0. DESIGN DATA

The plant has a reference capacity of 25 pieces/hour with a minimum of 20 pieces/hour in the assumption of regular maintenance interventions as prescribed in our manuals.

Type of input material:
Domestic refrigerators containing CFCs or pentane in the polyurethane foam.
Refrigerators to be fed to the plant must be without cables, glass, lamps, magnetic joints and any other foreign bodies.

1. PLANT COMPOSITION

POS.	Q.TY	DESCRIPTION	MOD.
1	1	SUCTION SYSTEM FOR OIL AND GAS	
2	1	ROLLS CONVEYOR	ROLL1000
3	1	SLOPING ROLLS CONVEYOR	ROLL1000
4	1	CONTROL CONSOLE FOR PUSHER AND CONVEYORS	
5	1	BELT CONVEYOR WITH METAL SLATS WITH TUNNEL FOR GAS	NTM1200
6	1	FOUR-SHAFT SHREDDER WITH DOUBLE PUSHER	TQ1300/104
6.1	1	PENTANE/OXIGEN DETECTOR	
7	1	VIBRATING CONVEYOR WITH STAINLESS STEEL SECTION	VC1000
8	1	MAGNETIC SEPARATOR OVERBELT	OVB1250
9	1	RUBBER BELT CONVEYOR	NG800
10	1	SCREW CONVEYOR	SC350
11	1	MAGNETIC GRADING MACHINE	30.60
12	1	SCREW CONVEYOR	SC350
13	1	GRANULATOR	FMS100/70 RP
13.1	1	PENTANE/OXIGEN DETECTOR	
14	1	SOUND-PROOF CABIN FOR GRANULATOR	FMS100/70 RP
15	1	SCREW CONVEYOR	SC350
16	1	CLEANING TOWER	
17	1	SCREW CONVEYOR	SC350
18	1	VIBRATING COVEYOR	VC700
19	1	EDDY CURRENT SEPARATOR	ECS750
20	1	SCREW CONVEYOR WITH BIG-BAGS SUPPORTING STRUCTURE	SC350
21	1	GAS RECOVERY SYSTEM WITH ACTIVATED CARBONS	
21.1	1	MONITORING PROBE FOR CFC AND PENTANE EMISSIONS	
22	1	DUST SUCTION AND FITRATION SYSTEM	
23	1	DEHUMIDIFIER	
24	1	BRIQUETTING PRESS	MB60
25	1	ELECTRIC CONTROL PANEL	QE
26	1	NITROGEN SELF-GENERATION SYSTEM	
27	1	STANDARD SET OF SPARE PARTS / CONSUMABLES	

2. DETAILED SPECIFICATIONS OF COMPONENTS

SUCTION SYSTEM FOR OIL AND GAS **Oil and gas recovery**	**POS. 1**

PROJECT DATA	
Type of manageable gas :	Isobutane- Propane (R600a)- R12-R134a – R22
Stored gas pressure :	15 bar
Total time for fridge recovery phase 1:	6 minutes – that is : • 3 minutes for suction of gas and oil • 3 minutes for the arrival of the fridge to the working station, the preparation to pinching, pinching and exit from the working station
TECHNICAL DATA	
Rules for Freon recovery	
This system complies with ATEX rules	
STANDARD EQUIPMENT	
TANK FOR OIL STORAGE	
Volume :	230 l
Max working pressure :	3 bar
Pressure sensor :	n. 1 (Eex i)
Level indicator :	n. 1
Liquid sensor for level control:	n. 3 (Eex i)
Security valve :	n. 1
Oil filter :	n. 1
Drain valve :	n. 1
TANK FOR OIL DEGASSING – *for the degassing of the coolants dissolved in the oil*	
Volume :	230 l
Max working pressure :	3 bar
Pressure sensor :	n. 1 (Eex i)
Level indicator :	n. 1
Liquid sensor for level control:	n. 3 (Eex i)
Security valve :	n. 1
Oil pulverizing system :	n. 1
Drain valve :	n. 1
Warming electrical equipment:	n. 1 (Eex d)
OIL SEPARATOR	
Spherical pneumatic valve to drain the oil into the oil tank:	n. 1
OIL PUMP - *to transfer the oil from the storage tank to the oil degassing tank, to the oil pulverising system and to the final tank (Eex d)*	
VACUUM PUMP –*to keep a permanent negative in the drilling gripper – Suitable for area 1*	
Volume :	40 m³/h
Oil separator on the discharge side :	n. 1
Drier on the discharge side :	n. 1
Pressure tank :	n. 1
COMPRESSOR	
Kit of isolating valves:	n. 1
External tank for oil with level contactor:	n. 1
Pressure sensor :	n. 1
Temperature sensor for pressurised oil and gas	n. 1
Security valve :	n. 1
AIR-COOLED CONDENSER	
Kit of pipes in copper:	n. 1
DRYER	
Kit of pipes in copper:	n. 1
Absorption container with molecular sieve filling:	n. 2

