



THE INSTITUTE  
OF INDIAN  
FOUNDRYMEN

**WESTERN**  
R E G I O N

Edition : December 2022  
By : IIF - Western Region



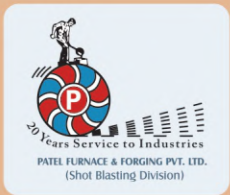
Innovation Article By



# FOUNDRY TALKS

Foundry E-Magazine

For The Foundrymen By The Foundrymen



# Happy New Year

Wishing you good health  
and good fortune for the new year!



**Mrs. Anuja Sharma**  
Chairperson

**Mr. Saibal Sen**  
Vice-Chairman

**Mr. Prayut Bhamawat**  
Hon. Secretary

**Mr. Rajesh Tanti**  
Hon. Treasurer

**Mrs. Shyamal Aroskar**  
Regional Director - WR

## MESSAGE FROM CHAIRPERSON

### Welcoming 2023



**Anuja Sharma**

Chairperson, IIF-Western Region  
Dir.-Mrkt.-Shamlax MetaChem Pvt. Ltd.

The end of another year, and its time to welcome 2023. The year 2022 has brought a lot of positivity in the foundry industry. The general situation around the world is quite positive with most and many foundries being very busy. However the current issues of lack of people, high energy, raw material cost are the major concern. But it is said by Bob Stengel that it is not India's decade but it is India's century.

Indian Business leaders have also given very positive remarks, Sanjiv Mehta CMD Hindustan Liver said "I truly believe that 2023 will be the beginning of India's era. I believe that with strength and resilience we build over last few years, we have multitude of growth to unleash in coming years."

"India will be favorite investment destination" says K M Birla. So let's welcome year 2023 with all the positivity and enthusiasm.

## LETTER TO EDITOR

Dear Editor,

Thank you very much for your efforts and hard - work . It is truly very helpful and lots of interesting artical to read. I am sharing the magazine to my production supervisors as well to implement it in their day to day activities.

Looking forward to your next issues as well.

Thanks & Regards,

From  
**Mr. Chirag Verma**  
Foundry - Owner

## MESSAGE FROM THE EDITOR



**Anant Bam**

Editor Foundry Talk  
Foundry Consultant  
& Energy Auditor

Dear Readers,

This 6th issue of Foundry Talks is dedicated to "Green Sand". Moulding capacity is biggest driver of foundry output and properties of mould directly decide quality of castings. Sand control is hence very important task for foundry supervisors.

We are presenting an elaborate article covering all aspects of sand including materials, process and practical tips on range of working parameters; from expert Mr. Vinay Desai. This article is outcome of his rich 30 years experience in sand control.

The innovation article from MPM is also feed to brains and in tune with trends.

The Questions and Answers are directly from field.

Do write back giving your feedback and suggestions.

Happy Casting.

We truly welcome your feedback or suggestions for WR E-magazine. Please feel free to write to us at [wr@indianfoundry.org](mailto:wr@indianfoundry.org) with subject "Letter to Editor".

# FOUNDRY TIPS



By Mr. Vinay Desai,  
 Foundry Consultant, Kolhapur | Vinaydesai50@gmail.com

Friends today I wish to give you some important points regarding sand control in green sand process. All these points have been derived through my 30 years experience in various foundries and with interaction and discussion with many of my foundry friends like you. I am going to discuss various points which generally many foundry friends miss out unknowingly which lead to change in sand properties and may cause rejections.

**Materials:**

**Silica sand: AFS:** Generally we talk of only AFS of silica sand. And specify it vaguely during purchase. But apart from the AFS we need to specify the sieve distribution also. If you go thru fig no 1 you can see that all the sand have almost the same AFS but have different sieve distribution and all will perform differently when added in system or when used for cores.

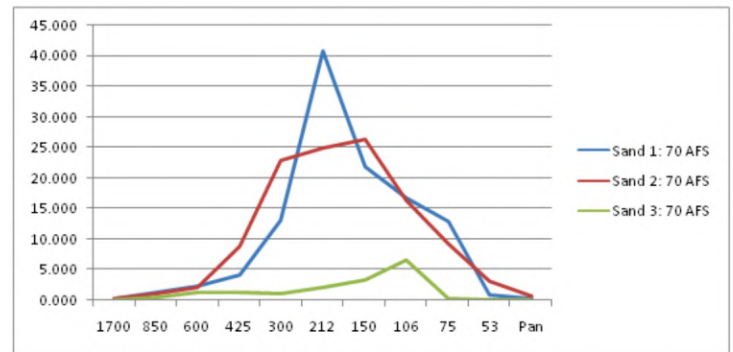


Fig. 1

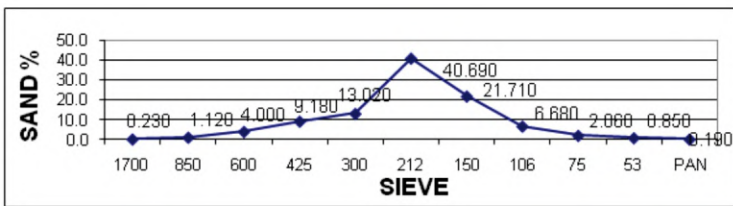


Fig. 2

Hence it is essential to specify how much we want in each sieve e.g. on last three sieves must be less than 5%, the fourth from last be 8-10% and retention on first four sieve is important( 16-18) and the peak retention too ref. fig 2

**Core Sand:** AFS of core sand should be 5-7 numbers coarser than moulding sand. Ideally 50-55 is best suited for all purpose.

