Recycling Industry in India Under Severe Threat of Closure

Metal Exports to get to Hit

- **Metaworld Research Team**

Non ferrous metals recycling industry is set to face huge problems due to non availability of scrap because of cumbersome law put in place by the government in new Foreign Trade Policy which has been introduced on April 1, 2015. When the new Foreign Trade Policy, 2015-20 and Hand Book Policy (HBP) came into force, the procedure for recognition of pre-shipment inspection agency (PSIA) and the liabilities caused have been revised. The major changes brought about in HBP 2015-20 are the PSIA will make a video clip of 3 to 5 minutes of the inspection which will carry out the capturing of time, date and place of inspection along with the name and identity of the Inspector, instrument and container, numbers and the event of the stuffing and sealing of the container.

Objections

After the issue of new provisions, various representations were received from PSIA's trade and the metal recyclers, the new provisions that are implemented was difficult and the time given was 3 to 6 months. To sort out the grievances of the trade, the DGFT had convened a meeting. The representations have been received from various PSIA's/associations including the following-

The major issues raised by the Trade in the meeting were that -

- On many occasion approximately 500 containers may be stuffed through mechanised system at yards and video clips will run for several hours
- No videography is allowed in most of the yards
- The PSIA will have to engage additional staff / manpower to comply with the new norms
- Many a times, in secured yards the material of several tonnes in bulk form is tested, while lying on the ground from different parts & then it is loaded
- Self certification by yard authorities may be accepted and no additional PSIA would be required.
- Sometimes containers are loaded in vertical position through machanised process and it is not possible to videograph the process
- It was represented by most of the associations that the sudden change of procedure had created immense problems for the containers which had already been stuffed; and is handed over to customs; shipped; and by now arrived in India; and also many of them were facing financial problems as most of the PSIA's were refusing to carry inspection of their

containers due to the changed procedure. They sought additional time to implement the new procedures.

In its letter to the Union Commerce Secretary, Rajeev Kher, the apex industry body Metal Recycling Association of India (MRAI) said that at least 3-4 months time should be given to scrap importers to put system in place. As per the existing old procedures, inspection agencies are doing inspection of metal scrap cargoes in overseas countries, at multiple locations (covering all nearby areas / container loading sites) in a single day. The work criteria laid down for them was to check and record background and surface radiation levels; and visually ensure that material is free from explosives. Now under the new proposed procedures, the inspector would need to take different pictures step by step i.e. from opening of the container, till final completion & sealing. Along with this, they need to provide photo of the loading yard, as well as their own photo which specify date and time of inspection. Such procedure would require the concerned inspector to spend entire day in one yard.

This procedure would need huge additional reinforcement of inspectors globally, and allot them time to get properly trained for this specific job. In addition, such inspectors would need to be hired / sourced from the country of loading / inspection, as Indian agencies cannot be deployed due to work visa restrictions. In addition, PSIA's would need to heavily invest in buying several state of art radiation detection equipment which are normally made in Germany or USA which has a minimum delivery period of 3-6 months, as each inspectors would need to carry them separately at individual sites.

Currently, India imports around 7 million tonnes of metal scraps from 150 countries annually. This metal scrap is processed / smelted, and converted into valuable raw materials for supplying core industries like automotive, infrastructure and construction etc. The secondary metal sector is growing at 11.4 per cent per annum and it is estimated that India is required to import 10 million tonnes of metal scrap in the current financial year. This equates to loading of 800,000 tonnes of scrap every month which will require nearly 1500 plus more inspectors.

Photograph in Place of Videograph

In view of the hardships stated by the PSIA's, it was decided that the provision of making a video clip may be replaced by photographs.

It was also decided that some provisions regarding import of metal scrap from secured yards may also be included in the HBP so that import of cargo from such secured yards would not require a Pre Shipment Inspection Certificate (PSIC).

NON-FERROUS METALS SCRAP AND WASTE IMPORT INTO INDIA

	2011-12		2012-13		2013-14	
	Quantity (Tonnes)	Value (Rs Cr)	Quantity (Tonnes)	Value (Rs Cr)	Quantity (Tonnes)	Value (Rs Cr)
Copper	161942	4702.3	204262	6433.33	143735	4945.93
Nickel	1128	39.17	668	29.02	2790	138.81
Aluminium	627672	6072.23	738470	7384.62	721630	7568.9
Lead	66653	652.49	51494	518.92	58834	660.33
Zinc	48581	410.91	612.19	549.78	69496	683.12
Oth. Base Metals	216	2.79	294	6.56	148	4.43

*Source : **Press Information Bureau***

Impact

The change in law would have a massive ramification on metal recycling sector in India with entire business that will come to a grinding halt. The current situation is alarming as metal scrap shipments from overseas countries has stopped since there is no clarification of matter declared as to what date the new guidelines will remain in abeyance. No Pre-shipment Inspection Agencies (PSIA) are doing inspection of cargos and overseas supplies fearing that their shipments may be stopped by DGFT if new guidelines are not implemented immediately. India imports huge quantity of metal scrap, nearly 800,000 Metric tons every month to cope up with the projected **GDP** growth of 7.5% per annum, said Sanjay Mehta, a Vice President, Metals Recycling Association of India.

