



# RICE STRAW PELLET PLANT

SERVODAY GROUP

[WWW.WOODPELLET.IN](http://WWW.WOODPELLET.IN)



# Servoday Group Responsibilities



1

Concept



2

Idea with  
Facts



3

Process  
Engineering



4

Automation



5

Training

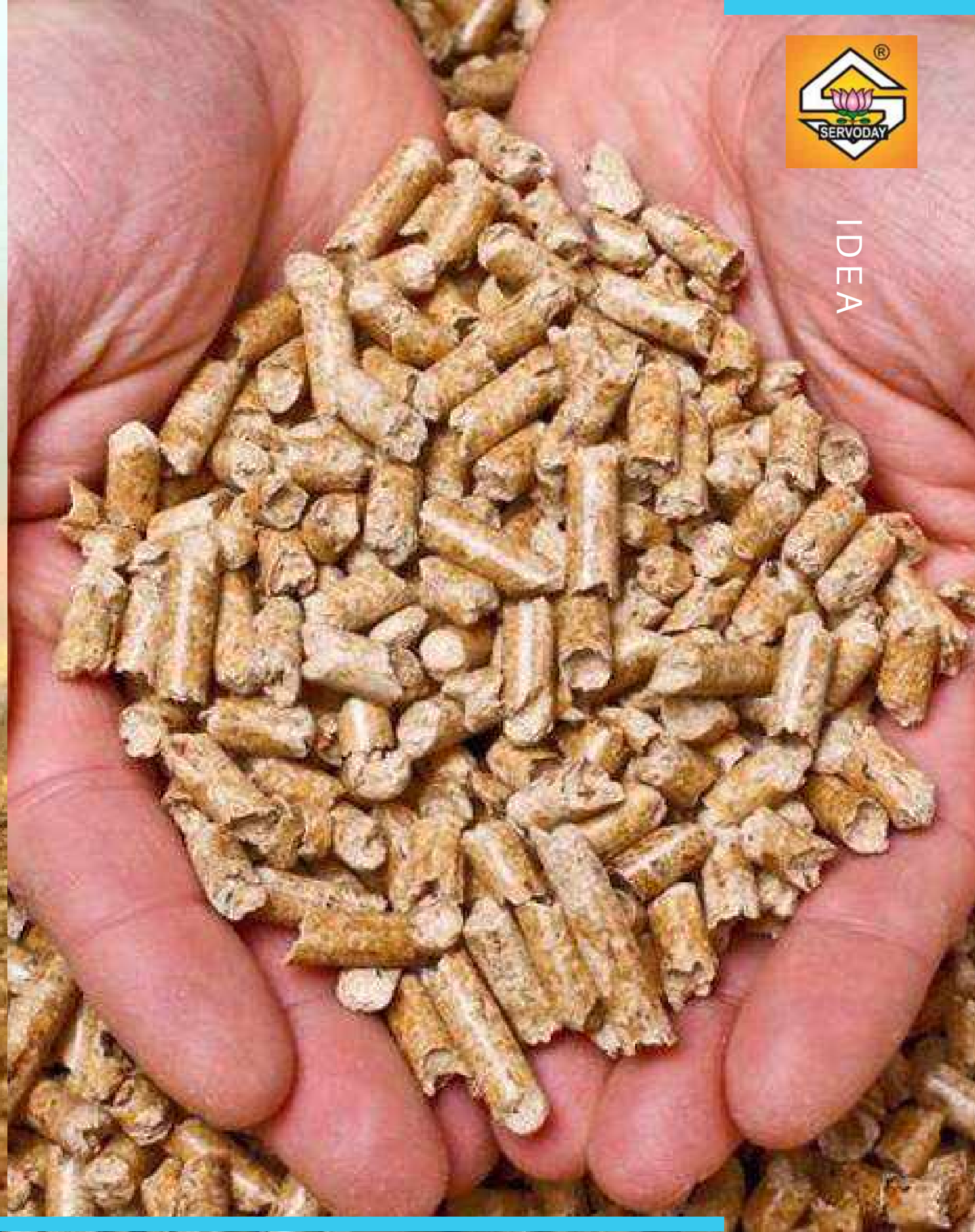
# Not a waste — until wasted



RICE STRAW



IDEA



# Rice Straw

## Specifications



FACTS

### CHARACTER

High Water Content  
Low Heating Value  
Less Grindability  
High Bulk Density  
High Ash content

### PROPERTIES

Calorific Value: 13.98 MJ/Kg.  
Fixed Carbon: 11.3-16.1%  
Volatile Matter: 35.0-72.4%  
Ash & Silica: 7.8-20.3%  
Cellulose: 39.2%  
Hemicellulose: 23.5%  
Lignin: 36.1%  
Pellet Tensile Strength: 1.130 MPa

### DENSITIES

Loose: 20-40 Kg/M<sup>3</sup>  
Chopped: 40-80 Kg/M<sup>3</sup>  
Baled: 110-220 Kg/M<sup>3</sup>  
Pelleted: 560-720 Kg/M<sup>3</sup>

# Rice Straw

## Flow Diagram



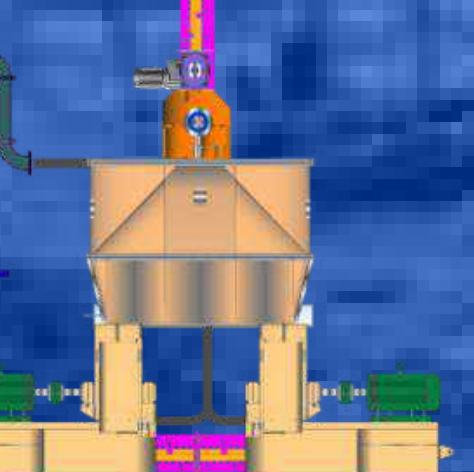
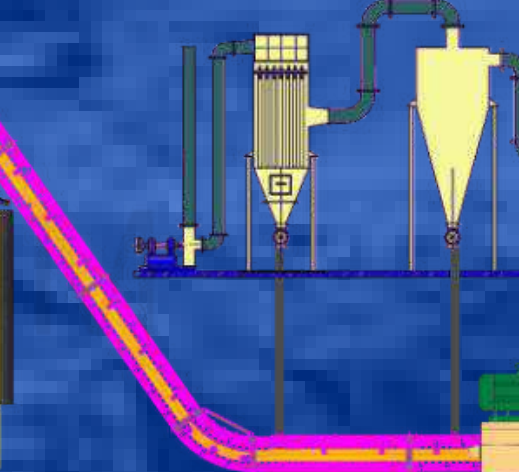
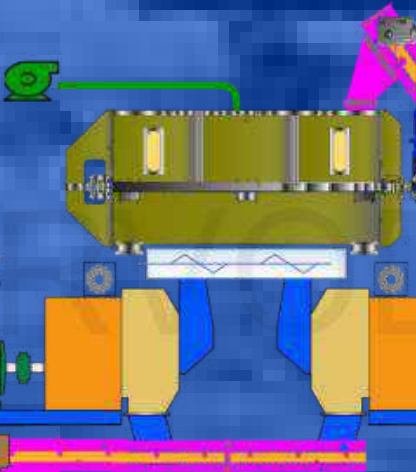
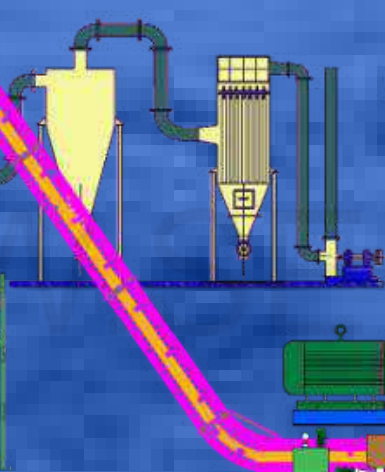
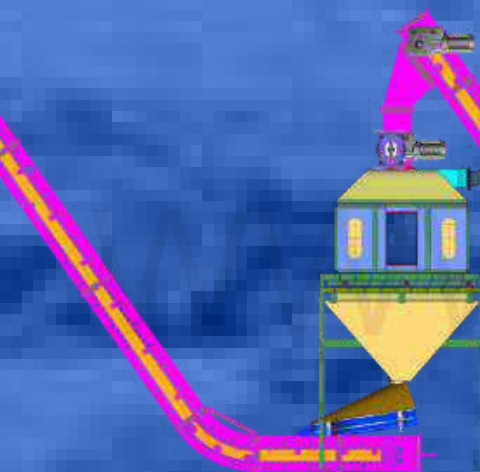
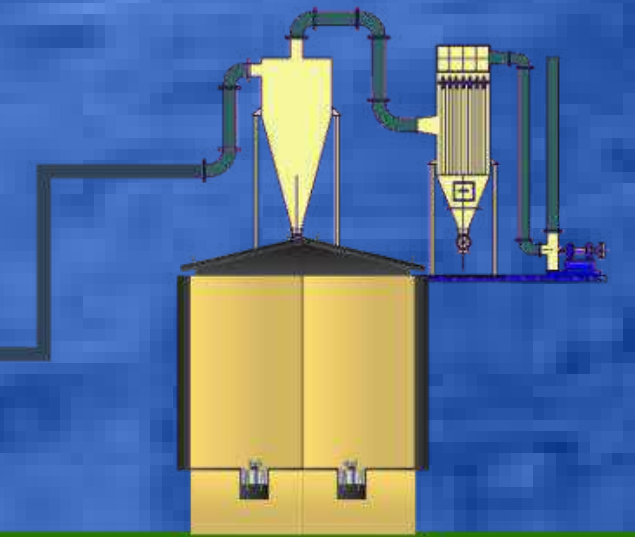
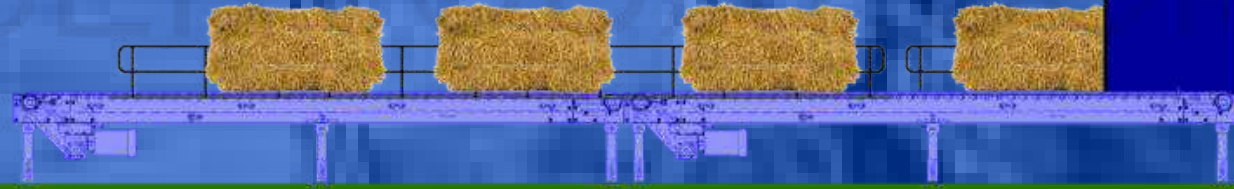
FLOW DIAGRAM - RICE STRAW PELLET PLANT - CAPACITY 8 TO 10 TONES PER HOUR

