

Clean air solutions



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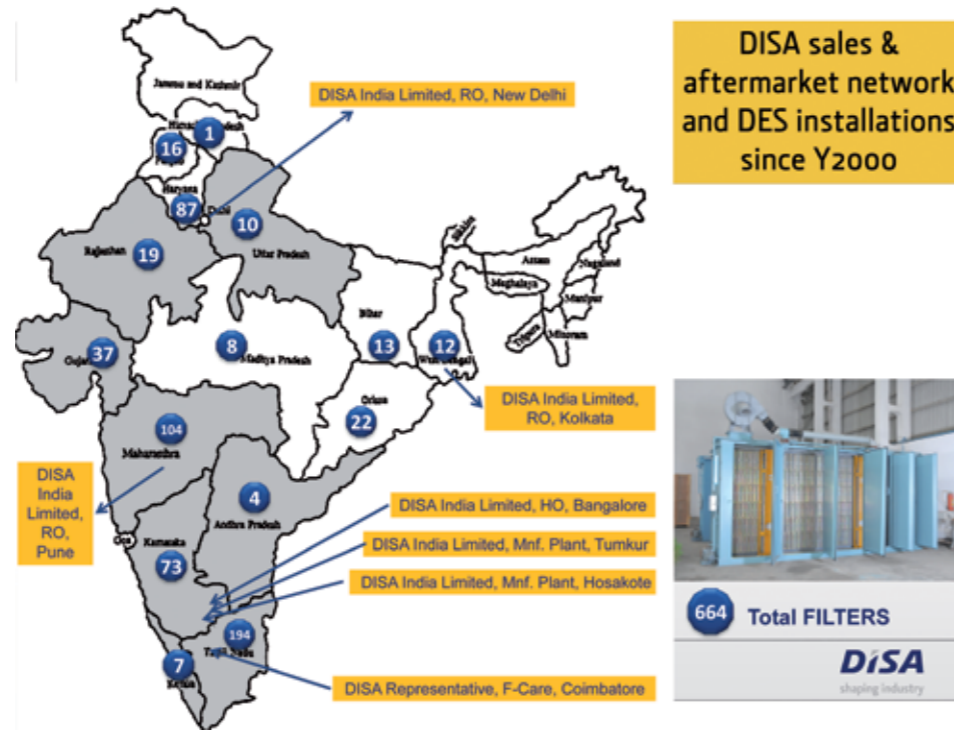
DISA
shaping industry

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DISA clean air solutions

With decades of global experience and increased technological prowess, DISA is your right partner in solving all air pollution related issues. Our efficient, European designed, state-of-the-art filtration systems ensure lower cost of ownership and hassle-free operation complying with governmental regulations.

DISA India Ltd. is an IMS (Integrated Management System) certified company and follows world-class high-quality norms and best manufacturing practices.



What is industrial air pollution?

Air pollution is defined as the addition of various hazardous chemicals, particulate matter, toxic substances and biological organisms into the Earth's atmosphere. In view of the several factors that attribute to air pollution, what comes from industries and factories is often considered the prime contributor to air pollution. According to a study conducted by the Environmental Protection Agency (a.k.a. EPA), it has been found that industrial pollution accounts for approximately 50 to 70 percent of the pollution. There are several serious ecological implications and health risks associated with industrial air pollution.

DISA clean air solutions offers pollution control systems for process oriented industries.

Why choose DISA for pollution control?

DISA has decades of invaluable knowledge in foundry processes and allied metallurgical operations. It is imperative to understand that pollution-control equipment can be engineered well only when the process is understood comprehensively.

This is where DISA stands out given its rich process-knowledge accumulated over the years in many countries across the globe.

