

TATA METALIKS LIMITED

PRAYAS

Dear Customer,

A warm hug to all of you. I am thrilled to get the opportunity to communicate to you through our news letter Prayas. Normally your interaction takes place with our marketing colleagues but this time I got the opportunity to communicate the feelings of the plant people and how important you are to us to sustain our existence. We consider you to be our family members who stand beside us also in turbulent times. Therefore we at plant value this contribution of yours and align our processes to meet your requirement round the year.



You will be glad to know that we use the best quality of raw material to ensure consistency of the product. Our employees at the cast house and pig casting machine are conscious of your requirement and work relentlessly to meet the physical and chemical quality of the pig iron. To bring in more consistency our operating team has started a new initiative called Kar Vijay Har Sikhar (KVHS) and Quality Circle to improve the product quality and widen the basket of delivery. We invite you to have a dialogue with us and select your range of product and shall be glad to take that campaign for you and we are committed to meet each and every customers' specific requirement.

Please give us your opinion on the opportunities to improve the product quality and the service mechanism to serve you better. We will be happy to incorporate your views to bring changes in our processes. We look forward to your continuous support and wish you to practice a safe working culture at your premises.

Yours Sincerely

Debasish Mishra

(Vice President – Operation)

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Editorial

Dear Readers,

In our previous issue, we shared information about the effect and importance of carbon & silicon in production of ductile iron. In continuation to the previous issue, we are giving insights of effects of Manganese, Sulphur, Phosphorus, Aluminum and other elements as these elements play vital individual & combined effects on the production and quality of ductile iron.

In our effort of creating awareness and increase automobile casting production in eastern region, we have conducted technical seminar in our Customer Service Centre by inviting key-note speaker from Tata Motors Ltd. As the level of importance is same for production and rejection control in foundry, we have presented the PPT on foundry defects and the glimpses are provided for your understanding.

We assure our technical hand hold in production of different SG iron grades to fulfill TML'S dream of making eastern region most advanced in India.

We wish you all success in SG iron production.

Regards,

M Sambasiva Rao & Koushik Dolui

Editorial Team

M Sambasiva Rao, Koushik Dolui,

Munmun Pal and Monideep Majumder

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Ductile Iron:

Ductile Iron is cast iron in which the graphite is present as tiny spheres. The relatively high strength and toughness of ductile iron gives it an advantage over grey iron or malleable iron in many structural applications. Ductile iron does not require heat treatment to produce graphite nodules for which it can compete with malleable iron even though it requires a melt treatment and inoculation process. Ductile iron can be produced to radiography standards because porosity stays in the thermal center but malleable iron can not tolerate

porosity, because voids migrate to the surface of hot spots such as fillets and appear as cracks.

In our previous issue, we have discussed about the effects of carbon & silicon elements and the other elemental effects are as below.

Manganese: The main source of manganese is steel scrap used in the charge. The element should be limited in order to obtain maximum ductility. In cast Ferritic irons, it should be 0.2% or less. For irons to be heat treated to the Ferritic condition, it should be 0.5% or less but irons to be used in cast Pearlitic condition, it may be present up to 1% manganese and is subject

to undesirable micro segregation. This is especially true in heavy sections, in which manganese encourages grain boundary carbides, which promote low ductility, low toughness and persistent pearlite.

Sulphur: Sulphur is derived from the charged metallic raw materials. In cupola melting, it is also absorbed from the coke. Before magnesium treatment, the sulphur content should be as low as possible, preferably below 0.02%. The final sulphur content of ductile iron is usually below 0.015%



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but if cerium is present, it may be higher because of the presence of cerium sulphides in the iron. Excessive final sulphur contents are usually associated with magnesium sulphide slag and dross.

Phosphorous: Phosphorous is normally kept below 0.05% because it promotes unsoundness and lowers ductility by forming phosphide eutectic at grain boundaries. It has a pronounced effect on transition properties of Ferritic ductile iron if the transition temperature increases upto a level where the material is brittle at room temperature because of phosphorus segregation at grain boundary, especially in heavy section thickness castings. The level of phosphorus percentage directly effects on the impact properties of the casting like, at higher level (0.16%) of phosphorus the transition temperature is above 100°C and at lower level (0.08%)

transition is at 0°C.

Aluminum: The presence of even trace amounts of aluminum in ductile iron may promote subsurface pinhole porosity and dross formation and should therefore be avoided. The most common sources of aluminum are contaminants in steel and cast iron scrap, notably in the form of aluminum pistons from scrap automobile engines.

Another source is aluminum containing inoculants and the use of inoculants of low aluminum content is advisable whenever possible. Aluminum as low as 0.01% may be sufficient to cause pinholes.

Other elements: Well recognized carbide promoters and stabilizers, acting similarly to but stronger than manganese are chromium, vanadium, boron, tellurium and molybdenum. Recommended maximum contents are

♥ Chromium	0.05%
♥ Vanadium	0.03%
♥ Boron	0.003%
♥ Tellurium	0.003%
♥ Molybdenum	0.01 to 0.75%

The higher value of Molybdenum is for Bainitic ductile irons with a corresponding lowering of manganese content.

Lead, Antimony, Bismuth and Titanium are undesirable elements that may be introduced in trace amounts with raw materials in the charge



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TECHNICAL SEMINAR:

Tata Metaliks Limited conducted Technical seminar on 26th June 2013. Around 35 customers attended the seminar. We had invited Dr Devinder Singh Padan, Assistant General Manager, TATA MOTORS LTD. as key note speaker. Presently he is



heading melting and R & D department of Foundry division.

Dr Padan has a wide experience of grey iron melting, production of S.G. Iron, steel melting, furnace refractory, green sand molding, cold box core making, production engineering, defect analysis etc. He has published technical papers on Foundry related topics in national and international journals eg AFS transaction and made several presentations especially on melting practice / metallurgy at various

seminars /congresses.

Key note speaker delivered lecture with presentation on the topic **"QUALITY SYSTEMS REQUIREMENT FOR PRODUCTION OF AUTOMOBILE CASTINGS"** which gave insights of monitoring and control parameters of various foundry processes like tooling manufacturing, raw material quality system.

Our colleague Mr. M Sambasiva Rao delivered speech with presentation on **"CASTING DEFECTS, CAUSES AND SUGGESTED REMEDIES"** which gave coverage of defect types, classification of defects, root cause analysis, corrective and preventive actions to be implemented in foundry processes.

Executive Vice President(Sales & Marketing), Chief (Corporate planning & Marketing) & CQH, Chief of sales and other sales and marketing colleagues graced the seminar with their presence.



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