FACTS

BALE STORAGE AREA

BALE LOADING

BALE BREAKING LINE



PELLET STORAGE

PELLET COOLING AREA

MIXING & PELLETIZING AREA

GRINDING AREA



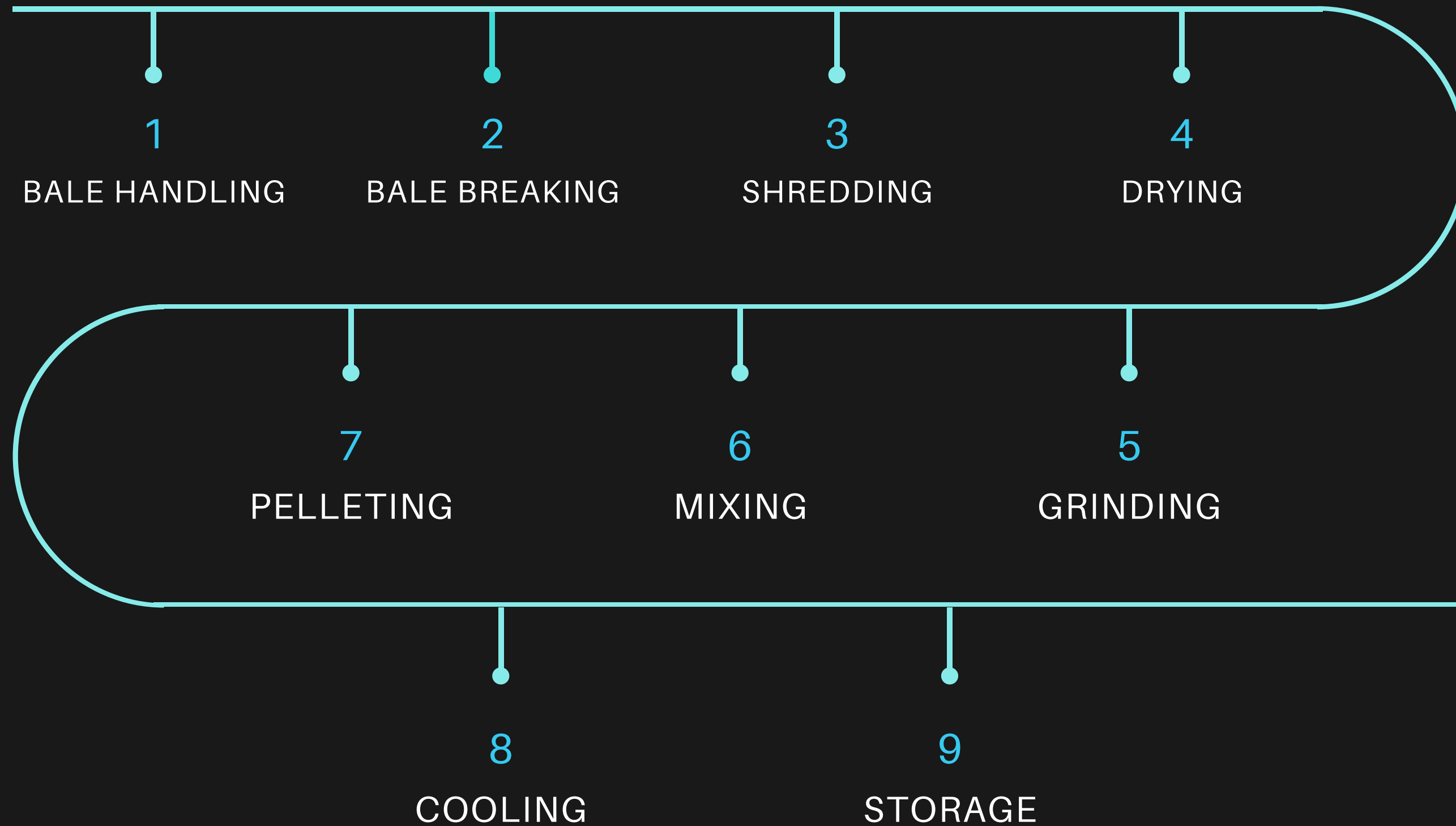


# RICE STRAW PELLET PLANT

1

# RICE STRAW PELLETTING PLANT

## PROCESS ENGINEERING



# BALE HANDLING

- Bale Density: 100 to 180 Kg/M3
- Bale Size: 460mm x 360mm x 400-1100mm
- Each Bale Weight: +50 Kg/each (approx)



