Shredder Process Description

The purchased scrap metal is processed by a Shredder aka Fragmentiser. Mixed non-ferrous metals that form a part of the frag feed are separated from the fragmented flow by a combination of air extraction, size sorting, magnetic separation, eddy-current separation and hand sorting.

Following arrival at the weighbridge, incoming material is identified and categorised as either automotive baled scrap or other.

All automotive baled scrap will be fed into a pre-shredder to reduce the risk of explosions. The pre-shredder is a hydraulically driven, high torque, low speed machine which uses a slicing action to cut open automotive baled material without generating sources of ignition. Once processed the feedstock will be visually inspected by the material handler operative before being placed onto the horizontal loading section of the shredder feed conveyor.

The pre-shredder will be enclosed within acoustic housing to significantly reduce potential noise emissions.

Feed stock is loaded into the fragmentiser plant by way of hydraulic mobile cranes fitted with scrap handling grabs. All feed materials are placed onto the horizontal loading section of the infeed Conveyor. The conveyor is hydraulically driven and consists of a static frame and support structure within which the steel fabricated belt carries the loaded feed materials. The uppermost section of the Infeed Conveyor is provided with rubber curtains that extend over the infeed chute of the scrap shredder in order to prevent uncontrolled ejection of high velocity fragments from the Fragmentiser.

Feed materials fall by gravity from the head section of the infeed conveyor into the infeed chute of the Fragmentiser. In the lower section of the infeed chute, a double feed roller compression device is fitted. This device is a pair of hydraulically driven rollers which move in a rotational motion as well as up and down. Their purpose is to provide initial densification of feed materials and to control the ingress of feed material into the shredding chamber of the Fragmentiser.

The Fragmentiser is a top and bottom discharge Hammer mill. A cylindrical sixteen hammer rotor is turned by a 6000HP electric motor, within a heavily fabricated steel enclosure. A vibration isolation system comprising spring dampeners is fitted between the concrete stanchions (on which the fragmentiser is mounted) and the fragmentiser itself.

The shredding chamber of the fragmentiser is fitted with sizing grids and an ejection door for the safe removal of unshreddable materials. A PLC controlled water injection system is fitted for suppression of dust and noise emissions from the fragmentiser. This system is adjustable and can be operated at >100% capacity in the event of a fire. Additionally a separate dousing system can be operated in an emergency which floods the shredder exit belt with water.

Material entering the Fragmentiser is disintegrated instantaneously by rotating hammers and an interactive shredding mechanism. Feed Material leaves the shredding chamber on conveyors to be separated into different constituent elements.

Mixed material will be initially separated into two waste streams via a gravity cascade, which allows light fractions to be pulled upwards through the main material flow by a stream of air in opposition to the heavier material, which falls through the cascade.

The light fraction will be separated into further fractions by a large plenum chamber and two large air cyclones. Material in this stream will be transported to the non-ferrous processing building on an industrial grade, fully covered, conveyor belt.

The heavier fraction waste that fell through the gravity cascade will be conveyed into the ferrous separation building for further processing. Two large rotary magnets will allow the ferrous material to be separated from the mixed material stream. The ferrous metal will be transported by an industrial grade, fully covered, conveyor to a quality control building where hand picking will be undertaken to remove any remaining non-ferrous material. On exiting the quality control building the ferrous material will be transported via a high level enclosed gantry conveyor to the dock for storage.

Non Ferrous Processing – Line 1

Within the fully enclosed non-ferrous processing building, the light material will be processed with magnets to remove the ferrous material, and will subsequently be processed through size separation and eddy current separation machinery to ensure that all recyclable material is extracted from the main stream. The recyclable materials will be stored in a covered waste bay outside of the non-ferrous building, prior to transport to an offsite plant for further processing. The non-recyclable materials will be stored in a covered waste bay outside of the non-ferrous building prior to transport to landfill for final disposal.

Non Ferrous Processing – Line 2

Heavy material not attracted to the two large rotary magnets will be transported via an industrial grade rubber, fully enclosed conveyor belt, to the non-ferrous separation building. Within this fully enclosed non-ferrous processing building the heavy material will be processed with magnets to remove any remaining ferrous material.

The material will then be processed through size separation and eddy current separation machinery to ensure that all recyclable material is extracted from the main stream. The recyclable materials will be stored in an external, covered waste bay prior to transport offsite for further processing.

The non-recyclable materials will be stored in an external, covered waste bay prior to transport to landfill for final disposal.

Covered Storage Bays

As part of the improvement programme, covered storage bays are proposed for all out-going non-ferrous materials. This will reduce the likelihood of dust emissions. The new covered storage bays will protect out-going material from the weather and will generally improve the appearance of the site.