Horizon

OCL India Refractory Newsletter

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OUR ESTEEMED CUSTOMERS, THANK YOU

With Customer Satisfaction ingrained in our day to day working philosophy it is not surprising that our Customers have the feel and they have recognized us with laurels. We grabbed the prestigious CAPEXIL Award for Excellence in Refractory Export from Govt. of India for the year 2009. Sterlite Industries has awarded us with Excellent Category Award for Refractory Supply for the year 2009. We are proud and we thank our esteemed customers for their partnership.

WHATS INSIDE

From Editor's Pen

Growth and growth forecast in all sectors of Indian economy has braved to reach 9-10 percent mark, the Steel Industry looks equally promising with production and consumption looking up in last 9 months. Despite financial crisis, steel production for 2009 was up 3 percent and its demand up by 6 percent as mentioned by a senior SAIL official. The government plans to spend heavily on infrastructure projects and consumer demand continues to drive automobile sales and construction projects. The demand from Railways is also likely to increase in 2010 which will buoy up the stainless steel products, as it is the fastest growing consumer of steel with annual growth of 20-30 percent. As per metal Bulletin "India is poised to outgrow China, BRIC and ROW countries". India needs to double its steel production the current 55 Million tones in five years if it wants to bridge the demand-supply gap. But greenfield difficulties are limiting spread and growth of Indian steel. This is a real dampener. The refractory industry is looking forward to upcoming greenfield projects by JSPL, Bhusan, NMDC, Tata Steel and expansions being carried forward by VSP, JSW and Tata Steel. Our capacity augmentation and timely shift to China has helped to keep things in right perspective. In raw materials, the imposition of export duty on Bauxite and BFA by Chinese authorities has further added to the availability woes and made things difficult for high alumina refractories, because reserves of pure refractory grade Bauxite in India is limited. Further augmentations of facilities are under way. CC, precast, purging refractories and slide plates continue to shine in overseas market, especially in Asia and Europe. This edition is especially relevant as it marks the inception of Basic bricks production at OCL China from February 2010 and the start of Dolomite bricks supplies in the Indian market. OCL refractory product range is on a rolling track.We wish all our customers and well wishers a growth-filled 2010.

Sk. Bashir Mohammed

ADDRESSING ENVIRONMENT CONCERNS

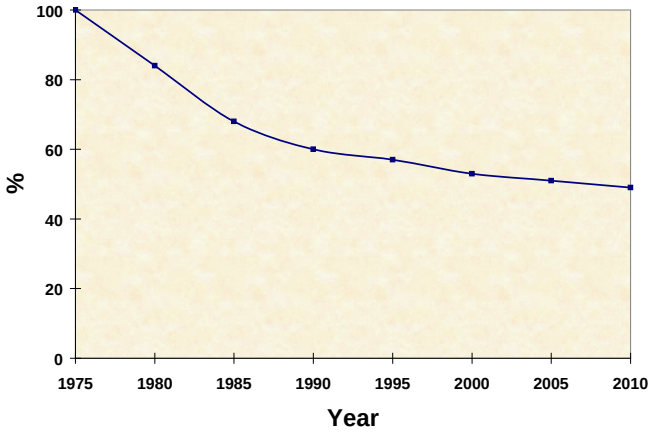
Korean steelmakers have decided to spend $16 billion in the next three years to reduce greenhouse gas emissions and energy consumption.

Editors : Sk. Bashir Mohammed, Utkal Garg, Ashok Sahu, Anupal Sen
Content Coordinators : B. Prasad

THAT'S EFFICIENCY!

From 1975 to 2010, the average energy consumption per tonne of crude steel produced has decreased by about 50% through enhanced energy efficiency in the steel making process, sharing best practices, more recycling of steel and use of steel by-products.

Indexed Energy Consumption per tonne of crude steel produced in North America, Japan and Europe [Considering 1975 = 100%]



INTERNATIONAL STEEL DRIVERS...

» Iron-ore producers BHP Billiton Ltd and Rio Tinto Group have achieved record figures of iron-ore production in the third quarter of this year to satisfy Chinese demand for steel.

» Indonesian Krakatau Steel will sign an agreement with South Korea's Pohang Iron & Steel to build a US$5 billion plant in Cilegan Industrial Complex, Banten, Bujang, which will increase the production capacity of Krakatau steel from 2.5 MTPA to 3.5 MTPA.

» Japan based JFE Steel Corporation will penetrate into Indian market by collaboration with JSW Steel for automotive and other high valued special steels. They are planning to work jointly towards securing raw material deals in India and abroad.