BALE HANDLING

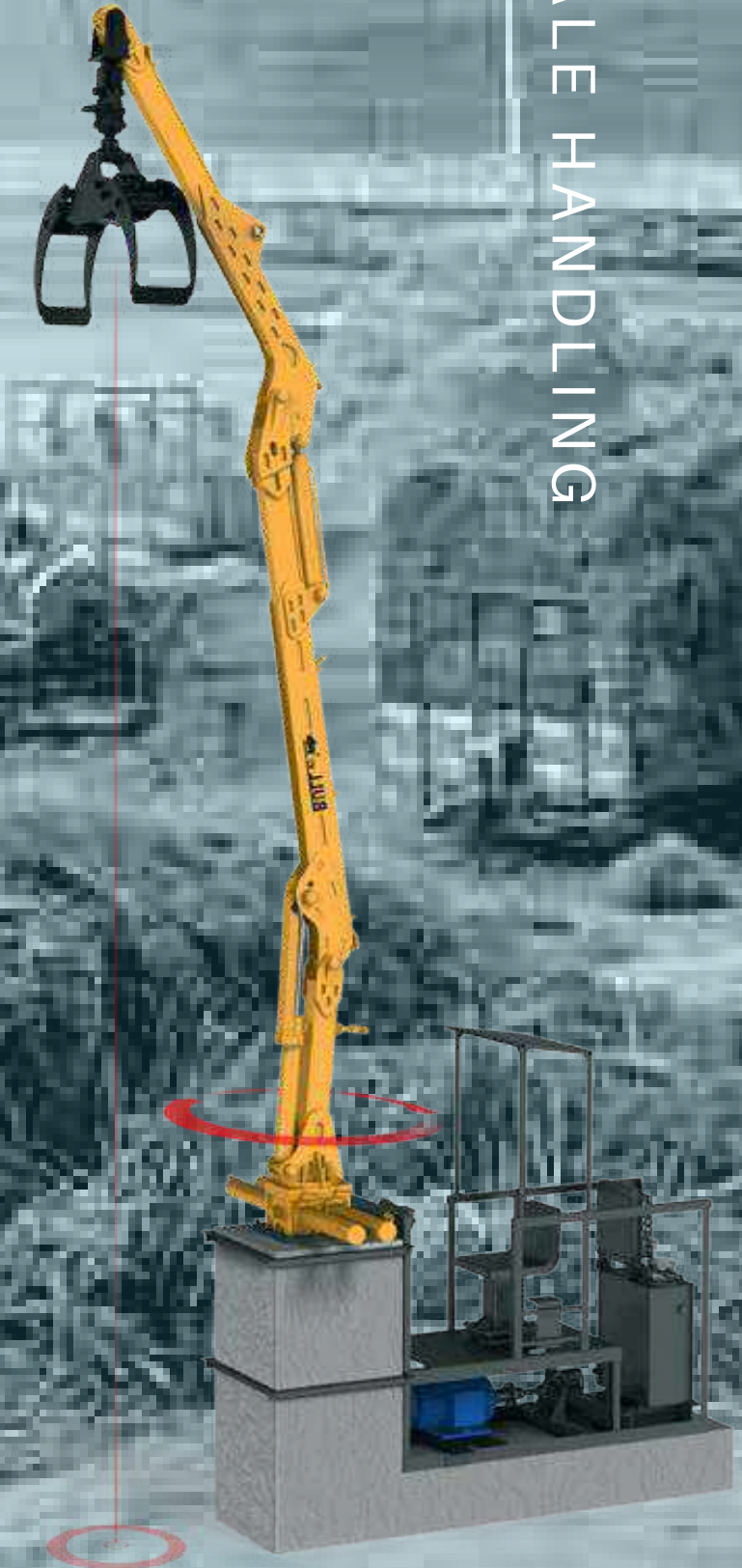
## Mechanical Handling

- Bale Unloader & Staker
- Radial Loader



## Process Line:

Baling at Farm - Bale Loading on Truck - Bale Unloading from Truck - Stacking - Covering - Loading to Bale breaker





# BALE BREAKING

- The bale breaker is designed to break up large bales and loose Rice Straw.
- Large bales of Rice Straw materials are placed onto the Conveyor, where the material is fed into the chain driven bale breaking system.



BALE BREAKING



## Mechanical Handling

- Suitable to break bale and loose straw for shredding
- Low level loading conveyor for manual and mechanical loading



### Process Line:

Bale Loading on Conveyor - Bale Breaking

# STRAW SHREDDING

- Double Shaft Shredder equipped with two motors, attributed to the two rotary cutting shafts with resistant knives, capable of shredding rice straw.
- The two cutting rotors powerfully grab the feed material, and easily shred them into small pieces.



STRAW SHREDDING

## Process Line:

Straw Shredder - Runout Conveyor - Dust Collection Unit

# STRAW DRYING

- Rotary Dryer and Flash Dryer, highly recommended for Biomass Pellet Production Plants, the shredded Rice Straw with high moisture content enters from one side of the Dryer and comes out from the other end with 8 to 12% of moisture, the hot air passing through the Dryer raise the inner temperature and Rice Straw dried to the required level of Biomass Pellet Production Plants.



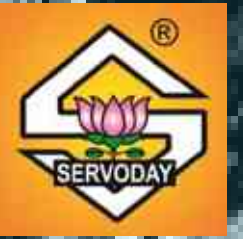
STRAW DRYING

## Process Line:

Tubular Conveyor - Rotary Dryer/Flash Dryer - Tubular Conveyor - Air Circulation System - Dust Catcher - Redler Conveyor - Hydraulic Moving Floor

# STRAW GRINDING

- Hammer Mill to shred Rice Straw in to small pieces, the heavy-duty Tear Drop design comes with:-
- Air Swept design
- Dual hammer position
- Mill Regrind chamber
- Diamond hammers
- Bearing Temperature monitor probes
- Vibration switches
- Trap key interlock
- Replaceable Abrasion-resistant wear liners



STRAW GRINDING

## Process Line:

Redler Conveyor - Magnetic Separator - Feeding Hopper - Multi Screw Feeder - Hammer Mill - Dust Separator Unit - Redler Conveyor - Hydraulic Moving Floor

# RIBBON MIXING

- Mechanism of mixing is shear.
- Shear is transferred by moving blades.
- High shear rates are effective in breaking lumps.
- Convective mixing also occurs as the straw powder bed is lifted and allowed to cascade to the bottom of the mixer.
- An equilibrium state of mixing can be achieved.
- Consists of horizontal cylindrical trough. Fitted with two helical blades, which are mounted on the same shaft through the long axis of the trough.
- Blades have both right and left hand twists.
- Blades are connected to fixed speed drive.
- Water spray system to control moisture of straw materials.

## Process Line:

Reder Conveyor - Ribbon Mixer - Feeder

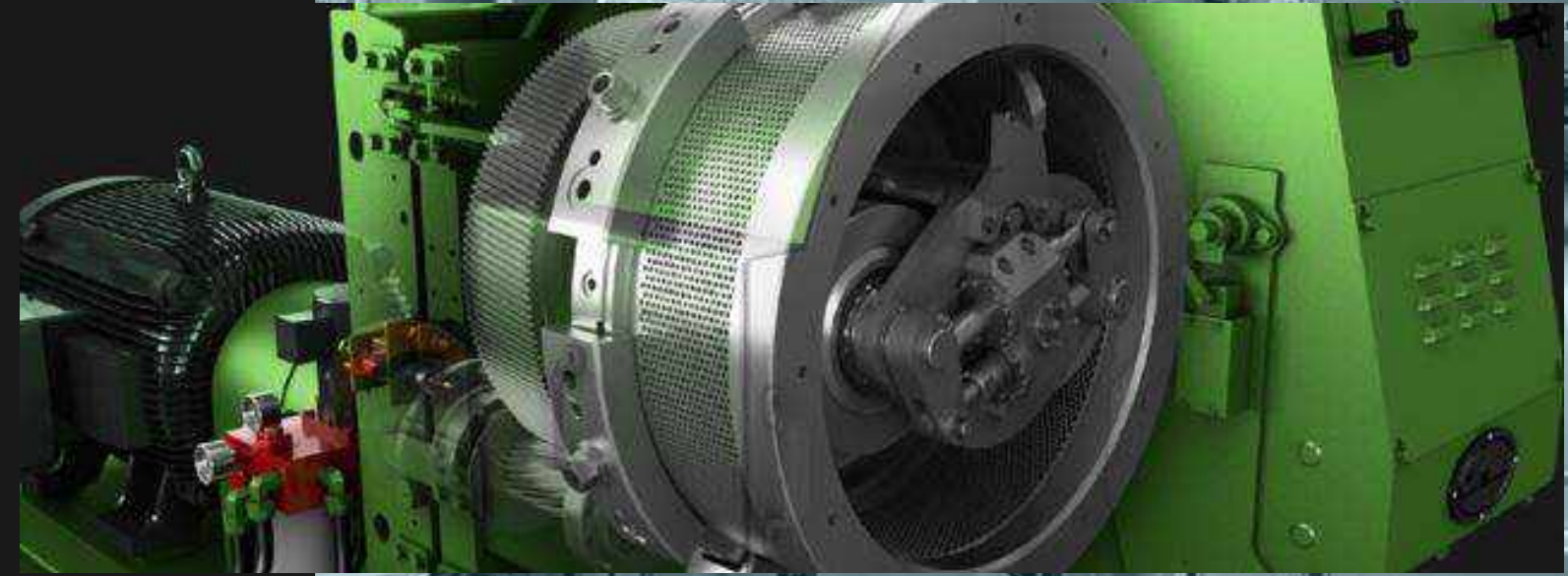
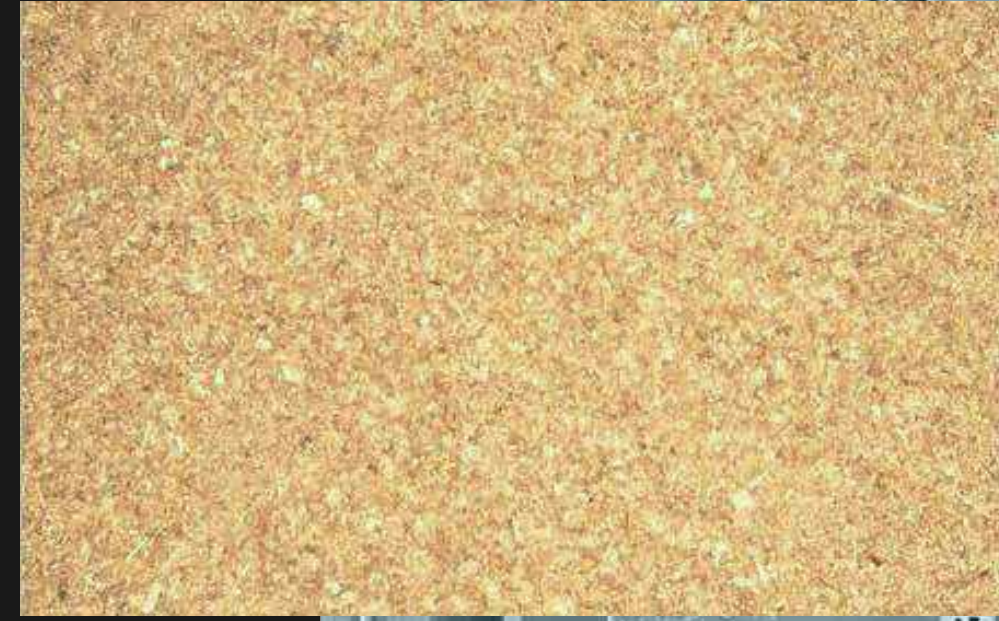


