Harris/Taurus Preshredder

The dual counter-rotating horizontal shaft, hydraulic Preshredder by Harris/Taurus, is normally used in ferrous scrap yards before a hammermill shredder to produce an homogeneous size feed. It is particularly useful in processing heavy density automobile or tin bales, to generate a uniform shredding process.

Advantages of operating with a Harris/Taurus Preshredder

- Eliminates almost completely the possibility of explosions.
- Reduces and optimizes the energy consumption during the shredding process. The result is a more uniform power demand, reducing the frequency and size of demand peaks by processing more homogeneous material.
- Increases the wear life of the internal shredder castings, such as hammers, grates and sideliners.
- Allows smaller shredder plants to operate at higher production levels and process heavier material like complete cars and heavy density bales.

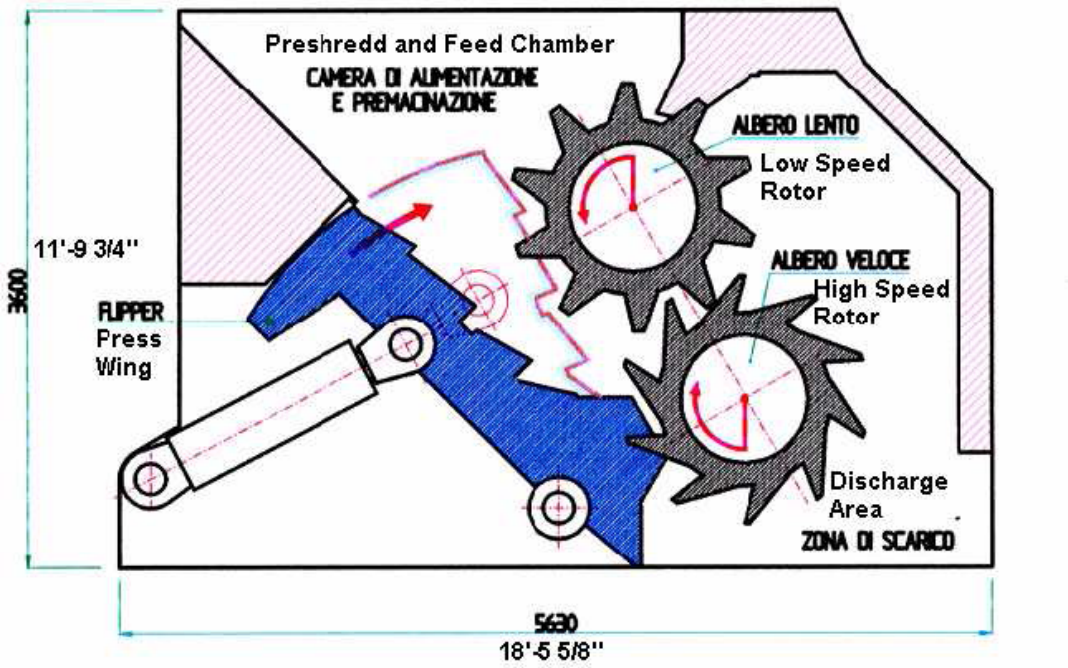
What is a Preshredder?

As explained above, the Harris/Taurus Preshredder is designed to prepare the material to be shredded in a hammermill into a more homogeneous mix, being it initially heavy density bales or cars or mixed loose tin.
The operator loads the material to be processed into the Inclined Feed Chute.

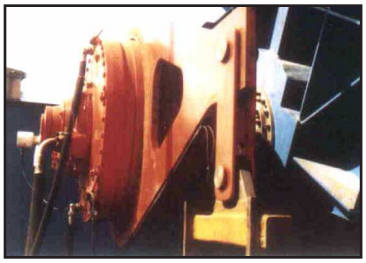
The material falls by gravity until it gets in contact with the Low Speed Rotor, which once it has engaged the scrap pushes it into the zone where the teeth of the teeth of the two counter-rotating rotors mesh.

