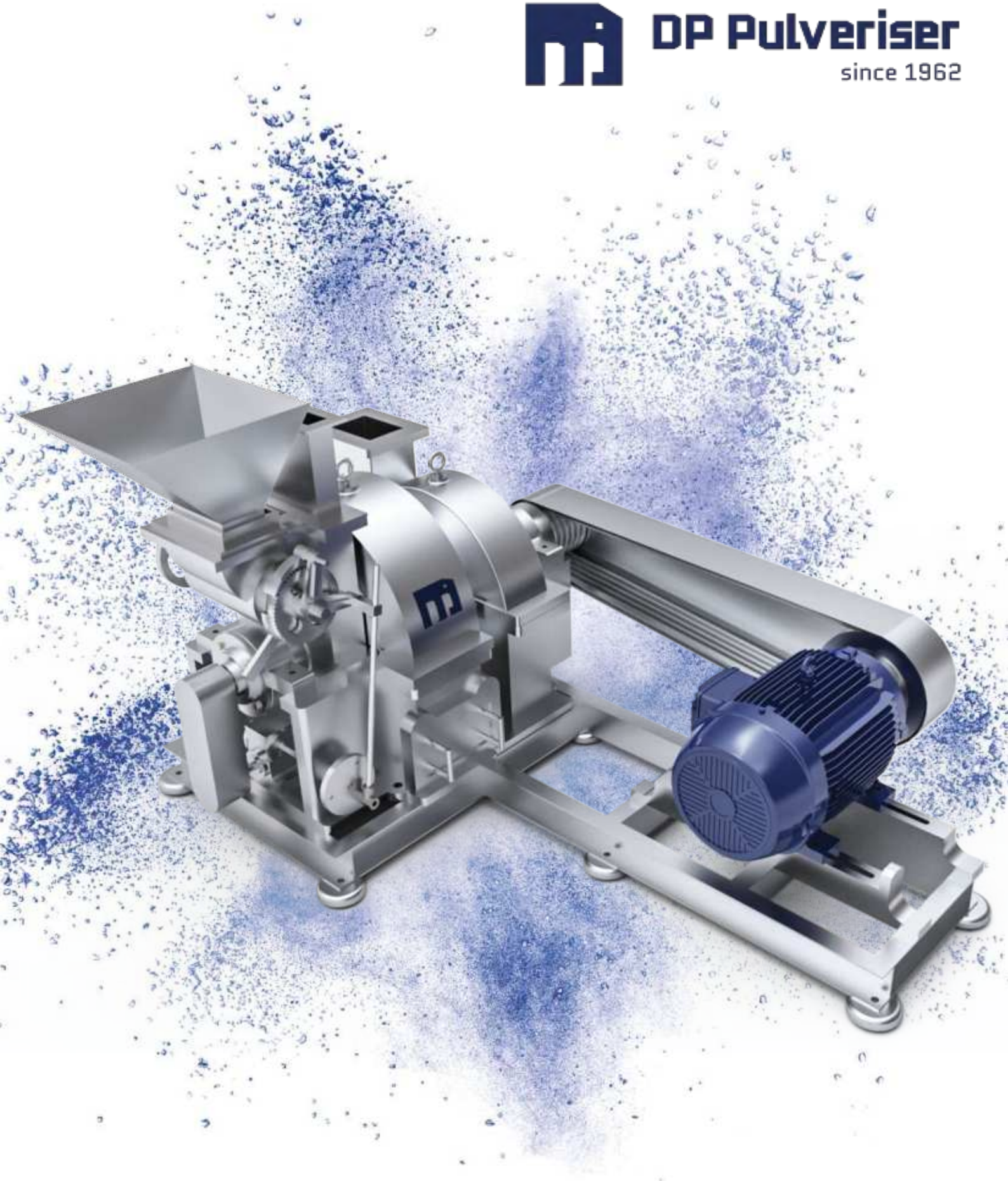
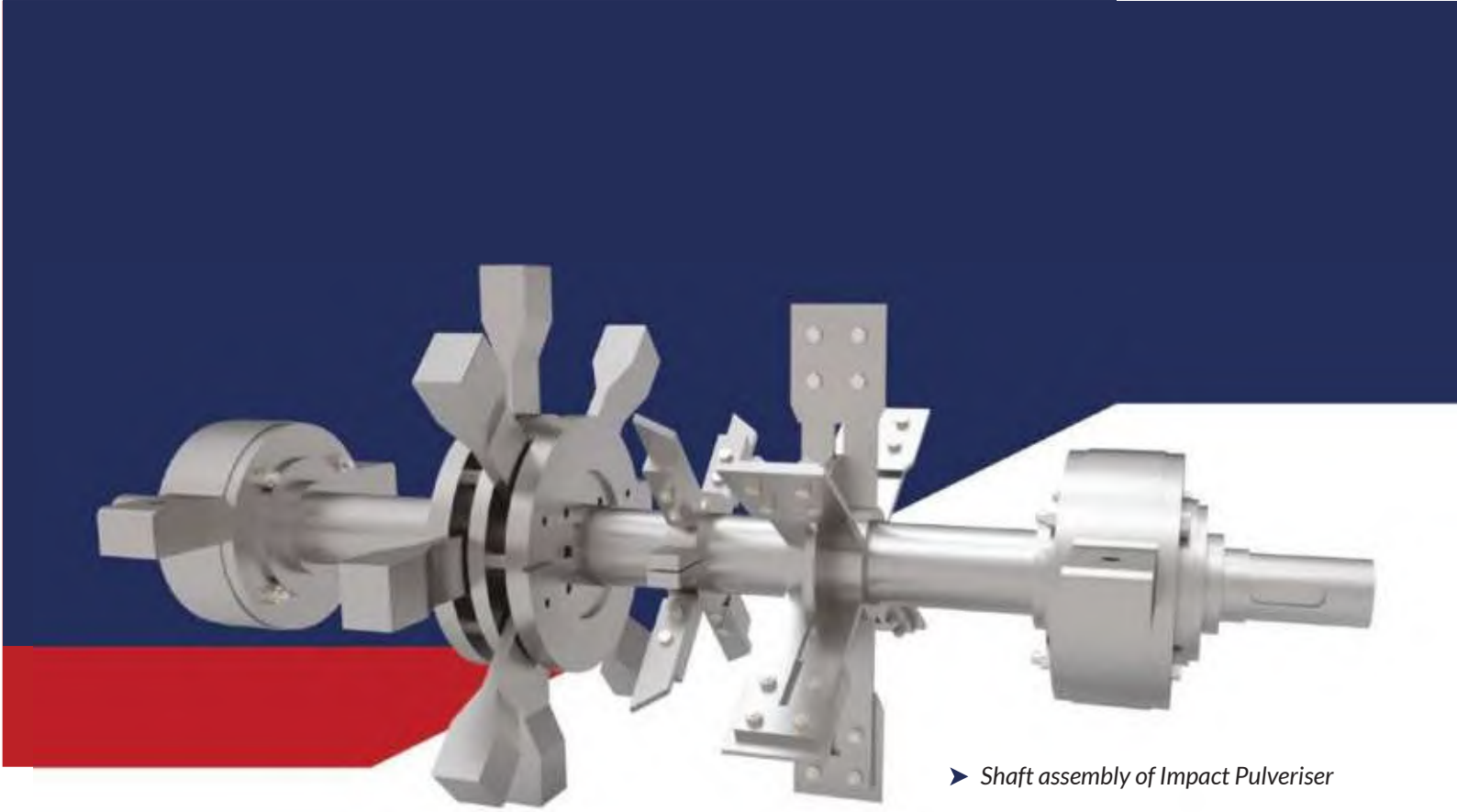
DP Pulveriser
since 1962