Spherical pneumatic valve :	n. 4

KIT OF DRILLING GRIPPERS – ATEX CERTIFIED	
Quantity :	n. 4
WORKING AREA FOR DRILLING GRIPPERS	
Total quantity:	n. 4
Equipment for each drilling grippers	
Spherical pneumatic valve :	n. 2
Absolute pressure transmitter :	n. 1
Pipe :	1,8 m
Manual spherical valve :	n. 1
ELECTRIC CONTROL PANEL	
PLC complete of software for the automatic management and errors detection	
Kit of contactors :	n. 1
Operator panel	n. 1
Inverter for air condenser	n. 1

ROLLS CONVEYOR MOD. ROLL1000 **POS. 2**
Fridges transport

TECHNICAL DATA	
Type of belt :	With rolls
Length :	8000 mm
Width :	1000 mm
STANDARD EQUIPMENT	
Support frame	

SLOPING ROLLS CONVEYOR MOD. ROLL1000 **POS. 3**
Fridges loading

DRIVE	
Drive :	Electrical
Electric motor power :	1 x 3 kW
TECHNICAL DATA	
Type of belt :	With rolls
Length :	8000 mm
Width :	1000 mm
STANDARD EQUIPMENT	
Support frame	

CONTROL CONSOLE FOR PUSHER AND CONVEYORS **POS. 4**

BELT CONVEYOR WITH METAL SLATS MOD. NTM1200 WITH TUNNEL FOR GAS CONTAINMENT **POS. 5**
Fridges loading into the shredder

DRIVE	
Drive :	Electrical
Electric motor power :	1 x 4 kW
TECHNICAL DATA	
Type of belt :	With metal slats
Length of smooth section:	2000 mm
Length of inclined section :	8000 mm
Width :	1200 mm
Step:	125 mm

Slats thickness:	3 mm
Inclination :	30°
STANDARD EQUIPMENT	
Support frame	
Tunnel for gas containment	

FOUR-SHAFT SHREDDER MOD. TQ1300/104 WITH DOUBLE PUSHER **POS. 6**
Size reduction to ≤ 40 mm

DRIVE AND TRANSMISSION	
Drive:	Electrical
Lower shafts electrical motors power:	2 x 30 kW
Upper shafts electrical motors power:	2 x 22 kW
Shafts speed rotation:	8 – 16 rpm
Transmission:	Electrical
Transmission details:	n. 4 Planetary gearboxes
CUTTING SYSTEM TECHNICAL DATA	
DIMENSIONS	
Length:	1230 mm
Width:	1260 mm
SHAFTS	
Design:	hexagonal
Quantity:	n. 4
Diameter:	150 mm
BLADES	
Design:	Standard
Thickness:	60 mm
Quantity:	n. 40
SPACERS	
Design:	with hexagonal hole
Thickness:	60 mm
Quantity:	n. 40
OVERALL DIMENSIONS AND WEIGHT CUTTING CHAMBER	
Length:	3400 mm
Width:	1600 mm
Height:	1670 mm
Weight:	9 ton
STANDARD EQUIPMENT	
Selection sieve:	Changeable with holes: diameter 40 mm
Reverse system in case of overloads:	managed by PLC
Shaft bearings lubrication:	automatic with grease pump managed by PLC
Double pusher	
Insulated support frame	
Loading hopper	

PENTANE/OXIGEN DETECTOR **POS. 6.1**

VIBRATING CONVEYOR WITH STAINLESS STEEL PART MOD. VC1000 **POS. 7**
Material distribution to allow a better iron separation

DRIVE	
Drive :	Electrical
Power :	1 x 5,2 kW
TECHNICAL DATA	
Length:	3500 mm
Width :	1000 mm

REFRIGERATOR RECYCLING PLANT

STANDARD EQUIPMENT
Support frame
Stainless steel part

SPARKS DETECTOR **POS. 7.1**

MAGNETIC SEPARATOR OVERBELT MOD. OVB1250 **POS. 8**
Ferrous metals separation

DRIVE	
Drive:	Electric
Power:	1 x 2,2 kW
TECHNICAL DATA	
Magnetic plate width:	700 mm
Magnetic plate length:	1250 mm
STANDARD EQUIPMENT	
Plate:	permanent magnets
Belt:	in rubber
Support frame	

RUBBER BELT CONVEYOR MOD. NG800 **POS. 9**
Ferrous metals storage

DRIVE	
Drive:	Electric
Power:	1 x 1,5 kW
Motor speed:	1450 (50Hz) rpm
Voltage:	400 V
TECHNICAL DATA	
Belt:	In rubber with 3 plies
Length:	5600 mm
Width:	800 mm
Step of supporting idlers:	250/500 mm
Step of return idlers:	3000 mm
Diameter of drive drum:	220 mm
Diameter of idler drum:	220 mm
Diameter of carrying idler:	50 mm
Diameter of return idler:	50 mm
STANDARD EQUIPMENT	
Support frame	

SCREW CONVEYOR MOD. SC350 **POS. 10**
Transport of non-ferrous materials

DRIVE AND TRANSMISSION	
Drive:	Electrical
Power:	1 x 4 kW
TECHNICAL DATA	
Length:	5000 mm
Diameter:	350 mm
STANDARD EQUIPMENT	
Support frame	

MAGNETIC GRADING MACHINE MOD. 30.60 **Additional removal of ferrous metals**	**POS. 11**