The scrap passing between the teeth is stretched and loosens.

The loose scrap is then pushed by the high-speed rotor into the discharge area, towards a stocking area or directly into an Infeed Conveyor feeding a Shredder.

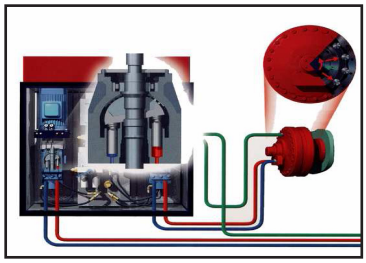


Both High Speed and Low Speed Rotors are independently driven by a Low Speed High Torque Hydraulic Motormounted on each rotor.



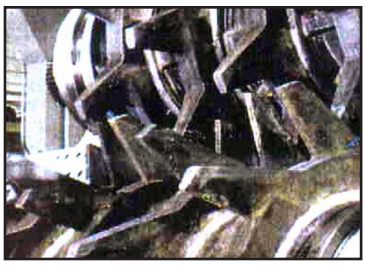
The two counter-rotating rotors transmit between 400 and 800 HP, rotating at different speeds maintaining a 4:1 ratio between speeds.

The Closed Loop Hydraulic System driving both hydraulic motors is comprised of an axial piston pump with a constant Horsepower limiter, allowing the system to maintain the maximum torque while adjusting the speed to maintain the power demand during operation.



The rotors have installed teethed wheels. The teeth are designed to tear apart the scrap.

The combined action of high torque and constant speed ratio between the rotors allows the teeth, meshed in between, to tear the scrap apart to produce a fairly homogeneous mix that is easier to run through the shredder.



On the lower High Speed Rotor there are mounted five wheels, each one furnished with 10 slanted teeth. The working area of the rotor has a diameter of 63" (1600 mm) and a length of 98 ½" (2500 mm).

On the higher Low Speed Rotor there are mounted four wheels, each one furnished with 10 slanted teeth. The working area of the rotor has a diameter of 63" (1600 mm) and a length of 98 ½" (2500 mm).

The wheels and teeth (joined together) are made of high resistance anti-wear steel plate.

Due to the high wear involved in this application, the teeth have to be hardfaced at periodic intervals, to bring them back to their original shape using proper materials and procedures.

The useful life of the teeth is variable, but 4,000 hours of operation can be used as an average before the teeth need to be replaced. This useful life is highly dependent on the type of material being processed.

The floor where the scrap slides to arrive to the counter-rotating rotors is a movable door (press wing), pivoted around the bottom part of the Preshredder structure. Automatically or under the operator's command, this press wing can compress the material against the teeth of the rotors.

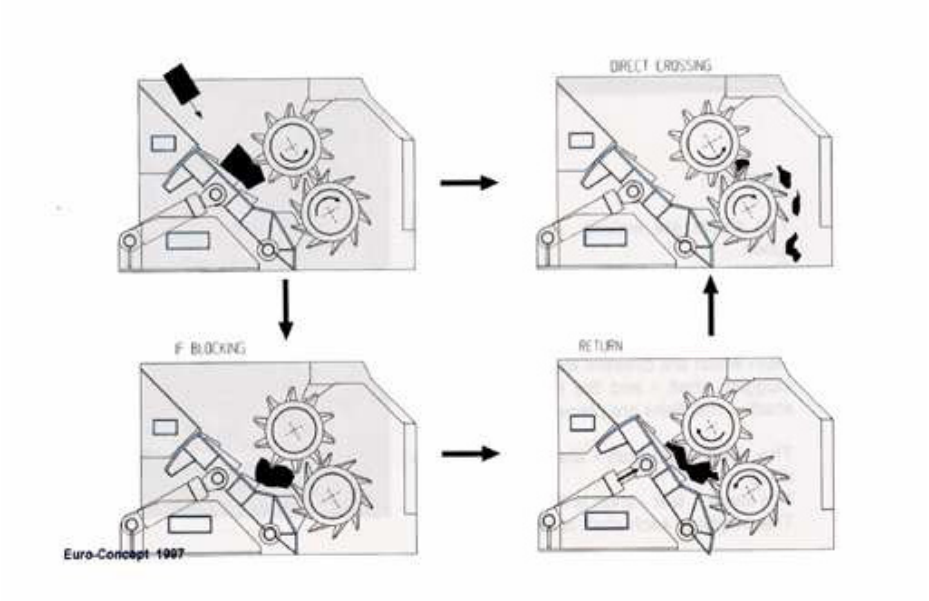
The press wing is actuated through a hydraulic system with a compressing force that depends on the power of the specific unit (from 150 ton to 250 ton).