RIBBON MIXING

# STRAW PELLETING



STRAW PELLETTING



- Ring Die type design.
- Compact, quiet, smooth and positive.
- Pellet Mill direct-gear drive systems are known for their trouble-free operation and extremely long operating life.
- Energy transfer is most efficient in this system.
- Direct drive offers reliability and low maintenance.
- Pellet mill "gear box concept" makes the machine exceptionally efficient and compact.
- The installed motor can conduct its energy directly to the installed rollers and die.
- The Pellet Mill with gearbox concept also allows the installation of commonly available high efficiency motors with high power ratings.

## Process Line:

Feeder - Conditioner - Pellet Mill - Redler Conveyor

# RING DIE & ROLLERS



RING DIE & ROLLERS

- Ring Dies are manufactured from the highest quality refined steel forgings. Normally in the following specifications: 4Cr13, X46Cr13, & 60Si2Mn (tempered to 53-55 HRC).
- Roller shells are manufactured from high carbon steels. Normally in the following specifications: C50, 100Cr6 or 20MnCr5.
- All roller shells are surface hardened, ensuring our roller shells have maximum durability and a long working life.



## Process Line:

Feeder - Conditioner - Pellet Mill - Redler Conveyor

# MILL PROTECTION

- Air Cooling type forced circulating Lubricator.
- Automatic cycled lubrication.
- Equipped with Air cooling device to cool the lubricant.
- Will send a signal when pressure is too high or no lubricant discharged.
- Online greasing system to lubricate Rollers with accurate input of grease every hour.
- High temperature protection to main bearings.
- Live Pellet Chamber temperature monitoring.
- Digital Roll RPM monitor.
- Shear Pin sensor.



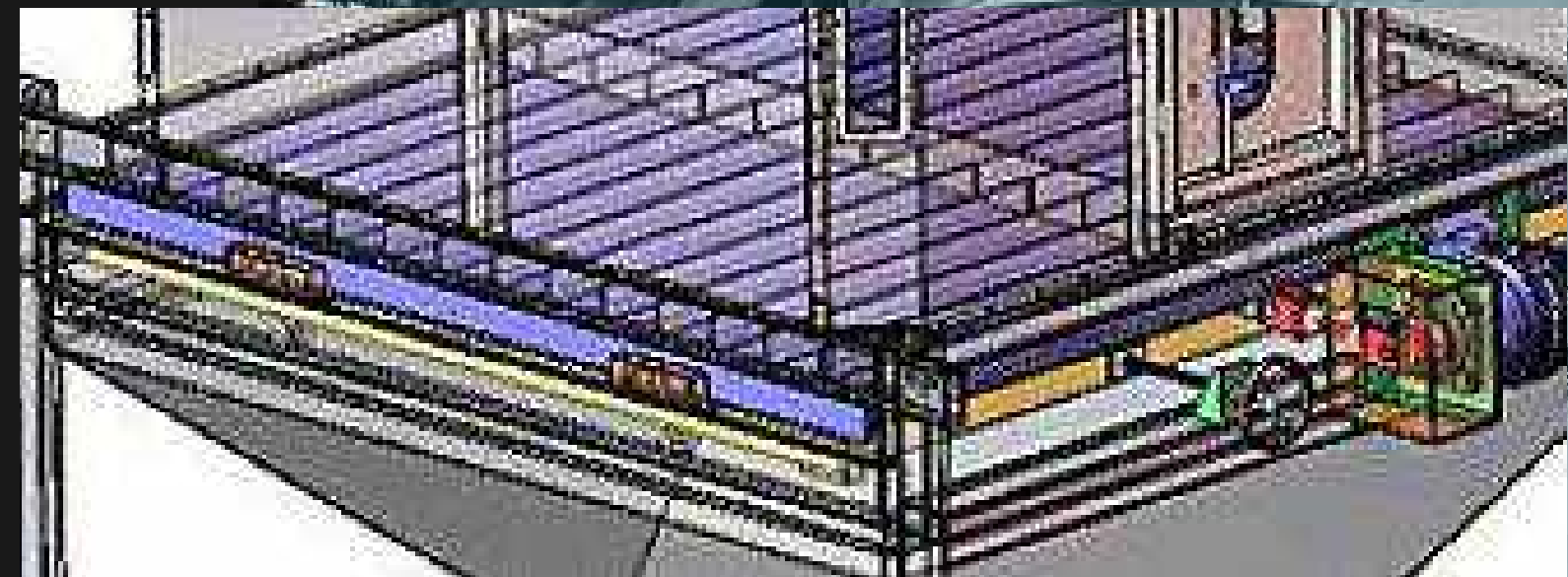
## System Logs:

ALARM						04/10/2019	14:08:39
DATE	TIME	MESSAGE	ACK TIME	RETURN TIME	COUNT		
04/10/19	13:55:36	Panel D : Oil Pressure Low		13:56:58	1		
04/10/19	13:55:34	Panel D : Pallet Door Not Close		13:55:38	1		
04/10/19	13:55:34	Panel D : Oil Pressure Low		13:55:38	1		
04/10/19	13:55:34	Panel D : Pallet Door Not Close		13:55:38	1		
04/10/19	13:55:34	Panel D : Oil Pressure Low		13:55:38	1		
04/10/19	13:55:34	Panel D : Pallet Door Not Close		13:55:38	1		
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04/10/19	13:55:34	Panel D : Pallet Door Not Close		13:55:38	1		
04/10/19	13:55:34	Panel D : Oil Pressure Low		13:55:38	1		
04/10/19	13:55:34	Panel D : Pallet Door Not Close		13:55:38	1		
04/10/19	13:55:34	Panel D : Oil Pressure Low		13:55:38	1		
04/10/19	13:55:34	Panel D : Pallet Door Not Close		13:55:38	1		



# PELLET COOLING

- Pellet Cooler uses the principle of counter current cooling to cool high temperature and high humidity pellets, that is, the ambient cold air passes vertically through the layer, first with the cold phase.
- The hot air heated in contact with the hot material and the direction of the wind flow is opposite to the direction of the flow.



PELLET COOLING

## Process Line:

Redler Conveyor - Rotary Valve - Pellet Cooler - Vibro Shifter - Redler Conveyor - Air Circulation and dust collecting system

# PELLET STORAGE

- Storage Silo for Biomass Pellet Production Plant provide a safe, efficient material handling solution for wood pellet, we design and supply silos with flexibility to comply with varying specification for the safe storage of pellets, capacity starts from 1.0 Tone to 1000 Tones.



PELLET STORAGE

## Process Line:

Bagging - Pallating - Loose

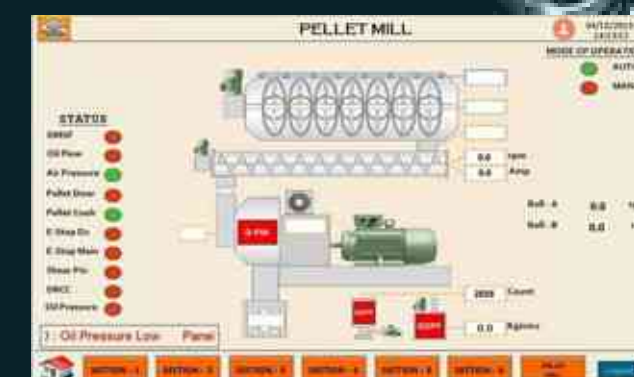
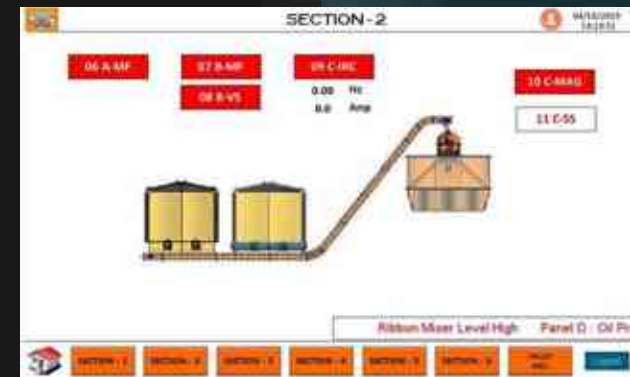
# AUTOMATION

- Enhance operations and improve pelleting efficiency with SERVODAY Pellet Plant automation system. It's the most cost-effective solution for pelleting control without a database. The flexible mounting design ensures it will conform to your unique environment and pelleting process, which means no unscheduled downtime, making your facility 10-15% more efficient.



