



Sims Smethwick_Operating Techniques_Appendix 4 Shredder Process Description

1 dry process (with water injection) hammer mill fragmentiser, LYNXS 6000HP electric operated, continuous operation, 220 tonnes per hr (2,640 tonnes, based on 12 hour operation.) capacity for treating non-hazardous (5.4 A (1) b) (iv)) & hazardous wastes for recovery (5.3 A (1) a) (ii)). Re Hazardous waste for recovery the actual daily treatment capacity for 5.3 A (1) a) (ii) is likely to be in region of approx. 200 tonnes based on current waste arising.

Additionally, the site permit restricts annual throughput to 374,999 for installation activities and 74,999 for non installation waste activities.

The metal shredding plant and downstream plant and processes are specifically designed, commissioned and operated to be fit for purpose, considering physical hazards and including an assessment of the environmental risks and emissions from the plant and processes.

The purchased scrap metal is processed by a Shredder. 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.

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.

Reference	Sims Group UK Limited_Rabone Lane_Operating Techniques Appendix 4	Page number	Page 1 of 3
Authorised by	O Latham	Issue date	April 2022

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.

The mixed material is initially separated into two waste streams, namely light fraction and heavy fraction via a cleaning drum, which allows the lighter material to be removed via the first air system abatement system to the shredder waste plant. Any ferrous material is extracted from this waste stream via a rotary magnet positioned over the waste plant entry belt. The wet scrubber, then dampens down any small dust particles, by adding water it will drop the dust in to the wet scrubber and reduce the dust emissions from the stack. and the ferrous material is separately conveyed to the ferrous conveyor, whilst the remaining material enters the waste plant.

At the waste plant the material is passed over a dual Eddy current separation system which removes any non-ferrous metallics from this light waste stream. This is achieved by eddy current magnets 'throwing' non ferrous material over a rotating shaft, where it is stored in a storage bay. The non-ferrous metallic stream is sent for further processing. The remaining dirt stream is size sorted and either sent for further processing or sent for final disposal at landfill.

The remaining 'heavy fraction' material leaves the cleaning drum and is transported by conveyor to the magnetic separation drum magnet. Material falls by way of an enclosed chute onto the drum magnet vibrating deck conveyor where two material streams are produced namely, ferrous and non ferrous.

The magnetic 'ferrous' materials are lifted over the magnet drum onto a new conveyor. Any non-magnetic 'non-ferrous' material will pass under the drum magnet onto the lower deck.

The magnetic 'ferrous' material is moved by conveyor to a picking station where material such as copper wire or armatures are removed by hand. The material is then dropped onto a further conveyor where the material is stacked by a Radial Stacker.

Non-ferrous material which passed under the rotating magnet is size sorted and stored in bunkers. This material is transported off site for further reprocessing.

Water injection on the fragmentiser mill, the cyclone extraction system and the wet scrubber system are the principal abatement techniques for dust suppression. The frag waste bay currently comprises a three sided bunker, with misting sprays. The system is fed by conveyors – the 2 picking conveyors are equipped with water sprays.

There is an appropriate regular inspection and maintenance programme covering all plant and equipment. This includes protective equipment such as water injection and cyclone systems, curtains and covers which are required to minimise fugitive releases.

The shredder will be used to batch treat (separately treat in batches via continuous feed) non-hazardous and hazardous wastes.

Reference	Sims Group UK Limited_Rabone Lane_Operating Techniques Appendix 4	Page number	Page 2 of 3
Authorised by	O Latham	Issue date	April 2022

Treatment of hazardous waste in shredder Installation (Section 5.3 A (1) a) (ii)) and treatment of non hazardous waste in shredder installation (Section 5.4 A (1) b) (iv)

Treatment of hazardous waste for example pre-treated SMW / Pre-treated SMW residues, will undergo the same process as the treatment of non-hazardous waste, which was detailed above. Hazardous waste are stored and processed separately to batches of non-hazardous waste.

Reference	Sims Group UK Limited_Rabone Lane_Operating Techniques Appendix 4	Page number	Page 3 of 3
Authorised by	O Latham	Issue date	April 2022