ALL INDIA INDUCTION FURNACES ASSOCIATION

AIIFA

INDUCTION FURNACE NEWSLETTER

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What's Inside

हमारे सभी सदस्यों को बैसाखी की हार्दिक शुभकामनाऐं

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ENVIRONMENTAL SUSTAINABILITY

Kamal Aggarwal
Hon. Secretary General
AIIFA

Climate change is the biggest issue for the steel industry in the 21st century. Reducing CO_2 emissions in steelmaking must be tackled on a global level. Making the substantial CO_2 reductions required will need technology transfer, collaboration and breakthrough technologies. The reduction of CO_2 from steel production is an established priority, as is the reduction of GHG emissions during the life cycle of products that use steel.

Efficient use of resources, re-use and recycling are also imperatives for sustainable development. Material efficiency is an integral part of the modern steelmaking process. Our goal is to use all raw materials to their full capacity, ensuring zero waste from steelmaking. This ambition guarantees that almost every by-product formed during steelmaking is used in new products. This approach minimises the amount of waste sent to landfill, reduces emissions, and preserves raw materials.

Environmental sustainability is also related to the development of new and stronger products, which in the long-term will provide clear and lasting positive benefits for the environment. For the steel industry, the impact of steel during the entire life cycle of products, the use of by-products, recycling, energy and water management are important focus areas.

Another example is the efficient use of energy. This has always been one of the steel industry's key priorities. Cost is a key incentive for this, considering that energy purchases account for 20-40% in basic steel production. One worldsteel study estimates that steel companies have cut their energy consumption per tonne of steel produced by 60% since 1960. While existing production technologies are already very efficient, every steel company is at a different point of maturity and development.

Further, we have many challenges to overcome as a global society. We are faced with resource shortages, water and land stress, environmental degradation and climate change. We believes that sustainable development must meet the needs of the present without compromising the ability of future generations to meet their own needs. Within this, a green economy delivers prosperity for all nations, wealthy and poor alike, while preserving and enhancing the planet's resources.

However, the transition to a green economy is already underway and presents countless opportunities for positive change. Steel has an essential role to play in this transition and in sustaining a green economy……

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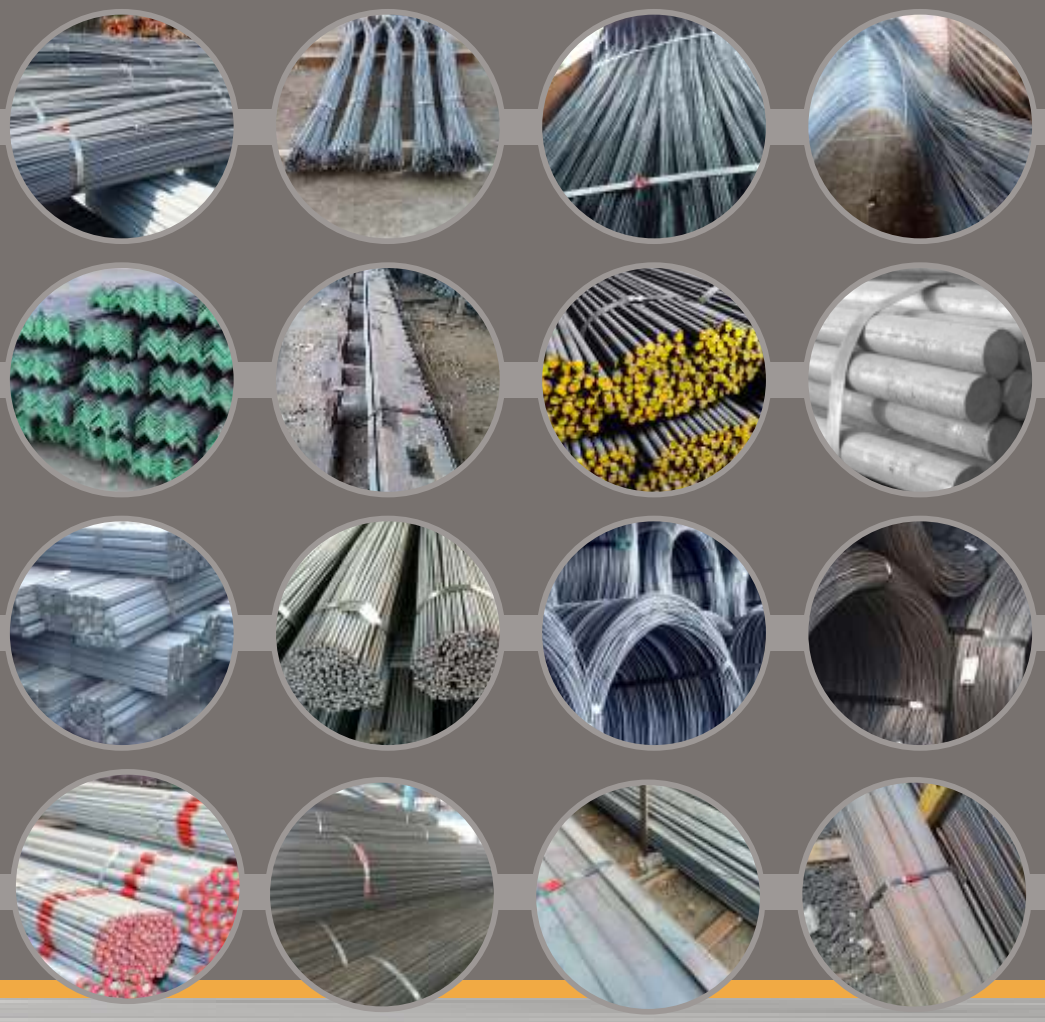