Benefits of DISA pollution control solutions:

- Energy-saving
- Long life filtering elements
- Easy to maintain with front access
- Very low emissions
- Can sustain high vacuum pressures
- Factory assembled and tested units
- Reduced installation time
- Compact design, smaller footprint
- Lower cost of ownership
- Advanced technologies from Europe
- Meets all Indian legal requirements
- Concept to handing over solutions
- Service and spares

Application range

DISA offers two types of filters:

- Cassette type dust collectors
 - Reverse air cleaning
 - Pulse jet air cleaning
- Cartridge type filters

Our filters can be employed in the following industries, amongst others:

- Iron and steel
- Foundry – ferrous & non-ferrous
- Coal handling
- Blast furnace – cast house , stock house dedusting
- BOF/LD/AOD converters
- Food
- Pharma
- Minerals
- Asphalt
- Ceramics
- Aluminium/ copper/ bronze/ non-ferrous melting



“The DISA brand is known as a good and credible filtration solution, as its products encompass modern technology and design. The working environment for the operators is now considerably cleaner. The DISA system is popular with the users who find it clean, efficient and easy to use”

Mr. Narayanaswami A., Vice President- Manufacturing, CRI Pumps, Coimbatore

DISA cassette type filters

Unmatched advantages of DISA filters – value for money

Low investment costs

Because of the unique shape and the way the cassettes are arranged, our cassette-type filters offer more filter area for the same casing volume than other comparable systems.

Advantages:

- Modular design – for easy adaptability of cassette-type filters to specific floor space requirements
- Standardised production – for unvarying high quality of filters
- Low operating and maintenance costs
- Due to the reverse air flow cleaning method, the filter bags have longer service life
- Spring-lock mechanism on doors and cassettes ensures fast and easy replacement by only one person
- Comfortable visual inspection from clean air compartment
- Minimal residual dust in cleaned air, well below permitted emission rates due to optimal efficiency of filter media in conjunction with reverse air flow cleaning system. Our filter consists of dirty air inlet and distribution.
- Low energy consumption cost due to filters employing low pressure reverse air cleaning
- Increased bag life and low operating maintenance cost
- Reverse air cleaning offers low emission rates due to optimal efficiency of filter media
- More filter area for the same casing volume than other comparable systems because of unique shape and arrangement of cassettes

- Modular design enables us to offer any size of filtering area suiting the need
- Modular design offers standardisation of component parts with high quality standard
- Factory assembled modular design offers minimum handling and easy installation at site
- Large doors permit easy access to the cassette rows from clean air compartment
- Only one person is needed to operate the door and remove the complete set of cassettes with distant mat
- Top entry of gas completely eliminates the re-entrainment that is predominant in hopper gas inlet
- Top inlet with distribution manifold ensures even gas distribution inside the filter
- Pre-assembled and factory tested filter components ensure quality
- DISA design control panel ensures trouble-free operation

“After installing DISA DUST COLLECTOR (GKVD 56) life has become very enjoyable for us and for 100 families dwelling around our factory premises. We find “ZERO DISCHARGE” of dust and moreover, the production-cycle of our machine has improved a lot. It helped us in achieving more savings as we are able to reduce our operating costs, power consumption and to date we haven’t experienced any breakdown of the machine.”

Mr. V. Devarajan, Proprietor,
Balajee Finishers, Coimbatore.

Unique design feature of DISA cassette type filters

In conventional filters, the gas travels from bottom to top and the cleaning air is injected on top; whereby it comes from top to bottom. This reflects a concept called **Can Velocity** (Can Effect).

Definition: It is the velocity with which the gas travels up thru the interspaces between the bags.

Can Velocity = Gas flow / (casing area- total bags occupancy area)

This is a very important parameter in design of conventional filters. Higher Can Velocity results in re-entrainment of dust. The desirable value is 1.0 m/sec for normal dust.

Can Velocity has 3 effects:

- Dust re-entrainment
- Due to cross flow increased wear of bags
- Higher DP due to cross flow

In DISA design the gas flow is from top to bottom. Gravity assists the flow of dust. The dislodged dust and gas travel in the same

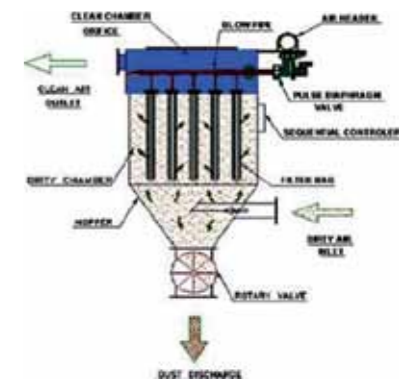
direction. Hence the gas flow assists the dust to fall downward unlike conventional filters. Given the pressure drop, the wear of bags is minimal.

