



Power Industries

Wind Mill Industries



Marine Industries



Automotive Industries



Offshore Industries



Railway Industries

Aviation Industries



# Blast Room System

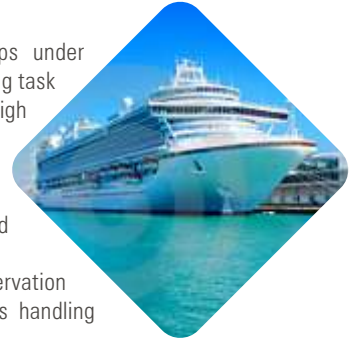
## Blast Cleaning & Finishing System





### Marine Industries

The turnkey structures of the ships under manufacturing is one of the challenging task to protect those structures from high humidity effect of high seas. The common structures hulls, belly, deck & various parts of in the Marine Industry required to be cleaned and painted. The engineering expertise of **PCS** has many references of preservation lines, blast rooms and the materials handling equipment located all over the world.



### Railway Industries

The Diesel Locomotive, Electro Locomotive, Coach Factories, Metro Rails requires surface treatments the Blast technology is already used in many applications throughout the rail transportation industry and its suppliers **PCS** provides technologically proven solutions and eco-friendly meeting pollution norms by using different production methods of internal blasting machines, paint rooms, blast rooms and more.



### Wind Mill Industries

Wind Mill structures are affected by varying environmental conditions after their installation & during service. These structures are protected by using different painting technology. **PCS** provides vast blast rooms & paint rooms for wind mill towers.



### Aviation Industries

In aviation industries every components are given precise surface treatment to make them safe for the flyers. **PCS** provides big blast room system for surface treatment of structures like: wings, rotors, fuselage, engine turbines & components.



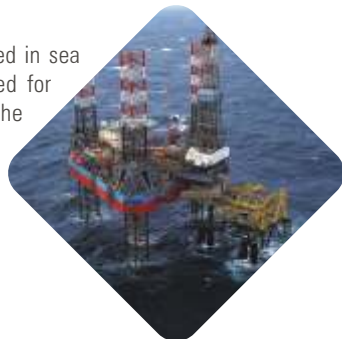
### Automotive Industries

For Automotive industry **PCS** has manufactured variety of typically equipment with high grade of technologies used to combat or minimize the effects of corrosion, reduce frictional energy loss, reduce wear, or to improve the aesthetic appearance of surfaces.



### Offshore Industries

The oil extractor structures submersed in sea water are severely & directly affected for contamination of the structures in the field of offshore drilling industries. **PCS** has provided vast blast rooms & paint rooms for offshore structures.



### Power Industries

In the power generating units the structures & components are directly affected with water falling from the heights steam gases burner & atomic reactions and require frequent maintenance for enhancing the service life. **PCS** manufactures and provide solution through blast room system & preservation line.