The DP Impact Pulveriser - IPR

Classifier Mill



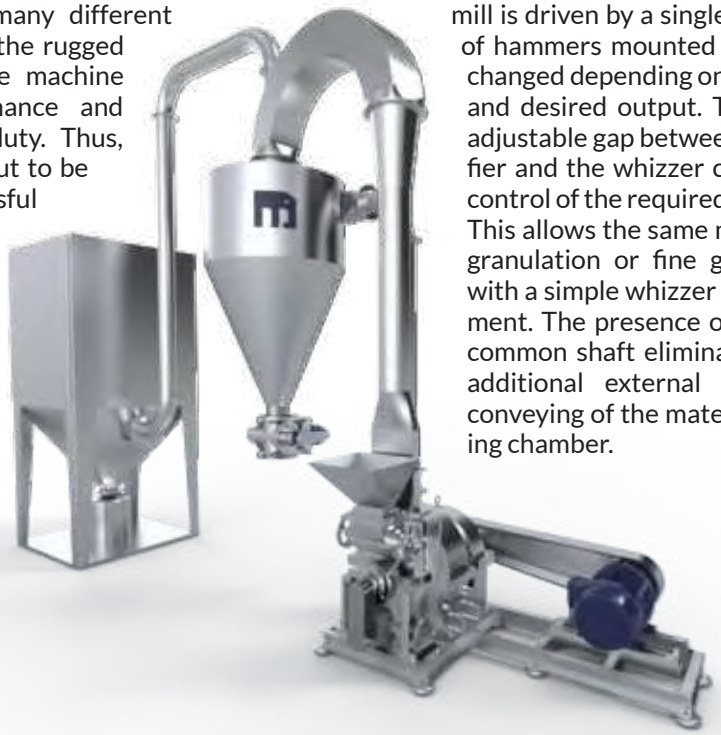
Shaft assembly of Impact Pulveriser

History

The introduction of the Impact Pulveriser into the Indian market in the early 1970s had a profound impact on the size reduction market in India. With combined functions such as feeding, grinding, classifying and drying, all power packed into a compact unit driven by a single motor, the Impact Pulveriser soon became a popular choice in India. It was designed to be heavy, rugged and versatile. Its versatility made it suitable for grinding many different kinds of materials and the rugged and tough built of the machine meant lower maintenance and downtime for heavy duty. Thus, and as such it turned out to be one of the most successful hammer mills in India.

Function

The DP Impact Pulveriser is an all-in-one medium speed screen-less hammer mill that combines feeding, grinding and air classifying into a single compact unit. It is suited to grind down to medium fineness but the adjustable nature of the whizzer classifier allows for ranges right from 60 mesh down to 300 mesh for many different materials. It has been designed to operate well in harsh environments and at continuous duty. It has a tough built and its versatile feature makes it suitable for grinding a plethora of different materials. The entire mill is driven by a single motor. The number of hammers mounted on the rotor can be changed depending on the type of material and desired output. The flexibility of the adjustable gap between the whizzer classifier and the whizzer cone enables precise control of the required output particle size. This allows the same mill to deliver coarse granulation or fine grinding as required with a simple whizzer classifier gap adjustment. The presence of an impeller on the common shaft eliminates the need for an additional external fan for pneumatic conveying of the material out of the grinding chamber.