There is no Can Effect. This is a unique feature of DISA design.

Advantages over conventional filters



DISA Filter

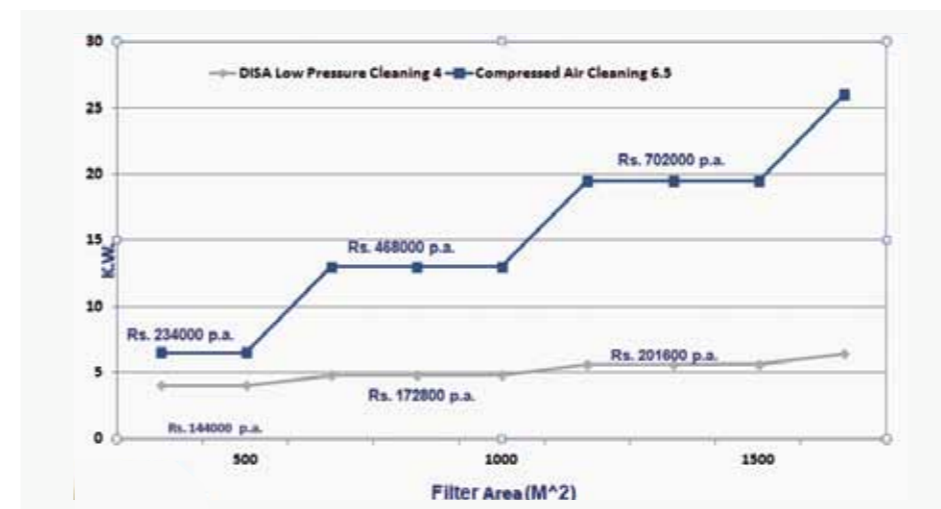


Conventional Filter

Energy cost saving

Subject	DISA DES	Conventional filter
Technology	Reverse air cleaning	Compressed air jet
Bag life	Approx. 4-6 years, the bags are subjected to low pressure during cleaning.	Approx. 2 years, the bags are subjected to high pressure during cleaning.
Energy	Consumption is less due to reverse air fan	Consumption is high due to compressor
Operating cost	Very low	High

Energy savings in DISA low pressure reverse air filters



Comparison of different types of filter cleaning systems - Energy consumption

Cassette type - reverse air cleaning

The functional unit of a GTFSL cassette type dust collector (reverse air cleaning) comprises an inlet hood for dust-laden gas, the filter casing and the **dust collection** hopper with support structure and a discharge unit.

The cassettes are arranged horizontally in the dirty gas chamber, and the connection with the slotted wall by a clamping frame with leg springs is airtight. Air flow direction through the filter is from top to bottom (down-flow principle).

The gas enters the clean gas chamber of the filter through the cassette. During this process, the dust is held back by the filter media and forms a filter cake which is important for dust filtration. The fully programmable dedusting process is activated after a specific time period and the dust is cleaned out of the filter cassette. For this, a Reverse air fan is used to blow the air in reverse direction. The air blown by the fan creates a balloon effect on the fabric and the dust falls into the collecting hopper and is discharged through Rotary airlock valve or Double flap valve and finally through a screw conveyor. The cleaning air fan is located outside the filter. The cleaning air is connected to the mobile cleaning carriage via a flexible hose. The cleaning carriage is

driven by a maintenance-free rope-and-chain drive. There is a pre-programmed indexing mechanism to move the cleaning carriage connected to reverse air fan for cleaning of bags.