DRIVE AND TRANSMISSION	
Drive:	Electrical
Power:	1 x 1,5 kW
TECHNICAL DATA	
MAGNETIC DRUM	
Length:	800 mm
Diameter:	300mm
STANDARD EQUIPMENT	
Support frame	

SCREW CONVEYOR MOD. SC350 **Transport to the granulator**	**POS. 12**

DRIVE AND TRANSMISSION	
Drive:	Electrical
Power:	1 x 4 kW
TECHNICAL DATA	
Length:	5000 mm
Diameter:	350 mm
STANDARD EQUIPMENT	
Support frame	

GRANULATOR MOD.FMS100/70 RP **Size reduction to pieces ≤16 mm**	**POS. 13**

DRIVE AND TRANSMISSION	
Drive:	Electrical
Electrical motor power:	1 x 90 kW
Shaft speed rotation:	320 rpm
Transmission:	Electrical
Transmission details:	Belt transmission with flywheel
CUTTING SYSTEM TECHNICAL DATA	
ROTOR	
Type:	Full rotor with interchangeable blades
Quantity:	n. 1
Length:	1000 mm
Maximum diameter:	700 mm
BLADES	
Type:	Interchangeable (flat blades)
Dimensions:	200 x 56 x 26 mm
Blades:	n. 20
Blades support frame:	n. 20
COUNTER BLADES	
Type:	Interchangeable
Dimensions:	500 x 125 sp. 36 mm
Quantity:	n. 2 lines – each one composed by n. 2 blades
OVERALL DIMENSIONS AND WEIGHT OF CUTTING CHAMBER	
Length:	3600 mm
Width:	2800 mm
Height:	4400 mm
Weight:	6,8 ton

REFRIGERATOR RECYCLING PLANT

STANDARD EQUIPMENT	
Selection sieve:	interchangeable with holes diameter 16 mm
Block system in case of overloads:	managed by PLC
Shaft Bearings lubrication:	Automatic with greasing pump managed by PLC
Lateral side openings for sieve and maintenance:	Hydraulic
Hydraulic unit :	1,5 kW 50 l
Flywheel	
Support frame insulated with anti-vibrations	
Support frame:	Customized dimensions.
Loading hopper:	Customized dimensions.

PENTANE/OXIGEN DETECTOR **POS. 13.1**

SOUND-PROOF CABIN FOR GRANULATOR MOD. FMS100/70 RP **POS. 14**

SCREW CONVEYOR MOD. SC350 **POS. 15**
Extraction of the material from the granulator

DRIVE AND TRANSMISSION	
Drive:	Electrical
Power:	1 x 4 kW
TECHNICAL DATA	
Length:	5500 mm
Diameter:	350 mm
STANDARD EQUIPMENT	
Support frame	

CLEANING TOWER **POS. 16**
To separate polyurethane from aluminium, copper and plastic

DECANTING CYCLONE	
ZIG-ZAG SEPARATOR	
TECHNICAL DATA	
Width:	500 mm
Inspection doors:	n. 4
Unloading hopper	
Connecting hopper	
Support frame	
Rotary Valve	
Diameter :	Ø 400 mm
Length :	400 mm
Power :	2 x 1,85 kW

SCREW CONVEYOR MOD. SC350 **POS. 17**
Extraction of copper, aluminium and plastic from the cleaning tower

DRIVE AND TRANSMISSION	
Drive:	Electrical
Power:	1 x 4 kW
TECHNICAL DATA	
Length:	7000 mm
Diameter:	350 mm
STANDARD EQUIPMENT	
Support frame	

REFRIGERATOR RECYCLING PLANT

VIBRATING CONVEYOR MOD. VC700	**POS. 18**
Material distribution to allow a better separation	

DRIVE AND TRANSMISSION	
Drive:	Electrical
Power:	2 x 0,55 kW
TECHNICAL DATA	
Length:	1500 mm
Diameter:	700 mm
STANDARD EQUIPMENT	
Support frame	

EDDY CURRENT SEPARATOR MOD. ECS750	**POS. 19**
plastic separation from non-ferrous materials	

DRIVE AND TRANSMISSION	
Drive:	Electrical
Power:	1 x 0,75 kW
TECHNICAL DATA	
Diameter of magnetic rotor:	300 mm
Width of magnetic rotor:	750 mm
STANDARD EQUIPMENT	
Neodymium magnet	
Support frame	

SCREW CONVEYOR MOD. SC350 WITH BIG-BAGS SUPPORTING STRUCTURE	**POS. 20**
Storage of aluminium and copper	

DRIVE AND TRANSMISSION	
Drive:	Electrical
Power:	1 x 4 kW
TECHNICAL DATA	
Length:	5000 mm
Diameter:	350 mm
STANDARD EQUIPMENT	
Support frame	
Big-bag supporting structure	

GAS RECOVERY SYSTEM WITH ACTIVATED CARBONS	**POS. 21**

PROJECT DATA	
Type of manageable gas :	R11, R12, R290, Pentane
Max hourly air flow:	1500 m³/h
Max input air temperature:	45°C
CARBON PLANT EQUIPMENT	
No-regenerated activated carbon filter	For 1500 m³/h complete of grids and doors for carbon loading and unloading inspection door
Suction fan (not explosion proof)	For 1500 m³/h prevalence up to 300 mmCA
Thermal insulation for absorber	
Support frame	