➤ *Impact Pulveriser*

Material of Construction

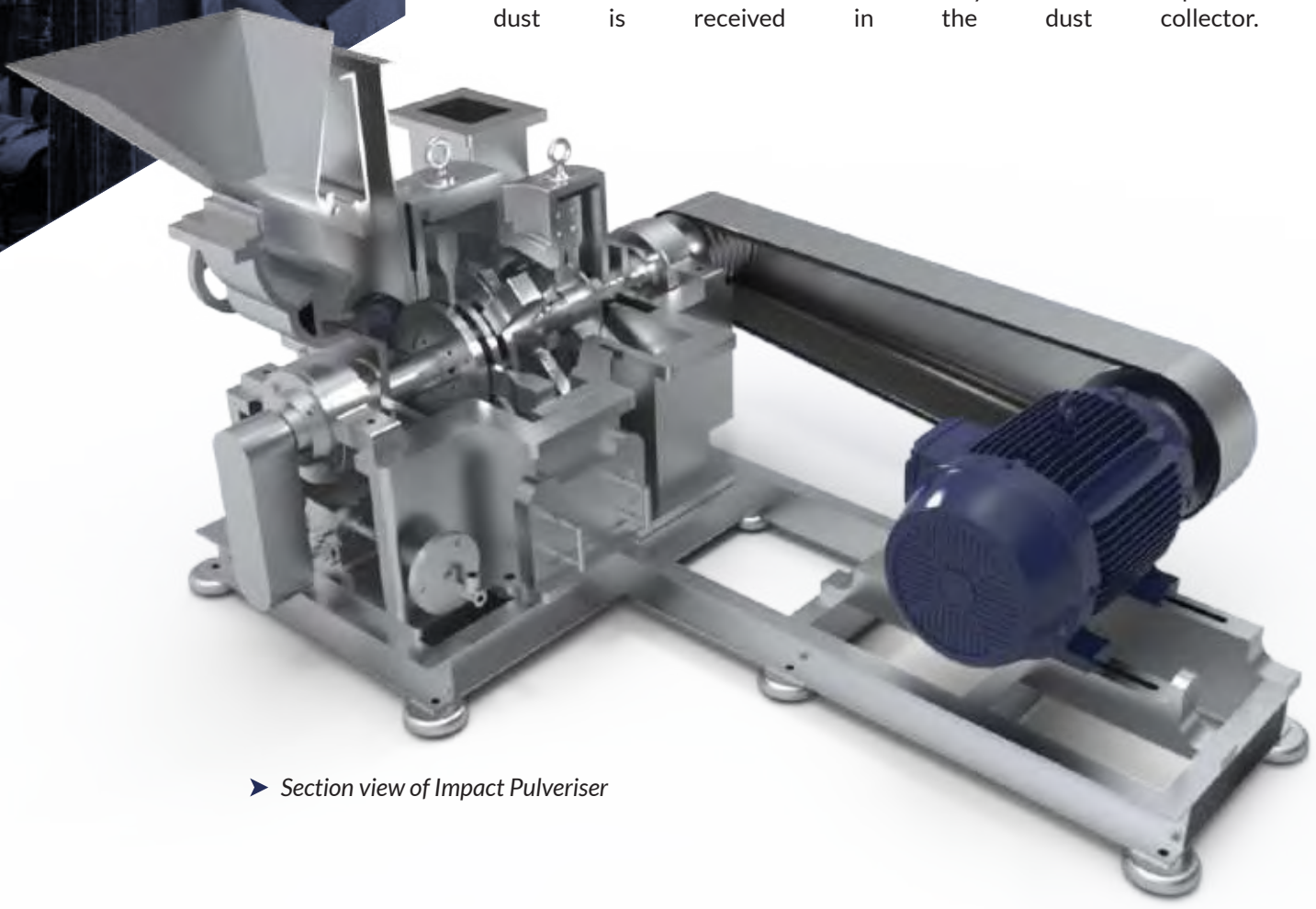
In the standard model, the mill housing is made of grey cast iron. Hammers are available in different grades from basic drop forged alloy steel to welded hard-facing having 6 times the life of the former depending on the properties of the material to be pulverised. Serrated liners are available in simple grey cast iron to hard alloy steel castings. Replaceable linings made of hard alloy casting can be provided to protect the internal parts of the casting when grinding abrasive and hard material. The mill can also be manufactured according to GMP standards with contact and non-contact parts in stainless steel depending on the client's requirement.

Features

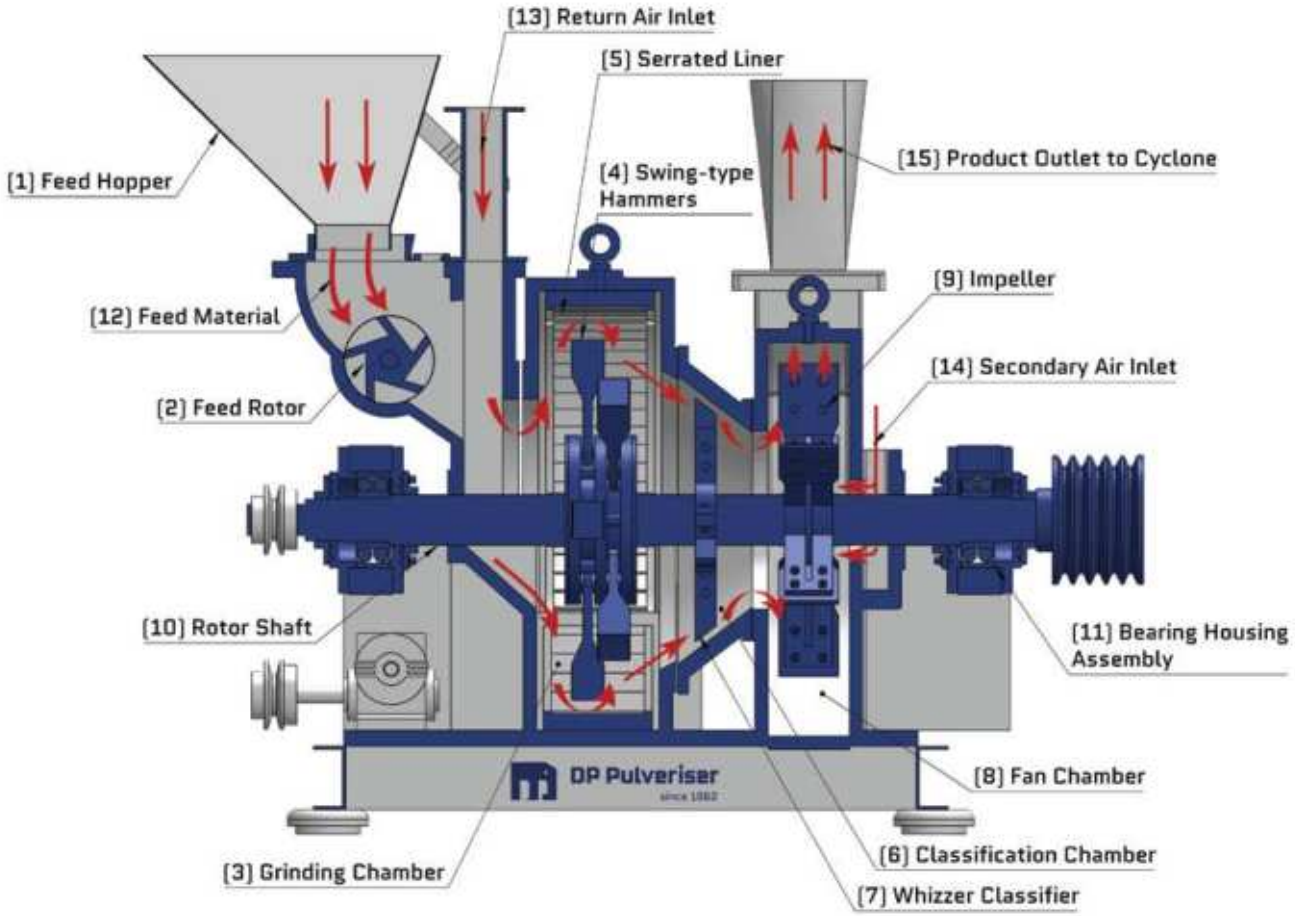
- **Pulveriser built is rugged and tough**
- **Grinding and classifying in a single machine**
- **Capable of fine reductions down to 50 microns or 300 mesh**
- **Screen-less classification**
- **Durable long life (Some 1970s and 80s models are still in use today)**
- **Adjustable particle size control of powders**
- **Integrated feeding, classification and pneumatic conveying all run by a single motor**
- **Available in abrasion resistant design for materials up to 6-7 Mohs hardnes**
- **Reliable operation due to robust design**
- **Cool and gentle grinding due to high airflows**
- **Suitable for combined grinding and drying**
- **Time proven design for decades**