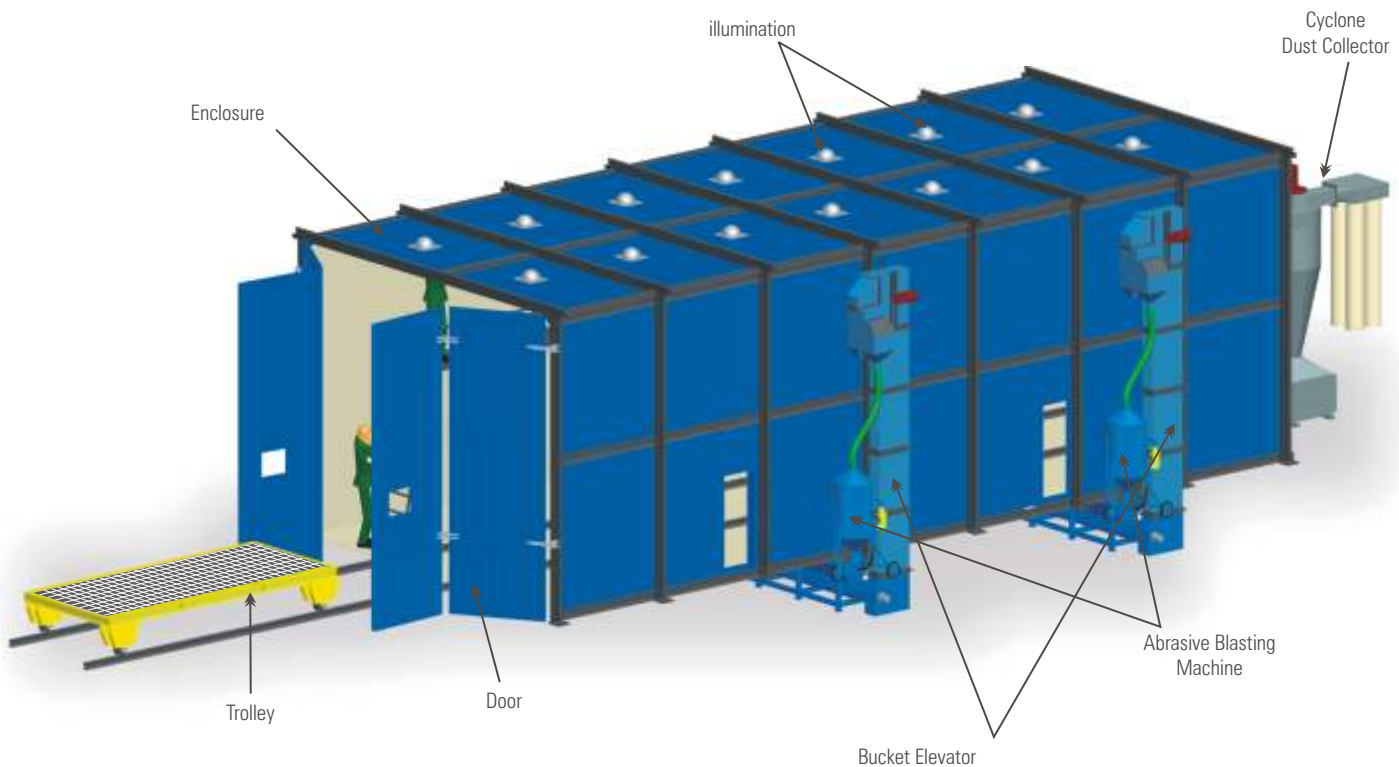


# Blast Room System



Blast room equipment is used in a wide variety of industries that require surface preparation prior to the application of a protective coating. The surface of the work piece is cleaned by a mixture of abrasive and high pressure compressed air being directed at the work piece by blast nozzle. The blast room contains the abrasive being shot at the work piece, as well providing lighting & ventilation for the operator's safety.

PCS offers a variety of Blast Room designs and room configurations which allow us to design a blast room facility uniquely tailored to meet the economic production, safety and environmental concerns of each customers.



Essentially an efficient Blast Room System consists of :

- :: Enclosure
- :: Abrasive Blasting Machine
- :: Dust Collector (Fabric/Pleated/Cartridge/Cyclone)
- :: Blasting Media Recovery & Separation System
- :: Operator Safety Wears
- :: Optional Equipment

European Directives & Standards :

- 97/23/EEC & 98/37/EC, 92/23 EC, EN9100, 89/336/EEC, BS EN 1248:2001, NFPA33
- ISO 12100-1&2, EN60204-1/ED.1, WAC-295-24-95601, 44/435/CDV,
- CEM GUIDE-414, ISO-8501-1-1968
- EN Standard: EN-13445 for Pressure Vessels

# Enclosure

The modular blast room is specially ventilated and illuminated for enclosed abrasive blasting, and is a full sealed, dust tight, all steel structure. The components are prefabricated for simple bolt-together erection, with little or not job site welding required. The ENCLOSURE stands by it's own structural support without connections to the surrounding facilities. The size of the enclosure depends on

- a) The size of the job
- b) Number of operators
- c) Adequate working space around the job.

It also influences size of the dust collector and reclaimer installation costs.



## Optional Equipments

Several additional equipments are available to increase efficiency of Blast Room System. A few are:

- :: Work Car or Trolley For Loading of Job.
- :: Overhead Beam Or Crane.
- :: More No. of Blast Nozzles To Increase Production Output.
- :: Automatic Movement of Blast Nozzle or Job or Both (for Small Blast Room).
- :: Vacuum Recovery Unit For Collection of Abrasive From Intricate Parts / Portion of The Job.



