Recycling of Advanced High Strength Steel (AHSS)

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Reasoning Behind Decision Matrix

Separate Alloyed Steel from Scrap: We gave the criteria of separating alloyed steel from scrap a weight of 0.45. This is our largest weighted value. This criterion is weighted the most heavily because of how important the proper separation of alloyed steel is. If the separation of steel does not work, then every other aspect does not matter. If a method does not separate steel properly, then we probably don't want to use the method, therefore this is the most heavily weighted criteria.

Scrap Cycle Management: Scrap cycle management is the management of metal materials before we even begin to separate them, this process begins at a very early stage. This management begins all the way at the scrap yard. We gave the criteria of scrap cycle management a weight of 0.5. We gave this such a low weight because we wanted our system to be able to accept all types of metal and scrap and still process them efficiently. Scrap cycle management is dependent on the methods of the scrap yard, not the methods which we are analyzing.

Avoid Off Chemistry Heat: The criterion of avoid off chemistry heat refers to preventing too many low quality metals from getting into the final batch of metals which will be turned into our final product. We want to prevent these low quality metals from getting into the final batch because it will create a reaction which will produce too much heat and ruin our metals. We gave the criterion of avoid off chemistry heat a ranking 0.25. This was given its ranking because it is an important criterion, but none of our methods have any significant changes to the process of mixing the metals, and melting down the metals which will be turned into our final product.

Material Usage: The criterion of material usage refers to the amount of each sample of metal which will be wasted so that we may separate these materials. We gave the criteria of material usage a weight of 0.1. We gave this criteria a relatively low ranking because of the difference between the amount of metal being wasted by each method is relatively low. The amount of metals which may be wasted is relatively insignificant in the big picture.

Energy Usage: The criterion of energy usage refers to the amount of energy which will be used during each method. We gave the criteria of energy usage a ranking of 0.15. We gave this criterion a weight between separate alloyed steel from scrap, and material usage. We gave energy usage this weighting because the amount of energy used by each of these methods, while it is somewhat significant, it is not nearly as important as the actual separation of ahss and the avoiding of off chemistry heat.