Principle of Operation

The material to be pulverised can be fed manually into the (1) feed hopper above the feeder box which consists of a (2) feed rotor that is driven by a mechanism coupled to the drive shaft via a gearbox. Optionally, the material can be fed into a hopper placed in a trench below ground level and an attached screw feeder can feed the material into the machine hopper. The (2) feed rotor constantly discharges the material into from the feed hopper into (3) grinding chamber. The grinding chamber consists of a rotating hammer-rotor assembly surrounded by static serrated liners. The swing type (4) hammers are mounted between the rotor plates using a rotor pin which allows it to swivel. When the material enters the grinding chamber it is impacted by the swing hammers onto the serrated liners. The serrations on the liners cause the material to rebound back onto the rotating hammers, thus forming a multiple collision impact cycle thereby reducing the size of the particles. The in-line impeller mounted on the same shaft in the fan chamber and located right after the classification chamber creates a suction which draws out the ground material from the grinding chamber after passing through the classification chamber. This is where the air classification of the material takes place. The classification chamber consists of a whizzer classifier fitted with whizzer conical blades. This is clamped onto the same shaft. The clamp fitting of the whizzer classifier allows it to move towards or away from the grinding chamber along the shaft. This movement increases or decreases the gap between the whizzer blades and the whizzer cone which basically forms the particle size control mechanism. A larger gap allows lower static pressure drop which can draw out the coarser particles from the grinding chamber for a coarse requirement and a smaller gap increases the pressure drop which results in only fine particles being drawn out of the grinding chamber. The material then passes through the impeller and exits the pulveriser air-material separation in a downstream cyclonic separator and dust collector. Majority of the material is received at the outlet of the cyclone and some superfine dust is received in the dust collector.



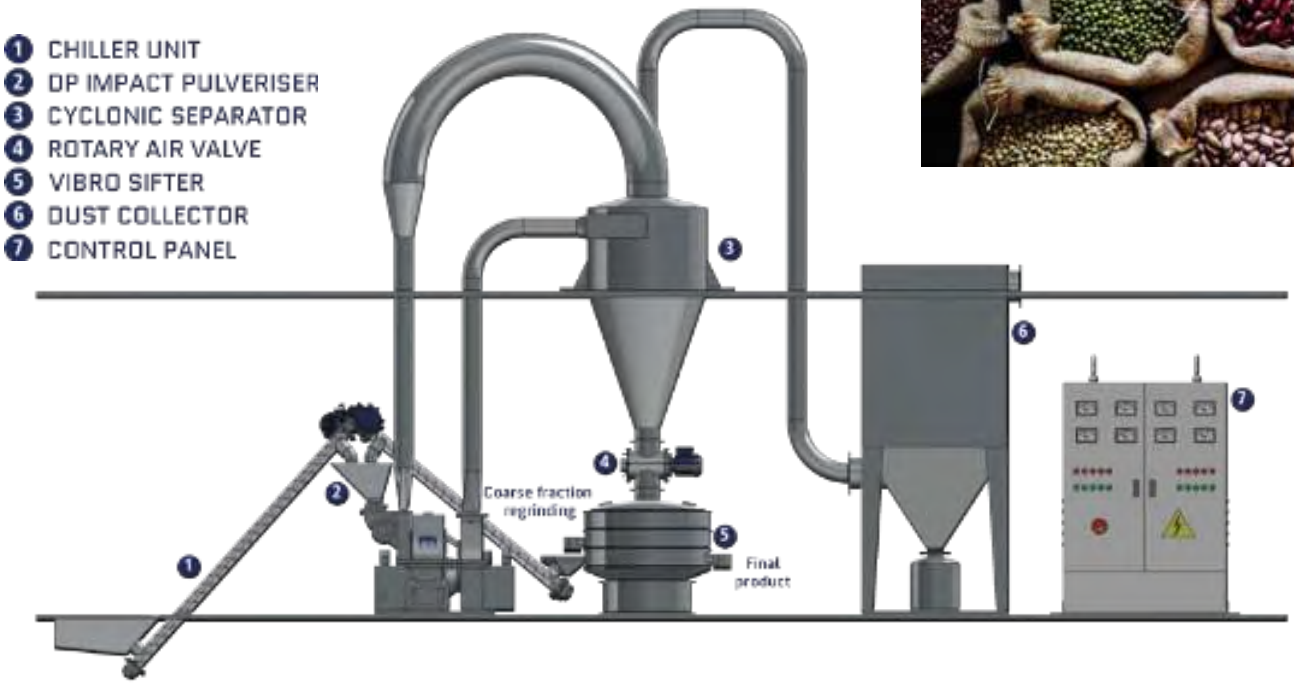
➤ *Section view of Impact Pulveriser*



➤ *Section view of Impact Pulveriser describing the process of flow of air and material.*

➤ *Installation of DP IP-42 in Ghana, Africa*

Foods & Spices - Dals [Lentils]



➤ This is a typical set up for grinding of dals. Raw material is fed into the hopper of a screw conveyor which feeds the material into the pulveriser at a constant rate. Ground material is received at the cyclonic separator outlet. This material contains a small percentage of coarse fraction and hence a vibratory sifter is used to separate this out. This material can be sent for re-grinding through a screw conveyor.

Product	Approx. Throughput	Output Product Fineness d95	Machine Size
Moong Dal	200-250 kg/hr	120-150 Mesh	DP IP-20 (20 HP)
Chana Dal	150-160 kg/hr	120-150 Mesh	DP IP-15 (10 HP)
Urad Dal	240-250 kg/hr	120-150 Mesh	DP IP-20 (20 HP)
Grass Pea (Kesari Dal)	400 kg/hr	120-150 Mesh	DP IP-25 (20 HP)
Chana Dal	1200-1250 kg/hr	120-150 Mesh	DP IP-32 BC (80 HP)
Vatana Dal	1000 kg/hr	120-150 Mesh	DP IP-32 (50 HP)

➤ **This is an installation of a DP IP-32 Impact Pulveriser at a client's site in Dammam, Saudi Arabia. The product being ground is Chickpea Flour (Besan).**

Food & Spices - Turmeric

- This is an installation of the Impact Pulveriser System with an open type dust collector at a major Spice Manufacturer in Maharashtra. In order to comply with domestic food norms, the client opted for a system with both contact as well as non-contact parts in stainless steel material of construction.