## Automation Features:

PLC - HMI - SCADA - VFD - IOS & ANDROID APP - IR-  
PRESSURE-OIL-TEMPERATURE-FLOW SENSORS -  
STATISTICS - ANALYSIS



AUTOMATIC  
PLANT AUTOMATION

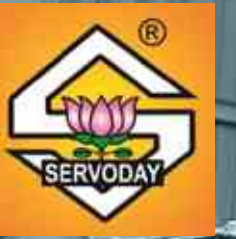


# TURNKEY SOLUTIONS

2

# TURNKEY SOLUTION

Our scope of work includes Design, Fabrication, Supply, Erection, Commissioning and Training.



TURNKEY SOLUTION

## PLANT CAPACITIES:

From 1 TPH to 25 TPH



### EN PLUS QUALITY PELLETS FROM PELLET PRODUCTION PLANT

All of our Wood Pellet Production Plants produce highest quality A1 specification pellets, which are accredited through the European EN Plus specification.

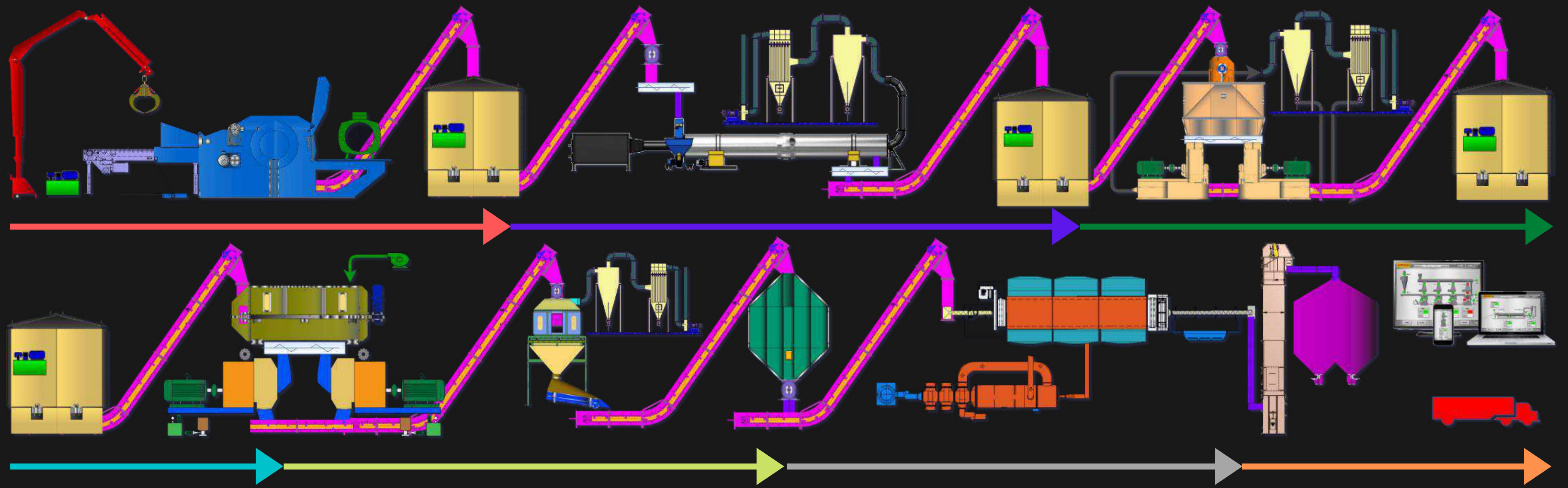
The EN Plus quality seal stands for low emissions and trouble-free heating with high energy value. All wood pellets within EN Plus specification must meet the following requirements.