Offline effect :

- Low difference between gross and net surface
- No dust is drawn to adjacent bags
- Low residual dust content
- Very high dust collection efficiency
- Fine dust (PM10, PM 2,5) collection

Special features :

- Pre-assembly of the filter in workshop
- Compact, modular design
- Small space requirements
- Short assembly time
- Low assembly costs
- Leak-proof welded construction
- Low maintenance costs
- High availability
- All maintenance is carried out at the front of the unit
- Efficient cross flow / down flow inlet air pattern



Control Panel – ensures reliability of filter operation

The GTFSL filter control panel is designed and manufactured by DISA. It is a standalone system comprising of motor circuits for ID fan, cleaning air fan, cleaning carriage, screw conveyor and flat valves. The control panel is housed in a sheet metal enclosure of the highest quality. The operator interface, push buttons, selector switch, indicators and meters are located ergonomically on the front door of the control panel for

easy operation. An optional feature for the operator interface, includes a mimic panel with LED lamps, and an LCD messages display unit. The control sequences are designed either using hardwired Relay Logic or state-of-the-art PLC depending on the application requirement.



Cassette type dust collector – pulse jet air cleaning (GK)

The construction of this product is the same as the reverse air cleaning type, except that compressed air at 5 bar pressure is used. This product is mainly used for online filters where dust is likely to exhibit sticking properties. Then it is cleaned with compressed air.

GK cassette-type Filter

- Pulsejet compressed air cleaning
- Easy to maintain cassette type filters
- Available in capacities up to 20,000 Am³/h

Cartridge type dust collectors

Cartridge type filters

The choice of cartridge filter depends on the application.

- Cartridge filters are preferable for systems with particles are finer.
- Cartridge filters can be surface or depth-type filters:
 - Surface filters are best if you are filtering sediment of similar-sized particles. If all particles are e.g. five microns, a pleated 5-micron filter works best because it has more surface area than other filters.
 - Depth-type filters capture particles and contaminants through the total thickness of the medium. Compared with pleated surface filters, depth filters have a limited surface area, but they have the advantage of depth.
- It can be generally stated that if the size of filter surface is increased, higher flows are possible, the filter lasts longer, and the dirt holding capacity increases.
- Cartridge filters are normally designed disposable: this means that they have to be replaced when the filter is totally damaged.

Compared to a conventional bag filter that offers a maximum of 99% efficiency for particle range to 7 microns, cartridge filter systems can filter up to 99.97% to 1 micron. (Today, we also have cartridges which can filter to 0.3 microns).

Special features:

- Compact equipment, requiring small footprint and minimal foundation
- Very low outlet emission level (less than 5mg/M₃) makes these suitable for indoor installation
- Available in capacities from 1,500 Am³/h to 30,000 Am³/h

Cartridge elements in a cartridge filter system are built out of fine filter media arranged in a pleated manner, due to which a very large filter area is accommodated in a very small cylindrical shape. The net effect is that a cartridge filter system occupies much smaller area and space compared to a conventional bag filter system (one-eighth)

The architecture of the cartridge filter system is designed in such a way that servicing or replacement of filters takes just a few minutes and can be carried out by one person, unlike a conventional bag filter system which requires up to several days to open and replace filters.

The dust dislodged by the reverse pulse jet cleaning system is pushed down. This obviates re-entrainment of the dust into the filters.

The filters are continuously cleaned with reverse air blasts controlled by an electronic sequential controller. The filter system remains continuously operative at its peak efficiency.

The typical life span of the cartridge filters is two to two and half times of conventional bag filters. It makes the cartridge filter systems far more economical too.

A cartridge filter system has several applications, such as dust collection, pneumatic conveying, central vacuum cleaning systems, fettling shops, etc.

In summary cartridge filter systems offer greater filtration efficiency at a reduced cost and therefore, are a better choice where the dust has to be completely removed or recovered. In many filtering applications, a choice between the use of a cartridge filter and a bag filter has to be made.