## Air Consumption & Media Delivered

Figures shown are for general reference only; many variables affect actual consumption. Rely on actual experience for job decision-making

Nozzle Model Nozzle Orifice	Pressure System PSI					Air, Media & Power Requirements
	50	60	70	80	90	
No. 3 5 mm	26	30	33	38	41	Air (cfm) Media (cfh) Compressor (hp)
	1.5	1.8	2.0	2.2	2.4	
	6	7	8	9	10	
No. 4 6 mm	47	54	61	68	74	Air (cfm) Media (cfh) Compressor (hp)
	2.7	3.1	3.5	4.1	4.5	
	11	12	14	16	17	
No. 5 8 mm	77	89	101	113	126	Air (cfm) Media (cfh) Compressor (hp)
	4.6	5.3	6.0	6.7	7.4	
	18	20	23	26	28	
No. 6 10 mm	108	126	143	161	173	Air (cfm) Media (cfh) Compressor (hp)
	6.7	7.6	8.6	9.6	10.5	
	24	28	32	36	39	

Pressure System Ratio: hose ID to nozzle orifice ID should be between 3:1 and 4:1.

## Abrasive Blasting Machine

Blast Rooms are generally provided with P7-501R and P7-1001R models. During the blasting process, the mushroom valve and exhaust valves are closed, the vessel is pressurized and the media is forced out through the feed valve to the nozzle. When the blasting ceases, the vessel is depressurized by opening the exhaust valve. The vessel remains depressurized except when blasting is in process.

The remote control valve provide in the system releases the pressure, stopping the blasting process thereby ensuring safe working conditions for the operator in case the hose and nozzle drops accidentally.



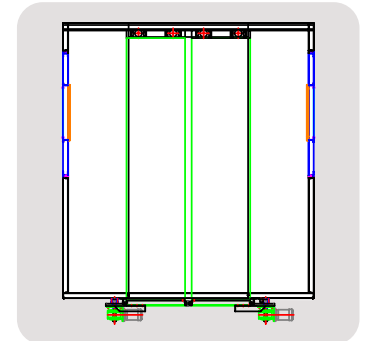
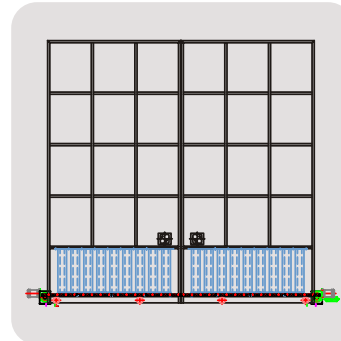
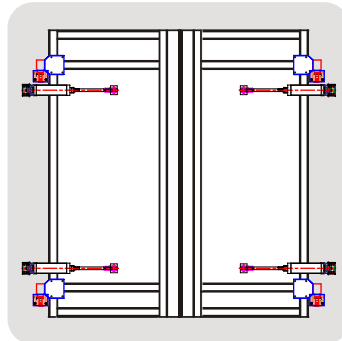
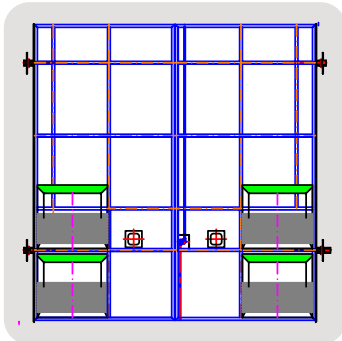
## Doors



The doors are the main constituents of any blast room system. The doors can be of Hinge, Sliding, Collapsible, Folding, Motorized, with Roof Opening types are being used as per the applicability for the blast room enclosures.

PCS supplies these doors as per the requirement of the customer & maintain their operation safety & trouble free movements.

1. Hinge Type Door
2. Pneumatic Door
3. Motorized Horizontal Sliding Door
4. 'L' Shape Motorized Sliding Door



## Work Car or Trolley

For conveying heavy & big components / job are loading & conveyed on trolley mounted turn table in blast rooms.

PCS supplies many types of Turn Table & Trolleys for 1-100 Tons as per the requirement of customers.



## Conveyor Belt System

Like other media recovery system, rubber belt media conveying system is used to transport the abrasive/shot in during blasting operation in blast room system. The abrasive falling in the blast room during blasting operation gets conveyed for recycle by the belt conveyors fitted under the floor hoppers.



# Dust Collector/ Extractor Unit



Choice of the correct model of dust collector is integral to any closed environment blasting system. It is very essential to remove dust and fine abrasive particles from the environment of the blast chamber to maintain the efficient operation.