**Surface Finish and AFS:** Finer the Sand better is the finish; but it's not 100% true. Parameters like compatibility or flow ability and most important the permeability are also important. LOI or the combustible matter in sand helps in achieving better surface finish. So combination of slightly finer sand and good range of LOI (5.8-6.0) gives good surface.

**Coal compounds:** VM of coal compound is checked at 925C. But we need to know how much loss in weight is at every stage. Especially at 480C which is the sand expansion zone (Alpha to beta transition of silica grains). Keep VM around 480. The gas evolution increases with time; if pouring time falls in zone where gas evolution is max then chances of Blow Holes increase. Hence monitor pouring time, metal temperature and low temperature gas evolution from coal compounds. In coal compound the coarseness of particle is important; too fine will be blown out during dry mixing and coarse will lead to high gas concentration spots in mold wall.

**Bentonite:** Generally we look for high swelling bentonite or high mb value bentonite (385 min). But in modern foundries with intensive mixers, speed of kneading of sand has increased so quick gelling time (less than 60sec) is important. Secondly number of turns made by the sand in system in close loop has gone up; hence durability of bentonite is also important. Indian bentonite are fast gelling whereas imported bentonite are slow gelling But Indian bentonite have less thermal durability than imported bentonite.

**Water:** The water added in mixer is first used for activation of bentonite (temper water), then for wetting of sand grains for moldability and balance is what we call free moisture. Thus how much water is required for bentonite to become active is important. So another parameter called liquid limit must be considered.

**Mixing:** Some important steps are: **Charging:** The quality, quantity (validation of load cells or feeder screw) and sequence of addition all are important. **Dry mixing:** Important for homogeneous mixing. **Water addition:** Rate of addition is important: for 500kg mixer it is 0.75 liters to 1 lit/sec and for 1MT mixer, it is 1- 1.5lit/sec. **Wet mixing:** Sub steps: wetting of sand grains, ionization of bentonite (tempering), swelling of bentonite, formation of slurry, distribution of slurry, coating of slurry on sand grains, distribution of coated grain, separating of each coated grain by aeration **Discharge:** Ensure that mixer pan is getting emptied fully and no sand remains in the mixer, no dry sand or un mixed sand leaks from the door of mixer on to the belt conveyor during dry and wet mix, maintain the gap between scrapers and the pan bottom and side.

**Return Sand Preconditioning:** Control temperature within +10 degrees than ambient, remove fines, lumps, cores and magnetic particles, and prevent spillage. The cooler needs to be set so that you get cool sand ( temp not above 42C) and also dust or fines extraction is achieved (de-dusting)The quantity and quality of dust extracted from return sand in cooler should be monitored and checked on regular basis.

Pl note that dust extraction is one of crucial tool to control dead clay and oolitics from system sand along with cooling the sand.

Check moisture in range of 1.4% to 1.6, suck dust to the tune of .25 to 0.35% every cycle to keep dead clay and oolitics under control. We need to watch Active clay , VM content and LOI of this dust along with its AFS to ensure that we do not suck out useful components which give us cushioning and good surface finish.

**Sand Storage and Number of Cycles:** Next important point is the total sand volume in the system & how many turns should the sand make in a close loop. (Ideally 4 -5 cycles in 24hr). We should ensure that no coning occurs, no sand sticks on side of the hopper walls and that FIFO is followed.

For ready reference i am giving you a the range of different properties of sand which you may target for each type of molding equipment you use with a slight modification according to pattern and ur sand plant infrastructure.

	450 Line	900 Line	1300 Line	HPML
Total Clay	12.5 to 13.0%	13 to 14.5%	13.5 to 14.5%	
Active Clay	9 to 9.5%	9.5 to 10%	10 to 10.5%	9.5 to 10%
Dead Clay	2.5 to 3%	2.5 to 3%	2.5 to 3%	2.5 to 3%
VM	2.5 to 3%	3 to 3.5%	3 to 3.5%	2.5 to 3%
LOI	5.5 to 6%	5.5 to 6%	5.5 to 6%	5.5 to 6%
AFS	55 to 58	55 to 58	55 to 58	55 to 58
Permeability	130 to 145	140 to 160	150 to 160	145 to 165
WTS	16 -18	18 - 20	20 - 22	24 - 28
GCS	1250 - 1350	1350 - 1450	1400 - 1500	1700 - 1950
Return Sand Temp	Maximum 10 Degrees above ambient			



**Mahesh Date**

# Raw Material Price Index

## Movement In Foundry Raw Material Prices

As per IIF data, there are nearly 7,000 foundries across India. The Indian foundry industry is ranked second globally with a production of 10 million tons per annum. It is catering to the automotive, tractor, power train, railways, energy and engineering sectors in domestic as well as overseas markets - Directly and indirectly.

There was sudden spike observed in April, 2022 and continued due to various reasons. Prices got declined-stabilized thereafter but these fluctuations led us to establish the common reference point where we can study the actual raw material prices variations.

