



ਪੰਜਾਬ ਪ੍ਰਦੂਸ਼ਣ ਰੋਕਥਾਮ ਬੋਰਡ

ਜੋਨਲ ਦਫਤਰ-2, ਵਾਤਾਵਰਣ ਭਵਨ, ਨਾਭਾ ਰੋਡ, ਪਟਿਆਲਾ

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Through Email

ਮਿਤੀ 27/06/2018

To

1. The Chief Environmental Engineer,
Punjab Pollution Control Board, Bathinda,
Patiala, Ludhiana, Jalandhar & PBIP, Chandigarh
2. The Senior Environmental Engineer,
Punjab Pollution Control Board,
Zonal Office, Patiala -1/2, Ludhiana 1/2,
Jalandhar, Amritsar, Bathinda, EPA & PBIP, Chandigarh.
3. The Environmental Engineer,
Punjab Pollution Control Board,
Regional Office, Amritsar, Hoshiarpur,
Jalandhar/Faridkot/Sangrur/Bathinda/
Patiala/Batala/ Fatehgarh Sahib,
Ludhiana-1/2/3/4 & SAS Nagar.

Sub: Standard Operating Practices (SOPs) for air pollution control in the induction furnace unit(s)

Ref: Office order no. GPC/Guidelines/RS/SP/F-/2018/290 dated 15.6.2018.

In above regards, it is intimated that the Board has devised Standards Operating Practices (SOPs) for operation and maintenance of Air Pollution Control Devices (APCDs) installed by the induction furnace unit in order to improve / optimize their performance. The copy of said SOPs is enclosed herewith for your information and further necessary action.

It is requested that the said SOPs may be circulated among the induction furnace units falling under your jurisdiction and compliance of the same shall be ensured during the regular inspection / monitoring of such industries. Assistant Environmental Engineers may also be advised to specifically mention the compliance of such SOPs by induction furnace in the agenda note while processing such cases.

DA/- As above

Endst No. 19858

[Signature]
Chief Env. Engineer (HQ)

Dated 27/06/2018

A copy of the above is forwarded to the Executive Director, Punjab State Council for Science & Technology, Chandigarh for information & necessary action. It is requested that SOPs parameters shall be the part of design of APCD and these shall be incorporated in the feasibility report/ adequacy certificate to be given to the industry by the Council.

DA/- As above

Endst No. 19859-72

[Signature]
Chief Env. Engineer (HQ)

Dated 27/06/2018

A copy of the above is forwarded to the following for information and further necessary action please:

1. The Chief Environmental Engineer (HQ), Punjab Pollution Control Board, Patiala.
2. The Senior Environmental Engineer (HQ- 1/2), Punjab Pollution Control Board, Patiala

PTO

3. The Senior Scientific Officer, Punjab Pollution Control Board, Head Office, Patiala
4. The Environmental Engineer, HWM /EPA(BMW)/Mega/Const/ CSA, SEAC/SEIAA, Punjab Pollution Control Board, Head Office, Patiala
5. The Senior Law Officers, Punjab Pollution Control Board, Patiala and Jalandhar
6. The Scientific Officer (Air), Punjab Pollution Control Board, Head Office, Patiala
7. The Environmental Engineer (Computer), Punjab Pollution Control Board, Patiala (to display SOPs on the website of the Board).

DA/- As above

Keall
26/6/18
Jc *2m*
Chief Env. Engineer (HQ)
Dated 27/06/2018

Endst No. 19873

A copy of the above is forwarded to the Private Secretary to Chairman, Punjab Pollution Control Board, Patiala for informed the Hon'ble Chairman please.

DA/- As above

Keall
26/6/18
Jc *2m*
Chief Env. Engineer (HQ)
Dated 27/06/2018

Endst No. 19874

A copy of the above is forwarded to the Personal Assistant to Member Secretary, Punjab Pollution Control Board, Patiala for informed the Worthy Member Secretary please.