Other products

There are some differences between these two filter systems;

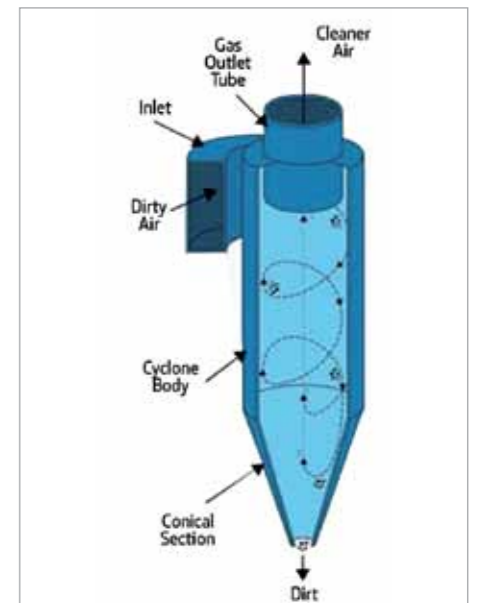
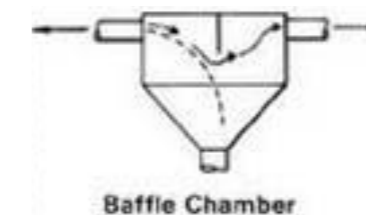
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- Cartridge filter can be surface or depth-type filter: depth-type filters capture particles and contaminant through the total thickness of the medium.
- Surface filters are best if you are filtering sediment of similar-sized particles. If all particles are e.g. five micron, a pleated 5-micron filter works best because it has more surface area than other filters. Compared with pleated surface filters, depth filters have a limited surface area, but they have the advantage of depth.
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Cyclones

Cyclonic separation is a method of removing particulates from air, gas or liquid stream, without the use of filters, through vortex separation. Rotational effects and gravity are used to separate mixtures of solids and fluids. A high speed rotating (air) flow is established within a cylindrical or conical container called a cyclone. Air flows in a helical pattern, beginning at the top (wide end) of the cyclone and ending at the bottom (narrow end) before exiting the cyclone in a straight stream through the center of the cyclone and out the top. With DISA technology and sizing, we can deliver cyclones with 99 to 99.5% efficiency.

Settling chambers (also called baffle chambers)

These are simple mechanical devices containing a large chamber where the dusty gas enters the velocity inside is reduced to a low value of 4 to 8 m/sec whereby large particles due to loss of inertia fall down and gets collected in the hopper. The collection efficiency depends on the percentage of large particles in this case. Generally it is 50 to 70 % depending upon the design and velocity maintained.



Other products

Centrifugal fans

It is a mechanical device for moving air or other gases with a big increase in pressure. These fans increase the speed of air stream with the rotating impellers. They use the kinetic energy of the impellers or the rotating blade to increase the pressure of the air/gas stream which in turn moves them against the resistance caused by ducts, dampers and other components. Centrifugal fans accelerate air radially, changing the direction (typically by 90°) of the airflow. They are sturdy, quiet, reliable, and capable of operating over a wide range of conditions. We build backward curve impeller fans upto 100,000 m³/hour capacity in Carbon steel and SS construction.

DISA range of backward curved high efficiency silent ID fans:

- Capacity of fan ranging from 2,000 cmh to 25,000 cmh.
- Static pressure ranging from 200 mmwc to 550 mmwc.

Gas coolers

Sometimes, process gases emanating from melting furnaces, kilns have to be cooled before they are passed to the filters due to high temperatures. The hot gases flow vertically downwards along cooling elements. Air drawn from atmosphere by means of axial fans is passed thru these elements. The cooling elements are circular tubes or also in the form of rectangular cassettes. As they pass through, they transfer the heat to the air passing through the tubes or cassettes. Then the gases are deflected by 180 deg and some dust also falls down in the hoppers. A temperature controller switches on the no of cooling fans on. At times, a cleaning arrangement is provided to clean the surface of the tubes of any dust collected. These coolers are also called air heat exchangers.



Centrifugal Fan 1

Model	Capacity (m ³ /hr)	Static pressure (mmwc)	Motor rating (Kw)
1.	2000 - 3500	300 - 450	2.2 - 7.5
2.	4000 - 6000	200 - 400	3.7 - 11
3.	7000 - 11000	350 - 500	11 - 22
4.	11500 - 16000	350 - 400	18.5 - 30
5.	16500 - 25000	350 - 550	30 - 55

Salient features of centrifugal fans are:

- Silent
- Efficient
- Rugged and compact

“The DISA filters are the best in their class and continuously provide efficient Dust Collection. DISA filters are best is their reliability - one never discusses about the system in the plant, one only sees them!”