Now prices ruling in Kolhapur during second week of Dec. 2022 are given in column 14 in the Table below. Also, given in table are the prices since Sept. 2022. These prices are collected from Kolhapur market. These are approximate, ruling during the month and week as indicated in the table.

In the prices indicated below, transportation cost is included in most items. Only applicable GST is to be added. Prices of many materials are on the basis of "Immediate Payment"

### Movement Of Prices of Raw Materials over a Period of 4 Months

<b>(A) Major Ferrous Metallic Raw Materials, Low Ash Metallurgical Coke, and Electro-Graphite Fines {Rs/ Tonne}</b>														
	Sep'22	Sep'22	Sep'22	Sep'22	Oct'22	Oct'22	Oct'22	Oct'22	Nov'22	Nov'22	Nov'22	Nov'22	Dec'22	Dec'22
	1 <sup>st</sup> Week	2 <sup>nd</sup> Week	3 <sup>rd</sup> Week	4 <sup>th</sup> Week	1 <sup>st</sup> Week	2 <sup>nd</sup> Week	3 <sup>rd</sup> Week	4 <sup>th</sup> Week	1 <sup>st</sup> Week	2 <sup>nd</sup> Week	3 <sup>rd</sup> Week	4 <sup>th</sup> Week	1 <sup>st</sup> Week	2 <sup>nd</sup> Week
Foundry Grade PigIron	57350	57350	57350	56850	56850	55850	54666	54666	54666	53666	52314	52314	52314	51766
MS Scrap (good quality)	51500	51500	50500	50500	50500	50500	50000	49000	47500	45500	47000	47500	45500	45500
Low Mn Steel Scrap	55000	55000	55000	55000	53000	53000	52500	52000	51500	50000	50000	49500	49000	48500
Si Steel Stamping Scrap	52800	52800	52300	52300	52000	52000	51500	51000	51000	49500	49500	48500	48500	48000
Low Ash Met. Coke	59250	58500	58500	57500	57000	56500	55000	53500	52500	51000	50000	52600	52600	52600
Electro-Graphite Fines	102000	102000	102000	102000	102000	102000	101000	101000	101000	100000	100000	100000	100000	100000

<b>(B)Major Ferro-Alloys {Rs./Kg}</b>														
Fe-Si (70-75% Si)	153	152	152	152	150	150	145	145	142	142	141	139	135	132
Fe-Si-Mg (5-7% < Mg)	230	230	230	230	230	230	210	205	205	205	200	195	195	190
Fe-Si-Mg (5-7% < Mg) (TOL)	±5	±5	±5	±5	±5	±5	±5	±5	±5	±5	±5	±5	±5	±5
High C Fe-Cr (60% Cr)	240±5	240±5	240±5	240±5	240±5	240±5	230±5	220±5	210±5	210±5	200±5	200±5	195±5	195±5
High C Fe-Mn (60% Mn)	130	130	130	130	126	120	115	115	110	100	100	100	100	98
Ferro-Moly (60% Mo)	110	99	99	99	95	95	92	92	90	90	89	90	88	88
Ferro-Moly (60% Mo)	2160	2160	2250	2450	2400	2400	2400	2200	2200	2350	2550	2700	2750	3000

1. Above Prices are Excluding Taxes, GST Extra as Applicable
2. Phenol Price: Rs. 130/Kg during 2nd week of December 2022

(Info collected during Dec. 2022, Reader are requested to check the market prices)

**Disclaimer:** Rates represented here are as per the data collected from the reliable sources based in Kolhapur and it may vary based on the supplier, location, payment terms & other conditions.



# SPECIAL INSIGHTS

## INDIAN FOUNDRY INDUSTRY PARTICIPATING IN A BIG WAY IN GIFA - NEW CAST

JUNE 12-16, 2023 AT DUSSELDORF, GERMANY

By: Mr. Subodh Panchal, Chairman, International Committee GIFA 2023

International Committee of the Institute of Indian Foundrymen is organising participation of IIF in GIFA-New Cast in a big way.

### The Bright World of Metals

GIFA is the most important trade fair for foundry technology in the world. It receives top marks size, competence and rating wise by visitors and exhibitors. The GIFA is the platforms for excellent business activate and is the indicator for the innovations which will orientate the future.

As usual, four fairs GIFA, NEWCAST, METEC and Therm process (GMTN) will be held together at the same exhibition centers of Messe Dusseldorf.

Visitors can buy common entry ticket easily online on [www.gifa.com](http://www.gifa.com)

### Reasons to attend GMTN:

For specialists and decision makers !

- Foundry/Meeting plants and installations
- Refractories technology
- Plants and machinery and moulding auxiliaries
- Casting machines and pouring equipment
- Knock-out, fetling finishing
- Pattern and die making
- Control systems and automation
- Environmental protection and waste management

### G M T N EXPECTS IN 2023

Expected by the Organizers:

- More than 75000 visitors
- More than 2000 Exhibitors from 120 countries. From top and middle management 68% visitors are directly involved in investment decision.