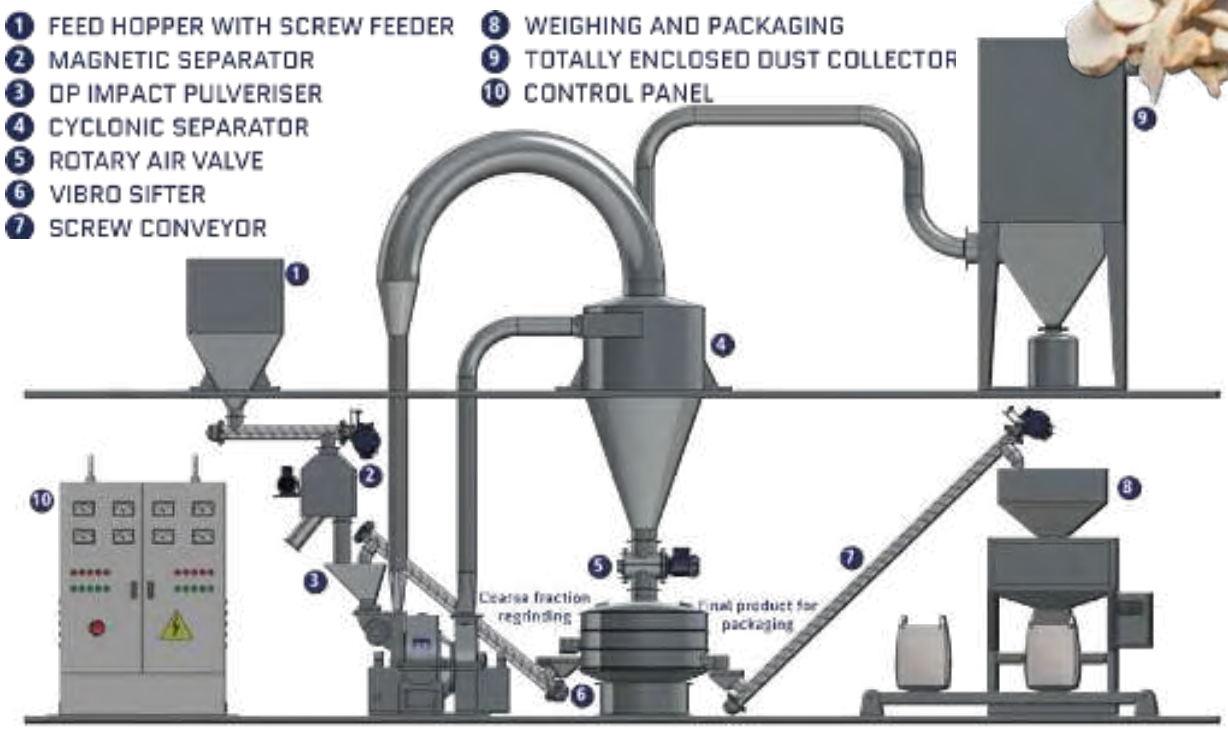
1. CHILLER UNIT
2. DP IMPACT PULVERISER
3. CYCLONIC SEPARATOR
4. ROTARY AIR VALVE
5. VIBRO SIFTER
6. TOTALLY ENCLOSED DUST COLLECTOR
7. CONTROL PANEL

- *Water jacketed liners*

- This set up is for grinding of Turmeric. Turmeric are ground at low temperature with the help of chiller unit so that the quality of the spices remain intact. Ground material is received at the cyclonic separator outlet. This material contains a small percentage of coarse fraction and hence a vibratory sifter is used to separate this out.

Product	Approx. Throughput	Output Product Fineness d95	Machine Size
Turmeric	180-200 kg/hr	80-100 Mesh	DP IP-25 (40 HP)
Black Pepper	40-50 kg/hr	80-100 Mesh	DP IP-15 (10 HP)
Dry Ginger	70-80 kg/hr	80-100 Mesh	DP IP-20 (20 HP)
Turmeric	350-375 kg/hr	80-100 Mesh	DP IP-32(50 HP)
Black Pepper	300-350 kg/hr	80-100 Mesh	DP IP-15 (15HP)

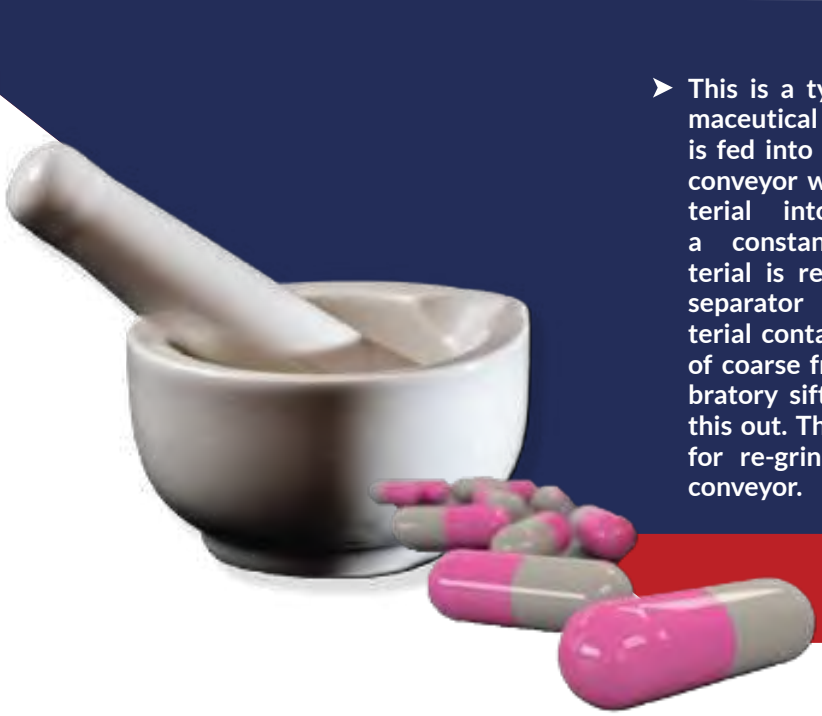
Ayurvedic Roots & Herbs



➤ This set up is for grinding of Ayurvedic Roots & Herbs. Raw material is fed to the magnetic separator with screw conveyor which feeds the material at constant rate. Magnetic separator separates the unwanted substances from the raw material. Ground material is received at the cyclonic separator outlet. This material contains a small percentage of coarse fraction and hence a vibratory sifter is used to separate this out. Coarse material can be sent for re-grinding through a screw conveyor while fine product is sent for the weighing and packaging through screw conveyor.