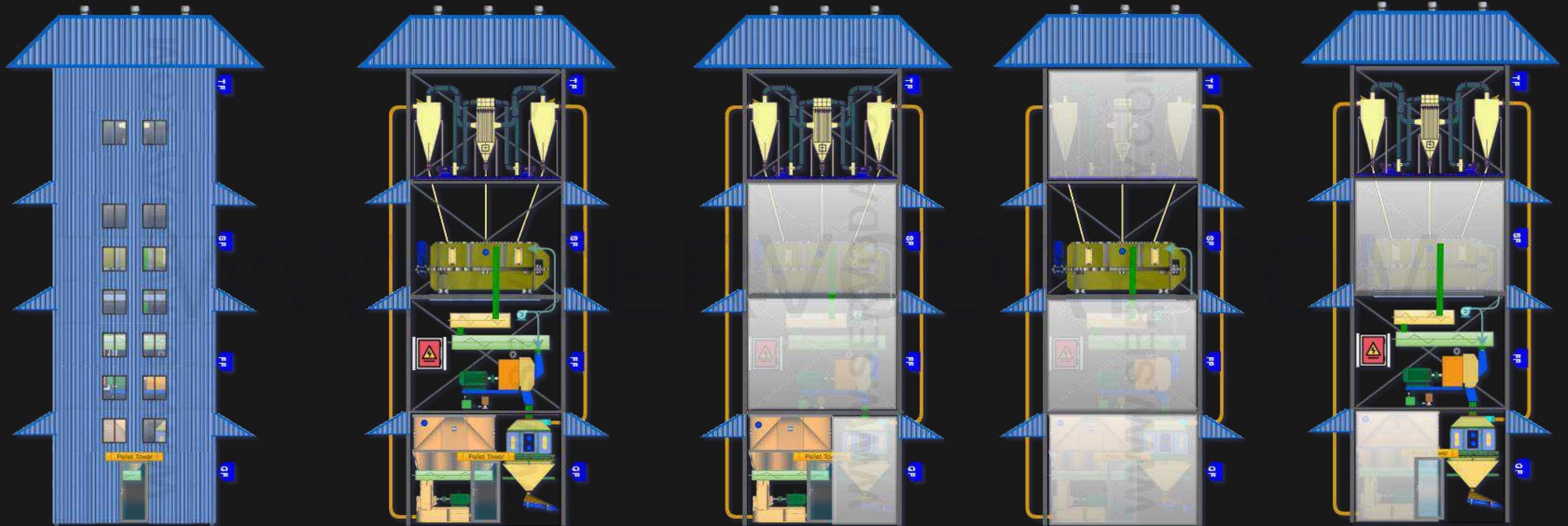
# GENERAL FLOW CHART

## CAPACITY 5 TO 25 TPH



# TOWER PELLET PLANT

## CAPACITY 1 TO 5 TPH



**1**

BUILDING

**2**

PLANT

**3**

GRINDING

**4**

MIXING

**5**

PELLETING



### EN PLUS QUALITY PELLETS

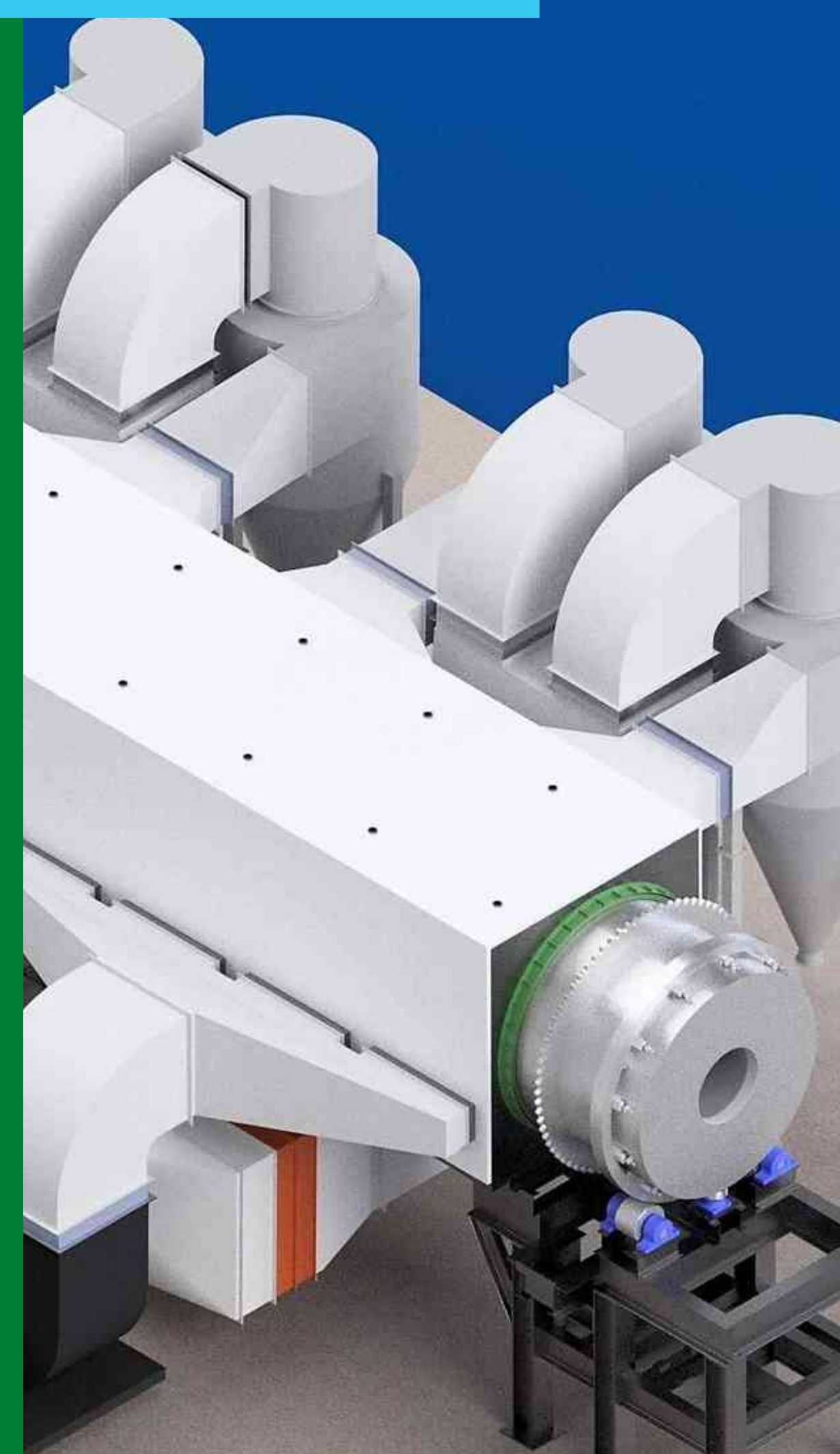
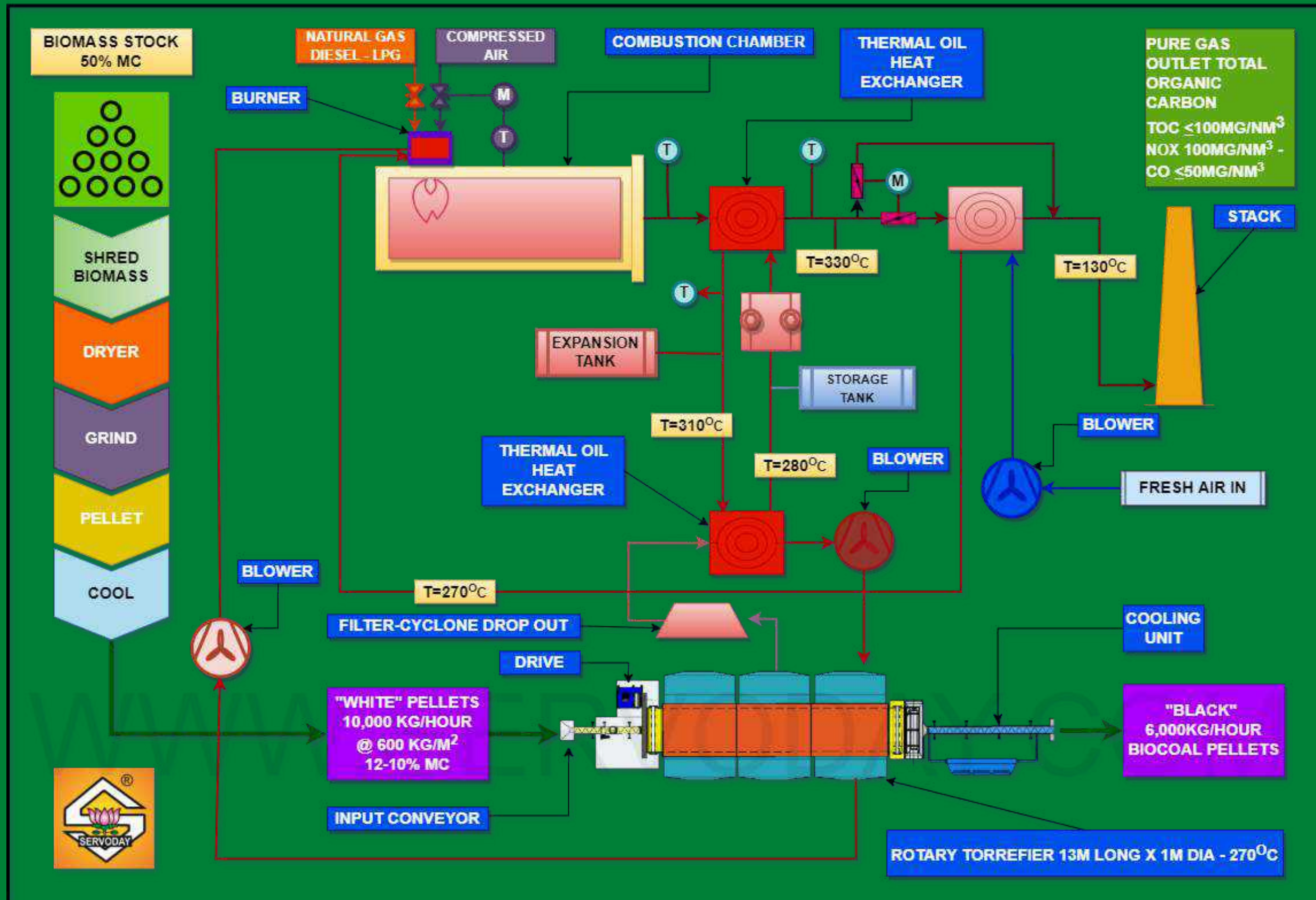
#### DIN EN ISO 17225-8:2016

- Improved combustion properties (energy content, heating value)
- Increased grindability (requires less energy during processing)
- Increased resistance to water absorption (outdoor storage is possible)
- Reduced biological activity (avoid problems with decomposition of biomass during storage) Increased energy density (reduces transport costs)