### Status of Exhibitions 2023 as on

26th Dec.2022 (Source : GIFA Website)

Total Exhibitors	:	1105
China	:	40
India	:	100
Germany	:	375
Italy	:	124
Turkey	:	18

### Data of last GIFA 2019 (Source Messe, Dusseldorf)

A. Total Exhibitors : 980  
From Germany : 337  
Nos. of Country : 46

B. Top Visitors Countries  
India : 10%  
Italy : 7%  
China : 7%  
Turkey : 6%  
Total Visitors : 45597

C. Management  
Top : 47%  
Middle : 21%  
Lower : 16%

### Data of last Newcast 2019 (Source Messe , Dusseldorf)

A. Visitors : 433  
Germany : 54  
India : 29  
China : 192  
Other countries : 379

B. Total Visitors : 3404  
Nos. of Countries : 127  
Germany : 34%  
Other Europe : 37%  
Non European : 29%

C. Management  
Top : 46%  
Middle : 21%  
Lower : 28%

D. Interested in Iron, steel, Malleable 67%, Non ferrous 36%  
E. Satisfied 96%  
F. New vendors formed 39%

**OVERALL ACTIVITIES PLANNED by the IIF.**

1. Foreign Buyers meet for foundrymen and suppliers
2. India Evening on cruise
3. Stand booking in GIFA-New Cast (with EEPC at discounted rates)
4. Organised Tours through approved tour operator/s
5. Guidance for Private accommodation
6. Works Visit
7. Made in India : "QR" with profiles of Indian Foundries and Suppliers (Don't miss the global publicity)

**Proposed Charges**

- A. For Company profile through QR Codes: Rs. 12,000/- plus GST each.  
Discount: 20% to IIF company members
- B. Casting Buyers Meet Rs. 6000/- per person  
Discount: 15% to IIF company members

Please write [toprofile.gifa23@gmail.com](mailto:toprofile.gifa23@gmail.com) for application forms.

Last Date to apply with profile and payment: 28th February 2023

**Sponsorship**

Leading Indian cos are invited to become platinum sponsors and to enhance their brands in the eyes of global exhibitors, visitors by wearing a special badge given.

Also avail other benefits.

For details of sponsorship packages please write to  
[india.gifa2023@gmail.com](mailto:india.gifa2023@gmail.com) | [subodh\\_panchal@hotmail.com](mailto:subodh_panchal@hotmail.com)

**Organized tours:** To travel in controlled budget, IIF will appoint experienced tour operator/s. Various packages including air fare, accommodation, daily transfer to fairground, Indian Food, VISA etc.

Guidance for private accommodation also will be given.

**VISA**

Those who are traveling on their own are advised to get VISA dates asap at least 3-4 months in advance. Pl plan to land in German airports only to avoid decline at immigration.

Chairman of this committee is attending all GIFAs since 1984 and also arranging Indian exhibitors participation since 1998 .A strong brand of Made In India is created..You can rely upon the guidance. This time we expect a strong presence of India. Considering the adverse situation elsewhere. Our aim is to create a platform to explore lots of opportunities for Indian foundry Industry.

**For more details and best possible assistance, please contact:**

Subodh Panchal, Chairman, International Committee, M. +91 98240 15380  
Amish Panchal, Convenor, M. +91 98243 02980  
Devendra Jain, Convenor, M. +91 99893 30999  
(Shyamal Aroskar and Ravi Dhawan at [india.gifa2023@gmail.com](mailto:india.gifa2023@gmail.com) )



# Innovation Article

By Mr. Deepak Chowdhary - Founder - MPM Group

Founder & Inventor of Globally Patented Software - Sandman

# Lustron®

## The Engineered Green Sand Additive

Innovation Article is sponsored article to promote the innovation done by the company. To Showcase your company product / Innovation, Please write to [wr@indianfoundry.org](mailto:wr@indianfoundry.org)

The Engineered Green Sand Additive that helps you Reclaim Lost Profits by:

**Improving Surface Finish** - Your Customer Delight

**Reducing Casting Defects** - Your Management Delight

**Optimising Additive Consumption** - Your Process Owner Delight

All this is possible! You can reclaim your 'Lost Profits' and restore Green Sand integrity because **LUSTRON** is a three decades proven proprietary blend of carefully selected and scientifically evaluated lustrous carbon carrying additives and anti-scabbing agents for use in Green Sand Molding foundries in India. Lustron also comes backed by a highly customer-centric and experienced Technical Application Team.

Interacting with foundrymen on-site, on-line and learning that our products had to adapt to the sand system rather than adapting the sand system to our products, **LUSTRON**

- ▶ **Experience** of the Green Sand System and the forces acting in, on and around it, that makes for good casting finish.
- ▶ **Proven track** record of 30+ years of 'on-site', 'on-line' application competency in virtually all types, dimensions and configurations of engineering Castings in SG and Grey Iron.

is tailor-made with the best possible formulation to match the needs of the individual foundry Green Sand process of our customers.

Today "**LUSTRON**" is no longer just a product; it is the experience of using a **Brand** which, when delivered to the customer, is backed by:

- ▶ **Research** of the requirement of the customer's Sand System.
- ▶ **Know-How** of its introduction and application in the Sand Preparation and Molding process.
- ▶ Reduced variables in Sand Control = Standardization of the sand molding process = consistent reproducible results.