REFRIGERATOR RECYCLING PLANT

AIR PIPE FROM DRYER TO ABSORBER	
Diameter:	200 mm
Length:	2000 mm
Horizontal ejection trunk:	2000 mm
Input collector	
STANDARD EQUIPMENT	
Dryer	
Refrigerating group for dryer	
Water heating system for dryer	Thermally insulated electric heater 5 kW -3 bar
	Recirculation pump
	Expansion chamber

MONITORING PROBE FOR CFC AND PENTANE EMISSIONS **POS. 21.1**

DUST SUCTION AND FILTRATION SYSTEM **POS. 22**

DEHUMIDIFIER **POS. 23**

BRIQUETTING PRESS MOD. MB60 **POS. 24**

DRIVE AND TRANSMISSION	
Drive:	Electrical
Total installed power:	35 kW
TECHNICAL DATA	
Briquette length:	200/300 mm
Briquette diameter:	60 mm
Compression pressure on piston:	2000-2500 kg/cm²
OVERALL DIMENSIONS	
Length:	2600 mm
Width:	1100 mm
Height:	2400 mm
STANDARD EQUIPMENT	
Vertical screw conveyor for feeding and pre-compression of the material into the compression chamber	
Oil lubrication pump	
Hydraulic stationary chuck	
Briquette outlet control device	
Protective casing on moving parts	
Safety door exit briquette	
Lubrication oil flow control sensor	
Mini-silo for material collection	

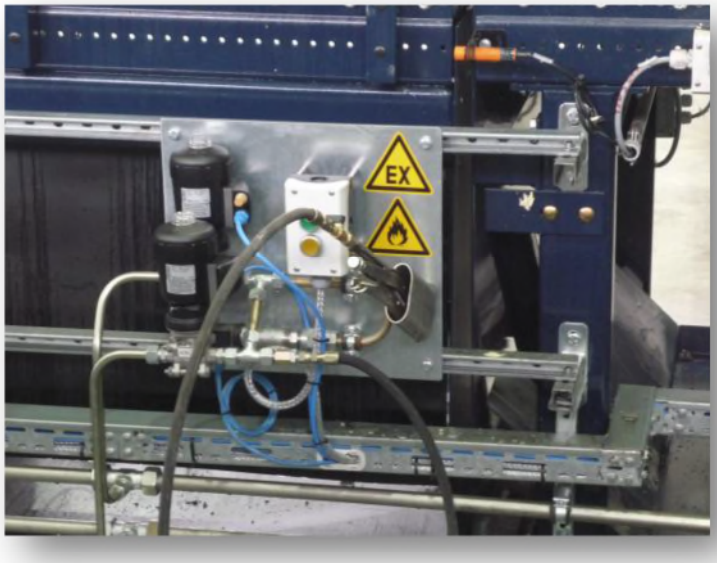
ELECTRIC CONTROL PANEL **POS. 25**
General management of the plant

STANDARD EQUIPMENT
General switch-on with door locking system
Start and stop buttons, emergency stop, signalling alarm
Backward and forward counter
Thermal relay
PLC to manage all the machine functions complete of touch screen panel
Complete of connections and electric wires (standard distance) max 5 linear meter from the machine (additional length to be separately quoted)
Tension: 400 V
Frequency: 50 Hz
Protection grade: IP54

NITROGEN SELF-GENERATION SYSTEM **POS. 26**
To produce nitrogen necessary for inerting the cutting chamber

STANDARD SET OF SPARE PARTS / CONSUMABLES (8 WORKING HOURS/DAY – 250 DAYS/YEAR)

