



Latest Executed Projects

▶ Hormozal

In August 2008 the bricklaying work of the 34 section Anode Baking Furnace (OPEN Top) for the Hormozal Aluminium Smelter Project in Bandar Abbas, Iran was successfully concluded.

The expansion project was implemented within the same industrial complex of the existing Almahdi Aluminium Co. Smelter, a company belonging to IMIDRO.

This expansion increased the yearly plant capacity by 147.000 tons/year, thus achieving an annual overall production equal to 257.000 tons of aluminum.

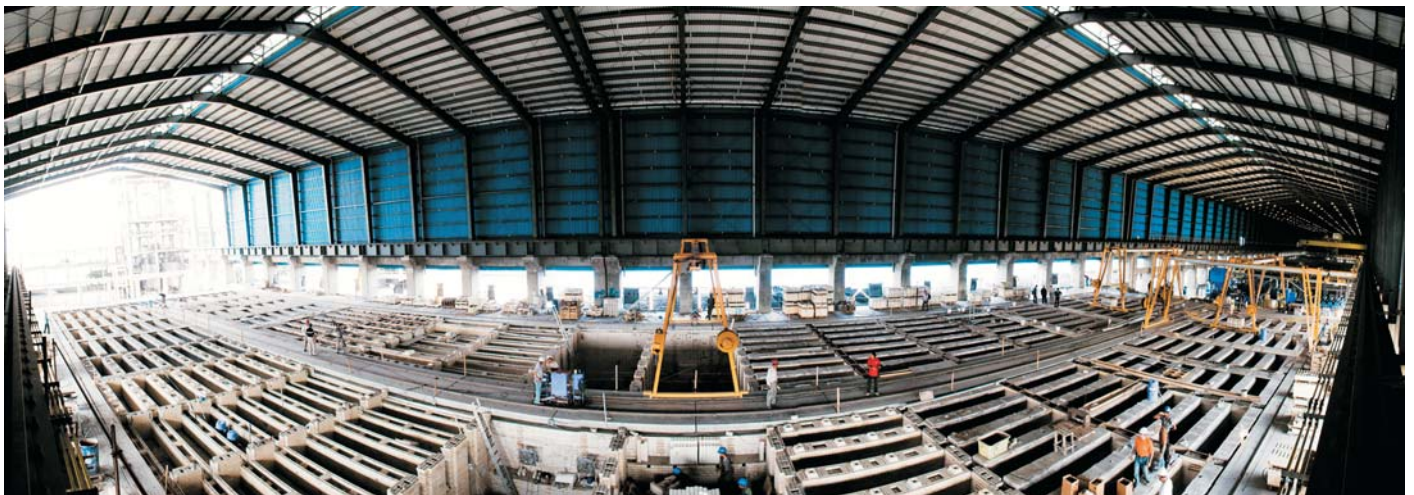
The Anode Baking project was executed together with FATA EPC, a division of FATA SpA of Torino, Italy, acting as General Contractor for the complete smelter expansion project. The machinery and equipment selected by FATA complied with the most advanced international standards in terms of quality,

reliability, safety and environment protection.

Riedhammer supplied the complete engineering as well as materials for the baking furnace, the auto firing system and the corresponding installation & supervision services.

Furnace Key Data:

Type:	Riedhammer, OPEN Top
Location:	Bandar Abbas, Iran
Number of sections:	34
Number of pits per section:	7
Number of fire groups:	2
Fire cycle	26 h
Type of fuel:	natural gas
Nominal production:	89.460 MT anodes/a



Latest Executed Projects

▶ MOSTAR

As part of the modernization and technological conformity of ALM – Aluminij Mostar, OUTOTEC of Cologne, Germany acting as EPC for the Anode Plant, awarded Riedhammer the contract for the engineering, material supply and assembly supervision for the rebuild of an anode baking furnace (replacement of a Pechiney furnace).

This project represented a special challenge in terms of accommodating a new design and anode configuration into an existing concrete tub: increase of pit size and corresponding section length, leading to replacement of operating floor as well as the ring main.

The rebuilt furnace reached nominal production in the 3rd quarter of 2008 and operating figures have been fully satisfactory.

Furnace Key Data:

Type:	Riedhammer, OPEN Top
Location:	Mostar, BiH
Number of sections:	36
Number of pits per section:	5
Number of fire groups:	2
Fire cycle	22 h
Type of fuel:	light fuel oil
Nominal production (total):	~ 70.000 MT anodes/a



▶ SEC - 6R

During 2008, the furnace number 6 ("6R") of SEC – Sumitomo Corporation, Kyoto Factory, for the production of electrodes for the steel industry, entered operation. The Procurement & Construction of the project was executed by MKK – Mitsubishi Kakoshi Kaisha (Kawasaki, Japan) whereas Riedhammer supplied the engineering as well as the corresponding assembly supervision. MKK and Riedhammer have had a long-term cooperation, that goes back to 1968, when an exclusive license agreement for the Japanese market was signed. A contract that has been renewed many times since then.