Product	Approx. Throughput	Output Product Fineness d95	Machine Size
Licorice Roots	60-80 kg/hr	80-100 Mesh	DP IP-25 (30 HP)
Henna Leaves	100 kg/hr	100 Mesh	DP IP-25 (30 HP)
Tobacco Leaves	250-280 kg/hr	100 Mesh	DP IP-32 (50 HP)
Galangal Root	70-80 kg/hr	80-100 Mesh	DP IP-20 (20 HP)
Vetriver Roots	60-80 kg/hr	80-100 Mesh	DP IP-25 (30 HP)

➤ This image shows an installation of the Impact Pulveriser being used to grind medicinal herbs at a Ayurvedic drugs manufacturer's factory.



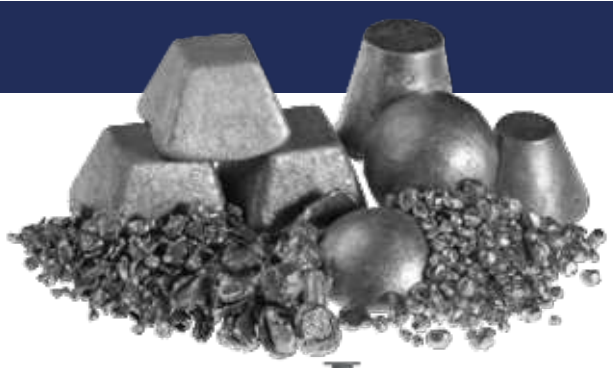
➤ This is a typical set up for Pharmaceutical material. Raw material is fed into the hopper of a screw conveyor which feeds the material into the pulveriser at a constant rate. Ground material is received at the cyclonic separator outlet. This material contains a small percentage of coarse fraction and hence a vibratory sifter is used to separate this out. This material can be sent for re-grinding through a screw conveyor.

Pharmaceuticals

➤ This set up is for grinding of Pharmaceutical materials. Raw material is fed to the hopper of Impact Pulveriser in which comminution and classification takes place. Ground material is received at the cyclonic separator outlet . Dust particles are separated from the air by pulsejet dust collector at the end of the system.

Product	Approx. Throughput	Output Product Fineness d95	Machine Size
Lactose	150 kg/hr	350-375 kg/hr	DP IP-25 (30 HP)
Tribasic Lead Stearate	200-225 kg/hr	200 Mesh	DP IP-25 (30 HP)
Dlbasic Lead Stearate	350-375 kg/hr	200 Mesh	DP IP-25 (30 HP)
Lead Stearate	375-400 kg/hr	200 Mesh	DP IP-25 (30 HP)
Calcium Stearate	350-375 kg/hr	200 Mesh	DP IP-25 (30 HP)

Metals



1. DP IMPACT PULVERISER (WITHOUT INTERNAL FAN)
2. CYCLONIC SEPARATOR
3. ROTARY AIR VALVE
4. DUST COLLECTOR
5. EXTERNAL CONVEYING FAN
6. SILENCER
7. CONTROL PANEL

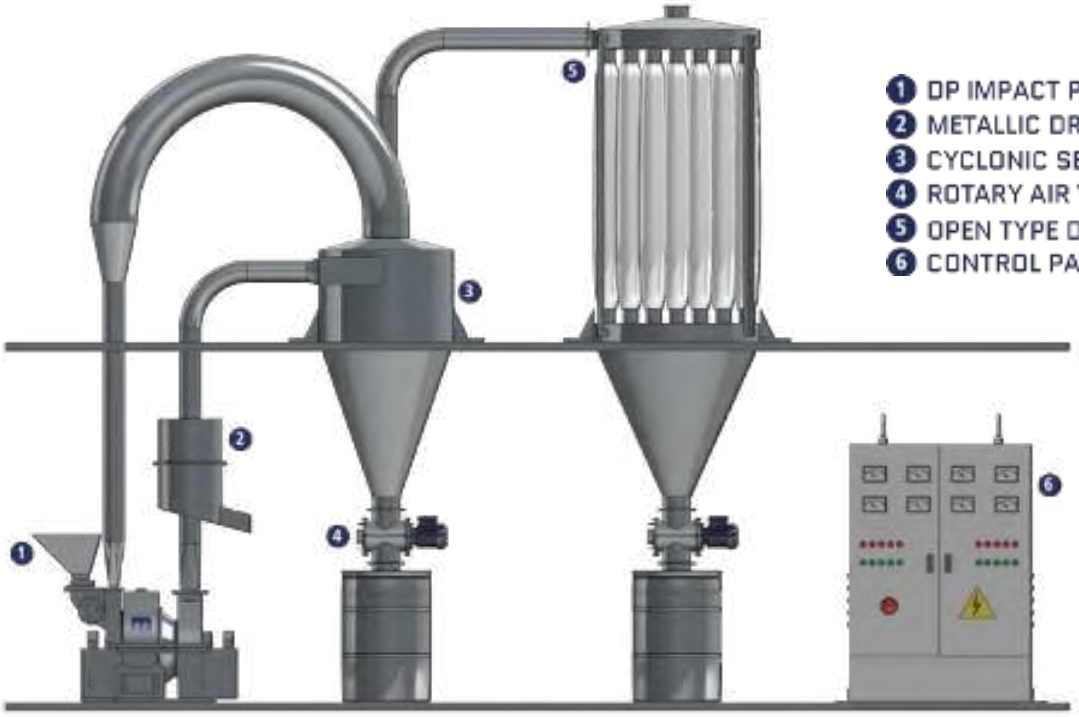
- This set up is for grinding of metals. Raw material is fed to the hopper of impact pulveriser in which only comminution takes place. Blower is not an integral part in the pulveriser instead placed externally at the end of the system follwed by silencer to reduce the noise during the operation of metals.Ground material is received at the cyclonic separator outlet.

