PRAYAS 2018

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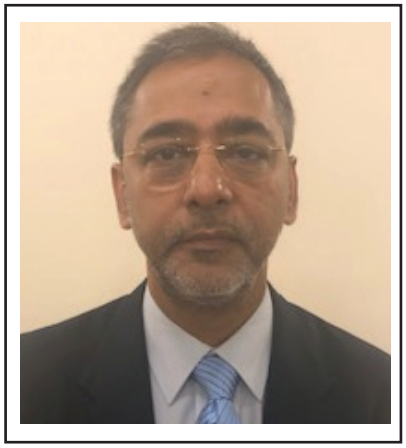
Dear Customer,

Season's Greetings.



On behalf of my Tata Metaliks (TML) team, I want to express my gratitude to you for giving TML an opportunity to serve you. We believe in long term relationships with all our stakeholders. Initiatives such as Technical services to foundries and Health camp for foundry workmen will certainly take our relationship to the next level.

We assure you that besides supplying high quality pig iron to suit your exact requirements, we will continue to explore and provide solutions to changing industry requirements. In the current issue of Prayas, we are covering procedure of Wet chemical analysis for pig iron that will help you in having a better understanding of process to determine the chemistry.

Technical assistance from Tata Metaliks will continue to provided through our engineers for improving your energy efficiency, reducing your rejections, making operations greener and reducing your overall cost of production. We hope our effort will improve your process and products to make you more competitive in the market place.

We look forward to receiving, not only your valuable feedback for improvement of Prayas but also your suggestions on topics of interest which we would cover in future editions.

Thanks once again for being with Tata Metaliks and reposing your confidence in Tata eFee product and services.

Sanjay Gupta
Chief of Sales

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EDITORIAL

Dear Readers,

Greetings from Kolkata!

With the onset of winter in the Indian subcontinent, the TML team is back with the 14th issue of Prayas. During the last three months we have interacted with different foundries to understand technical topics that can be addressed through Prayas.

As a voice of the Foundry Industry, majority of the responses were getting focussed towards Quality Assurance, both for Raw Material as well as Finished Castings. With India, strongly holding its position as the 2nd largest casting producing nation in the world, we need to be globally ready in terms of technology and quality of castings.

A majority of Indian foundries fall under the MSME category. Due to lack of awareness, knowledge and capital expenditure, majority of the foundries do not have in house quality testing facilities, so they are dependent on local labs to support Quality Assurance at their end. As casting buyers are becoming more and more quality conscious, it is the need of the hour for foundries to develop a deep understanding of Quality Assurance.

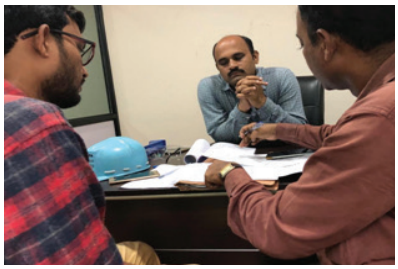
In this issue of Prayas, we are covering the Procedure of Wet Chemical Analysis for Iron. We hope that this issue of Prayas will assist you in developing an understanding of the basic chemical process followed during testing of metallics (iron).
For further consultation & to avail our services, we request you to kindly remain in touch with our Customer Service Centre, Howrah.

Regards
Shivam Pandey
& Swati Pal

On site Technical Services
at Deepshikha Castings Pvt Ltd, Nagpur

Deepshikha Castings Pvt Ltd (DSCPL), Nagpur is a well-known name for production of DIDF & CIDF pipes and Cast Iron Castings for various sectors and plants.

DSCPL & TML have been associated for almost a decade. In order to take this association to the next level, Mr. Dilip Pawar (Managing Director, DSCPL) has invited TML Team to conduct a process review.



DSCPL & TML Team during conducting Tata eFee trials

Accordingly, The TML Team from Customer Service Centre, Howrah visited DSCPL during the 1st week of Aug`18. The TML Team along with DSCPL's, CFT under the guidance of Mr. C.J. Mankar, Director Technical, DSCPL, conducted a process audit & a pilot run. During the 4 day period, the joint team has conducted two days of melting and found significant savings in coke rate and melt rate improvement by using Tata eFee.

