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# Benefits

of using **Shredded  
Ferrous Scrap**  
in **Steel Mills**  
and **Foundries**

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Bureau of  
International  
Recycling



# Shredding Process

## BEST PRACTICE DEPOLLUTION:

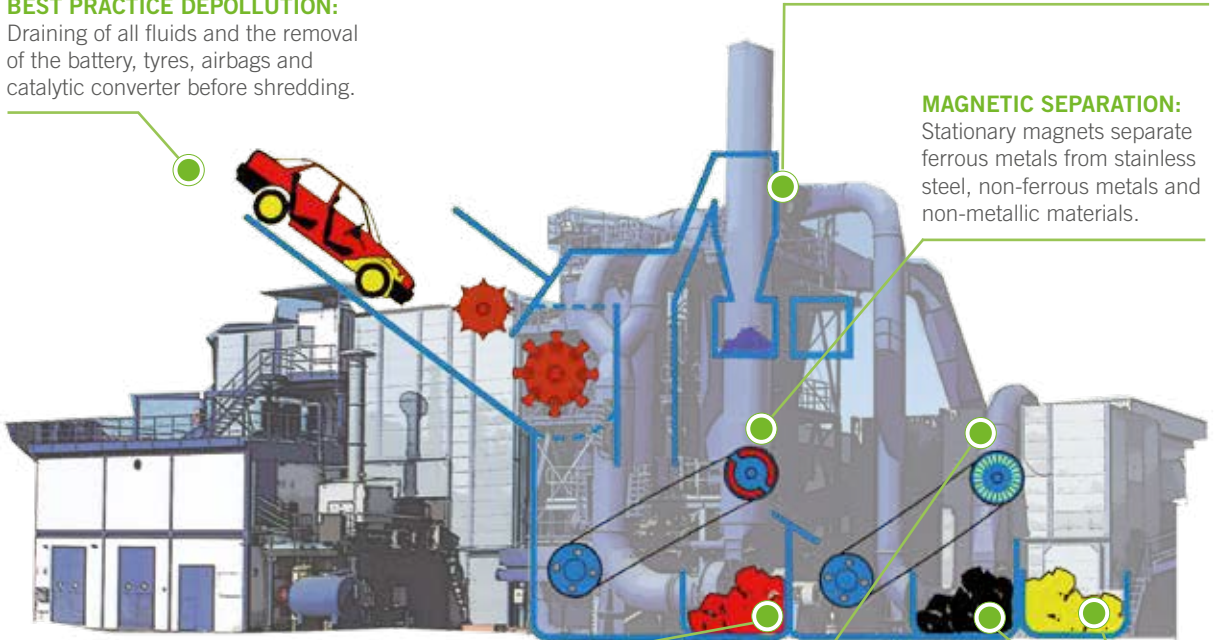
Draining of all fluids and the removal of the battery, tyres, airbags and catalytic converter before shredding.

## DUST (FLUFF) COLLECTION SYSTEM:

Airborne materials go to landfill or for further processing prior to energy valorisation.

## MAGNETIC SEPARATION:

Stationary magnets separate ferrous metals from stainless steel, non-ferrous metals and non-metallic materials.



## FERROUS METALS:

Delivery of high-quality scrap as furnace feed to steelworks and foundries.

## EDDY CURRENT SEPARATION:

Fast-moving magnets segregate the materials by lifting them and throwing each into separate containers.

## NON-METALS AND NON-FERROUS METALS:

Delivery to post-shredder technology plants for further processing.

# 8

## Benefits of using Shredded Ferrous Scrap in Steel Mills and Foundries



1

The size, shape, density and composition of shredded ferrous scrap brings **cost benefits to steelmakers and foundries** owing to savings in time and in resource and energy use, and through a **reduction in CO2 emissions** in comparison to sheared or baled scrap. Electric arc furnaces (EAFs) can use 80-90% shredded scrap.