The Dust collectors are broadly classified into four types

1. Cyclone Type
2. Fabric Bag Type
3. Cartridge Filter Type
4. Pleated Bag Type



In operation, the exhauster fan on the clean air side of the collector draws dust laden air from the blast room through the fabric filter bags. Dust collects on the inner side of the bags and when the exhauster fan is turned off the bag shaker mechanism reconditions the filters by shaking most of the caked dust from inside of the bags into a dust collecting hopper.

## Pleated Bags (Latest Innovation in Filter Bag Technology)

High efficiencies upto 99.999% of 3 microns, and very easy release characteristics with a high tolerance to moisture and temperature. Latest design, the Pleated Bag, has been developed with the following advantages :

- :: No Steel, top & bottom in polyurethane.
- :: Low pressure drop because of surface filtration.
- :: Very easy to install.
- :: Very compact, 2-3 time greater filter area than traditional bags.
- :: Low consumption of air (cleaning process)
- :: VERY COST EFFICIENT

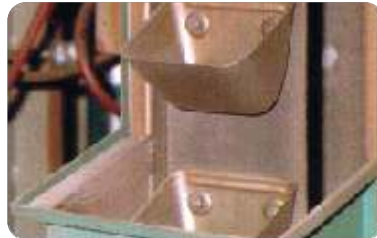
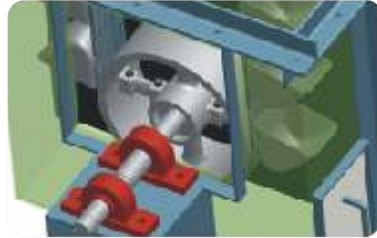




# Blasting Media Recovery & Separation System

## Bucket Elevator

The buckets are of seamless type made of 3.15mm thick steel sheet. Bucket Elevator is fabricated from Ms material of 5 mm thick at boot section 3.15mm thick at trunk and top section, respectively. A one-piece cast iron pulley; which has been crowned for tracking & rubber lagged to prevent slippage, are located in the boot & head section of the elevator to drive the belt.



All abrasive recovery system include three basic functions :

- :: Delivering the abrasive which rebounds off the workpiece to a central recovery point.
- :: Transporting the abrasive from that central point to an abrasive cleaner.
- :: Removing dust, fines & other unwanted material from the abrasive before it enters the blast machine to re-use.

## Mechanical Recovery System

Consists of Bucket Elevator, Abrasive Cleaner & Screw Conveyor System

## Pneumatic Recovery System

Consists of Mini Hopper, Plenum, Reclaimer & Dust Collector

## Abrasive Cleaner

The media separation unit is an air wash rotary screen separator which receives all media and debris from blasted work piece by the bucket elevator. Contaminants are removed by rotary screen & are discharged through a chute. The finer contaminants are abrasive that passes through the screen then cascade over the air wash where fine contaminants and small abrasive particles are removed. Reusable abrasive falls in the machine.



## Screw Conveyor

The reclaim floors utilize a heavy-duty screw to return the abrasive to the separator / classification system. The standard screw is 9" in diameter, which consists of a 5" diameter schedule - 40 pipe wrapped with 1/4" thick flighting.



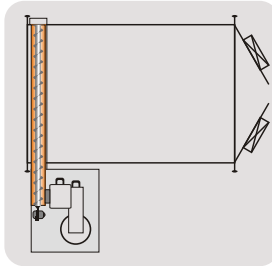
# Floor Design

( For Mechanical Recovery )

The Floor Design You Select Will Determine The Capabilities of The Room, The Degree of Labour Involvement, Cost of Purchase & Installation And Return on Your Investment.

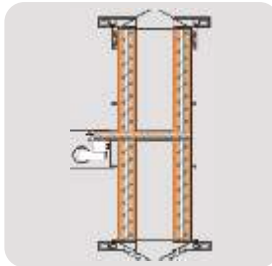
## Single Screw Partial Reclaim System

A single screw partial reclaim system is the most economical floor design available. The system contains the major components heavy-duty screw, belt and bucket elevator, air-wash separator, perforated plate rotary drum separator and oversized abrasive storage hopper with a caged man ladder and handrail. This is a basic "automatic" reclaim package that can be expanded to an "H", "U" or full floor reclaim system. **It is best suited for low to medium productive levels.**



