

Killing the meatball problem

For more than a century, scrap yards have been processing vehicles. Today, vehicle shredders must provide their steel mill customers with a premium quality to obtain a premium price. No 1 Shred is 0.17% or less copper content, according to Management Science Associates (MSA). The premium is US\$ 5 to US\$ 30 per short ton and averages US\$ 12 per ton, according to MSA. Shredders can also recover copper and other non-ferrous metals rejected from the No 2 feedstock for additional income. As shredders reduce the hand-sorting required, profitability gets even more exciting.



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Electric motors or 'meatballs' in the shredder stream are problematic for scrap processors and steel mills that seek the best ferrous possible. Too much copper in a melt will soften or embrittle the steel batch and affect the surface quality of the end product. According to the Steel Recycling Institute, there is no existing chemical process to remove copper alloyed with steel. Recycling facilities need to extract the biggest copper-containing culprit - meatballs - from their shredded ferrous streams. As a liability, meatballs can weigh 20-plus pounds and damage non-ferrous separators if not recovered from the shredder discharge. The Eriez P-Rex Drum separates meatballs, protecting the non-ferrous stream. As an asset, meatballs are several times more valuable than shredded ferrous scrap and a ready market exists. The secret is to

separate them from the ferrous stream downstream of the ferrous drums.

CleanStream process

Recently, Eriez introduced its CleanStream Technology and Shred1 Separator. The company's goal in developing the new machine was to produce No 1 Shred at less than 0.17% of greater copper content in the steel from a 100% vehicle feedstock. To test its theories, Eriez created a CleanStream process incorporating the power of its P-Rex Scrap Drum Separator so that all potential ferrous is recovered, together with the finesse of the new Shred1 Separator to produce a <0.17% copper content No 1 Shred. Copper and other non-ferrous metals went to one hopper, while the 'pure' steel went to the stacker end of the line of the CleanStream system. After many successive separations and adjustments, according to a steel mill that read their 'melt', the analysis measured a 0.16% copper content. Eriez estimated that the recovered copper would generate an additional US\$ 0.50

per pound in today's metal market. According to the company, shredders can also reduce their picking staff since Shred1 separates 60-80% as a No 1 product, requiring little if any further handling. This leaves only 20-40% to be hand-sorted, most of which can be accomplished by the Eriez CleanStream process, with one rather than two parallel picking streams and narrower picking conveyors that travel at half the feet-per-minute. According to Eriez, this allows hand-picking to be more effective. The Eriez Shred1 Separator uses ballistics to automatically separate ferrous from mixed metals and waste. 'Unlike other "ferrous cleaning" processes, Shred1 does not remove one or a few contaminants from a ferrous stream, but rather removes the very clean ferrous from the mixed material stream,' a spokesman says. 'In addition, this No 1 shred material is more uniform in size and represents 60-80% of the feed stream, requiring little or no hand-sorting.'

Payback time

The payback on the CleanStream process is measurable. 'We can decrease the number of hand-pickers and make

them more efficient, thus reducing expenses,' Eriez says in a press release. Shredder operators who deliver a consistent, low-copper shred to the steel mills earn on average a US\$ 12 per short ton premium. Take as an example a shredding operation that produces 20 000 tons per month: it can earn more than US\$ 1 million annually with only a US\$ 5 a ton premium for low-copper shred. MSA has reported premiums as high as US\$ 30 per ton for No 1 Shred. Meatballs are worth several times more by weight than shredder steel, and automated equipment recovers more of the material than manual sorters can. If you take each increment of 0.05% or 0.10% per ton of shred multiplied by the value of copper, you will come up with the amount of income your CleanStream system can produce. Eriez's experience with shredder operations and the statistical data available at this time appear to indicate that the CleanStream process, which includes a Shred1 Separator and a P-Rex Scrap Drum, will attract the attention of recyclers, steel mills and the recycling industry everywhere. The profit picture is significant. □



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