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ENVIRONMENT FRIENDLY STEEL

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Steel Equipments to Work at Elevated Temperature

Srikumar Chakraborty*
Abhijit Niyogi **

Introduction : Advanced technology of steel making, hot working, product heat treatment and quality control measures in the entire process chain results high performance low C low alloy Cr-Mo grade products used for making equipment and components in power plant ensuring smooth and safe operation. This is where heat and corrosion resistant alloy steels like F11, F22 grades are coming into play as better suited to meet increasingly demanding requirements in specific areas of power plant which is growing at much faster rate the current capacity being 330,860MW (~331GW). However, Nuclear power plants have material requirements similar to those of fossil power plants but presently the prime valve materials and critical components are manufactured by only austenitic stainless steel.

Thus, the demand for special alloy steel like F11 and F22 has grown substantially and this trend is expected to continue which is, presently, met mostly by induction furnace melting units in mini steel plants. Types and selection of such steels are typically defined as low C low alloy Cr-Mo steels. The demand and selection of heat and corrosion resistance alloy steels is driven by the production and smooth operation in power plants based on working temperature, Pressure, corrosiveness (hydrogen sulphide, carbon dioxide, chloride etc.).

Common popular grades like F11 and F22 are used as basic construction materials and equipments designed for working at elevated temperature possessing good creep strength, plastic properties and safe working in the steam temperature up to 600°C in power plants. Besides high creep strength these materials, also, exhibit other properties like good corrosion and crack resistance as well as good weld ability. These alloys are, mostly, designed for power plant applications in the area of thick section boiler components, steam lines, turbine rotors and turbine castings, valve shells (bodies and bonnets), power devices e.g. pipe lines of live steam which are usually manufactured from a combination of casting/ or forged which function reliably over long periods of time in severe environments.

Grade Characteristics & Properties : Products in these grades are used in specific areas forcing development of high efficiency and low emission systems in economic ways in the power plants increasing the thermal efficiency of power plant by increasing the temperature and the pressure of steam while entering the turbine. Keeping in mind, components of these grades have been developed for better properties to operate at such conditions. Products in the grades F22 & F11 with specification of about 2.25 - 3% Cr, 1% Mo with carbon content lower than 0.20% have good hot workability with higher hardening and welding ability due to its alloy trait where Cr improves its anti-oxidization and anti-corrosion properties, and Mo enhances its high temperature strength.

The temperature regulation of the superheated steam is done automatically via the three-way valve produced by forging F11, F22 steel grades which are also used in making water heater. The components made from these steel grades are subjected to water and steam pressure and to high temperatures, combined external loadings. However, recommended operating temperature for safe working of various components and valve by the designer is 500°C–600°C, though F22 products with lower range of carbon content can work safely even above 600°C for its strength and thermal stability but worsening weld ability to some extent.