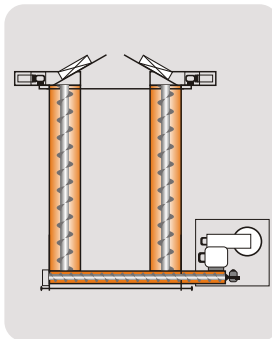
## "H" Shaped Partial Reclaim System

The "H" shaped partial reclaim system adds two longitudinal screw assemblies along each side wall of the blast room. The position of the screw assemblies allows the abrasive delivered from the blasting nozzle, which is either blown or rebounded off the work piece, to strike the side walls and fall into the screws, automatically reclaiming approx. 60 - 90% of the blast media. **This system is best suited for medium to high production.**



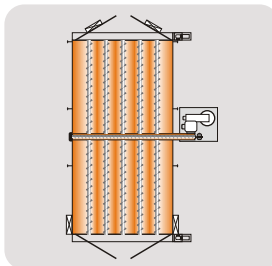
## "U" Shaped Partial Reclaim System

The "U" shaped partial reclaim system adds two longitudinal metered screw assemblies along each side wall of the blast room. The position of the screw assemblies allows automatically reclaiming approx. 60 - 90% of the blast media. This floor design is typically utilized in a "flow-through" room configuration where heavy work pieces and/or material handling devices can drive into the room and position the work piece on the steel covered concrete floor located between the longitudinal screws. **This system is best suited for medium to high production.**



## Full Floor Reclaim System

The full floor reclaim system utilizes multiple screw assemblies to create a fully automatic abrasive reclaim system, where 100% of the blast media is returned to the separator system during the blasting operation. **This system is best suited for high production requirements.**







# Pneumatic Recovery System

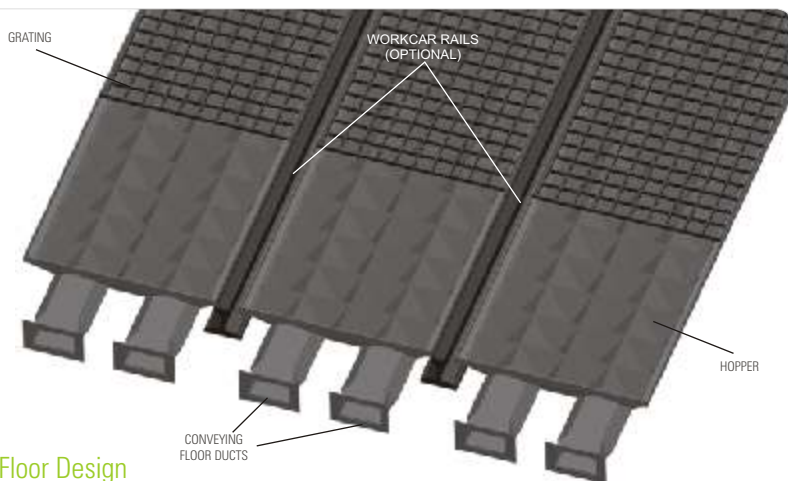


Pneumatic Recovery works best with light weight media, such as agricultural, plastic, glass bead or aluminum oxide. In PCS "W" Section pneumatic recovery system, dust and media fall through funnel shaped holes into channels beneath the floor. High velocity air carries this media and dust to the reclaimer.

Because there are no moving parts, pneumatic floors are simple to operate and maintain. Pneumatic recovery requires the use of a reclaimer - a type of cyclone separator - to separate blast media from the dust, debris and fines.

## Reclaimer (Separator System)

The purpose of the reclaimer is to receive contaminated media from the mini hoppers and to remove dust & large debris particles while allowing reusable media to pass on into the generator system for reuse. The reclaimer is fabricated from steel sheet and of welded construction. The reclaimer is circular in cross section with a conical hopper bottom to collect cleaned media for return by gravity to the pressure vessels below. The large debris particles are collected on a vibrating screen located at the bottom of the reclaimer. This screen is vibrated by means of an air driven eccentric ball type vibrator.



