

North American Stainless

Award: Sustainability
Category: Material efficiency

AOD Dust Reuse

Challenge

Disposal of AOD dust generation rates containing high dolomitic lime concentrations.

Action

NAS has historically disposed Argon Oxygen Decarburization (AOD) baghouse dust as a hazardous waste. The AOD dust at NAS has a high dolomitic lime (>50%) concentration which makes it difficult to stabilize for disposal in a landfill. Due to the high dolomitic lime content and lower metal content, it has been cost prohibitive to recycle AOD dust for its metal content (unlike EAF baghouse dust).

After receiving approval from authorities, NAS started using the AOD dust as an ingredient in the EAF. The AOD dust is now a replacement for new dolomitic lime by substituting 4 tons of AOD dust for every 2.2 tons of purchased dolomitic lime. The AOD dust is placed into supersacks which are then added to the EAF charge baskets with the stainless steel scrap. Each heat consists of two baskets; the first EAF basket contains scrap and quick lime, while the second EAF basket contains scrap and AOD dust.

Outcome

NAS has been able to reduce quantity of dolomitic lime purchased by 6,412 metric tons, and to reduce the quantity of hazardous waste that is landfilled by 10,238 metric tons for calendar year 2018.

NAS evaluated the total quantity of dust that was being generated at the melt shop as well as the EAF baghouses to verify that the AOD dust that was placed in the EAF was not just passing through to the baghouses, but was producing slag.

During 2018, the quantity of dust generated at the melt shop would have been 44,478 metric tons if the dolomitic lime in the AOD did not react and directly

passed through to the baghouse. However, NAS produced only 34,240 metric tons of baghouse dust (the reduction of 10,238 metric tons).

The EAF baghouse dust generation rate was verified as well. The 2018 average dust generation rate was 24.06 lb/ton of steel which is consistent with the generation rates for year 2013-2017. The average historic generation rate is 24.62 lb/tons of steel. The average generation rates for 2013-2017 range from 23.61 to 25.86 lb/ton of steel produced.

NAS was able to save approximately \$1,000,000 by using the AOD dust as a source of dolomitic lime in the EAFs.