Customers order these grades as F11 equivalent to DIN 13CrMo44 & F22 equivalent DIN 10CrMo910 in composition, but they prefer use of F22 grade in most of the areas. Equivalent International Specification of F22:

Country	Grade
EU	10 CrMo910
Germany	DIN 10 Cr Mo910
France	10/12CD910
Japan	SCM V4
China	12 CrMo
Sweeden	SS 2218
Russia	GOST 10KH2M

In both the grades, carbon content of 0.05% or more is required only to increase the tensile strength and creep rupture strength, but on the other hand, the increased amount of carbon content reduces the weld ability increasing susceptibility of the stress relief cracking and reduce the creep rupture ductility as well as the impact toughness. Therefore the carbon content should be judiciously maintained in balanced way considering end use of applications areas.

Silicon acts as a deoxidizing element in a refining process during steel making which improves strength and harden ability. However, Silicon, at the same time, is responsible to increase the susceptibility to temper embrittlement and so it is better limited to 0.10% or less for good impact toughness of the steel after prolonged exposure at the high temperature range where the temper embrittlement may occurs.

Manganese acts as a deoxidizing element in the same manner as Silicon, and also improves the harden ability of the steel, but on the other hand, it increases also the susceptibility to temper embrittlement. Therefore, its content was limited to the range of 0.30%-0.80%, preferably at the middle or lower side of range.

Presence of small amount of Nickel, though not specified in the composition, improves the harden ability of steels and also their impact toughness, but acts to increase the temper embrittlement susceptibility and also remarkably decreasing the high temperature creep rupture strength. Therefore its content even as residual must be limited to 0.25% or less.

Chromium is the element necessary to improve oxidization resistance in steel in high temperature use, and also acts to improve harden ability increasing creep rupture strength by forming a stable carbide. For these reasons, the content of chromium should be 1.0% or more in the range, but if it exceeds 3.5%, it reduces the amount of solid solution of carbon and induces the growth of precipitated carbide, which causes lowering of creep rupture strength. Therefore, the most appropriate content of Chromium in this grade is preferred in the range of 1.00-2.50%.

Molybdenum has the effect of solid solution hardening which increases the creep rupture strength combining with Carbon forming a stable carbide. For these reason, the content of Molybdenum should be 0.5% or more. However, its effect in increasing creep rupture strength saturates if its content exceeds 1.5%, and therefore considering also the high price of Molybdenum at present time, the content of Molybdenum is to be set nearer to 1.00%.

Small amount of optional Vanadium to the level nearer to 0.05% addition forms fine carbide with carbon remarkably increasing creep rupture strength of the steel but increased amount deteriorates weld ability increasing the susceptibility of stress relief cracking lowering the impact toughness and the creep rupture ductility of the steel.

To stabilize Nitrogen and Oxygen, Aluminum, Titanium, Niobium etc may be added which will refine grain size. Values of yield strength, tensile strength and creep rupture strength at the high temperature are very important material properties in these grades.

The increased Molybdenum content up to about 1 % and Cr (2-2.5%) in F22 grade resist oxidation at elevated temperature, stabilizing the micro-structure enabling the usage of the products at higher

temperature even upto 600°C. For this property, there has been much more use of the common creep resistance power plant grade components as F22 products by the user industries compared to F11. The F22 steel are used for making tube products in power plant and are found to be suitable as an important material with respect to maintenance activities.

In the areas of pressure vessels under high temperature and pressure, products in these grades are unsatisfactory. However, high temperature properties like creep rupture strength of the welding material in these grades can be improved further by addition of V and Nb. In addition, the low carbon gives better thermal properties. In many countries, the steels are often used within the temperature range 480-565°C with standing the service stresses.

Steel Making & Processing – Role : In the present competitive global market, Induction furnace steel making units are concerned about the cost effectiveness of the total process by judicious use of scrap, scrap substitute, ferroalloys, improved financing arrangements and various other technical supports from suppliers. Production of superior quality alloy & special steel products with low level of inclusion content and fine grain sizes at a competitive price has become the most challenging tasks to the induction furnace steel making units. In the area of alloy steel production, it is important to maintain close collaboration between steelmaker and ferroalloy producer/dupplier particularly in the perspectives of development of new steel grades, improvements in steelmaking technologies by use of state-of-the-art processes largely driven by the need to produce high quality steel at a competitive price because of change in customer demands.

The principal aim of steel maker is to attain ultra-high purity and ultra-cleanliness with cost reduction and environmental control which have also become dominating drivers in the production of steel optimizing energy for commercial reality. However, high fixed cost in mini steel plant having induction furnace, secondary refining units, hot working and finishing units as well as expensive power, raw material and ferro-alloys force the management towards high production rates for quality products reducing process cost by improving process efficiencies and economics of scale.