Floor Design

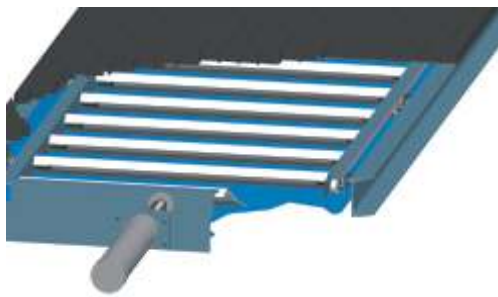
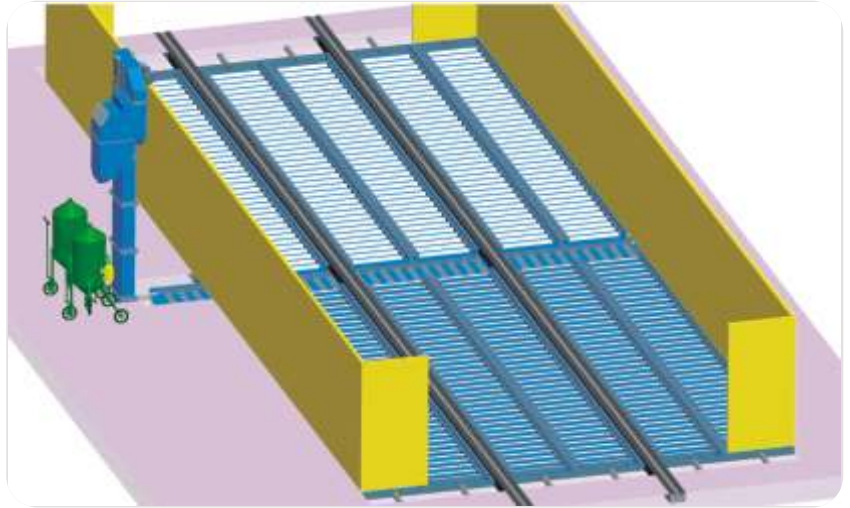
## Mini Hopper Floor & Pick Up Ducts

The mini hopper floor is the heart of the system. It consists of a multitude of small hoppers, each having an outlet in the bottom. The hoppers which covers the entire floor area of the room are overlaid with perforated plate to form the actual working surface of the room floor. Integral with the floor hoppers is a series of ducts running along the room length. Abrasives and debris falling through the hoppers and into the floor ducts are picked up by ducts and conveyed into the reclaimer system. Mini hoppers, pick-up ducts and plenum are fabricated from 3.15 mm thick steel sheet. Duct elbows are provided with abrasion resistant, replaceable wear plates.

## Scraper Floor Recovery System

One of the mechanical recovery systems from blast room floor where the abrasive is pushed forward by pushers in to the plenum/screw hopper for reuse.

The scraper floor is designed to automatically recover spent abrasive and contamination back to a bucket elevator. The scraper floor consists of a series of pivoting blades fitted into a movable frame. The scraper move back and forth by a pneumatic cylinder. The blades ride up and over the media on the backwards stroke, pushing the abrasive along on the forward stroke. The media is then transported to the abrasive cleaning unit. The advantage of the scraper floor system is its low profile design which reduces or, if floor mounted, eliminates any foundation costs. The system is designed for low maintenance and does not require any tools to remove the blades from the modules for inspection or repair.



## Air Ejector Recovery System

Air Ejector type Recovery is a low cost abrasive recovery system in which abrasive is swept manually in a corner & fed in the feed hopper. From the feed hopper air-operated, air-injector by a reciprocating pipe forces the abrasive into separator drum through elevator pipe. Fine dust from the abrasive is separated in and usable media with fine particles of abrasive passed through fine screen separator. In fine screen separator the fine abrasive particle get filtered out and usable media transferred into pressure tank for reuse.