» South Korea's steel giant POSCO has built a plant in Pittsburgh, USA that will produce 270,000 tons of high quality pipes per annum for supplying to American Petroleum Institute for oil transportation.

» Taiwan's Formosa Plastics Group (FPG) is constructing a major steel mill in Ha Tinh province, Vietnam. The first phase of construction will commence in Feb'10 with an investment of US$8 billion. When the two blast furnaces will start operation in 2013, the proposed steel mill will be the largest in South-east Asia.

» Tata Steel, the world's sixth largest steelmaker, is expected to commence its US$5 billion project in Vietnam for setting up a 4.5 MTPA plant.

» China's crude steel production has reached 420 million tonnes in the first nine months, which is an increase by 7.5% than the same period in previous year. This worksout to an output of 562 million tonnes this year. Present steel capacity of China is around 600 MTPA with another 58 MTPA under augmentation. Chinese steel demand has increased by 20% year-on-year in the first nine months to 421.8 million tonnes.

» Arcelor-Mittal has reported an EBITDA of $1.6 billion in third quarter of 2009, which is up by 30% as compared to second quarter 2009.

» World steel body has forecasted that global steel demand will rise by 9.2 % i.e. from 1.104 to 1.206 billion tonnes in 2010.

ON THE INDIAN STEEL FRONT

The finished steel consumption in India is expected to grow at 8% CAGR by 2012. This will be triggered by Indian infrastructure and construction business along with the rapid development of automobile sectors. Fast development in the consumer durables and steel packaging industries will push the non-alloy steel demand to grow at a CAGR of 6.3% in 2010. To satisfy this increasing steel demand, India has imported close to 9.8 million tonnes of steel in 2009.

» Tata Steel, India's largest producer has augmented its annual production capacity to 30 million tons, including U.K. unit Corus. The company's standalone net profit rose to 11.92 billion rupees ($258 million) for the fiscal third quarter to end-December from 4.66 billion a year ago.

» Steel Authority of India plans to increase its capacity to 23.46 million tons from 14 million tons by March 2012. SAIL's net profit rose to Rs 1,676 crore ($361 million) for the third quarter from Rs 843 crore reported a year ago.

» Jindal Group will begin construction work for the proposed steel plant at Salboni and a 800 MW Power plant at Icchapur within six months after being enthused by the sobering recession.

» JSL, Orissa will take up phasewise capacity augmentation from 0.7 MTPA to 2.3 MTPA within 2.5 years by investing another Rs. 17,000 crores.

IN SYNC WITH GLOBAL QUALITY AND SAFETY STANDARDS

Our concern emerge as a quality supplier and adopting global standards got a new high with the movement for implementation of ISO 14001 AND OHSAS 18001, in addition to upgrading our quality systems with ISO 9001:2008. The effort was recognized and we were audited by TUV NORD, Germany and the certificates displayed bear a testimony of this commendable achievements of all OCLites.

ISO 9001:2008 ISO 14001:2004 OHSAS 18001:2007

LOOK WHAT I HAVE DONE !

Steel industry has come up with Advanced and Ultra High-Strength steels (AHSS & UHSS) which are thinner yet strong. These steels are extensively used by the automotive industries for more than 50% of steel components in a vehicle, which reduces the mass of the vehicles by 17% to 25%, while maintaining safety standards. Less mass leads to lower emissions from driving the vehicle. If the body structure of all cars produced worldwide in a year (71 million in 2009) were made of AHSS, could have resulted in saving of total lifetime emission of 156 million tonnes CO_2 equivalents.

OCL IN INTERNATIONAL FORUM : UNITECR 2009. Salvador

The development and innovations being carried forward was highlighted through presentations publication of technical paper in UNITECR-2009, held at Salvador, Brazil from 13th-16th Oct'2009, OCL and our R&D wing, DISIR published and presented five technical papers on

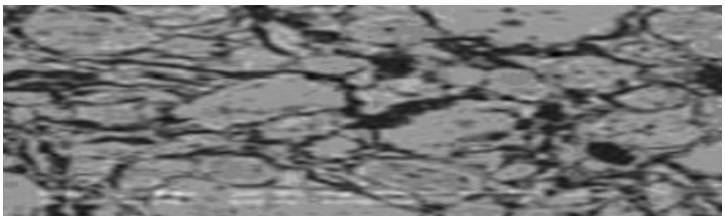
- Role of Alumina on setting of CA Cement
- Effect of nano-oxides and anti-oxidants on corrosion of SEN
- Mag-Al spinel brick for Cement Rotary Kiln
- Thermal Behavior of Coke Oven Silica Bricks and
- Influence of aggregates on the properties of Bottom Purging Refractories. Sri B. Prasad of OCL and Dr. B.K. Panda and Sri B.B. Sahu of DISIR participated to present the papers.