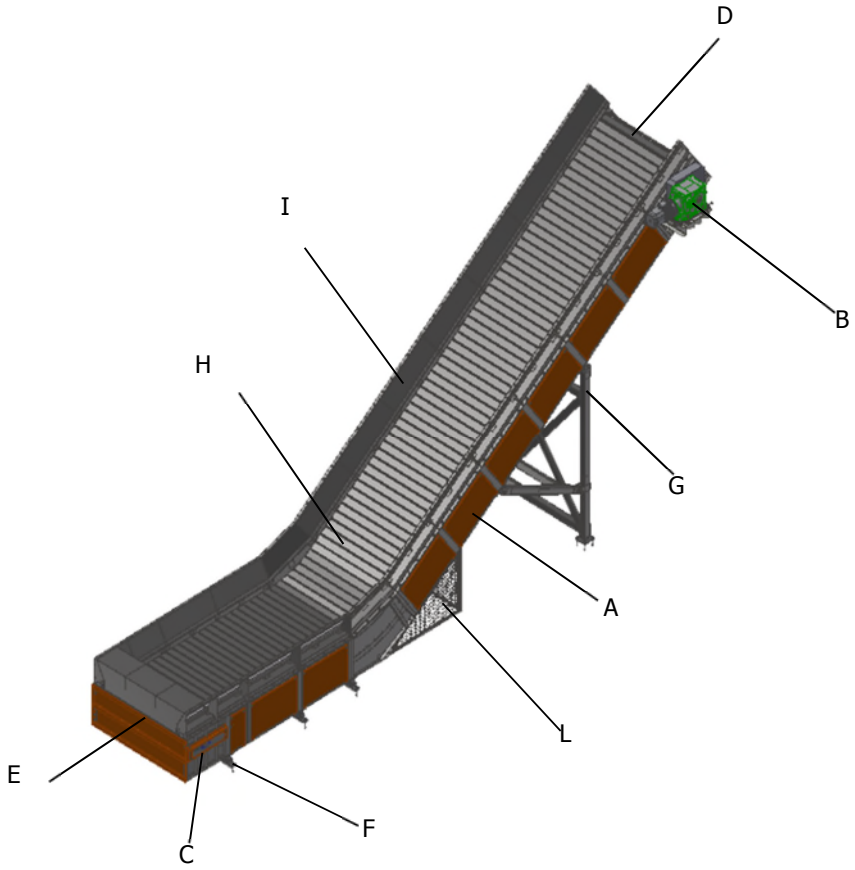
OIL AND GAS SUCTION SYSTEM **POS. 1**



Transport

ROLLS CONVEYOR MOD. ROLL	**POS. 2+3**

BELT CONVEYOR WITH METALLIC SLATS MOD. NTM **POS. 5**



A_ Main frame
B_ Motor frame
C_ Tail unit
D_ Drive shaft group (shaft-bearings-gearbox-pinions)
E_ Lay shaft group (shaft –bearings)
F_ Front holding leg
G_ Back holding leg
H_ Transport group (chains – slats)
I_ Edges
L_ Lower protections

FRAME

Built with tubes electrically welded with transversal frames every meter, made in rigged stumps to facilitate installation with interchangeable sliding plates for chains, feet, side and lower protections.

Removable protections for a fast inspection and maintenance of the belt

Adjustable holding legs for a perfect placement of the belt

SIDE PANELS

In shaped iron plate, with external reinforcement every meter. A reinforcement plate will be fitted at their base along the whole length of the conveyor in contact with the material to carry, where the wear of the material is higher.

SLATS

They are reinforced with holed loading devices in order to be lifted when necessary.

CHAIN

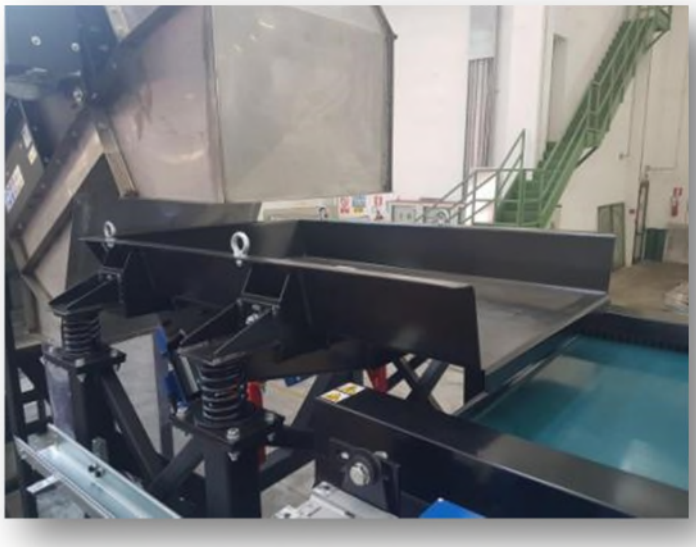
With treated bossed wheels for centering, containment wings on one side, wheel, bush and pin. The chain is lubricated on either side by a manually opened tank. Completed with lubrication system.

The chain is automatically lubricated on each side by a tank with manual opening

DRIVE

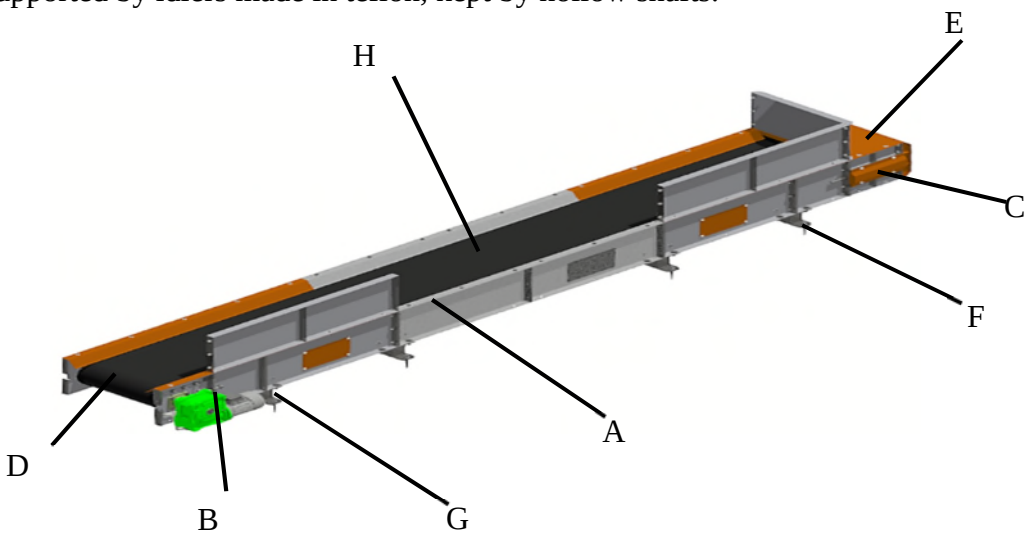
Coupled with boss to the conveyor driving shaft in order to be easily taken apart when needed, with auto-breaking engine of suitable power.