## Various Types of Blast Room Systems

### Multiclone Blast Room System

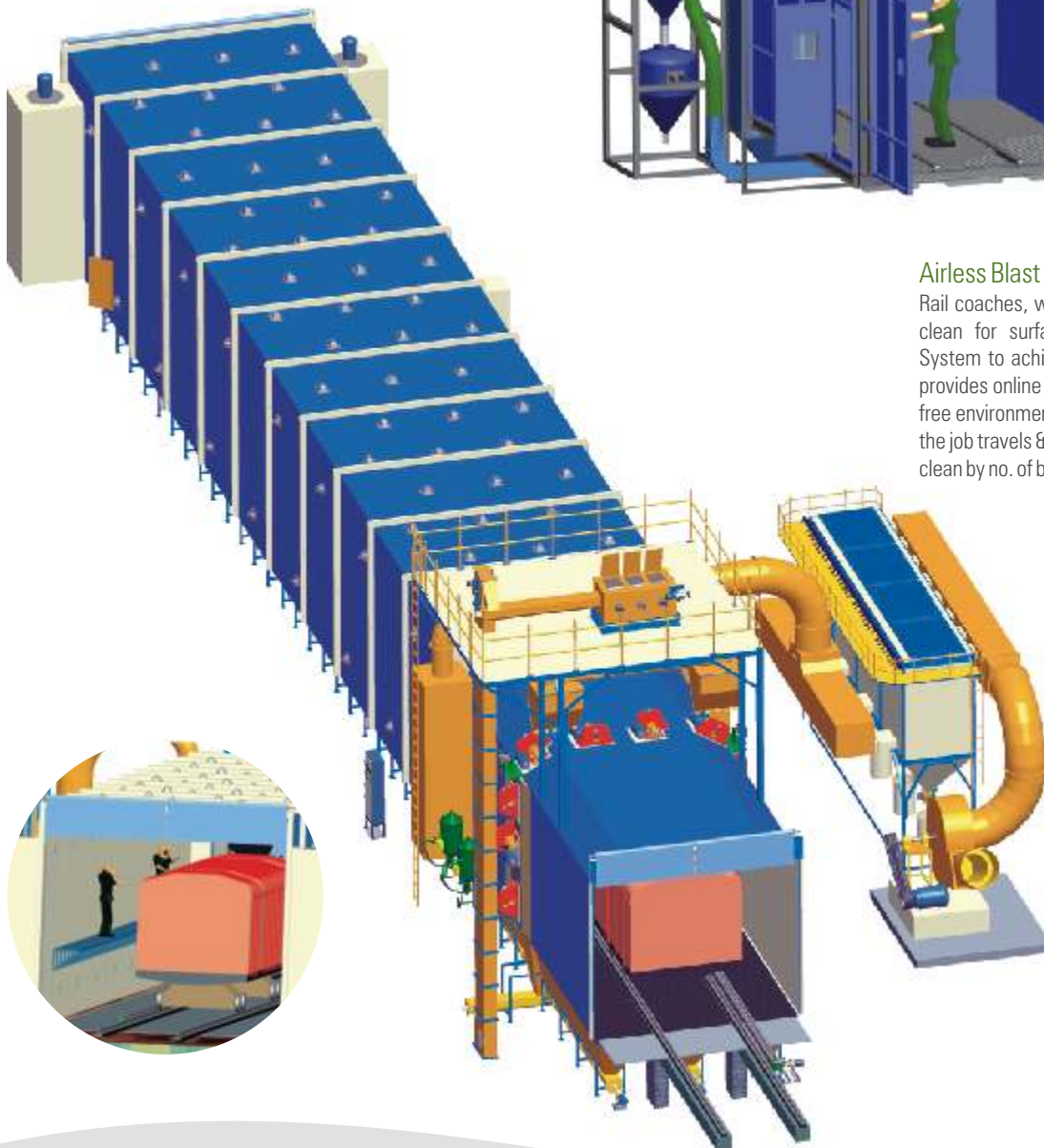
PCS has recently designed, manufacturer & supplied multiclone blast room system suitable for the fine media conveying like glass bead, aluminum oxide, corn cobs for blast cleaning of stainless steel coaches of Metro Rail & Aviation Industries.

A multiclone cyclones the fine & lighter particle are 90% re-cycled without wasting the usable fine abrasive. This system is cost effective, uninterrupted & eco-friendly.



### Airless Blast Room System

Rail coaches, wagon, huge castings etc. are being blast clean for surface preparation in Airless Blast Room System to achieve productivity. The Airless Blast Room System provides online blast cleaning, media reclaiming and dust free environment. In PCS make Airless Blast Room the job travels & enters in one side automatically; get blast clean by no. of blast wheel ranging from 10-15 wheels.