2

In comparison to other scrap types, using shredded ferrous scrap as infeed in the steelmaking process **reduces costs** overall and increases meltshop productivity, in some cases, in direct proportion to the amount of shredded scrap added to the charge mix. **Charging times may be more than halved** when using shredded scrap owing to the need for fewer charging bucket loads.



3

**Melting times are reduced**, increasing EAF efficiency and therefore electrode and refractory lifespans. Shredded steel scrap is **more cost effective** to use in steel furnaces because of consistency from melt to melt.

4

The shredding of scrap enables **improved quality control**, controlling among other factors the residual copper content and preventing radioactive presence, while also reducing the likelihood of closed containers.

5

Shredded scrap commonly has a **high density** above  $0.9 \text{ tonnes/m}^3$ ; the unwanted materials (soil, plastics and non-ferrous metals) are kept below 2% and may be as low as 0.75%. **Very high density** shredded scrap of around  $2 \text{ tonnes/m}^3$  is used to cool molten metal.



6

**Slag production is much reduced** and may be more than halved in comparison with slag from sheared or baled scrap grades, which means savings on additions of slag formers such as lime, leading to a higher productivity.

7

Shredded scrap brings benefits in the scrap yard as the **handling efficiency** by grab or by conveyor belt is up to twice that of sheared or baled scrap in terms of tonnes handled per hour.

8

**Faster loading times** are possible for inland water and deep-sea transportation in comparison to other scrap types; furthermore, the risk of damage to the vessel hold is lower if shredded scrap is loaded first.

# Specifications for Shredded Ferrous Scrap

SPECIFICATION	DESCRIPTION	DENSITY	STERILES
<b>EU27 Steel Scrap Specifications - Shredded E40</b>	Shredded steel scrap. Old steel scrap fragmented into pieces not exceeding 200mm in any direction for 95% of the load. No piece, in the remaining 5%, shall exceed 1000mm. Should be prepared in a manner to ensure direct charging. The scrap shall be free of excessive moisture, loose cast iron and incinerator material (especially tin cans). Must be free of metallic copper, tin, lead (and alloys) and steriles to meet the aimed analytical contents. Refer to points B) and C) of the general conditions.*	>0.9 tonnes/m <sup>3</sup>	<0.4 %
<b>ISRI Scrap Specifications Circular 210</b>	Shredded scrap. Homogeneous iron and steel scrap, magnetically separated, originating from automobiles, unprepared No. 1 and No. 2 steel, miscellaneous baling and sheet scrap.**	Average density 50 pounds per cubic foot.	
<b>ISRI Scrap Specifications Circular 211</b>	Shredded scrap. Homogeneous iron and steel scrap magnetically separated, originating from automobiles, unprepared No. 1 and No. 2 steel, miscellaneous baling and sheet scrap.**	Average density 70 pounds per cubic foot.	
<b>Japan Ferrous Raw Materials Association</b>	Shredded A	Automobiles (mainly from End of Life Vehicles)	
	Shredded B	Except for Shredded A	
<b>Shredded Cooling Scrap</b>		Circa 2 tonnes/m <sup>3</sup>	

\*NB: read in the context of EFR's EU27 Steel Scrap Specifications 'General Conditions applicable to all grades; Environmental, health and safety considerations (including: A) Safety; B) Steriles (cleanliness); C) Residual and other Metallic Elements; D) Mixture of Grades'; Table 2: Aimed Analytical Contents; and Environmental Quality Criteria'. ([http://www.efr2.org/html/downloads/EFR\\_EU27\\_steel\\_scrap\\_specification.pdf](http://www.efr2.org/html/downloads/EFR_EU27_steel_scrap_specification.pdf))

\*\*NB: read in the context of ISRI's Scrap Specifications Circular 'Guidelines for Ferrous Scrap: General Information [incl. a. Cleanness; b. Off-grade material; c. Residual alloys; d. Deviations]'. ([www.isri.org/specs](http://www.isri.org/specs))

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