Continuous interaction with the individual foundryman and experience with their numerous sand systems - each unique in their own right - led to the development of several variants of "Lustron" to suit specific sand system parameters such as:

**Advantages of Using Lustron :**

- ▶ Improved sand peel off from the casting.
- ▶ Improved surface finish.
- ▶ Optimized consumption of additives.
- ▶ Reduced consumption of Steel Shots.
- ▶ Reduced fettling/ rework for casting finishing.
- ▶ Reduced sand related casting defects.
- ▶ Reduced man-hours in the pre-dispatch casting preparation; faster turnaround.

▶ **Lustron HPL:**

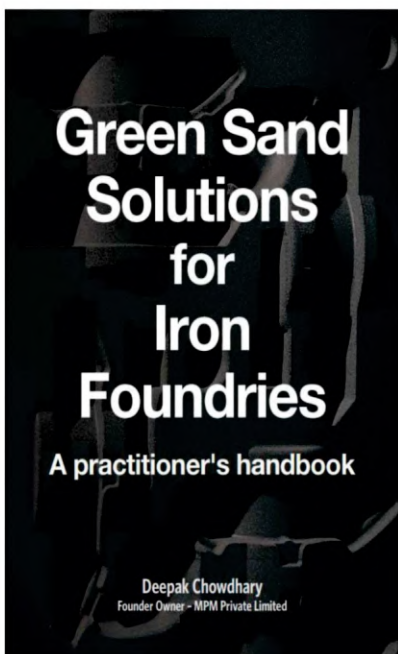
Essentially designed for high-pressure molding lines and to perform ideally in the highly dense and compact molds.

▶ **LAC-LCA**

This is a blend of carefully selected and evaluated “coal dust” and other complementary ingredients, designed to improve surface finish of Grey and S.G. Iron castings.

<b>General Specifications:</b>			
Products	Volatile Matter	Ash Content	Fixed Carbon
Lustron	50 - 60%	7% Max	By Difference
Lustron-Premium	50 - 55%	7% Max	By Difference
Lustronite	40 +/- 3%	7% Max	By Difference
Lustron - HPL	40 - 50%	7% Max	By Difference

**“Green Sand Solutions for Iron Foundries”**  
A practitioner’s handbook



**Deepak Chowdhary**  
Founder & Managing Director  
MPM Private Limited

Direct Link to Amazon:  
<https://tinyurl.com/2p82frja>

1st book in world on Green Sand Parameters causing defects and science behind it for proper root cause analysis.

**This Book is available on AMAZON at Rs. 1500.**

**Special Discount price Rs. 1000 per copy, available at all branches of MPM.**

**Please Contact MPM local branch for book & fishbone wall charts.**

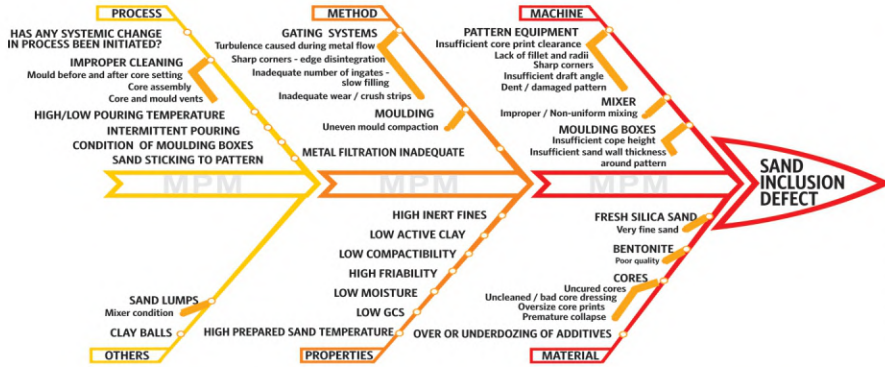
MPM Central Contact for Fishbone Wall Charts, Green Sand Book, Sandman demo, Digitalization & personalized solutions:

**MR. MANISH PATRIKAR**  
(Vice President - Technology & Marketing)  
Email: [manish@mpmindia.com](mailto:manish@mpmindia.com) | Cell: +91 9822464730