During the process review, various aspects of casting production such as coke bed preparation, charge materials size and weight optimisation, cupola charging, air pressure requirement of cupola, tap hole preparation and factors impacting melt rate in cupola were reviewed, discussed and modified.

It was very encouraging to see the young workforce from DSCPL having an urge to learn and gain confidence as process experts in cupola functioning. TML wishes the DSCPL team a very successful and bright future ahead.

Customer Visit at Tata Metaliks
Kharagpur Plant

On 14th November'18, eight consumers & three channel partners from the Howrah foundry cluster visited the TML Kharagpur facility. The objective of this visit was to establish a direct line of communication with foundries and develop an understanding of their requirements. The day started with a safety awareness session by Mr. Jaydeb Chatterjee, followed by the Cross Functional Team's (CFT) interaction with customers. CFT comprised of officials from Production, Quality Assurance, Sales Distribution Centre, Iron Making Technology Group & Business Excellence.

Mr. Sandipan Bagchi (TML) explaining customers MBF production process flow

Customer delegation & TML Team during Safety awareness session and CFT interaction

The customers also visited MBF2 & DI Pipes facility to have a look at our production, quality management and sales distribution process. TML has plans to conduct more such plant visits in the coming months. This will help us in getting a better understanding of customer expectations.

CSR Initiatives at Foundries

In continuation with our CSR effort, during the 2nd Quarter of FY 2018-19, TML has covered 4 foundries & 700 lives. In total, TML has touched 1461 lives in 12 foundries by conducting 9 health camps till date. These health camps cover primary health screening of the foundry workers by conducting tests such as BP, Blood Sugar, Weight, Pulmonary Function Test (as per requirement) & Blood Group determination followed by personalised counselling regarding their health conditions & general medicine distribution according to their requirements.

Team TML at Prompt Castings Pvt Ltd, Hooghly

Team TML at Parucco Foundry Pvt Ltd, Hooghly

The response from both the foundry workers and their owners was very encouraging for Team TML and they have requested us to conduct similar camps on a regular basis.

Tata eFee Customer Conclave

Tata eFee Customer Conclave was held on 11th August covering 76 customers from Delhi NCR region. In the conclave, TML shared various initiatives it has undertaken at the market place; it also held a technical session highlighting the advantages of using pig iron in the foundries along with demonstrating how Tata eFee helps in improving the energy efficiency while melting faster than any other brand of pig iron, during the interactions with the customers, the Plant team also got inputs regarding issues faced by the customers along with their expectations. On this occasion, TML has facilitated four OEMs as a token of appreciation for their continued support & association.

We are having a plan to conduct such conclave in Ahmedabad, Jalandhar & Kolkata.

Mr. R.K. Seth
Honda Cars India Limited with
Mr. S. K. Sharma, EVP, TML

Mr. V.K. Jayaswal
Shriram Pistons & Rings Limited with
Mr. Debasish Mishra, VP - Operations (PI), TML

Procedure of Wet Chemical Analysis
for Metallics (Iron)

The wet chemical analysis uses a procedure to decompose a sample with a reagent such as acid to dissolve in a solvent.

The wet chemical analysis can be divided in two types of analyses, the qualitative analysis to identify the elements and the quantitative analysis to determine the quantity.

The wet chemical analysis utilizes stoichiometric methods such as the gravimetric method and the volumetric method ensuring the precise and accurate (quantitative) chemical analysis of the sample. This method is widely used in determining the major components with high accuracy and precision.

Traditional analyses for quantitative results includes gravimetry, based on the measurement of mass and titrimetry (volumetric analysis) using a volume measurement of a liquid.

Gravimetric analysis entails the measurement of solids precipitated and weighted from a sample after dissolution. A known amount of sample is weighted, dissolved, manipulated either chemically or physically to precipitate a compound and the collected solids are weighted. The amount of constituent in the original sample is calculated from the mass of the precipitate and its chemical composition.