DA/- As above

Keall
26/6/18
Jc *2m*
Chief Env. Engineer (HQ)
Dated 27/06/2018

Endst No. 19875

A copy of the above is forwarded to the President, Mandi Gobindgarh Induction Furnace Association C/o M/s Gian Casting Pvt. Ltd., Grain Market, Mandi Gobindgarh for informed and it is requested to bring the said SOPs in the knowledge of all the members of your Association for compliance of the same.

DA/- As above

Keall
26/6/18
Jc *2m*
Chief Env. Engineer (HQ)
Dated 27/06/2018

Endst No. 19876

A copy of the above is forwarded to the President, Induction Furnace Association of North India (Regd.), 204, 2nd Floor, Savitri Complex, G.T. Road, Dholewal, Ludhiana for informed and it is requested to bring the said SOPs in the knowledge of all the members of your Association for compliance of the same.

DA/- As above

Keall
26/6/18
Jc *2m*
Chief Env. Engineer (HQ)



STANDARD OPERATING PRACTICES FOR EFFICIENT OPERATION OF AIR POLLUTION CONTROL SYSTEM

A. Charging & Melting

Scrap is the major raw material in induction furnace units in Punjab. It has been observed that majority of induction furnace unit feed unprocessed scrap or non-shredded scrap which is fed with the charge mix mainly by magnet or in few cases through manual charging mechanism. Further it has also been observed that the induction furnace units were overfilling the furnace above coil height. Due to this charging practice, the bulk density of the scrap charge is low which results in air pockets (voids) between the scrap pieces that subsequently leads to low power density, ultimately increasing the heat/cycle time, low furnace efficiency and high pollution levels.

The size and shape of scrap plays an important role in running the electric induction furnace at full power/load, which is the best operating practice. The more the electric induction furnace runs at full power, lower will be total energy losses leading to lower specific energy consumption. The best practice for better and efficient operation of melting, charge should:

- Be clean (free from oil, grease, rust, paint etc.)
- Be as dense as possible for faster melt rate, lesser energy consumption and less pollution levels
- The furnace should be filled up to the desired coil height for effective & faster heat transfer leading to reduction in specific energy consumption (2-3%) with less pollution levels
- Be segregated for harmful ingredients like explosives
- The length of the scrap being charged into the furnace should be less than the size of the crucible.
- Have less sharp pointed edges, particularly in case of heavy and bulky scrap.

B. Air Pollution Control System

In Pulse jet filtration technology, the dust is collected on outside of the bags and has airflow from outside to inside the bags. Reconditioning of bags will be accomplished by the pulse of high-pressure air (6-7 kg/cm²), which rapidly pressurizes and inflates the bag causing it to snap away from the spotting cage, breaking the dust cake and dislodge the accumulated dust from the fabric. The dust will be taken out of the bottom hopper by operating the rotary air lock valve proposed at the bottom.



☐ BAG FILTER MAINTENANCE

⊙ DIFFERENTIAL PRESSURE

During operation of air pollution control system, differential pressure across the bag house is a major concern. A sudden drop in the pressure may indicate a leak in the system. A rise in pressure may indicate that the filter bags have become blinded or caked with particulate. The differential pressure across the filter bags needs to be monitored with the help of **U-Tube manometer**. By operating the bag house at a stable and optimum differential pressure, the over and under cleaning of the filter bag can be avoided. The benefits accrued are:

- Check pressure drop after hood and before spark arrestor regularly.
- Maintain optimum pressure drop 3-6" wc across the bag house.
- The pressure drop in excess of 6" indicates choking of the bag filter and less of 3" indicates puncture of bags.
- The filter bags shall be inspected as per preventive maintenance schedule indicated at **Annexure-A**.

⊙ TEMPERATURE

The temperature of the flue gas should be monitored by temperature gauge and maintained in the range of 100-120 °C. The temperature in excess to 140 °C would lead to burning of the bags.

⊙ COMPRESSOR

An adequate volume of clean, dry and oil free compressed air of sufficient pressure (6-7 kg/cm²) must be applied to ensure efficient cleaning of bags. Therefore, oil & moisture filter of air compressor should be checked at regular intervals.