PURE NON-OXIDES AND THEIR COMPOSITES

SiC is known to be the first non-oxide that has wide applications in refractories because of its excellent abrasion resistance and oxidation resistance. Other known non-oxides like B_4C, Si_3N_4, BN, etc. are gradually being used in small amount to incorporate some specific properties to the refractories. However, their price and availability has always laid a limitation to their use.

A relatively newer material having comparatively low price is Al_4SiC_4 powder. The bulk density, hot strength and oxidation resistance of MgO-C bricks can be significantly improved by adding this powder in suitable amount. Al_4SiC_4 reacts with CO gas to form $MgAl_2O_4$ spinel and SiC above 1200^0C. Al_4C_3 and AlN are not formed in this reaction process, which may be hydrolyzed.

The Al-AlN bonded corundum based refractory is synthesized where AlN exists in the form of whiskers and hexagon pellet particles and a significant amount of Al remains in the matrix. This multiple bonding system results in excellent mechanical properties and thermal shock resistance with very limited hydration tendency. This kind of material may become the new candidate for carbon-free slide plates.



AlN deposits at the grain boundary of Corundum

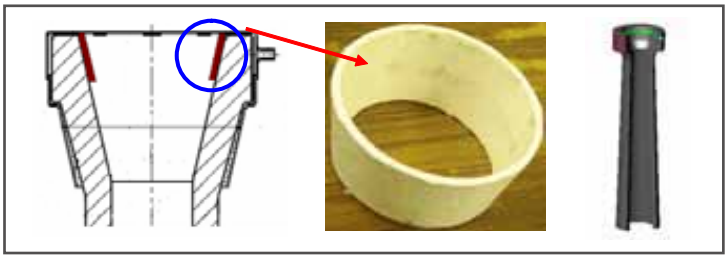
YOUR STEEL – OUR CONCERN : OCL Contribution towards Cleaner Steel

A. Sen, B. Prasad, Dr N Sahu & JN Tiwari – OCL INDIA LTD.

With the advent of cutting edge technologies in steel manufacturing, the process parameters as well as steel properties can be measured and controlled with high level of precision. As a matter of fact, the demand for high quality steel with cent per cent consistency has increased among the consumers. Hence, the main focus of the steelmakers has been on reducing the non-metallic inclusions in steel so that cleaner and cleaner steel could be produced which will provide value-addition without adding any external quality. Since, refractories play a very vital role, they can be effectively used with precise efforts to reduce unwanted inclusion level in steel.

(a) Ladle Shroud with Excellent sealing system:

Maximum chance of atmospheric exposure of steel is during the flow of steel from ladle to tundish through ladle shroud. During use of shroud, air from atmosphere penetrates into the flowing steel through the gap between collector nozzle and Ladle Shroud (LS) mouth leading to N2 pickup in steel. OCL has developed a special type of LS where argon purging is done from the top of LS mouth through equi-spaced slots between LS mouth and steel CAN. Moreover, a special type of gasket is provided in between LS mouth and collector nozzle to completely seal the gap between them.Thus nitrogen pick up of steel through LS mouth could be eliminated. OCL regularly supplies this design of LS to Tata Steel where nitrogen pick up is restricted to only 3-4 ppm. Lately ESSAR Steel has assigned to OCL to design and develop LS for them to reduce nitrogen level in steel.



(b) Reverse taper Ladle Shroud:

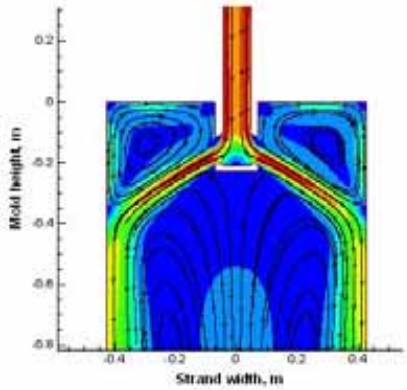
Steel may also get exposed to atmosphere when it comes out from the bottom of LS into the tundish because of turbulence in tundish surface. OCL has designed reverse taper LS which can be dipped inside tundish level even at the initial period of slide gate opening without any back splashing or tundish surface turbulence. The increasing volume at the bottom of these LS releases the ferrostatic pressure. Thus absorption of gaseous inclusion can be avoided. This type of LS has been successfully tried by OCL at Tata Steel (8 heats life) and Bokaro Steel (6 heats life).