Melt Shop - Making steel in IF allows to melt in small/ large batches of liquid steel of homogeneous bath by selecting a frequency that results in the desired stirring level given the power and chosen furnace size. The inductive stirring in the melt during full-power melting is a valuable benefit in melting shop aiding the formation of homogeneous alloys promoting uniform bath temperature. In this melting process, the charge/ melt is heated directly so chances of formation of hot spot is almost nil anywhere in the furnace. Further, homogeneous temperature of the metal and refractories reduces hydrogen pick-up and oxidation of the metal compared with EAF melting leading to better quality of liquid steel with lower levels of inclusions and porosity resulting in less time and expense involved in removing waste slag or dross from the furnace.

The motion also promotes a more complete mixing of alloying materials which is essential for the production of alloy steels requiring a high degree of alloy consistency. It's a cost-effective way to increase the productivity and metal quality without requiring any additional downstream operations. The required ferroalloy product quality depends on the specific use but in general sulphur, phosphorous and nitrogen contents are of concern. Apart from the presence of trace and impurity elements, ferroalloys and scraps also contain inclusions e.g. ferromanganese may contain MnO-MnS-SiO2 inclusions while high-carbon ferro-chrome may contain different kinds of Cr-Mn-spinels. The presence of these impurities and inclusions has a significant impact on steel production techniques, cost and hence, on the selection and use of furnace charge. There is interrelationship between scrap, ferroalloy quality and steel production and processing technology in individual plant, its specific product specific and hence, effective communication at all the processing stages, scrap & ferroalloy suppliers and other related essential items to steel producers and processors is essential.

In vacuum refining applications, however, further stirring is needed at the end of the melt. But using full induction power for this stirring is not practical because the bath would be superheated. There are two

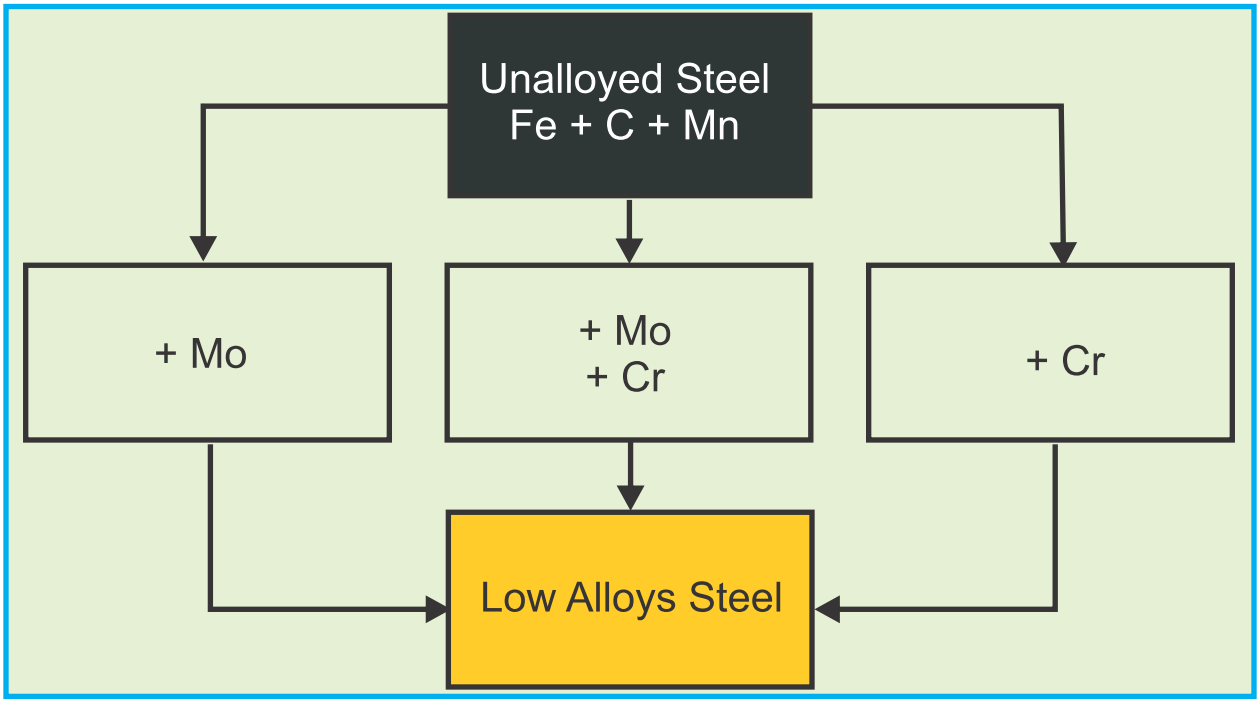
ways to provide the end-of-the-melt stirring needed by some applications. The first is Multi-phase Stirring. By combining a multi-output power supply with a multi-section coil, strong inductive stirring can be provided at low power levels which offers ample stirring action without superheating the bath. The second is FM Stirring. With this arrangement, low power is injected, at very low frequency, producing resonant wave action in the metal- induction stirring which is a natural by-product and benefit of melting with induction technology.