Furnace Key Data:

Type:	Riedhammer, CLOSED Type
Location:	Kyoto, Japan
Number of sections:	22
Number of pits per section:	5
Number of fire groups:	1
Fire cycle	30 h
Type of fuel:	heavy oil
Nominal production (tot.):	14.863 MT electrodes/a



Latest Executed Projects

▶ TRIMET



In the 3rd quarter of 2008, Riedhammer finalized the supply of the complete engineering package for the conversion of the CLOSED Type furnace (of Riedhammer type, initially built in 1973 with an installed capacity of about 64.000 MT anodes/a) into an OPEN Top.

The CLOSED Type furnace will be replaced by an OPEN Top of latest generation, improving significantly the environmental friendliness (reducing overall level of emissions), optimizing fuel consumption and producing anodes of outstanding quality. In order to fulfil the strict environmental regulations in force in Germany, a fume treatment unit based on RTO – Regenerative Thermal Oxidizer will be installed.

Furnace Key Data:

Type:	Riedhammer, OPEN Top
Location:	Hamburg, Germany
Number of sections:	48
Number of pits per section:	6
Number of fire groups:	3
Fire cycle	26 h
Type of fuel:	natural gas
Nominal production:	121.400MT anodes/a

Projects under Execution

▶ KAS

In the last quarter of 2008, Riedhammer was awarded the contract for the supply of the Anode Baking Facility (on a LSTK) of KAS – Kazakhstan Aluminium Smelter in Pavlodar, Kazakhstan. The scope includes the supply of the baking furnace (brickwork), Auto Firing System, Fume Treatment Plant, Furnace Tending Cranes and Anode Handling System (conveyors + anode cleaning machine) among others.

The civil works (furnace foundations + building) have already been started and site mobilization for furnace construction and equipment installation is scheduled to commence beginning of 2010. Unloading of first baked anodes is expected in the 1st quarter of 2011.

This is without a doubt one of the most important projects of Riedhammer, given its commercial significance and our intention to push and consolidate the acquisition of the OPEN Top technology as well as the supply of complete plant solutions.

Furnace Key Data:

Type:	Riedhammer, OPEN Top
Location:	Pavlodar, Kazakhstan
Number of sections:	50
Number of pits per section:	7
Number of fire groups:	3
Fire cycle	23,5 h
Type of fuel:	heavy oil



Projects under Execution

▶ EMAL

Riedhammer is proud to have been awarded the contract for the supply of anode baking technology, engineering and services for the two anode baking furnaces at Emirates Aluminium (EMAL), the largest single-site aluminium smelter in the world, with an initial capacity estimated at 700.000 tonnes of Aluminium for Phase I.

The Carbon Team of Riedhammer has been working very closely with SLWP, a joint venture between SNC-Lavalin and Worley Parsons appointed as EPCM for Phase I, in order to ensure that design, engineering and construction of the baking area are carried out without delays in accordance with the highest industrial and environmental standards.

The baking area is presently under construction at EMAL Taweelah site in Abu Dhabi and bricklaying is estimated to start in the second quarter of 2009. Anode production is planned to commence by last quarter of 2009.

Furnace Key Data:

Type:	Riedhammer, OPEN Top
Location:	Taweelah in Abu Dhabi, UAE
Number of sections:	2 x 64
Number of pits per section:	8
Number of fire groups:	2 x 4
Fire cycle	29 h
Type of fuel:	natural gas
Nominal production (total):	~ 452.000 MT anodes/a



▶ Inalum

Between 1980 and 1982, 3 Riedhammer ring pit furnaces of CLOSED Type were installed and commissioned at the Inalum plant in Kuala-Tanjung, Indonesia. A 4th furnace followed in 1982. After 28 years of continuous operation, Inalum decided to undertake the major repair of their anode baking furnaces.

Riedhammer was entrusted with the contract for the general refurbishment with modernization on a LSTK basis of ABF #1 and ABF #2. ABF #1 was completely refurbished, with an increase of the number of anodes / section from 75 to 90. Thanks to a new, modern and fully computerized Auto Firing System (Riedhammer) and changes in furnace design, global output could be increased by more than 40%.

ABF #1 started its nominal operation in the 4th quarter of 2008. In parallel, Riedhammer received the "go ahead" of Inalum to proceed with the refurbishment of ABF #2, presently under execution, with the same scope of supply and work (LSTK). ABF #2 shall enter in nominal operation in the 3rd quarter of 2009.