Titration can be used to determine the concentration of a known reactant. A reagent, called the titrant, of known concentration and volume (standard solution) is used to react with a measured quantity of reactant, making it possible to determine the exact amount that has been consumed when the end point is reached. Titrations often use visual indicators, such as a color change in the reactant mixture, to indicate the endpoint of a reaction.

In this edition at PRAYAS, we cover the Wet Chemical Analysis of Pig Iron to determine quantities of Carbon, Silicon, Manganese, Sulphur & Phosphorous.

Determination of Carbon

a) Take a known weight {0.5 gm. for Pig} of sample in a pre-ignited combustion boat.

b) Connect Stopcock T to Stopcock L1. Stopcock L1 open to atmosphere.

c) Raise levelling bottle to fill the carbon burette with levelling solution. Stopcock L1 connected to Stopcock T.

d) Adjust the temperature of Furnace at 1000-1100 ˚C. Insert the combustion boat into the middle of the Combustion tube. Close the tube with a rubber cork and Stopcock T connected to Stopcock L1.

e) Place levelling bottle in its original position. After 2-3 minutes start the flow of oxygen. The level of solution gradually comes down. Adjust the flow of oxygen so that the solution comes down with a moderate speed.

f) As soon as the solution comes down to zero position, adjust Stopcock L1 in such a way that oxygen can flow to atmosphere. Close Stopcock T.

g) Take initial reading, connect Stopcock T to the absorption vessel. Connect Stopcock L2 to T.

h) By repeated lifting and lowering of the levelling bottle, the absorption of the combustion gasses in Potassium Hydroxide solution is completed.

i) After complete absorption, the remaining gas is taken back to the absorption bottle. Close stopcocks.

j) Note the final reading.

Analyze carbon of standard sample following the same procedure and determine factor as per given formula.

FACTOR = ACTUAL RESULT / OBSERVED RESULT.

% C = (Final reading - Initial reading) X Factor X 2.

SOLUTION:

1. Potassium hydroxide 40 % (Weight / Volume)
2. Levelling bottle solution: Salt solution acidified with little H_2SO_4 and colored with Methyl red indicator.

Determination of Silicon

a) Take known weight {1 gm for Pig} of drilled sample in a beaker, covered with a watch glass. Add 20 ml of 1:3 Nitric acid. When vigorous reaction ceases add 20 ml 1:1 HCL, heat for 5 minutes, cool and add 15 to 20 ml Perchloric acid.
b) Evaporate the solution to fumes for 15-20 minutes at such a rate so that the Perchloric acid refluxes on the sides of the beaker.
c) Cool the solution and add 100 ml of hot water and 10 ml conc. HCL. Boil gently for 5 minutes till the salt dissolves.
d) Filter through ashless filter paper. Wash the residue thoroughly with hot dilute HCL (1:1) and finally with hot water.
e) Transfer the paper along with residue to a crucible (platinum or silica) and ignite in a muffle furnace at a temperature of 900-1000 °C till the residue is converted into ash.
f) Take out the crucible and cool to room temperature. Weight of ash taken (let weight of ash A gm).

CALCULATION

% Si = (46.72 X 100 X A) / Weight of sample.

Determination of Manganese

a) Take 0.2 gm sample in a beaker. Digest with 50ml 1:3 HNO_3 for 10 minutes.
b) Add 25 ml 5% Ammonium Persulphate and 20 ml 0.3% Silver Nitrate solution to the filtrate at boiling condition.
c) Warm till pink color develops and boiling just starts. Remove the flask from the hot plate and cool to room temperature. Titrate against a standard Sodium Arsenite solution using 25 ml 1% Sodium Chlroide solution. Color changes from pink to colorless. Note down the burette reading.

CALCULATION

% Mn = Burette reading X 0.01 X Factor
[Factor of Sodium Arsenite determined against standard BAS sample.]