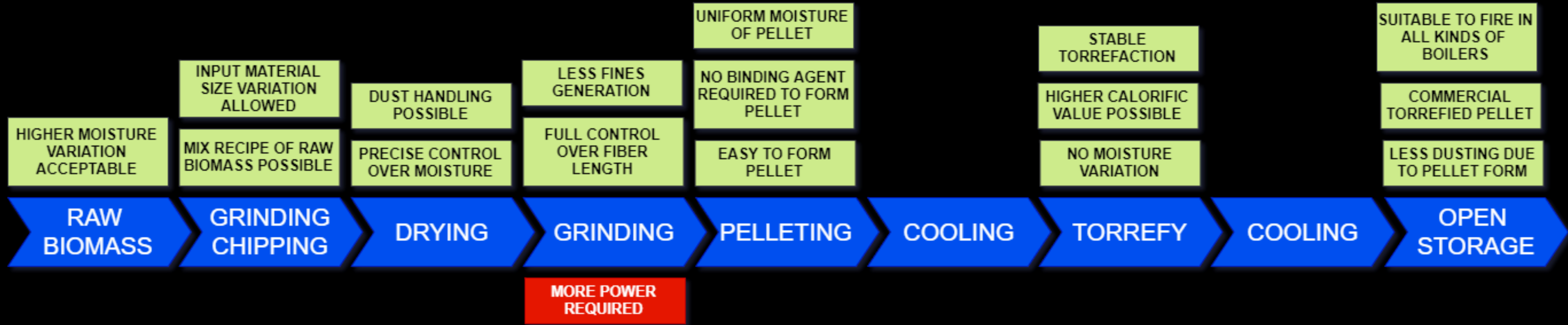


# TORREFACTION PLANT (LICENCE FROM UK)

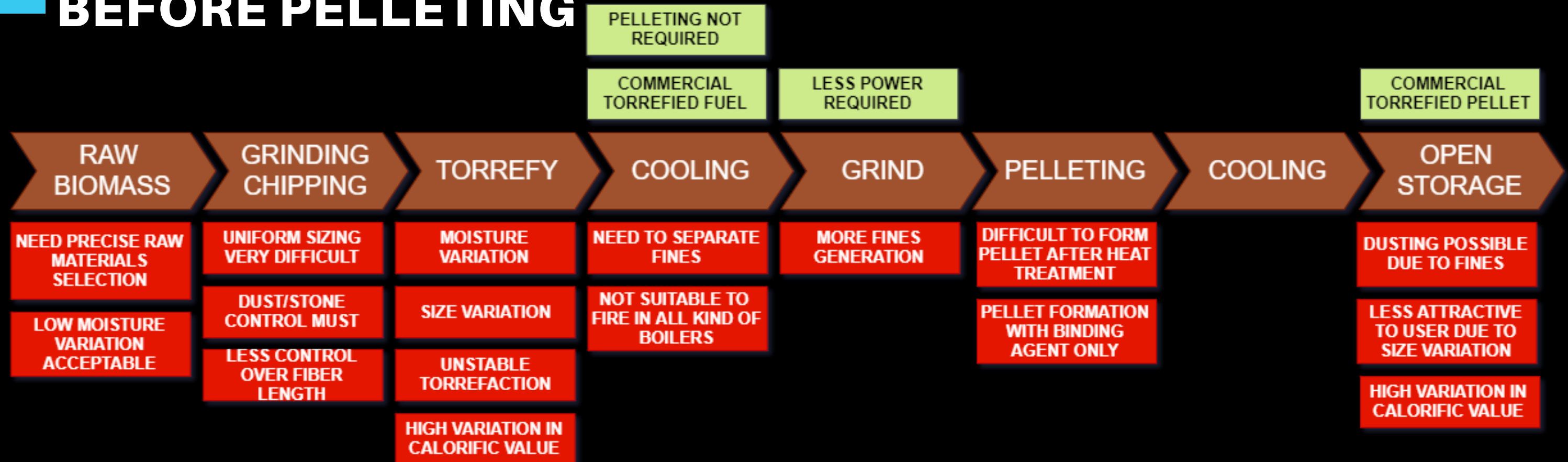
## CAPACITY FROM 5 TPH



# TORREFACTION AFTER PELLETING



# TORREFACTION BEFORE PELLETING





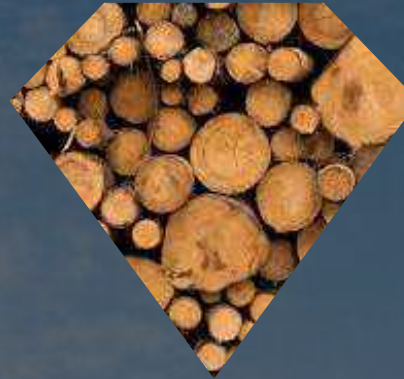
# APPLICATIONS

3



# PELLET RAW MATERIALS

## WASTE TO BEST



WOOD



CHIPS



SAW DUST



OFF CUTS



WOOD WASTE



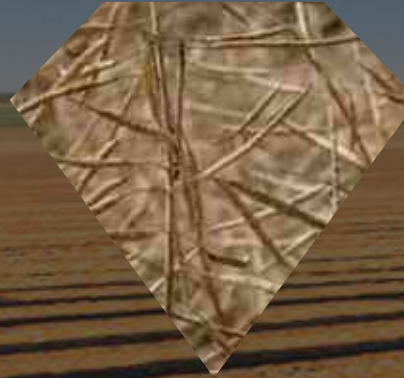
BAGGASE



STRAW



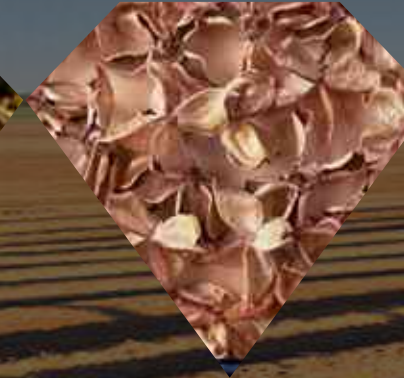
PADDY HUSK



MUSTARD



COTTON STALK



COTTON HULL



PALM KERNAL



PALM EFB



JULIFLORA



PEAT



SOYA HUSK



COBS



COCONUT



BAMBOO



COFFEE SHELL



MSW COMPOST



FERTILIZERS



FORESTRY



CHIPS



# PELLET FUEL

## ENERGISING YOUR WASTE



BOILER



BURNER



STOVE



STEEL



HOUSE HEATING



BAKERY



CEMENT KILN



PADDY HUSK



# DIVERTING WASTE FROM LANDFILLS

## WASTE TO ENERGY



# COMPOST PELLETS

## FOOD FOR SOIL & PLANTS

### Raw Materials

The most common raw materials used to make compost are yard wastes such as grass clippings, leaves, weeds, biomass, crop residues, animal manure, residues after oil extraction and compost from Municipal compost facilities.

### Compost Pellets

This innovative form of compost allows the soil to be nourished slowly over time, in a way that plants love.

**N** NITROGEN  
LEAF GROWTH

**P** PHOSPHORUS  
ROOT FORMATION

**K** POTASSIUM  
PLANT IMMUNITY

### Value Added Biosolids Pellets

Biosolids pellets provide slow-release nutrients meaning that it takes microbial activity in the soil to release the soluble forms of nitrogen (N), phosphorus (P), and potassium (K) that plants can absorb.

### NPK Organic Fertilizers

Variety of NPK Organic Fertilizer Pellets can be made with soil organisms to break them down and release their nutrients, so they release more quickly when the soil is warm and the soil food web is at its most active.

**COMPOST FEEDS THE SOIL & FERTILIZER FEEDS THE PLANTS!**

## NPK ORGANIC FERTILIZER PELLETS



# ABOUT SERVODAY GROUP

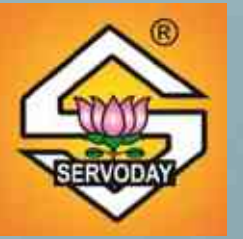
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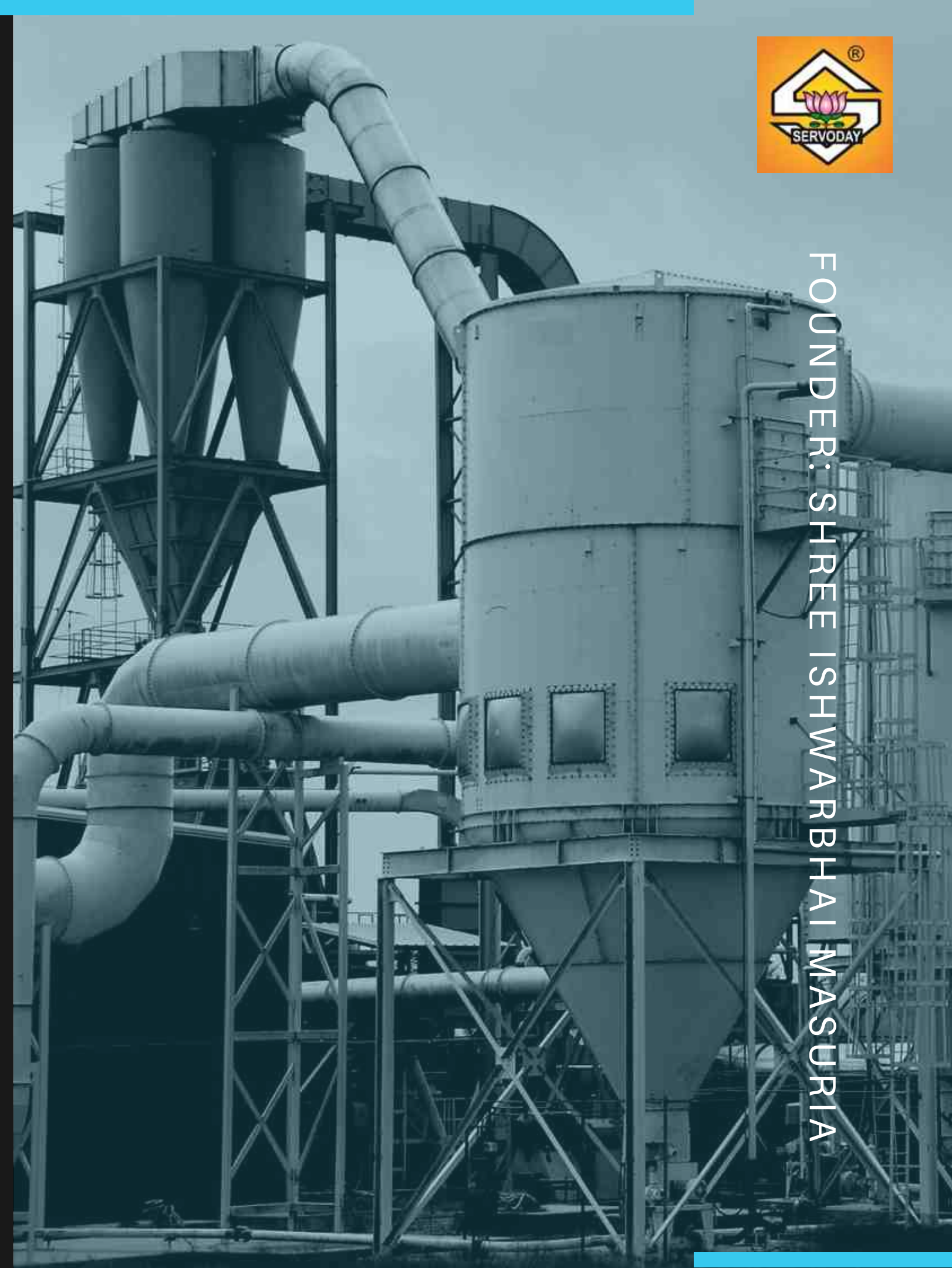
# Empower with Servoday Group