Furnace Key Data:

Type:	Riedhammer, CLOSED Type
Location:	Kuala-Tanjung, Indonesia
Number of sections:	2 x 30
Number of pits per section:	5
Number of fire groups:	2 x 2
Fire cycle	30 h
Type of fuel:	heavy fuel oil
Nominal production (total):	135.973 MT anodes/a



Projects under Execution

► Nippon Carbon

In response to the growing demand of electrodes for the steel industry, also Nippon Carbon decided to install a new ring pit baking furnace at their plant in Toyama. Procurement & Construction of the project was executed by MKK – Mitsubishi Kakoshi Kaisha (Kawasaki, Japan) whereas Riedhammer supplied the engineering and the corresponding assembly supervision.

The bricklaying of the furnace was started in December, 2008 and the first baked electrodes are expected to be unloaded by the middle of 2009.

Furnace Key Data:

Type:	Riedhammer, CLOSED Type
Location:	Toyama, Japan
Number of sections:	26
Number of pits per section:	4
Number of fire groups:	1
Fire cycle	26 h
Type of fuel:	heavy oil
Nominal production (total):	19.407 MT electrodes/a



Last November Riedhammer had the honour to be invited to attend the "First Brick Ceremony", that took place in the furnace building with the participation of the senior management of Nippon Carbon as well as MKK.



Events

► Symposium in Puerto Ordaz, Venezuela

During November 27th and 28th 2008, Riedhammer participated in the "Simposio de Aluminio 2008" in Puerto Ordaz Venezuela, with the presentation of a paper describing the strategies, technical & economical aspects related to the conversion of CLOSED Type into OPEN Top furnaces. The paper emphasized the importance of obtained results in terms of equipment performance, product quality and the corresponding impact in the reduction process and smelter production costs.

The event was organized by Fundacite Bolivar at the Teatro Orinoco of CVG – Venalum with the attendance of more than 250 professionals and representatives of industry as well as different universities and educational institutions of Venezuela and abroad.

The region of Ciudad Guayana is very important in the context of aluminium production both for the domestic and for the export market. With 2 smelters (Venalum and Alcasa) and 1 dedicated anode plant (Carbonorca) with a yearly production of about 650.000 MT of primary aluminium, Venezuela is certainly the important global player in this industrial sector.



Joining Forces

To meet the requirements of new smelters, R&D Carbon Ltd. of Switzerland, Outotec GmbH and Riedhammer GmbH of Germany, propose to jointly design, engineer, procure, construct, commission and start-up anode plants, mainly comprising the following facilities:

- Recycled Processing plant to treat green and baked scrap returned from the anode production facilities and anode butts from the smelters.
- Green mill.
- Anode baking furnaces and ancillary equipment.
- Waste gas cleaning systems to treat the fumes from the green mill as well as from the baking furnaces.
- Storage area for green anodes.
- Area for cleaning and storage of baked anodes.
- All equipment to transport and transfer the raw materials (calcined petroleum coke and coal tar pitch) from the port to the anode plant.

The present demand for high quality anodes and the necessity to adapt to the rules of a growing and

dynamic aluminium market, are the driving forces for the presentation of complete solutions for modern Anode Plants. Our know-how and many years of worldwide experience are the key components to ensure the preparation and submission of highly competitive solutions from the technical as well as economical point of view.

Outotec

R&D
Carbon Ltd.



Riedhammer - Technical Assistance Center

Riedhammer "TA Center", your key partner in after sales support, furnace inspection and equipment survey.

To ensure optimum performance of your baking furnace, our TA Center provides you with specialists to perform comprehensive furnace inspections and surveys, with assessment of structural, dimensional and operational parameters.

A detailed report is generated, describing the results of the inspection as well as a complete analysis of the impact of the furnace aging in terms of:

1. expected furnace lifetime
2. present situation of furnace draught
3. measures to improve baking curve performance
4. optimization of fuel consumption, product quality and operations

5. maintenance actions (brickwork, mechanical, electrical): preventive & corrective
6. furnace sealing activities
7. firing equipment
8. conclusion and comments

For further details and information please contact:

RIEDHAMMER TA CENTER

Armin Preissler
Tel: +49 911 5218 670
Mobile: +49 173 688 1359
e-mail: armin.preissler@riedhammer.de

A team of competent professionals will be happy to assist you.



RIEDHAMMER GmbH • Industrial kiln plants
Klingenhofstrasse 72 • 90411 Nürnberg • Germany
Telephone: +49 911 52 18-0 • Telefax: +49 911 52 18-231
e-mail: mail@riedhammer.de • www.riedhammer.de

a company of  **SACMI**