VIBRATING CONVEYOR MOD. VC1000 POS. 8



RUBBER BELT CONVEYOR MOD. NG800 POS. 9

The rubber belt conveyor is complete of supports, idlers, anti-skid profiles, drive unit with gearbox, belt tensioning, edges, loading and unloading hoppers and holding legs. On the under part the belt will be supported by idlers made in teflon, kept by hollow shafts.



A_ Main frame
B_ Motor frame
C_ Tail unit
D_Drive shaft group (shaft-bearings-gearbox-pinions)
E_ Lay shaft group (shaft –bearings)
F_ Front holding leg
G_ Back holding leg
H_ Belt

BELT

Belt made in crawling rubber 3 plies

Scrapers and brush for the belt cleaning

System for the reactivation of the belt tension

Supports and lane keeping profiles.

Belt hold by idlers in the under section

FRAME

Structure in pressed-folded and reinforced sheet

Structure made in modules to allow fast maintenances, fast substitution in case of breaks or modifications in case of adjustments

Containment side in different heights to avoid the material exit

Adjustable holding legs for a perfect placement

Removable protections for a fast inspection and maintenance of the belt.

Protections in electro-welded network next to the moving organs that needs maintenance

Customized loading hopper

DRIVE

Drive unit equipped with 4-pole gearbox with suitable power

SCREW CONVEYOR MOD. SC350 **POS. 10+12+15+17+20**

Shredding

FOUR-SHAFT SHREDDER MOD. TQ1300/104 WITH DOUBLE PUSHER POS. 6

The use of four-shaft shredders (TQ) increases the operating possibilities for the treatment of solid waste. In fact, they combine the reliability and power of the double-shaft shredders with the possibility of controlling the output material size. Built for heavy-duty uses, the shredders TQ are the result of an innovative design that aims to create efficient and flexible machines. The exclusive and innovative interchangeable shaft system and the use of wear-proof screens have drastically reduced the management and maintenance costs.

LOADING HOPPER

Built in heavy steel sheet, with welded ribs, the hopper is bolted on the shredding chamber and it is equipped with pusher

SUPPORT FRAME

Built in heavy steel section bars, punched plates for floor anchoring and protection carters to avoid the access to dangerous parts.

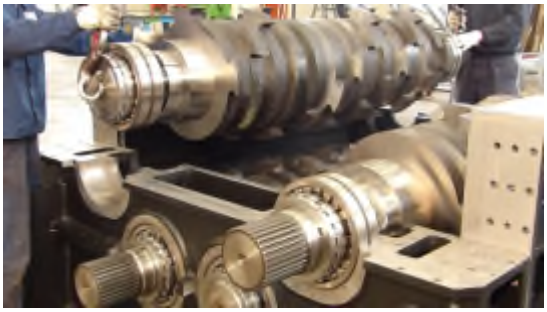
CUTTING CHAMBER

High thick steel frame with minimum number of welding points.

Changeable upper shafts with lower shafts to redouble the machine life and to reduce the maintenance costs.

Removable blade carriage shafts without blade removal for faster maintenance.

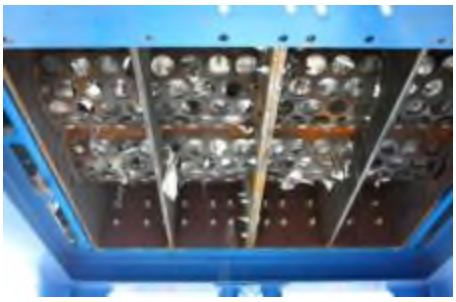
Special steel shafts with surface heat hardening to drastically reduce wear.



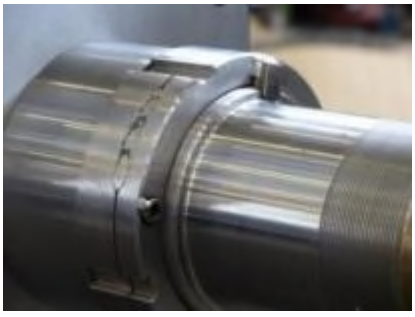
Bearings placed outside the cutting body protected by a double chamber in order to avoid damages due to material leakage.

Special steel blades with a high percentage of chromium, hot forged, manufactured to allow several sharpening. Independent spacers, with hexagonal hole, not welded to the blade for an easy sharpening.

Interchangeable wear-proof selection screen for fast maintenance.



Blades locking with trapezoidal special thread and nuts that ensure the perfect tightening in any working conditions.