# Green Sand Solutions

## SAND INCLUSION DEFECTS

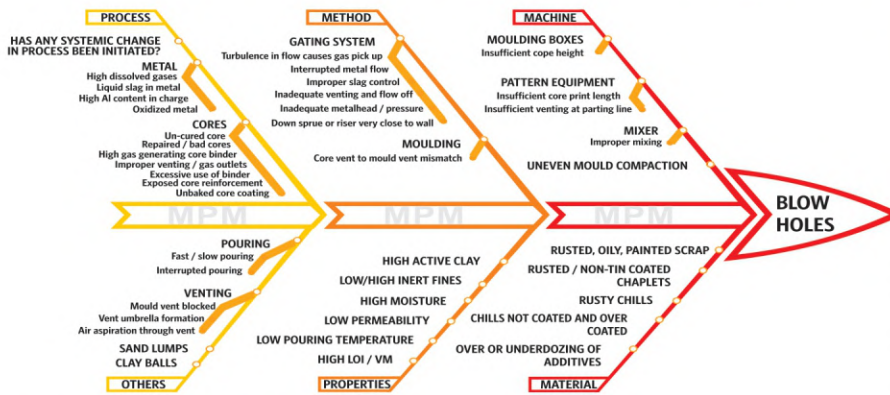


### REMEDIES

1. Check if any systemic change in process has been made recently.
2. Check mould's pressure marks and, if necessary, insert pressure (crush) pads.
3. Improve pattern plates, increase pattern taper and radius, if necessary, use parting agent.
4. Check moulding plant flask stripping and overhaul moulding plant if necessary.
5. Ensure uniform mould compaction, avoid over-compacted sections.
6. Ensure proper core dressing, cleaning of core, core assembly and core vents cleaning.
7. Ensure proper core setting and cleaning of mould before and after core setting.
8. Ensure sufficient mould wall thickness between mould and boxes.
9. Raise the compactibility and thus plasticity of the sand.
10. Maintain adequate moisture and reduce high temperature of sand to reduce friability of mould.
11. Increase the bentonite content and increase wet mixing time.
12. Reduce very fine sand / dust content to reduce clay ball / lumps in the sand.
13. Increase the strength of the core, use better proportion of the binder and avoid binders causing pre-mature collapse.
14. Avoid intermittent pouring, high pouring rate and impact of metal stream against mould wall.
15. Ensure proper removal of slag and adequate metal filtration.

www.mpmindia.com info@mpmindia.com

## BLOW-HOLES | GAS DEFECT

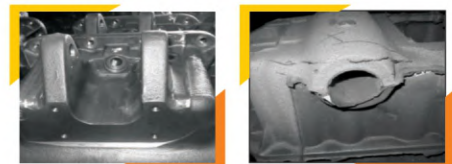
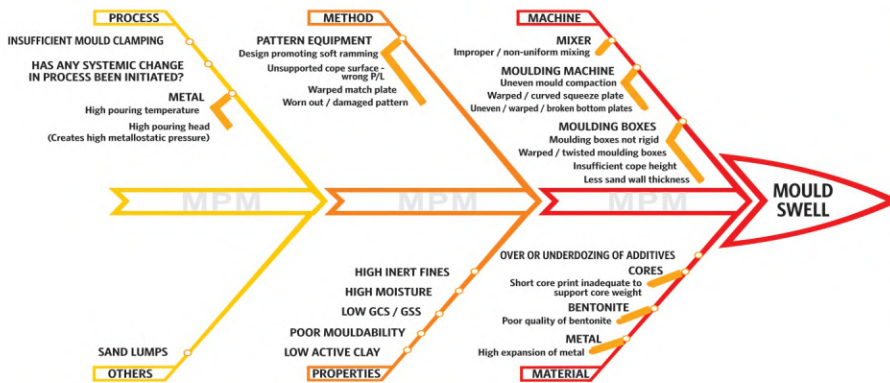


### REMEDIES

1. Check if any systemic change in process has been made recently.
2. Avoid excessive gas producing materials in scrap (scrap coated with paint, TRAMP elements and oily materials).
3. Avoid excess binder in core or moulding sand. Avoid under-cured and unbaked cores.
4. Employ correct pouring speed (not too fast / slow) and do not pour cold metal (low fluidity).
5. Maintain proper pouring head and avoid interrupted pouring.
6. Ensure proper cleaning of moulds and core vents.
7. Ensure proper drilling / piercing to avoid umbrella formation and mismatch with the core vents.
8. Avoid low carbon or carbon equivalent iron (higher melting temperature).
9. Use metal filtration filters for avoiding metal turbulence and ensure slag removal.
10. Control moulding sand moisture %, inert fines %, LOI, VM, permeability in moulding sand.
11. Do not use rusty / overcoated / non-coated chills and rusty / non-coated chaplets.
12. Remove clay balls from sand system.
13. Ensure proper non turbulence gating system to avoid air aspiration.
14. Avoid use of cold ladles and cold slag rods.
15. Avoid excessive core / mould wash thickness.

www.mpmindia.com info@mpmindia.com

## MOULD SWELL | OVERSIZE CASTING DEFECTS



### REMEDIES

1. Check if any systemic change in process has been made recently.
2. Improve flowability of molding sand.
3. Improve distribution of the sand prior to compaction. Increase pressure, if necessary.
4. Reduce sand compactibility.
5. Avoid high moisture, low GCS, low active clay, and high inert fines in sand.
6. Improve compaction of cores.
7. Ensure adequate venting of molds.
8. Avoid high temperature and high metal pouring heads while pouring.
9. Ensure proper clamping of mould flasks.
10. Ensure sufficient mould wall between pattern and boxes.
11. If necessary, reduce the degree of saturation of iron in order to reduce graphite expansion.
12. Reduce metallostatic pressure.
13. Avoid design promoting soft ramming.
14. Avoid unsupported core surface and ensure adequate core print length.
15. Avoid warped match plate, moulding boxes and squeeze plates.