Product	Approx. Throughput	Output Product Fineness d95	Machine Size
Ferro Molybdenum-80%	175 kg/hr	50-150 Mesh	DP IP-25 (30 HP)
Ferro Titanium-30%	350 kg/hr	50-150 Mesh	DP IP-25 (30 HP)
Ferro Vanadium-80%	175 kg/hr	50-150 Mesh	DP IP-25 (30 HP)
Ferro Vanadium-50%	210 kg/hr	50-150 Mesh	DP IP-25 (30 HP)
Ferro Chrome-80%	175 kg/hr	50-150 Mesh	DP IP-25 (30 HP)
Ferro Manganese-80%	210 kg/hr	50-150 Mesh	DP IP-25 (30 HP)

- This is a typical set up for grinding of metals. Raw material is fed into the hopper of a screw conveyor which feeds the material into the pulveriser at a constant rate. Ground material is received at the cyclonic separator outlet. This material contains a small percentage of coarse fraction.

➤ This is a typical set up for grinding of metallic dross. Raw material is fed into the hopper of a screw conveyor which feeds the material into the pulveriser at a constant rate. Ground material is received at the cyclonic separator outlet. This material contains a small percentage of coarse fraction and hence a vibratory sifter is used to separate this out. This material can be sent for re-grinding through a screw conveyor.

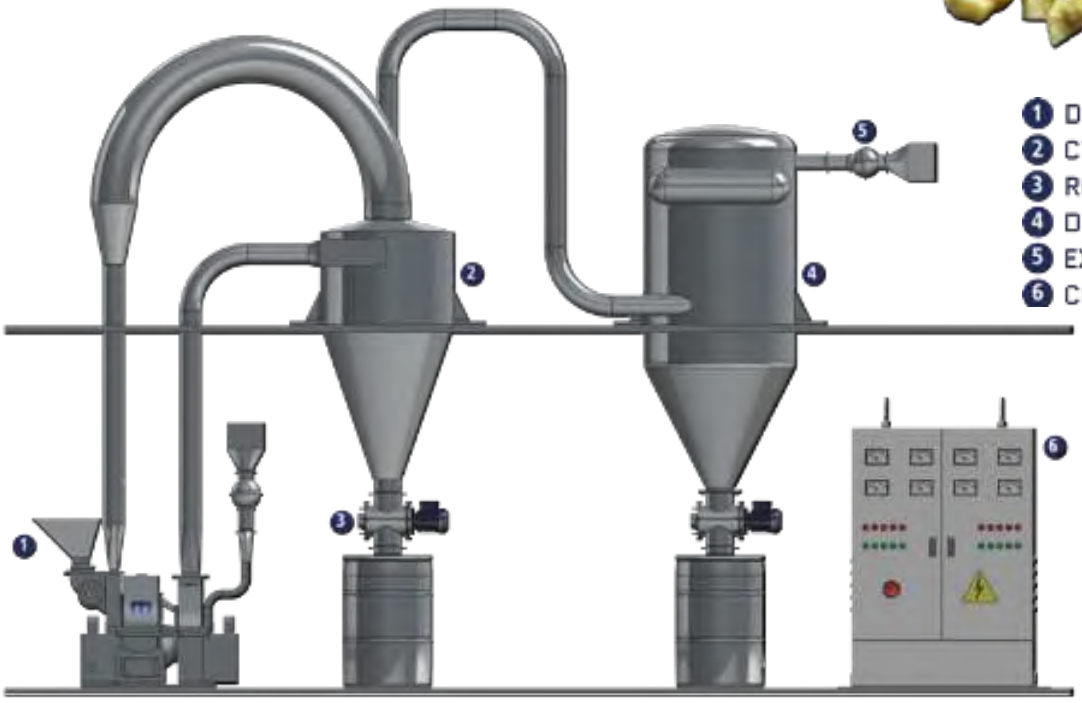
Metallic Dross Separation



➤ This set up is for grinding of metallic dross separtion. Raw material is fed to the hopper of impact pulveriser where comminution and classification takes place. Material passes through the metallic dross separator before entering into the cyclone separator, where dross separator and leaves maximum quantity of oxides and small quantitiy of metal to cyclone separator. Very fine oxides are collected from the open type dust collector.

Product	Approx. Throughput	Output Product Fineness d95	Machine Size
Metallic Aluminum Dross	500-550 kg/hr	-	DP IP-32 (60HP)
Zinc Metallic Dross	200 kg/hr	-	DP IP-25 (30 HP)
Copper Metallic Dross	140-150 kg/hr	-	DP IP-25 (30 HP)
Metallic Brass Dross	100 kg/hr	-	DP IP-20 (20 HP)
Metallic Brass Dross	100 kg/hr	-	DP IP-25 (30 HP)

Chemicals



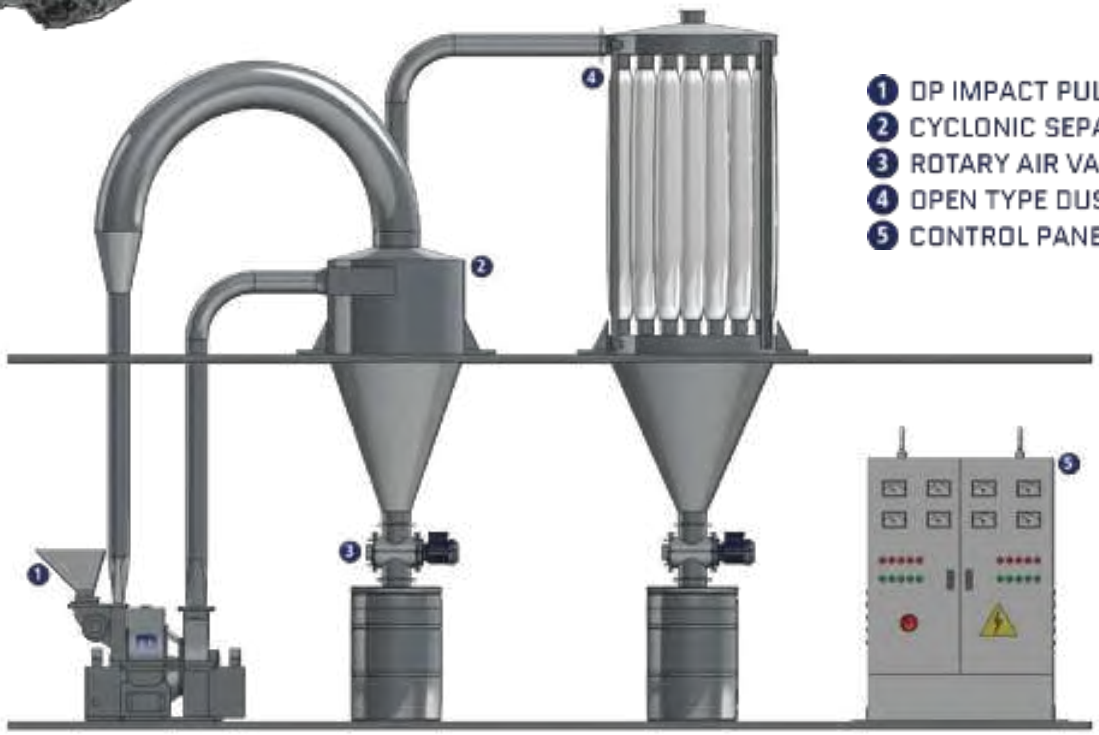
➤ This set up is for grinding of chemicals. Raw material is fed to the hopper of impact pulveriser where comminution and classification takes place. Material passes through the metallic dross separator before entering into the cyclone separator, where dross separator and leaves maximum quantity of oxides and small quantitiy of metal to cyclone separator. Very fine oxides are collected from the open type dust collector.