The secondary refining techniques like vacuum degassing, ladle refining techniques in line with IF melting units reduce hydrogen, nitrogen and various other impurities at ultra-low levels modifying inclusion shapes as well as the composition. Induction furnaces have been popular for a long time in making alloy & special steel due to their clean operation and greatly reduced air pollution and noise level producing homogeneous alloy and temperatures using natural metal stirring which reduces refractory costs when compared to EAF. The electromagnetic forces imparted on the molten metal during melting produce a constant motion forcing inclusions to join together for easier slag removal and much cleaner metal.

Mini steel plants, successfully, produce low Carbon Low Cr-Mo steel grades F11 and F22 in induction furnace and subsequent products as bar, forgings, flat/ plates. However, before establishing the grades / products, representative samples from the products are tested so as to fulfill short and long term creep test in reputed laboratories.

Further, different shaped castings are also made in the casting units pouring liquid steel in the mold of different appropriate shapes/sizes of valves or components. The parts are then removed from the mold, cleaned up and machined as necessary. However, castings are cheaper in specific areas and easy process for producing different shaped valve or components compared to machined forged or wrought products where the casting process usually achieves the desired ratio of strength to cost. However, quality control measures are to be taken in the casting process to ensure inherent defects in achieving defect free products.

In the casting process, the valve or component designers consider parameters with the help of CAD (computer aided design) to achieve an additional degree of strength or safety factor by increasing the casting thickness. It has been observed that developing steel quality improving casting process and product design, the life of valves and components in these grades has achieved even more than 150 years or so. Flow diagram of low alloy steels, Mo based, Mo & Cr based and only Cr based are shown.



In one of the mini steel plant, F22 grade was successfully developed optimizing cost and quality, at the trial stage. Cr in the grade maintained ≈ 2.0% level with tiny Cr2O3 particles in an emulsified form & therefore viscous with the following characteristics –

1. It is more difficult for inclusion to float inside liquid steel in the mold,
2. Forces, responsible for ingot cracks are not transmitted inside the mold, as would have been possible in an ideal fluid.

Recommendations improved internal soundness tested by ultrasonic test, inclusion rating which were from surface scabbiness –

a) Use high superheat at 90-95°C in teeming to help float inclusions, the breakup being

b)

Liquidus (°C)	**1515**
losses in refractory(trumpet, runner & riser)+ loss in air(°C)	55
Steel Superheat on entering mould (°C)	40
(against 10-20°C in normal grades)	
Total(°C)	95
Tapping loss*(During tapping & Argon purging)(°C)	55

This means **tapping temperature of the order of 1665°C. Use of big nozzle of 45-50mm dia for identical purpose as above.** This recommendation is an illustrative one based on facilities which helped in achieving good result, but not exhaustive as steel makers may decide parameters suiting to their own process and facilities. Chemical composition of consecutive four casts in F22 grade after recommendation is shown below:

Element	C	Mn	S	P	Si	Cr	Mo
Spcn.	**0.05-0.15**	**0.3-0.6**	**0.035max**	**0.035max**	**0.5max**	**2-2.5**	**0.87-1.13**
#1	0.08	0.54	0.033	0.030	0.35	2.30	0.95
#2	0.10	0.38	0.030	0.032	0.30	2.38	1.00
#3	0.07	0.42	0.032	0.030	0.25	2.42	0.92
#4	0.07	0.38	0.034	0.032	0.28	2.40	0.98

However, IF steelmakers, in the fierce competition, should accept challenges responding for exciting and innovative developments in traditional process technology aiming towards inclusion control, grain refinement, grade-wise correct tap temperature maintaining super heat, secondary refining like VD/LRF , ingot teeming.