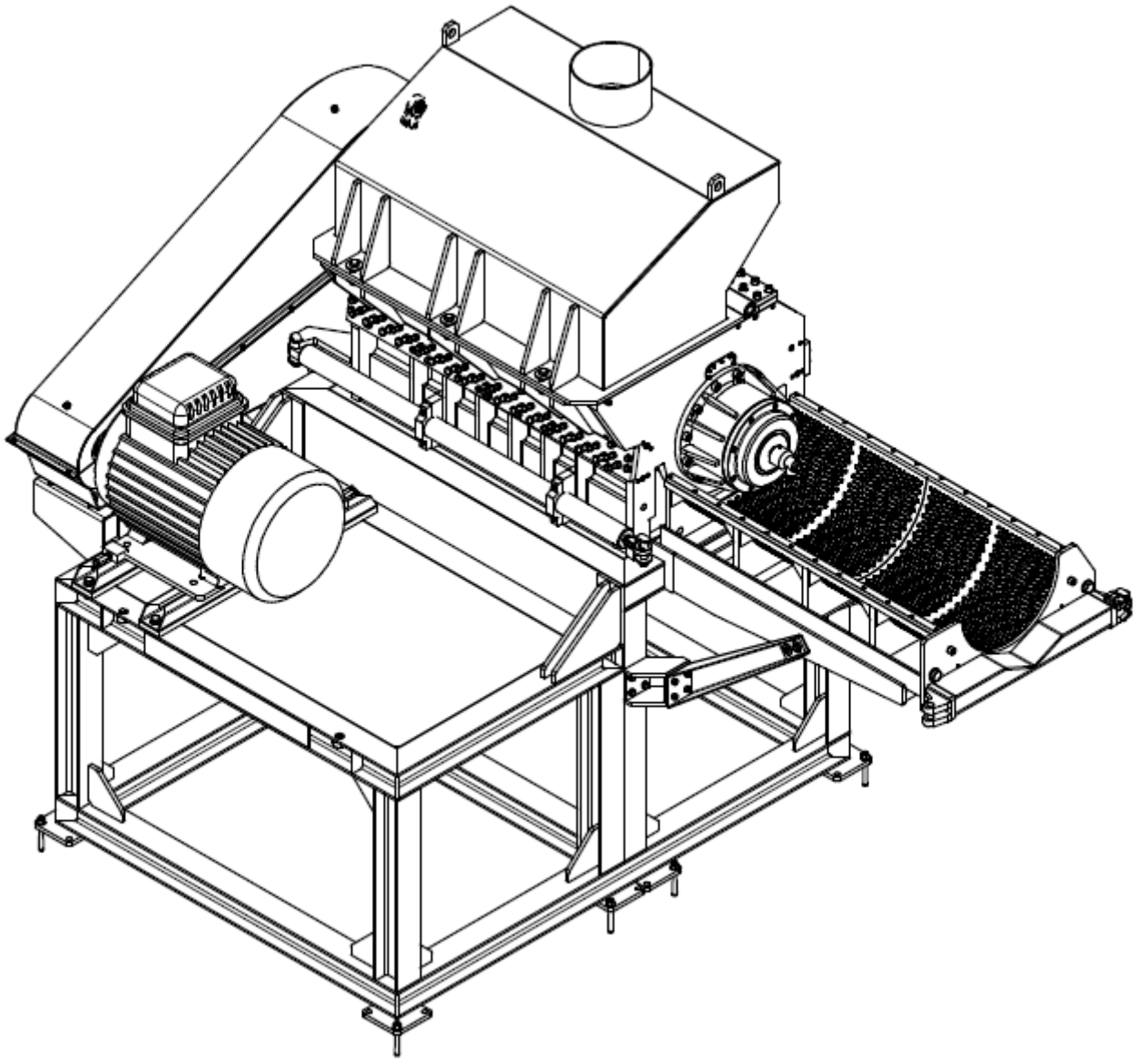


Automatic greasing system controlled by PLC which protects bearings in all working conditions creating a flow that "stops " any kind of pollutant.

DRIVE AND TRANSMISSION

Motorization realized with three-phase electric motors and planetary gearboxes of primary constructor, with oil bath lubrication. The high reduction ratio allow to obtain high cutting torques on blades-holder shafts.
Each shaft is equipped with its own gearbox and motor to allow high performances of the machine.

GRANULATOR MOD. FMS100/70 RP **POS. 13**



LOADING HOPPER

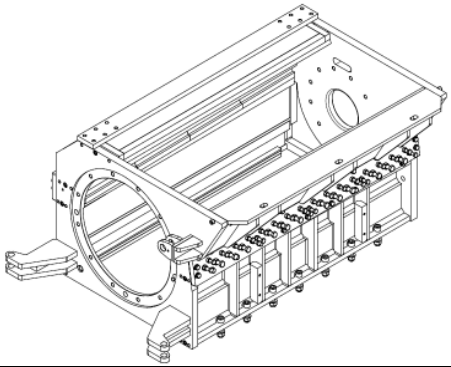
Built in heavy steel sheet, with welded ribs, the hopper is bolted on the shredding chamber.

SUPPORT FRAME

Built in heavy steel section bars, punched plates for floor anchoring and protection carters to avoid the access to dangerous parts.