www.mpmindia.com info@mpmindia.com



**Lustron**  
The engineered green sand additive

Product Solutions  
**Lustronite**  
The pre-blend advantage

**Sandiron**  
Bentonite solutions

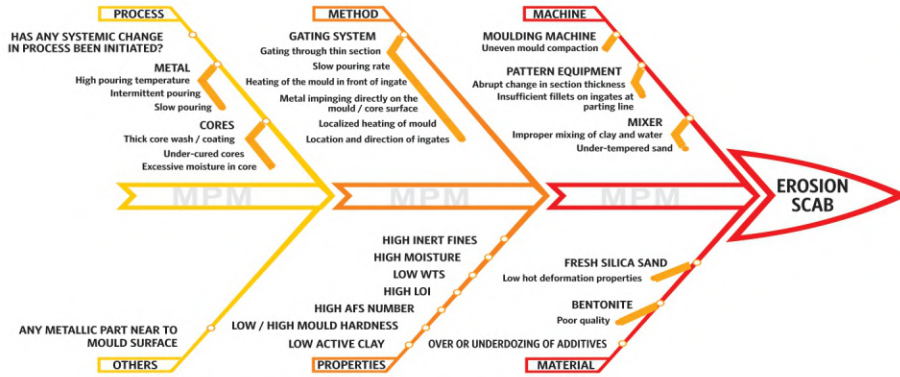
Industry 4.0 Solutions  
**digisandman**  
Moulding sand 4.0

**sandman**  
Green sand - Art to analytics



# Green Sand Solutions

## EROSION SCAB

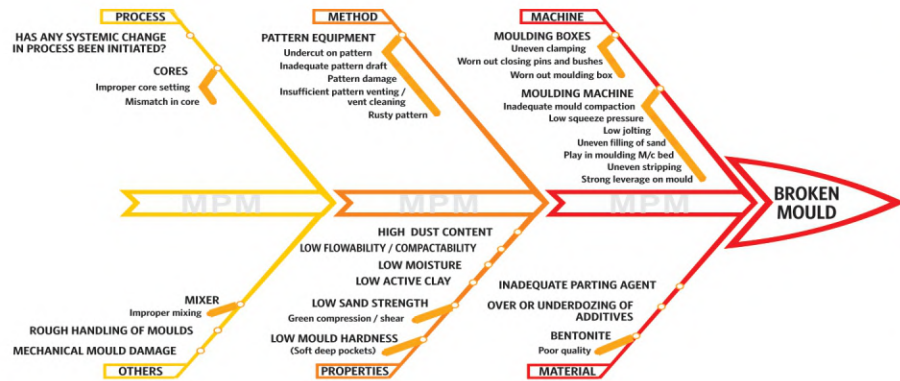


### REMEDIES

1. Check if any systemic change in process has been made recently.
2. Increase active clay, (Bentonite), LOI (LCA) and use finer sand (higher AFS no. FSS).
3. Control return sand temperature to below 40° C (sand cooler) and pre-moisturize return sand to improve bentonite development.
4. Ensure fresh silica sand has high hot deformation property.
5. Increase wet mixing time. Check mixer condition to ensure homogenous mixing of sand for uniform mould compaction. (Mixer)
6. Improve sand flowability by moisture control.
7. Avoid low wet tensile strength ensuring quality of bentonite.
8. Avoid slow / intermittent pouring and high pouring temperature.
9. Modify gating system to achieve uniform heating of sand in the mould, reduce pouring rate and avoid metal impinging from ingate directly on cores. (Method)
10. Ensure proper fillet radii near ingates at parting line.
11. Ensure proper mould hardness.
12. Avoid thick core wash, uncured and excessive moisture cores.
13. Avoid any metallic part near mould surface.

www.mpmindia.com info@mpmindia.com

## BROKEN MOULD | MOULD BREAKAGE

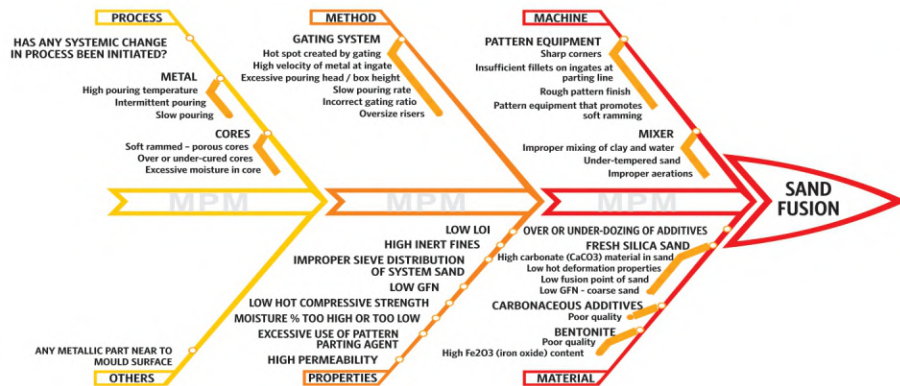


### REMEDIES

1. Check if any systemic change in process has been made recently.
2. Improve stripping of mold from pattern if necessary. Use parting agent.
3. Increase tapers on patterns and molds.
4. Distribute sand evenly in the flask.
5. Ensure even / adequate compaction of molds.
6. Improve plasticity of the sand. Improve compactability.
7. Improve flowability of molding sand.
8. Reduce dust content.
9. Reduce the return sand temperature by ensuring sand cooler functioning.
10. Increase active clay and development of bentonite in sand by pre-moisturizing of return sand.
11. Reduce clustering / lump formation of the sand.
12. Ensure proper core setting and avoid core mismatch.