Where quality is the only criteria for using products of these grades in specific areas, forging/ rolling and machining of products of various components in specific design is the only answer to user industries even at higher costs. After teeming the liquid steel in different mold sizes, released ingots are either forged or rolled. During cooling of ingots, residual stresses build up in the different layers of the solidifying ingot. The stress development strongly depends on the heat transport properties of the steel and the cooling rate. Hot transfer of ingots is always preferred on cost and quality ground.

If the already solidified outer shell cools down and thus shrinks rapidly compared to the inner area, cracks can occur which can be controlled or eliminated to adjust the cooling rate properly or arranging hot transfer of ingots for hot working like forging or rolling. The stresses that are built up in the ingot and also in the mould can be simulated. By comparison of these stresses with the known material properties, it is possible to predict cracks that are initiated during casting.

F22 grade is shaped into various products by hot working such as forging and rolling the product in a temperature range of 1150°C to 900°C, finishing temperature should not fall below 900°C. F22 grade

forged product is the best solution for making valve closure element materials because both corrosion and erosion resistance cause by the high velocity created during opening and closing of valves which are to be carefully calculated to avoid flow problem at high temperature and pressure. In the forging or rolling units, heating schedule is to be maintained as per standard considering composition and size of the ingots which are either forged as bloom, billets in hammer or press or in rolling mill for subsequent production as components by shaping the red-hot piece of metal under high pressure in a forging press yielding parts that are free from the defects.

The round shaped components, usually, are intensely rolled or squeezed through a mandrel, sometimes at room temperature and sometimes at very high temperatures which are devoid of defects due to massive working in the process.

Normalizing after casting or forging is preferably carried out at a temperature which is higher than austenitic transformation temperature. Specifically, when normalizing temperature is less than 900°C, particles coarsen and strength and toughness of steel are deteriorated. Therefore, normalizing temperature is preferably be kept at 950°C or higher. When F22 grade steel is hot-rolled into the products such as round, flat or tubes at temperature 1000-1150°C, finishing temperature preferably to be maintained around 900°C in order to attain effectively uniform recrystallization and precipitation induced by work strain caused by hot rolling. When the temperature falls outside the range, dislocation is not accumulated and the effect of hot rolling is not attained. When controlled rolling is carried out, production cost may be lowered by saving energy, since normalizing can be omitted after hot rolling. Mostly, F22 grade products are supplied in annealed or normalized and tempered conditions.

There is currently considerable research in progress to implement higher alloy steels with the aim of improving the creep strength so that the service temperature can be increased further (Alberry and Gooch, 1983; Middleton, 1986). Alternatively, the higher strength can be exploited by reducing section size, which can be beneficial from the viewpoint of welding, thermal fatigue and the reduced cost of support structures.

Mechanical Properties of Grade F22 Products: Tensile Strength: 515 – 690MPa, Yield Strength: 310MPa min, Rupture Strength at 600◦C in timing 100000 hrs: 38MPa, Elastic Modulus: 190-210GPa, Poisson's Ratio: 0.27-0.30, Elongation at break: 18% min.

Conclusion: Advances in materials technology and manufacturing techniques in melting and processing of F22 grade contribute to the development of valves and components in power plants designed closely with OEMs capable of operating in extreme conditions where every piece inside the boiler suits to adhere the specific welding procedures and standards. Also, rapid developments in electronics have driven advances in control systems and state-of-the-art critical components and valves of F22 grade which are now installed in new power plants.

It is reported that F22 steel products like valve, components, tubes etc in power plant produced by mini steel plants are successfully working at an increased steam temperature and pressure in super critical boilers.

Images of few Components Produced from F22 Grade Steel

References:

1. Standards
2. Properties of steel at high temperature and pressure

Acknowledgement: Thanks to the Management of the Units for conducting trials and implementation of Recommendations.

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** Ex DGM I/c (RC Lab), ASP, ex Consultant, Dasturco, Chief of Consulting Team

Valve & Critical Components Manufactured from F22 Grade Steel

Implementation of "Public Procurement (Preference to Make in India)" Order, 2017

Dear Members,

As you are kindly aware that, the Government has issued Public Procurement (Preference to Make in India), Order 2017 to encourage 'Make in India' and promote manufacturing and production of goods and services in India with a view to enhancing income and employment.

Subject to the provisions of this Order and to any specific instructions issued by the Nodal Ministry or in pursuance of this Order, purchase preference shall be given to local suppliers in all procurements undertaken by procuring entities in the manner specified.