The hydraulic cylinder is controlled by an independent open loop system driven by a 30 HP to 50 HP electric motor.

The press wing movement is linked to the rotation and load on the main rollers.

The larger material that is difficult to pass through the rollers could cause overload and on the rollers and waste of time when the Low Speed Rotor teeth cannot properly engage the material. In this case, by extending the Press Wing and compressing the material against the rotors, it can help to break apart the material, reduce its dimensions and allow the rotor teeth to properly tear it.

If the material is initially too dense or too big to be passed through the rollers, it could generate an overload situation. The system has arrived to its maximum torque and the hydraulic motors "stall". In this case during the automatic operation, the rotors are turned at half speed in opposite sense, freeing the teeth from the material that has produced the stall situation.



At the same time, the Press Wing is actuated compressing the material against the Low Speed Rotor. The Press Wing remains in an intermediate position until the end of the “overload” cycle.

The teeth of the Low Speed Rotor tear the material apart against the face of the Press Wing that has grouser teeth properly located.

After this intermediate cycle, the rotors turn again in their normal sense, processing this time the material that did not pass through the first time. In case of very dense material, this process can be repeated automatically without any operator intervention until the material is able to pass through the Preshredder (this depends exclusively on the power available at the rotors). At the end of the cycle, the Press Wing returns to its normal operating position.

The operator can also move the flipper at its own discretion during normal operation.

The upper surface of the Press Wing in contact with the material being processed is constructed in thick high strength wear resistant steel.

The Preshredder structure is designed in sections to reduce the corresponding freight and facilitate installation. Once assembled the structure remains a very sturdy and robust monolitic unit.

Why use a Preshredder?

The normal operation of a shredder used to process auto bodies and regular scrap, either as received or baled to a high density is subject to some risks due to explosions and fires caused by the insertion of gasoline tanks, gas containers and other flammable materials into the shredding chamber of a hammer mill or shredder.

The presence inside the shredder chamber of high temperature due to the intense friction developed during the shredding operation, of atomized petrochemical products and sparks resulting of the contact between the high speed rotating hammers and the ferrous scrap create all the conditions to generate an explosion. No matter how much care is taken during preliminary inspections, it is impossible to completely eliminate all the potential sources of explosions, especially if they are “hidden” in auto bodies or bales.

By preshredding the material in a low speed machine before feeding it into a shredding chamber reduces almost completely the chances of an explosion, since there are more chances of ripping apart the gasoline tanks and gas containers allowing the explosive mix to dissipate before arriving to the shredder.

There is almost no chances of an explosion inside the Preshredder during operation due to the low speed to the rotors, lower internal temperature inside the chamber and the fact that the chamber is mainly open.

The different counter-rotating rotor's speed, the position, number and shape of the teeth are designed to tear apart gasoline tanks and most gas containers.

The operating cost of the Preshredder is surpassed by the reduction in several costs of the shredding process, such as:

- Lower energy consumption
- Increased wear parts useful life (hammers, grates, liners.)
- Lower maintenance cost the higher productive life of castings.
- Less downtime associated with explosions and removal of "hidden" unshreddables.
- Allows the operator to process materials (such as bales) on smaller shredders that otherwise could only be processed in larger machines.