Determination of Sulphur

a) Take known weight of sample in a conical flask (500ml). Attach thistle funnel & delivery tube fittings to the conical flask.
b) Dip free end of delivery tube into 250ml conical flask, containing 25ml Cadmium Chloride & 100ml water.
c) Add 100ml of boiling 1:1 HCL to sample through thistle funnel and after completion of reaction boil for 3-5 minutes.
d) Yellow precipitate of Cadmium Chloride appears in absorption flask. At the end of the reaction add 40ml of 1:1 HCL to the above precipitate and cool the solution to room temperature. Titrate against (N/160) KIO_3 solution in presence of starch solution. Color changes from colorless to violet.

CALCULATION

% S = (Burette reading X16 X Factor X 100) / (160 X 1000 X Weight of sample in gm)

[Factor determined against standard BAS sample.]

Determination of Phosphorous

a) Take known weight {1 gm for Pig} of sample in a covered beaker.
b) Add 70-80ml 1:3 HNO_3 and boil for 10-15 minutes. Filter the solution and collect the filtrate in a 500ml conical flask.
c) Boil the filtrate and add 5% $KMNO_4$ solution drop wise till pink color persists. Boil till pink color changes to brown and then add 5% solution of Sodium Sulphite drop wise till pink color becomes colorless.
d) Remove the solution from the hot plate and adjust the temperature at 70-80°C. Add 70-80ml Ammonium Molybdate solution.
e) Shake the solution for 10 minutes and allow the yellow precipitate to settle for 30-45 minutes.
f) Filter the precipitate through pulp and wash with 1% KNO_3 solution till it becomes acid free.
g) Add known volume (A ml) of 0.1 (N) NaOH solution to this solution. Shake the pulp till it becomes colorless. Add two to three drops of phenolphthalein and titrate against 0.01 (N) HNO_3 solution (Bml). Color changes from pink to colorless.

CALCULATION

%P=[(A - B) X 0.0001354 X 100] / Weight of sample in gm.

Customer Speaks

We are associated with Tata Metaliks Ltd since inception of our company. For nearly one decade, we have found pig iron supplied by TML consistent in sizes and chemistry. This has further improved our melt rate per hour significantly and ultimately reduced our cost. This was proved during the trial taken by the TML team of Mr. Shivam Pandey and Mr. MS Rao in Deepshikha Castings Pvt Ltd recently.

We also appreciate services and efforts of the TML sales team for customer delight. We are thankful to TML's technical and quality teams for their technical support, simplification of processes and improvement in melting.

Mr. Chandrashekhar J. Mankar
Deepshikha Castings Pvt Ltd, Nagpur

TML used to supply us in time all grades of Pig Iron having consistent quality. All dealings from TML's end are very fair, transparent and quick.

Apart from the professional activities TML's hospitality used to touch us for forever. TML also provides us technical assistance as well as medical healthcare to our workmen as a part of customer welfare.

Based on TML ethics, we believe the organization will go on an upward curve on light of their development.

Mr. B.N. Saraf
Prompt Castings Pvt. Ltd, Hooghly

It was a very nice and wonderful experience for us to visit Tata Metaliks, Kharagpur and interact with officials. The Safety Awareness session taken by Mr. Jaydeb Chatterjee was very impressive and thought provoking. Such interactions help foundries to develop a broader outlook and approach to the safety aspect.

Mr. Pawan Kumar Saboo
Revata Iron Works, Howrah

DI Pipes Corner

TML DI Pipes Division embarked upon a new initiative towards Customer Centricity by forming a Technical Services Team (TST) from August'18. TST was formed to cater the needs and aspiration of DI Pipes customers who has emphasised on technical assistance during commissioning of water infrastructure projects.

TML has identified 24 key customers and has started providing Technical Assistance in laying, jointing, testing and other activities. So far we have undertaken two programs at Raipur WSS Project under Amrut (client - IHP) & WSS Project at Jatani , Bhubaneswar (client - PHED Odisha) .

The TST demonstrated and imparted training to the execution teams of contractors at various project sites. The contractors were trained to use recommended tools and tackles for jointing of pipes, fittings, valves; follow safe practices and using appropriate PPE during work. The TST helped the laying gangs for repair and maintenance jobs like cement mortar line repairing, correction of ovality and deformation, pipe cutting, repairing of external coating, champhering etc.

This initiative has been highly appreciated by our key customers like IHP and EE, PHED Odisha.

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