Product	Approx. Throughput	Output Product Fineness d95	Machine Size
Metformin Hydrochloride	150-170 kg/hr	100 Mesh	DP IP-20 (15HP)
Pigments	100 kg/hr	300-350 Mesh	DP IP-20 (20 HP)
Phenolic Resin	100 kg/hr	100 Mesh	DP IP-20 (20 HP)
EDTA	150-160 kg/hr	30-60 Mesh	DP IP-20 (20 HP)
Etidronic acid	150-160 kg/hr	30-60 Mesh	DP IP-20 (20 HP)
Dried Ferrous Sulphate	180-200 kg/hr	300 Mesh	DP IP-20 (30 HP)

This is a typical set up for chemicals. Raw material is fed into the hopper of a screw conveyor which feeds the material into the pulveriser at a constant rate. Ground material is received at the cyclonic separator outlet. This material contains a small percentage of coarse fraction and hence a vibratory siftscrew conveyor.

This is a typical set up for grinding of minerals. Raw material is fed into the hopper of a screw conveyor which feeds the material into the pulveriser at a constant rate. Ground material is received at the cyclonic separator outlet. This material contains a small percentage of coarse fraction.

Minerals



- This set up is for grinding of minerals. Raw material is fed to the hopper of Impact Pulveriser where comminution and classification takes place. Material passes through the metallic dross separator before entering into the cyclone separator, where dross separator and leaves maximum quantity of oxides and small quantitiy of metal to cyclone separator. Very fine oxides are collected from the open type dust collector.

Product	Approx. Throughput	Output Product Fineness d95	Machine Size
Limestone	900-950 kg/hr	100-300 Mesh	DP IP-32 BC (75HP)
Bentonite	2000-2500 kg/hr	200 Mesh	DP IP-52 (175 HP)
Coconut Shells	400-450 kg/hr	80-100 Mesh	DP IP-25 (30 HP)
Sea Shells	380-400 kg/hr	30 Mesh	DP IP-25 (30 HP)
Sodium Bentonite	330-350 kg/hr	125 Mesh	DP IP-25 (40HP)
Feldspar	600-900 kg/hr	80-300 Mesh	DP IP-32 (75HP)

DP Impact Pulveriser - IPR sizes

Machine Size	IPR	8″	15″	20″	25″	32″	42″
Main Drive Motor	HP	5	7.5-10	15-20	25-30	50-75	100-125
Rotor Speed	RPM	5000	3000	2200	2000	1800	1600
Scale-up Factor	F	0.25	0.5	1	1.8	2	4.2
Airflow	m3/hr	510	1350	1800	2700	5400	9000

Design Options

Broad Chamber					●	●	
Heavy Design				●	●	●	
GMP				●	●	●	
External Fan				●	●	●	●

➤ *Spare parts available 24x7 in a variety of different wear resistant materials.*

Options

- Machine Contact and Non-Contact Parts available in Cast Iron, Carbon Steel, 304, 304L, 316, 316L
- Wearable parts available in hard materials like Forged Alloy Steel, Welded Hard Facing, Hard Alloy Steel Casting, Cast Iron
- Internal fan available in single or two-piece design
- Available in external fan design where airflow control is required
- Liners available in water jacketed design to provide cooling in the grinding chamber

Who are WE?

We are DP Pulveriser Industries and have been designing and building size reduction equipment in India since 1962. We believe in using the materials of the highest grade to build our equipment because we understand your need for a machine that will perform - without breakdown - day in and day out.
61 years, 7000 installations and 32 countries later we now hold the reputation of being one of India's finest manufacturers of size reduction equipment. Regardless of the industry you operate in, DP can optimize, innovate and automate your entire process with tailor made solutions and expertise that is backed by 61+ years of experience.
We are a young bunch of passionate engineers excited to work on your next challenging project.

What do we DO?

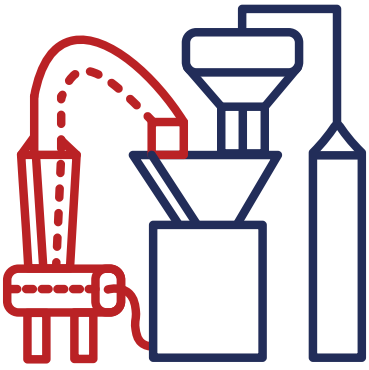
DP Pulveriser Industries' offerings are broadly classified under 3 segments:

Powder Processing Equipment

DP Pulveriser's machines are widely known for their rugged, tough built and low maintenance even after years of service. Our major forte is Size Reduction and Air Classification. We have a wide range of machines to cater to all your particle size requirements.

Testing and Other Services

We offer various services such as material trials of our equipment, grinding and air classification of your material on a contract basis and even particle testing and analysis at a fully equipped laboratory on the campus of our partner IIT Gandhinagar.



Turnkey Systems & Plant Automation

Thanks to our decades of experience, we understand what processing technologies and equipment are best suited for your application and industry. This means we can be your one stop solution for setting up complete powder processing plants carefully tailored to your needs.

Our Global Footprint

Australia Bahrain Bangladesh Bhutan Canada China Estonia Egypt Bremen Ghana

Hongkong Iran Indonesia Kenya Mauritius Mexico Malaysia Madagascar Newzealand Nepal

Nigeria Oman Philippines Qatar Saudi Arabia South Africa Singapore Switzerland Sri Lanka Tanzania

Uruguay U.A.E. Zambia

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