Servoday Group a engineering firm providing services to the industrial client. The firm specializes in design, manufacture, erection, commissioning and managing complete industrial plant project on TURNKEY basis, as well as technical support and training programs for a variety of processes. The firm's commitment to high quality service to its clients has led to the growth of the company over the last 50 years.

## Concept to Commissioning



FOUNDER: SHREE ISHWARBHAI MASURIA



# Founding Father

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## Servoday Group

I am proud to announce that we have reached another milestone in the history of our company. Earlier this year marked our 50th year in business. What began as a small operation in a rented place is now a well-established manufacturing facility.

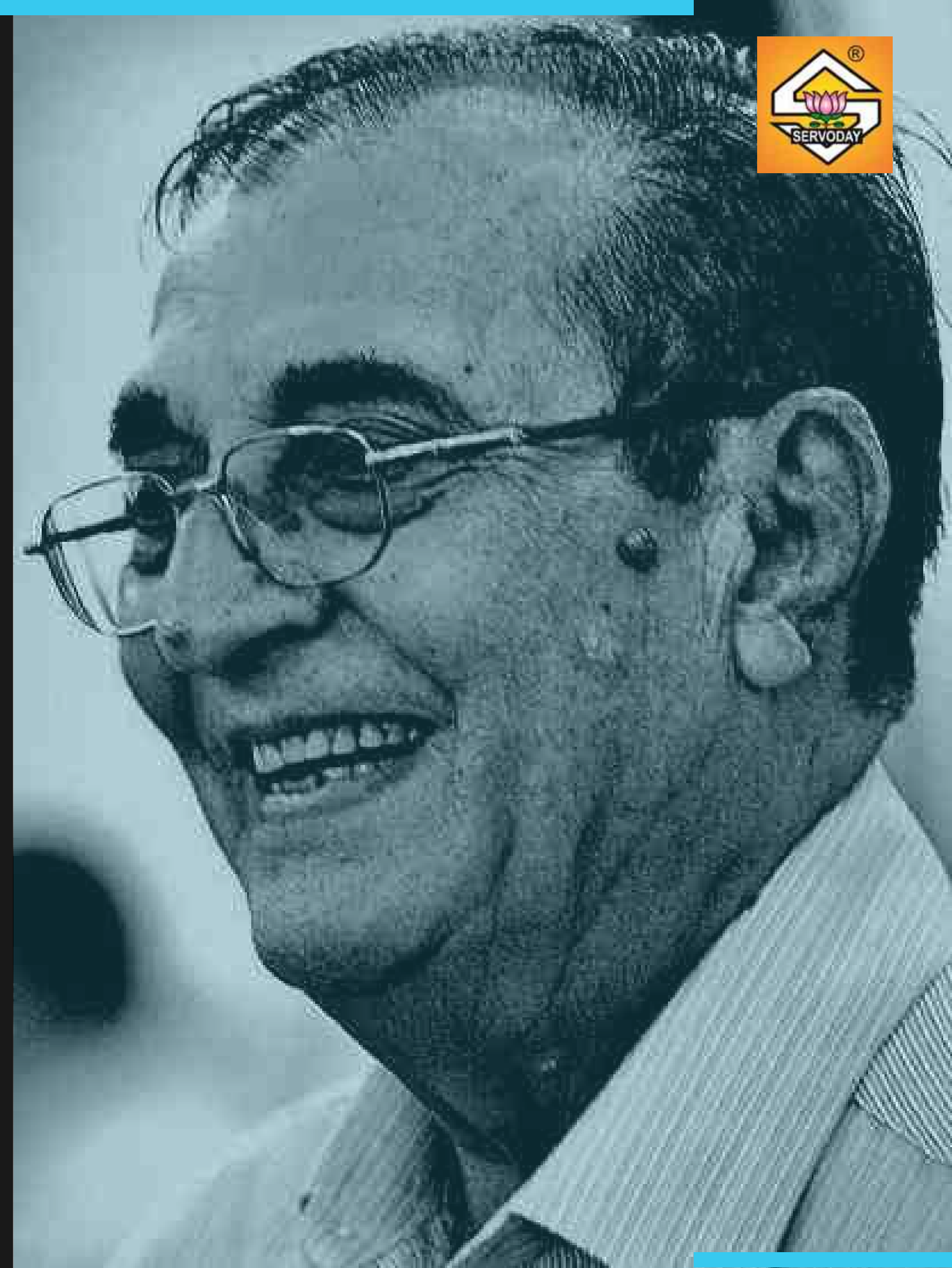
Our company has many achievements and accomplishments, with many notable projects completed in India and around the world. We wish to thank our clients, vendors and stakeholders for their support.

Also, without the support of our excellent Servoday Group team, our success would never have been possible. Each employee plays a very important role in the success of our company. It is their enthusiasm, support and dedication that have brought us this far. Servoday shall forever remain indebted to the contributions of its employees - past and present!

-----  
Our founding father the late Shri Ishwarbhai R. Masuria

**Since 1971**

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# Turnkey Projects by Servoday Group

INDIA AND ABROAD



22

## SOLVENT PLANTS

For Soya, Ground Nut, Rice Bran etc. From 100 to 350 TPD

## OIL REFINING PLANTS

Edible & Non Edible Oil Refining Plant from 10 to 100 TPD

38



87

## OIL MILLING PLANT

For Ground Nut, Mustard, Cotton, Castor etc. From 10 to 300 TPD

## PELLET PLANTS

For Peat, Wood and Biomass, from 2 TPH to 5 TPH

4





# Turnkey Projects by Servoday Group

INDIA AND ABROAD



58

## SCRAP HANDLING GRABS

Orange Peel Grabs for handling Metal and all kind of Scraps

## REMOTE CONTROL GRABS

For handling bulk cargo like Salt, Bauxite, Clinker, Lime, Grains etc.

128



26

## TIMBER LOG GRABS

Hydraulic Timber Grabs for handling of Wood Logs

## MECHANICAL GRABS

For Peat, Wood and Biomass, from 2 TPH to 5 TPH

14





# Turnkey Projects by Servoday Group

248

## PEB STRUCTURES

Steel Structures for Factory and Warehouses with EOT Cranes

16

## SHIP LOADING SYSTEM

For Bauxite, Sulfur, De-cake, Salt etc. From 50 to 800 TPH

8

## TANK FARM

For Petrol, Diesel, Oil etc. From 5000 to 25000 Tones

500+

## MATERIAL HANDLING

Redler Conveyors, Belt Conveyors, Elevators, Screw Conveyors etc.

14

## TUBE MILL LINES

HF Welded Tube Mill Lines from 10mm to 200mm Diameter Tubes

68

## LATTICE TOWERS

For Wind Mills from 100 to 800 kW to Bonus Energy Denmark

400+

## PRESSURE VESSEL

High Pressure Vessels from Carbon Steel and Stainless Steel

32

## COIL PROCESSING LINES

Slitting Line, Cut-to-Length Line and Forming Lines

INDIA AND ABROAD



# Thank you!

LET US KNOW IF YOU HAVE  
QUESTIONS OR CLARIFICATIONS.

[WWW.SERVODAYGROUP.COM](http://WWW.SERVODAYGROUP.COM)