## Various Types of Blast Room Systems

### Acoustic Cum Blast Room System

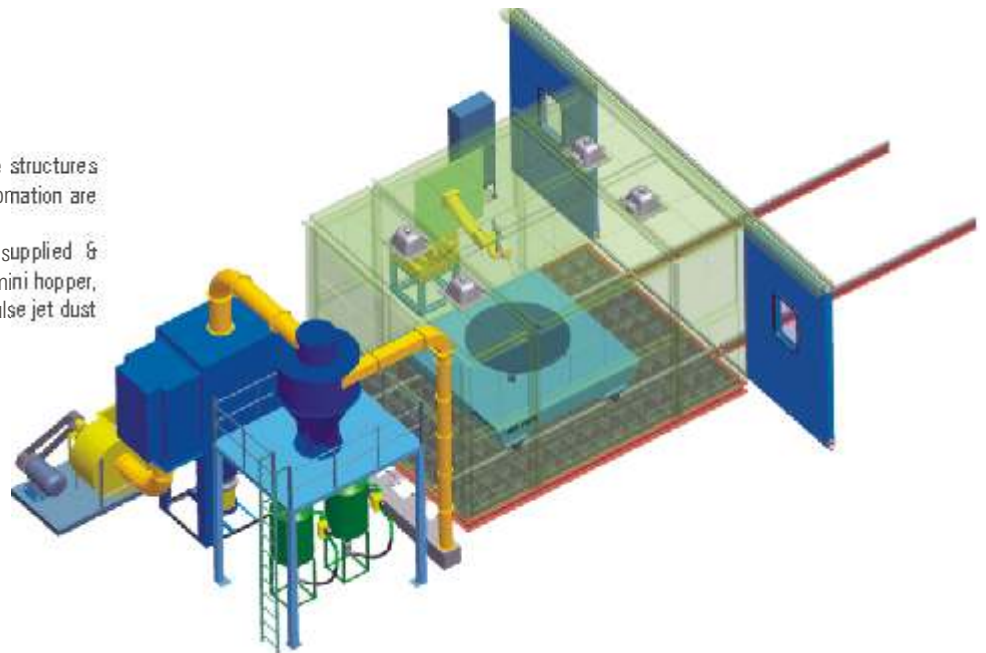
The blasting process itself is a high producer of sound. The thick acoustivity panels are provided to dampen the sound level outside of blast rooms. During blasting the sound level inside the 90 to 100dba but outside the acoustic room the sound level is maintained to 60 to 70dba.



### Hybrid Robotic Blast Enclosure System

To shot peen the huge aeroplane wing and fuselage structures robotic blast enclosure systems with all required automation are mandatory requirement.

PCS has recently designed, manufactured, supplied & commissioned Robotic Blast Enclosure System with mini hopper, reclaimier, shot sieve & shape classifier and reverse pulse jet dust collection system.



### Container Blast Room System

The steel containers used for transporting of material in the ships & aeroplane get discarded. These steel structures are being used for blasting enclosures. PCS supply these blast rooms with different media reclaiming system, blasting machine & dust collection system duly internally rubber lined to make them erosion free.





# Blast Room Accessories



Control Panel with PLC



Aluminum Oxide



Aluminum Oxide



C.I. Grit



Steel Grit



Glass Beads



Centrifugal Fan



Rubber Sheets



Gratings

## Consumables (Abrasive / Grit)



Remote Control



Blast Hose



Abrasive Regulating Valves



Nozzle Holder & Coupling



Illuminations



Safety Wears



Air Fed Helmet & Air Breather



Mixing Tube & Dead Man Handle

# Vacuum Recovery System



The PCS Vacuum Abrasive Recovery System meet the high demand from the industry due to its efficiency, reliability, ease to operate and giving excellent value for money.

The Abrasive & dust Laden air is carried to the Recovery System by Suction effect created by Exhaust Fan of Turbo Pump. Due to suction effect, the heavy particles are separated & collected in Abrasive Hopper. The abrasive get transferred in blasting machine for reuse. The fine particles & dust laden air is further carried to Dust Collector System, where the fine particles get trapped in Dust Element & clean air is let out in atmosphere thus keeping the environment eco friendly.



## Safety Features For Blast Room

- Air Fed Helmet is meets the OSHA'S requirement to protect operator from lead dust concentrations up to 1000 times the permissible exposure limit.
- CPF filter removes moisture, oil and particles from breather air.
- Blast Suit and Gloves (included with the blast machine package) protect operator's hands and body from rebounding abrasive.
- Remote Control Handle stops blasting automatically if operator drops blast hose.
- Interlock System prevents blasting if any door is open. View ports allow monitoring of operator without interrupting blasting.
- Red emergency stop button on control panel shuts down entire system.

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14, Raja Naba Krishna Street, Kolkata - 700 005

Mbl- 9051202216 / 9831199611

E mail. [processskmodi@gmail.com](mailto:processskmodi@gmail.com)

Web:- [www.Processblast.com](http://www.Processblast.com)

Our New Phone No : (033) 2530 0070