- Check Hour meter reading of compressor on daily basis
- Check moisture trap drain of compressor on daily basis
- Check compressed air pressure on weekly basis
- Check / replace oil filter of compressor as recommended by the manufacturer
- Check / replace air filter of compressor as recommended by the manufacturer

⊙ FAN MAINTENANCE

Fan selection is based on the design volume and pressure required to ventilate the process. Check the mechanical condition of the fan as per preventive maintenance schedule indicated at **Annexure-A**.

- The induction motor with the ID fan should be installed as recommended by the fan manufacturer.
- Keep the fan clean - Even a thin layer of dirt on air flow surfaces can reduce the performance of the fan.
- Check pressure drop across (inlet as well as at outlet) ID fan regularly as per preventive maintenance schedule.



- Fan speed - Be sure to check the fan manufacturer's recommendations for the maximum safe RPM.
- Fan Vibration – The noise from the fan is the indicator for the same.
- Fan Motor - Motor shall be checked for winding temperature and current.

COLLECTION & DISPOSAL OF DUST

- The rotary air lock should be provided in the hopper of spark arrestor, cyclone(s) and bag house for collection of dust.
- Dust should be removed periodically as per preventive maintenance schedule to prevent re-entrainment of dust

It has been observed that most of the industries do not have proper arrangement for the storage of dust. As a result, part of the dust flies back into the environment because of the cross currents. The dust is being filled in HDPE bags and should be disposed off as per the recommendation of Punjab Pollution Control Board.

TRAINING TO THE OPERATING STAFF

Dedicated staff should be employed for the effective operation and maintenance of the air pollution control system. The operators involved in the operation and maintenance of the pollution control system shall be trained to perform thorough trouble shooting inspections.

GENERAL

- Use of Man cooler should be stopped.
- Sheds should be covered to the maximum extent possible to avoid cross winds.
- The rotation of hood should not be with the magnet and should be motorized to maintain its size and shape.
- Hood should be placed near the furnace as recommended in the report for adequate suction.
- The ducts especially at the bends, housing of bag filter, inlet & outlet connections of fan should be checked regularly (once in a month) to prevent air leakages.
- Solenoid valves should be checked at least once in a week for their operation.

INTERLOCKING OF AIR POLLUTION CONTROL DEVICES WITH MANUFACTURING PROCESS

The induction furnace unit (s) shall interlock its Air Pollution Control Device (s) (APCDs) with its manufacturing process to ensure the regular operation of APCDs.



ANNEXURE-A

Preventive Maintenance Schedule

	Date								
	Time								
	Operator								
Daily									
1.	Check visible suction at hood								
2.	Check visible stack emissions								
3.	Record differential pressure across filter bags (inches)								
4.	Record differential pressure across ID fan (inches)								
5.	Record differential pressure at hood (inches)								
6.	Check operation of solenoid valves								
7.	Hour meter reading of compressor								
8.	Check air filter clog indicator of compressor								
9.	Check moisture trap drain of compressor								
10.	Dust collection from spark arrester & bag filter (kg)								
Weekly									
1.	Record compressed air pressure (kg/cm ²)								
2.	Clean compressed air filter								
Monthly									
1.	Check bag house for leaks								
2.	Check flanges at duct joints / bends for leaks								
3.	Check underground trench for cleaning								
Semi-Annually									
1.	Check / replace oil filter of compressor after recommended running hours (2000 hrs)								
2.	Check / replace air filter of compressor after recommended running hours (2000 hrs)								
3.	Check fan blades for dust build up								
4.	Check condition of bags								
5.	Check fan, V-belts etc.								
6.	Check electronic sequence controller for pulse duration								
Annually									
1.	Check duct for dust build up								
2.	Check / replace separator element of compressor after recommended running hours (4000 hrs)								
3.	Check / replace oil- air lube XD after recommended running hours (4000 hrs)								