N. Krishna Samaraj, Managing Director,
Magna Electro Castings Ltd, Coimbatore.

Auxiliary equipment



Rotary airlock valves

Rotary airlock valves:

With open / close rotors of sizes 150 mm, 200 mm, 250 mm, 300 mm, 350 mm, 400 mm & 500 mm.

Double flap valves

Motorised or Manually operated. Sizes : 150 mm, 200 mm, 300 mm, 400 mm & 500 mm.

Lime dosing units

A motorised metered unit for periodic dosing of Lime into the filter for pre-coating of bags or protecting bags from Sulphur attacks.

Spark arresters

In many processes, sparks emanate and when they go to the filter they damage the filter bags. In order to avoid this damage, Spark-arresters are employed before the filter. They are designed with cyclonic construction or perforated baffle type. The cyclonic type is the most efficient kind.

Dust monitoring units

This is for continuous emission monitoring in chimneys. A high intensity light source modulated at high frequency is detected at transmitters provided in the dust path measures the transmissivity of light path across the flue and provides an accurate average measurement of dust in the path. They are provided with all features to enhance accuracy levels.



Double flap valves

Explosion rupture discs

A precisely pressure set rupture disc made of SS to open under surge pressure and protect the equipment. The disc is to be replaced once it is ruptured.

Explosion doors

(Also called Explosion Panels): These are quick opening type door hinged at one side. It will open when the set pressure is reached and will close automatically on reaching normal pressure.

Dampers

It is used to turn on /off or regulate the flow of air inside a duct, chimney, or other air handling equipment. They are electrical actuator operated or Pneumatic cylinder operated.

CO₂ dosing systems for fire protection

Carbon Dioxide (CO₂) gas has a high ratio of expansion which facilitates rapid discharge and allows for three dimensional penetration of the entire hazard area quickly. Carbon Dioxide extinguishes a fire by reducing the oxygen content of the protected area below the point where it can support combustion. Carbon Dioxide Fire extinguishing systems store the agent in one of two different ways: in high pressure cylinders, or in low pressure CO₂ tanks the gas flow is triggered by a fire signal.



Lime dosing units

Hot gas generators

Whenever sticky dust flows as a part of gas in the ducts, it sticks to duct walls and chokes the ducts. Many times, due to temperature fall condensation take place and also results in dust settlement. In order to take care of these problems, we inject hot air into the duct directly. For this, we provide LPG/NG fired hot air generators using reliable burners. They are available from 100000 Kcals/hr to 1000000 Kcals/hr also. They are reliable and skid mounted.

Auxiliary equipment



Dampers



Gas fired heating systems for ducts



Control systems / Energy Management systems

Gas fired heating systems for ducts:
They wrap around electrical heaters provided on ducts to heat up the dust laden gas flowing in ducts to avoid settlement / choking problems.

Telescopic dust loading spouts:
They are used for loading dust collected in hoppers/bins into a trolley or truck thru an enclosed flexible duct operated telescopically. This prevents spreading of dust seen as secondary pollution.

Control systems / energy management systems:
These are custom-built control systems for interfacing various elements in an Air Pollution Control system. They are designed and built for specific needs on request employing the most reliable Rittal Panels.

Filter bags, Pulse valves as spares:
These are spare bags for various filter models supplied by DISA. We also supply all other spares used in our filters.

Special projects

Fettling booths:
Design and construction of booths with automatic doors, for conducting fettling operations with dust / fume extraction and dust disposal from bottom as well. The booths are designed with single layered or sandwich construction for good noise control. It helps the shops to be maintained clean.

Accoustic enclosures:
For noise abatement, we design and construct Accoustic chambers for fans etc.

DISA undertakes total turnkey projects for all your air pollution control problems based on products listed above.

Final Word:
Most air pollution control problems need in-depth understanding of process and must be customised to suit the specific application. At DISA, with our resources and backup from our European partners we go into the process and then make a proposal to your needs.