(c) Tundish flow modifier

OCL has designed Tundish Flow Modifier (TFM) which is a single tundish furniture that can replace impact pads, dams, weirs safety pads and side-wall pads. The inside of TFM is specially designed to get a churning effect when steel falls in it and leads to floatation of powder inclusions at the tundish surface where they get absorbed by basic tundish powder. TFM also promotes homogeneous mixing and temperature distribution of steel in tundish ensuring less skull formation hence less wastage.

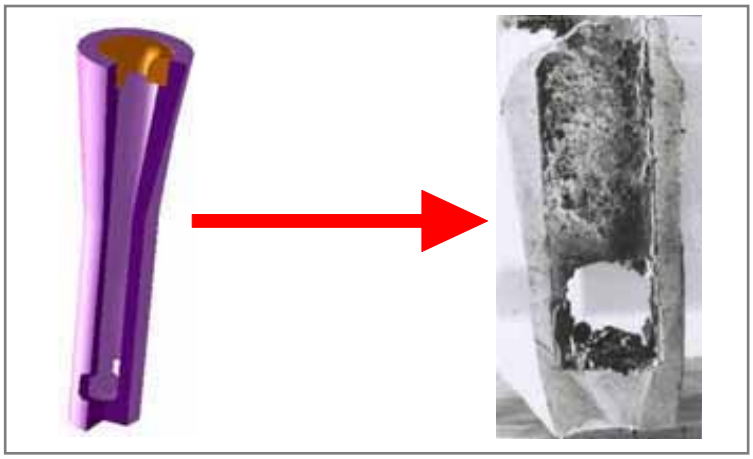
(d) Metal flow through Subentry nozzle:

Inclusions can also come from mold powder if the surface turbulence in the mold is more. Optimum linear velocity of steel at the mold surface is 0.3-0.4 m/s. If it exceeds this, mould powder inclusion is inevitable. If velocity is lower then inclusion floatation, subsequent absorption at the surface will not occur. This velocity can be controlled by suitably designing the Sub-entry nozzle. OCL provides optimum designing of SEN by mathematical modeling by varying the design parameters like port height & width, port geometry, port angle, bore diameter, immersed depth, etc. to ensure the required surface velocity and hence reducing the inclusion level in steel.

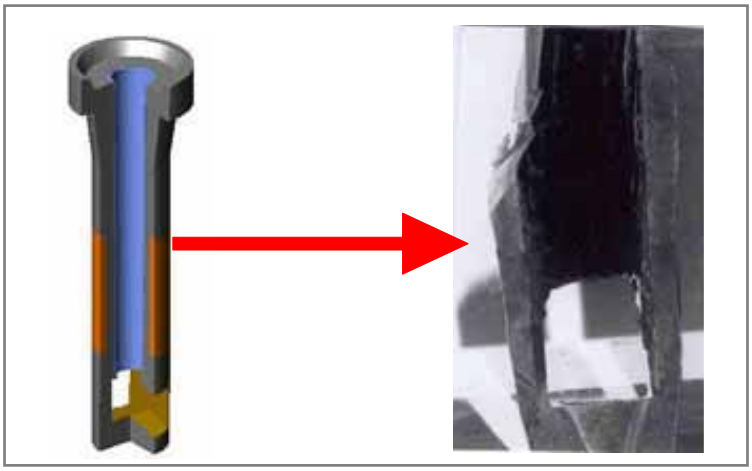


(e) Anticlogging Subentry nozzle :

Solid inclusions may also come in steel from the alumina clogging in the bore of SEN. OCL has developed a special anti-clogging layer at the bore of SEN that prevents any alumina build up, thus ensuring cleaner steel.



SEN without anticlogging layer shows Alumina deposition



SEN with anticlogging layer shows no Alumina deposition

REFRACTORY GROWTH BLUES: INDIA & CHINA

The annual refractory production in China and India is increasing, with increasing steel and cement output. Over 80% of new demand in 2012 will be attributable to China. Likewise India is also showing advances as its refractories output has shot up by 67% in last 5 years. China remains the dominant producer and consumer of refractories with an output of 24.7mmt in 2008. Japan's refractory output is down 70% since 1970 and that of USA by 61% since 1974.

Your comments and suggestions may please be sent to bmohammed@ocl.in
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