"Department of Industrial Policy & Promotion (DIPP)" is responsible for formulation and implementation of promotional and developmental measures for growth of the industrial sector, keeping in view the national priorities and socio-economic objectives. While individual Administrative Ministries look after the production, distribution, development and planning aspects of specific industries allocated to them, Department of Industrial Policy & Promotion is responsible for the overall Industrial Policy.

As per the order the minimum local content shall ordinarily be 50%. The Nodal Ministry may prescribe a higher or lower percentage in respect of any particular item and may also prescribe the manner of calculation of local content. The margin of purchase preference shall be 20%. Ministries /Departments and the Boards of Directors of Government companies may issue such clarifications and instructions as may be necessary for the removal of any difficulties arising in the implementation of this Order. The full details of the order can be seen at

In order to discuss the issues related to procurement by the Government Procurement Agencies a meeting was held on 28th March, 2018 under the Chairmanship of **Secretary, Department of Industrial Policy Promotion (DIPP)** at Udyog Bhawan.

On behalf of AIIFA, Mr. Kamal Aggarwal, Hon. Secretary General said that, in order to diminishing the "Anomalies appearing in Classification of Steel Producers" (viz. Integrated Steel Producers, Primary Steel

Producers, Secondary Steel Producers, Main Producers, Major Producers etc.) the matter was put up with the Ministry of steel and on humble request of AIIFA, Ministry of Steel had taken a serious note on this issue and issued a revised guidelines for classification of steel Producers vide notification no. 8(1)/2015-TD (vol-iv) dated 12th May, 2016, wherein it was clearly mentioned that "no steel producers will be classified/ certified as 'Integrated Steel Producers', 'Primary Steel Producers', 'Secondary Steel Producers', Main Producers', Major Producers' or 'Others' by Ministry of Steel or Joint Plant Committee (JPC). The classification/ certification issued by Ministry of Steel and/ or JPC Kolkata prior to this notification on classification of steel producers/ plants, stand withdrawn and become null and void with immediate effect".

He also said that, in spite of the notification by the Ministry of Steel to eliminate the categorization of Primary, Secondary and other producers, none of the Government Procurement agencies like RDSO, CPWD, NHAI, MES, Ministry of Railways etc., are agreeing to use materials produced through Electric Induction Furnace route and are still continuing with the old classification.

AIIFA approached Ministry of Steel and informed about the issues as cited above by the small and medium units and subsequently on humble request of AIIFA, Ministry of Steel issued a letter to various user departments not to continue with the classification issued by Ministry of Steel in past as it has no bearing on the quality of steel. With the mandatory BIS certification requirement on a large number of steel products, the concerns of quality of steel can easily be addressed by insisting on BIS certified products but still they are ignoring the request of Ministry of Steel and adherence will be given to steel making route. This might be the challenges for increasing production from this sector.

He said that, if the Department of Industrial Policy Promotion (DIPP), Ministry of Commerce, Government of India is really serious in true sense to implement Public Procurement policy order-2017, there is a specific need to give directives to various user departments to make necessary amendments in their internal procurement policy, so that small and medium units can also eligible to supply quality steel in on going or upcoming project of the government. I hope that, your kind intervention in this direction will definitely help these small and medium units to produce more quality steel and achieve the ambitious target of 300MT.

The Chairman said that, the government is very serious to implement public procurement order 2017 which will make the Indian steel sector more vibrant and competitive, and facilitate taking the steel industry to new heights of success,". Moreover, we would like to request the representatives of Industry association that the issues/restrictions, if any, being faced by the industry at the time of registering / enlisting their unit as a vendor in the Government procurement agencies, please bring it to our notice immediately so that appropriate action shall be taken accordingly.

In view of the above, members are requested to kindly inform us about the difficulties/issues being faced by them while enlisting their unit as a vendor in the government procurement agencies by making suitable representation, so that, the same will be forwarded to DIPP for appropriate action.

Hope members will cooperate on these issues.

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GOVERNMENT OF INDIA
MINISTRY OF COMMERCE AND INDUSTRY
DEPARTMENT OF COMMERCE
DIRECTORATE GENERAL OF FOREIGN TRADE

PUBLIC NOTICE NO. 70/(2015-2020)

NEW DELHI: Dated the 28th March, 2018

Subject: Amendment in Para 2.54 of the Handbook of Procedures, 2015-2020.