The situation is grave. Secondary metal sector will come to a stand-still and suffer huge losses, as almost 60% of India's non-ferrous metals and more than 40% of Ferrous/steel requirements are met through Secondary sector. This sector pre-dominantly relies on imported raw material (scrap) and currently the collective volume of import is around 7-10 million tons per annum, employing 17 lacs people in this sector, he added.

Since domestic production of base metals would get affected, manufacturing of artifacts would get hit. India being the largest exporter of metal artifacts would lose its luster.

Copper Scrap Processing

The entire economy of the copper and copper alloy industry is dependent on the economic recycling of any surplus products. There is a wide range of copper based materials made for a large variety of applications. To use the most suitable and cheapest feedstock for making components, give the most economic cost price for the material.

The usual commercial supplies of pure copper are used for the most critical of electrical applications such as the production of fine and superfine enamelled wires. It is essential that purity is reproducibly maintained in order to ensure high conductivity, consistent annealability and freedom from breaks during rod production and subsequent wire drawing. Since the applied enamel layers are thin but have to withstand voltage, they must have no surface flaws; consequently the basis copper wire must have an excellent surface quality. Primary copper of the best grade is used for producing the rod for this work. Uncontaminated recycled process scrap and other scrap that has been electrolytically refined back to grade 'A' quality may also be used. The copper used for power cables is also drawn from high conductivity rod but to a thicker size than fine wires. The quality requirements are therefore slightly less stringent. The presence of any undesirable impurities can cause problems such as hot shortness which gives expensive failures during casting and hot rolling. For the same

reason, scrap containing such impurities can only be used for this purpose if well diluted with good quality copper. For non-electrical purposes, copper is also used to make large quantities of plumbing tube, roofing sheet and heat exchangers. High electrical conductivity is not mandatory and other quality requirements are not so onerous. Secondary copper can be used for the manufacture of these materials, though it is still within stipulated quality limits for impurities. Whereas scrap copper is associated with other materials, for example after having been tinned or soldered, it will frequently be more economic to take advantage of such contamination than try to remove it by refining. Many specifications for gun metals and bronzes require the presence of both tin and lead so this type of scrap is ideal feedstock. Normally it is remelted and cast to ingot of certified analysis before used in a foundry. Scrap of this type commands a lower price than uncontaminated copper.

Brass Recycling

The recycling of brass scrap is a basic essential of the economics of the industry. Brass for extrusion and hot stamping is normally made from a basic melt of scrap of similar composition adjusted by the addition of virgin copper or zinc as required to meet the specification before pouring. The use of brass scrap bought at a significantly lower price than the metal mixture price means that the cost of the fabricated brass is considerably less than it might otherwise be. The presence of brass in some other elements such as lead is often

required to improve machinability so such scrap is frequently acceptable. Besides the common free-machining brasses, there are many others made for special purposes with properties modified to give extra strength, hardness, corrosion resistance or other attributes, so strict segregation of scrap is essential. Brass scrap arising from machining operations can be economically remelted but should be substantially free from excess lubricant, especially those including organic compounds that cause unacceptable fume during remelting. When brass is remelted, there is usually some evolution of the more volatile zinc. This is made up in the melt to bring it back within specification. The zinc is evolved as oxide that is drawn off and trapped in a baghouse and recycled for the manufacture of other products. Brass to be made into sheet, a strip or wire form must be significantly free from harmful impurities in order to retain ductility when cold. It can then be rolled, drawn, deep drawn, swaged, riveted or spun. It is normal therefore, to make it substantially form virgin copper and zinc, together with process scrap arising from processing that has been kept clean, carefully segregated and identified.