CUTTING CHAMBER

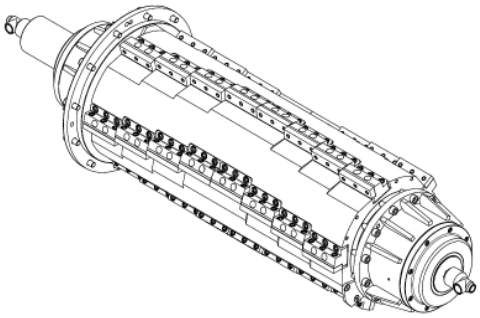
High thick steel frame with minimum number of welding points.



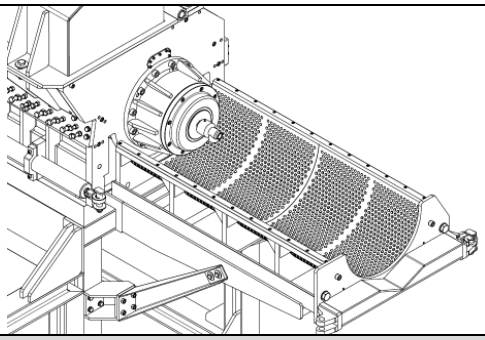
Bearings placed outside the cutting body protected by a double chamber in order to avoid damages due to material leakage.

Special steel shafts with surface heat hardening to drastically reduce wear.

Interchangeable blades and counter-blades

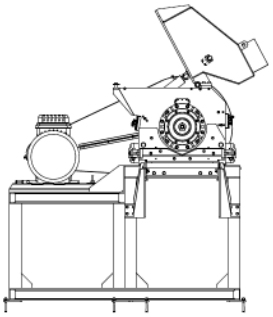


Interchangeable selection sieve in wear-resistant material and easy to replace



HYDRAULIC OPENINGS

Hydraulic openings for sieve and inspection for easy maintenance



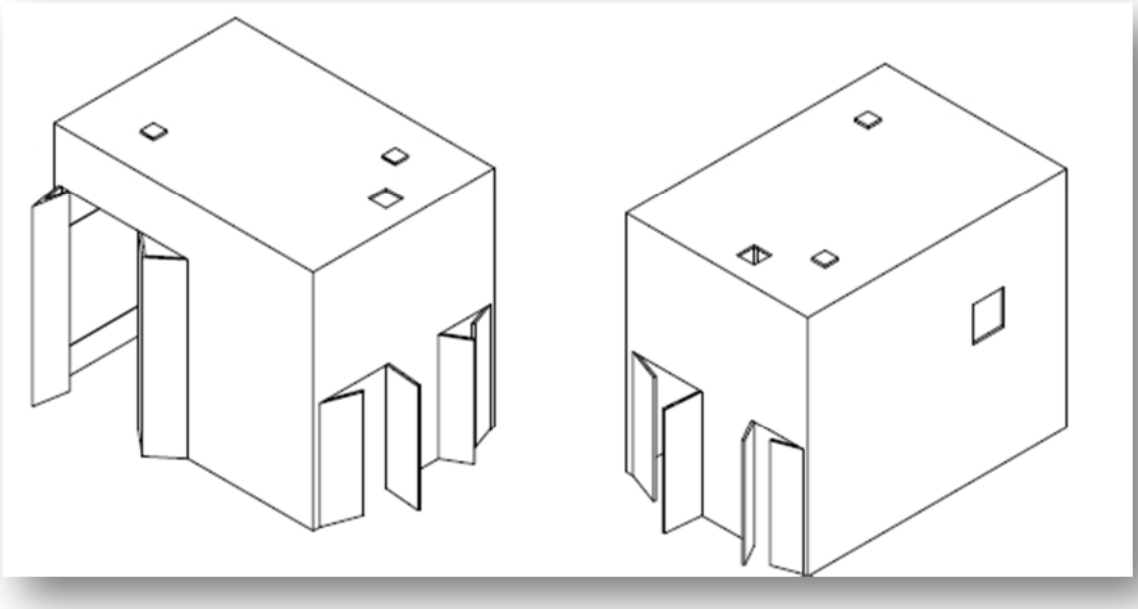
GREASING SYSTEM

Automatic greasing system controlled by PLC which protects bearings in all working conditions creating a flow that "stops" any kind of pollutant.

TRANSMISSION

Belt transmission

SOUND-PROOF CABIN FOR GRANULATOR **POS. 14**



Separation

MAGNETIC SEPARATOR OVERBELT MOD. OVB1250 **POS. 8**

MAGNETIC GRADING MACHINE MOD. 30.60 **POS. 11**

CLEANING TOWER **POS. 16**

EDDY CURRENT SEPARATOR MOD. ECS750	**POS. 19**

Dust suction

DUST SUCTION AND FITRATION SYSTEM	**POS. 22**

Polyurethane briquetting

BRIQUETTING PRESS MOD. MB60	**POS. 24**

Management and control

ELECTRIC CONTROL PANEL MOD. QE	**POS. 25**

Nitrogen generation

NITROGEN SELF-GENERATION SYSTEM	**POS. 26**

SAFETY SYSTEMS
All machines are designed and constructed in accordance with the safety regulations of the European Community and they will be provided with EC marking and certification.
TECHNICAL MODIFICATIONS
Technical data listed in this document are subject to modifications of improving kind, dictated by design changes or by new laws and regulations. The pictures shown in this quotation are indicative and not binding.