www.mpmindia.com info@mpmindia.com

## SAND STICKING | SAND FUSION | BURN-ON SAND



### REMEDIES

1. Check if any systemic change in process has been made recently.
2. Increase % of lustrous carbon additive.
3. Reduce inert fines and oolitics if necessary, add new sand.
4. Ensure adequate mould compaction.
5. Reduce % active clay, if necessary, reduce the amount of bentonite.
6. Use purer silica sand with better refractoriness and avoid high permeability / low GFN.
7. Avoid too high / too low moisture.
8. Ensure bentonite quality (low Fe2O3).
9. Avoid excessive use of parting agent.
10. Reduce pouring rate, liquid metal temperature and avoid intermittent pouring.
11. Proper design of gates for equal distribution of metal to avoid local overheating, turbulence and high velocity.
12. Ensure proper pouring height from box to ladle lip.
13. Avoid rough finish pattern and pattern equipment that promotes soft ramming.
14. Avoid sharp corners and insufficient fillet radii at parting line.
15. Do not use soft rammed / porous and unbaked cores.

www.mpmindia.com info@mpmindia.com



**Lustron**  
The engineered green sand additive

### Product Solutions

**Lustronite**  
The pre-blend advantage

**Sandiron**  
Bentonite solutions

### Industry 4.0 Solutions

**SANDMAN digismart**  
Moulding sand 4.0

**sandman**  
Green sand - Art to analytics

# Ask The Expert

**Q 1: What are the key parameters of active fines, inactive fines and moisture content to be maintained in green sand system for horizontal parted flask less high pressure moulding?**

**Ans:** As a basic principle, the mould should be sound enough and not hard, to produce good quality castings. To produce this in green sand, generally it is suggested to maintain an active fines (clay-bentonite) of around 8 - 9%, inactive fines (dead burnt clay/coal dust/dead burnt coal dust (coke, ash) / natural fines from the base sand) of around 3 – 4% (Total fines content of around 12% - Fines are defined as all the grained particles that are smaller than 0.02 mm) and adequate moisture until a desired compactibility is achieved.

Compact ability testing measures a property of moulding sands which is of decisive practical importance in establishing their behaviour on modern automated moulding machines. It determines the percentage decrease of height from the original constant level of the loose sand under the influence of squeeze compaction. Generally, it is recommended to have around  $38 \pm 2$  for shoot & squeeze mould making technology and around 33 - 36 for aeration mould making technology.

Different sands have different water requirements. They will have the same green-sand condition at very different individual water contents. The lower the fines content, the greater the water sensitivity. Too high content of inactive fines increases water consumption and brittleness of the moulding sand and reduces its permeability. With excessive content of inactive fines, bonding strength drops steeply.

There are two types of clay, each with specific properties: kaolin (fireclay) and montmorillonite clay. Kaolin is not suitable for high-density moulding sand due to low bonding strength, low durability when being heated and low plasticity. Therefore, kaolin can only be used when it exists in semi-natural moulding sand and should be enriched with montmorillonite. Bentonite is a clay containing a minimum of 70% montmorillonite and therefore it is recommended to use bentonite for automatic high-density green sand moulding. In nature there are two types of bentonite: sodium bentonite, which predominantly contains ions  $\text{Na}^+$ , and calcium bentonite, mainly containing ions of  $\text{Ca}^{++}$ .

In spite of the great differences between the two types of bentonites, the one cannot be preferred to the other without taking into consideration the concrete job (casting type) in question. No one will choose a Ca-bentonite for steel castings, where the thermal load of the moulding sand is very great, or use a pure Na-bentonite for thin-walled castings. For the same reason, Na-bentonite is not used for aluminium castings, which, on the other hand, must be added in great quantities for the production of thick-walled cast iron castings. It is normally recommended to use both Na- and Ca-bentonite in a proportion corresponding to production conditions so that the correct mould stability is obtained, as well as correct sand consistency, green strength and dry strength plus collapsibility in shake-out.

Answer by Mr. S. Vignasha

To ask your question or get the suggestions, please write your problem with detailed description to [wr@indianfoundry.org](mailto:wr@indianfoundry.org) with subject "Ask the Experts". Identity of the Questioner will be kept confidential.

## Message from IIF Pune Chapter Chairman



**Mr. Rajendra Newadkar**  
Chairman, IIF - Pune Chapter

Global warming is the phenomenon of a gradual increase in the temperature near the earth's surface. This change has disturbed the climatic pattern of the earth.

The main causes of global warming are deforestation, using vehicles, using air conditioners and refrigerators, and adding CFCs (Chlorofluorocarbons), the harmful emissions from factories/foundries that add to the increasing temperature of the earth. overpopulation.

### Steps to be taken by foundries

1. Recycle waste generated from the foundry. e.g. Sand, packaging material, etc.
2. Use flue gases generated from melting furnaces for preheating of cores or furnace charge.
3. Provide a common transport facility to employees, if possible, and use E-vehicles.
4. Reduce energy consumption by reducing casting and core rejection, and reduce liquid metal transport from the furnace to the pouring station.
5. Use solar power for office buildings.
6. Plant trees on birthdays instead of cutting a cake.
7. Use energy-efficient devices.
8. Save water.
9. Create awareness.

## Western Region Activities



IIF WR Innovation Tech Series @ Rajkot



Yogyata Vikas Training Programme in  
Jash Engineering Ltd., Indore



Yogyata Vikas Training Programme in  
Powal Auto Components, Indore