Copper Alloys Processing

Copper alloys such as phosphor bronzes, gunmetals, leaded bronzes and aluminium bronzes are normally made to closely controlled specifications in order to ensure fitness for demanding service. They are normally made from ingots of guaranteed composition together with process scrap of the same composition that has been kept carefully segregated. Where scrap has become mixed, or is of unknown composition, it is first remelted by an ingot maker and is analysed so that the composition can be suitably adjusted to bring it within grade for an alloy. Good quality high conductivity copper can be recycled by simple melting and check analysis before casting, either to finished shape or for subsequent fabrication. However, this normally only applies to process scrap arising within a copper works. Where copper has been contaminated and it is required to re-refine it, it is normally remelted and cast to anode shape so that it can be electrolytically refined. If, however, the level of impurities in the cast anode is significant, it is unlikely that the cathode produced will then meet the very high standards required of grade 'A' copper used for the production of fine wires. Where copper and copper alloy scraps are very contaminated and unsuitable for simple remelting, they can be recycled by other means to recover the copper either as the metal or which gives some of the copper compounds that are essential for use in industry and agriculture. This is the usual practice for recovery of useable copper in slag, dross or mill scale arising from production processes or from life-expired assemblies of components containing useful quantities of copper.

If the scrap is pure copper and has not been contaminated by anything undesirable, a high quality product can be made from it. Similarly, if scrap consists only of one alloy composition it is easier to remelt to a good quality product, although there may have to be some adjustment of composition on remelting.

If scrap is mixed, contaminated or includes other materials such as solder, then when remelted it will be more difficult to adjust the composition within the limits of a chosen specification. Where lead or tin have been included, but no harmful impurities, it is usually possible to adjust composition by the addition of more lead or tin to make lead bronzes. For some scrap that are contaminated with undesirable impurities it is sometimes possible to dilute it when melting so that the impurity level comes within an acceptable specification. All these techniques retain much of the value of the scrap. The way in which alloys can be made from scrap is shown in simplified diagrammatic form in the figure. Where scrap has been contaminated beyond acceptable limits it is necessary to re-refine it back to pure copper using conventional secondary metal refining techniques that provide a useful supplement to supply primary copper.

Aluminium Recycling

For most aluminium products, the metal is not actually consumed during the lifetime of the product, but simply used, with the potential to be recycled without any loss of its inherent properties. Therefore, the life cycle of an aluminium product is not the traditional "cradle-to-grave" sequence, but rather a renewable "cradle-to-cradle". This property of infinite recyclability has led to a situation where today almost around 75% of the one billion tonnes of aluminium ever produced is still in productive use, some have been through countless loops of its lifecycle. Through the use of only 5% of the original energy input, this metal can be made available not just once but repeatedly from these material resources for future generations. The growing global markets for aluminium products are supplied by both primary (around 65%) and recycled (around 35%) metal sources. The increasing demand for aluminium and the long life of many products, limiting their availability for short term recovery but maximising their in-use benefits mean that, the overall mass of primary metal consumed will continue to be around double that of recycled metal, for the foreseeable future. However, improving the overall collection rates of used products is an essential element in the pursuit of sustainable development. Industry continues to recycle, without subsidy, all the aluminium collected

from end-of-life products as well as from fabrication and manufacturing process scrap. With a growing number of industry initiatives and the help of appropriate authorities, local communities and society as a whole, the amount of aluminium collected could be increased further.

Zinc Scrap Processing

Approximately 60% of the zinc consumed worldwide originates from mined ores and the remaining 40% from recycled or secondary zinc. The level of recycling increases each year, with step in progress in zinc production and recycling technology.

For the zinc and steel industries, recycling of zinc-coated steel provides an important new source of raw material. Historically, the generation of zinc-rich dusts from steel recycling was a source of loss from the life-cycle (landfill); however, today technologies exist which provide incentive for steel recyclers to minimize waste. Thus, the recycling loop is endless - both zinc and steel can be recycled repeatedly without any loss of their physical or chemical properties.

Zinc is recycled at all stages of production and use, including scrap that arises during the production of galvanized steel sheet, scrap generated during manufacturing and installation processes and from end-of-life products. The presence of zinc coating on steel does not affect steel's recyclability, and all types of zinc-coated products are recyclable. Similarly, the presence of zinc in alloys does not affect its recyclability; the alloys are remelted and used to manufacture new products of the same alloy.

The amount of zinc available for recycling varies due to the generally long, useful life of zinc-containing products, which is variable and can range from 15-plus years for the zinc-coated steel panels used in cars or household appliances - to over 100 years of zinc sheet used for roofing. Galvanized steel used in public infrastructure applications, such as street lighting columns and transmission towers, are often in service for 50 years or more. All of these products tend to be replaced due to obsolescence, not because the zinc has ceased to protect the underlying steel or building.