In exercise of powers conferred under paragraph 2.04 of the Foreign Trade Policy, 2015-2020, the Director General of Foreign Trade hereby amends sub-para (v)(ii) of Para 2.54 of the Handbook of Procedure (2015-20) as under:

Existing sub-para (v)(ii) of Para 2.54	Amended sub-para (v)(ii) of Para 2.54
The existing designated sea ports namely Chennai, Cochin, Ennore, JNPT, Kandla, Mormugao, Mumbai, New Mangalore, Paragraphdip, Tuticorin, Vishkhapatnam, Pipava, Mundra and Kolkata will be allowed to import un-shredded scrap till 31st March, 2018 by which time they are required to install and operationalize Radiation Portal Monitors and Container Scanner. Such sea ports which fail to meet the deadline will be derecognised for the purpose of import of un-shredded metallic scrap w.e.f. 1.4.2018.	The existing designated sea ports namely Chennai, Cochin, Ennore, JNPT, Kandla, Mormugao, Mumbai, New Mangalore, Paragraphdip, Tuticorin, Vishakhapatnam, Pipava, Mundra and Kolkata will be allowed to imort un-shredded scrap till 31st October, 2018 by which time they are required to install and operationalize Radiation Portal Monitors and Container Scanner. Such sea ports which fail to meet the deadline will be derecognised for the purpose of import of un-shredded metallic scrap w.e.f. **1.11.2018**

Effect of this Public Notice: The period for installation and operationalisation of Radiation Portal Monitors and Container Scanner in the designated ports is extended up to 31.10.2018.

(Alok Vardhan Chaturvedi)
Director General of Foreign Trade
Email: dgft@nic.in

[Issued from No.01/89/180/53/AM-01/PC-2 (B)/e-2382]

WORLDSTEEL WILL HOLD ITS 5TH STEEL SAFETY DAY ON 28TH APRIL 2018

Established in 2014, Steel Safety Day was set up to reinforce awareness of the five most common causes of safety incidents and to create a safer working environment across the entire steel industry worldwide. By focusing every year on the five causes - moving machinery, working at heights, falling objects, on-site traffic and process safety incidents – world steel intends to set up a continuous improvement process and reiterate its commitment to the safety and health of the people who work in the industry.

Each year, one of the five causes is highlighted to raise awareness of the cause and how to prevent associated risks. This year the focus will be on on-site traffic.

The five most common causes of safety incidents and preventative measures have been identified as follows:

- **Moving machinery** – Isolate, lock or pin all energy sources before any machinery is accessed.
- **Working at heights** – Provide regular training, appropriate harnessing equipment and ensure checks are in place when working at height.
- **Falling objects** – Ensure regular checks are in place to remove or secure objects in risk areas.
- **On-site traffic** – Ensure all traffic on the site is operated safely, including road, rail and pedestrians, and remove all unnecessary traffic.
- **Process safety incidents** – Identify potential process safety hazards that could cause explosions or fires and take adequate precautions.

The aim of this audit is to raise awareness of the main causes of serious incidents and to make the workplace even safer, with the ultimate target for the industry: the 'zero' goal: an injury-free and healthy workplace.

We would like to request our members **to carry out an extensive safety audit**

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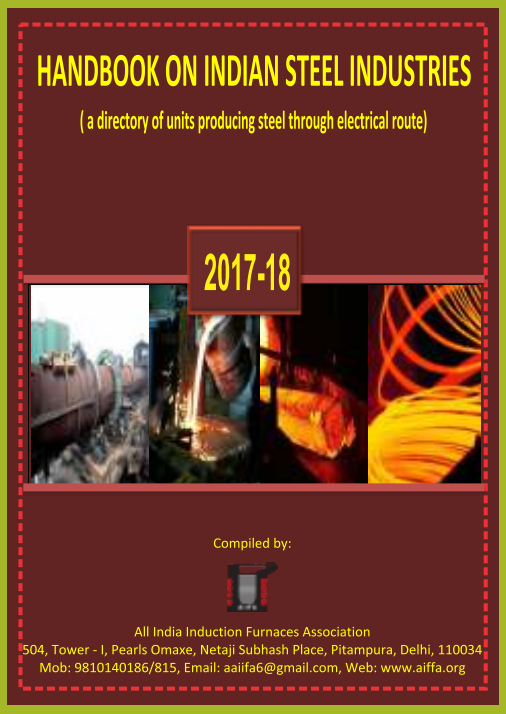

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