Pollution control systems

Important requirements to be considered in solving any air pollution problem:

1. Capturing
2. Conveying
3. Conditioning
4. Filtering
5. Exhausting

- For **capturing**, hoods must be designed to allow the minimal escape of fumes with the right face velocity
- For **conveying**, the right duct design must allow with no settlement of dust, and must allow clear access
- For **conditioning**, Flue gas must often be treated before being sent to the filter. It may require cooling, heating, neutralization, pH control etc. For this we need to employ the right product in the system
- For **filtering**, a filter with the correct technical parameters must be used, such as: Air to cloth ratio, Can velocity, right type of entry to filter casing, selection of right fabric
- For **exhausting**, the correct fan and direction to the flue gas exhaust duct / chimney must be used

A complete air pollution control system comprises a range of auxiliary equipment, in addition to the filter unit.

DISA has successfully handled many complete projects.

Some of them include:

- Fume extraction systems – Melting furnaces
- Shakeouts and sand plants
- Sand reclamation units
- Blast furnace casthouse application
- Coal Handling,
- Asphalt plants
- Welding booths
- Fettling booths



History

1984:

BMD Foundry Machinery Ltd started in Tumkur
ARPA Moulding Machines
TM Mixers
Sand Plants
Shot Blast Machines

1992:

BMD Garant Filters introduced

1996:

2nd Plant started in Hosakote
Name changed to Georg Fischer
DISA Ltd

2005:

DISA sold the Air Division– the Indian Operations were not part of this sale and DISA INDIA Ltd. (DIL) continued its operations of the Filters business and fully own the original BMD Garant Technology for Industrial Filters.

2009:

Norican Group was formed in May 2009, after the merger of DISA – World’s Leading Moulding & Sand Plant Solutions Company & Wheelabrator – the World’s largest in Surface Preparation Solutions.

2010:

Wheelabrator Shot Blast Machine HB-1 launched with DISA Cartridge filters for non-foundry markets



DISA acquired BMD in the year 1986 and with this, also acquired the BMD India Operations. Basis this Global acquisition, the Industrial Filters Business of BMD also came under the DISA purview given the legendary BMD Garant brand. This Filters Business was later renamed by DISA as the DISA Air Division. DISA then went on to sell this Air Division on January 1, 2005. As the Indian Operations were not part of the sale, DISA INDIA Ltd. (DIL) continues its operations of the Filters Business to this day under the DISA Clean Air Solution Division.

DISA India Ltd. holds proprietorship of all Garant technology for usage across the globe.

“We set up a 1.2 MT DI plant. Seeing the criticality of the Zn Dust, we invited DISA technical team to analyse our plant situation and provide us the solution. After several strategic technical discussions they proposed offline cassette filter. Today, we are very happy with the performance of DISA’s dust collectors as it has not only made the Zn coating area clean but also gives a very good Zinc oxide recovery. We are also buying the second Zn dedusting unit from DISA for our expansion project. We have been associated with DISA and we are happy with the equipment and the support service of DISA.”

- Mr. G. Sreenivasu, DGM-Project,
Rashmi Group, West Bengal

DISA facilities



In order to offer the very best equipment and solutions to its customers, DISA has set up a world class manufacturing facility at Hosakote near Bangalore, India. DISA also has an excellent **Design and Engineering Centre** catering to the entire range of dust and fume collector filters.

The Hosakote plant, operational since the year 1997, is one of the two Indian manufacturing facilities of DISA India Ltd. Spanning over 4.5 acres (18,000 m²) of land area and 7000 m² of covered shop floor area, the Hosakote plant employs 120 people. With the Wheelabrator range of products produced at Hosakote, there is significantly higher growth potential for this plant. The Hosakote plant is recently expanded by approx. 2200 m² of covered shop floor area.

The facilities currently available include:

- Dedicated fabrication, assembly and testing bays for filters and shot blast machines
- Plasma cutting machine
- Paint shop – two independent booths for filters and shot blast machines
- Stores and utilities

World Class Manufacturing (WCM) is practiced at Hosakote, encouraging excellent employee involvement across all areas of improvement. Many innovative ideas from our associates have been implemented at the plant, resulting in significant savings and improvements to our processes.