiated practices and measures to improve environmental emissions and waste generation from carbon facilities, to be within the limits prescribed by international and national environmental regulatory authorities

- Trained the manpower in Carbon Technology

- Above works are a few examples of the optimization and developmental work done…

Publications (based on Industrial ResearchWork)

- Have presented and published many research papers in conferences organized by The Metals, Minerals and Materials Society, (TMS) USA, Light Metal Division, ICSOBA, Gulf Aluminium Council etc… Some examples are:

1. Baked Anode Density Improvement through Optimization of Green Anode Dry Aggregate Composition (TMS 2010, Light Metals 2010)

2. Desulphurization Control during Baking: Its Impact on Anode Performance and Operational Costs (TMS 2010, Light Metals 2010)

3. The Impact of the Firing and Control System on the Efficiency of Baking Process (TMS 2003, Light Metals 2003)

4. Reducing Anode Problems in high kA pots in EMAL (GAC Carbon Conference 2014)

5. Factors affecting Baked Anode Properties (TMS 2015, Light Metals 2015)

6. Role of Anode Manufacturing Processes in Net Carbon Consumption (ICSOBA 2015)

7. Optimum Baking Level for Carbon Anodes for Aluminum Production (ICSOBA 2016)

8. Impact of Impurities and Desulphurization on carbon anode consumption during aluminium production (GAC Carbon Conference 2016)

9. Modernization of ALBA Carbon Plant 1: Its Impact on Productivity, Anode Quality and Environment (Presented at ARABAL Conference)

10. Performance of Anodes made from Alba Calcined Petroleum Coke (Presented at Carbon Technology Conference organized by Aluminium Pechiney, France at Bahrain)

11. Development of a Procedure to Control Pollution as well as Conserve Energy during Kilns Shut Down (applied in Industry now as a useful procedure)

12. Ways to Improve Energy Efficiency of Aluminium Production by Electrolytic Process (Presented at Aluminium Conference, India)

13. Recovery of Spent Cathode Lining and its use in the Preparation of Cathode Ramming Paste (Presented at a Conference organized by Institution of Engineers, India)

14. Impact of Quinolene Soluble Content on the Pitch Addition to the Green Anodes (Published in the Journal of Indian Institute of Metals, Calcutta, India)

15. Kiln 3 Performance-Long Flue Wall Life (Presented at Carbon Technology Conference organized by Aluminium Pechiney, France at France)

16. Have written Carbon Technology Books covering the following modules:

    - Raw Materials
    - Green Anode Manufacturing
    - Baked Anode Manufacturing
    - Sealed Anode Manufacturing
    - Anodes Quality and Anode Performance in Pots
    - Bath and Butts Processing Plants
    - Fumes Treatment Plants

    The manuals are being used as source materials in many Aluminium Plants to train professionals in Carbon Anodes Manufacturing

Membership of Professional Societies

Member of following professional institutions:

1. The Metals, Minerals and Materials Society (TMS), USA
2. American Society of Metals (ASM), USA
3. Indian Institute of Metals (IIM), India
4. Indian Carbon Society (ICS), India

Positions held

- Key positions in all the places of work, at higher Management level

Present Work

- Presently working as Consultant and providing services to Carbon Plants of Aluminium Smelters in Middle East and India
- Have established a consultancy firm: Falcon Consultancy Services for Carbon Anodes LLP"

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