

Stainless statistics

Welcome to the first edition of **Stainless Statistics**, a new feature from **The World Bureau of Metal Statistics (WBMS)**, which will highlight significant developments in the stainless steels market. **WBMS** recently published **World Stainless Steel Statistics 2021**, which also includes trade in stainless steel scrap. Following is a review of stainless scrap, including the latest trade data.

By The World Bureau of Metal Statistics

It is useful to remind ourselves of how important scrap is in the production of stainless steel. However, we should first consider the importance of other competing materials and their strengths and weaknesses. Firstly there are other metals, including carbon steel and aluminium. Like stainless, these can be remelted and used again, so they share these merits. Plastics have seen massive growth in the last few decades, but the environmental damage of discarded obsolete products will require a paradigm shift in that industry. For some applications, stainless could be an alternative recyclable material.

In this context, it is interesting to compare stainless steel to gold. Almost all the gold that has ever been mined and melted over the millennia is still in use. It is a store of value, so why would you discard it? The same is true to a lesser extent with stainless scrap. Its value, even in a recession, is many hundreds of US dollars per tonne. You do not need to refine it and remove carbon, sulphur etc, as with primary raw materials, that has already been done. You simply need to remelt it for the most part. So recycling is a merit in

terms of economics and the environment.

Origin of raw materials

Chart 1 shows the traditional view of the origin of raw materials for stainless production. The actual numbers vary from year to year. In boom years, stainless slab production increases strongly, whereas scrap supply tends to be price inelastic, so more primary material is needed to fill the gap. In recession years, slab production falls as the industry runs down inventory, scrap is available from the higher

recent production, and fewer primary purchases are needed.

Nearly half of the industry needs are supplied by scrap, which is a plus point for the stainless industry. Run-around or home scrap is probably less than 15% for many producers where yield from slab to say cold-rolled flat is typically greater than 90%.

New & old scrap

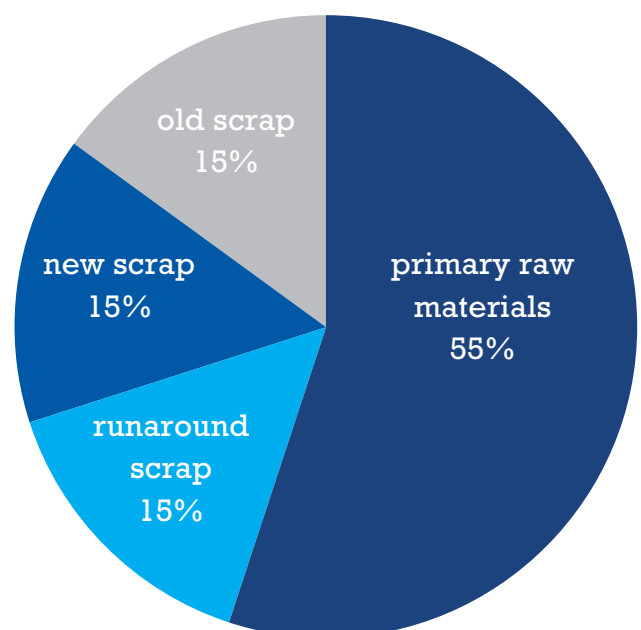
New scrap is also known as fabricator scrap. Where a large fabricator is generating clean, new scrap in large quantities, this may

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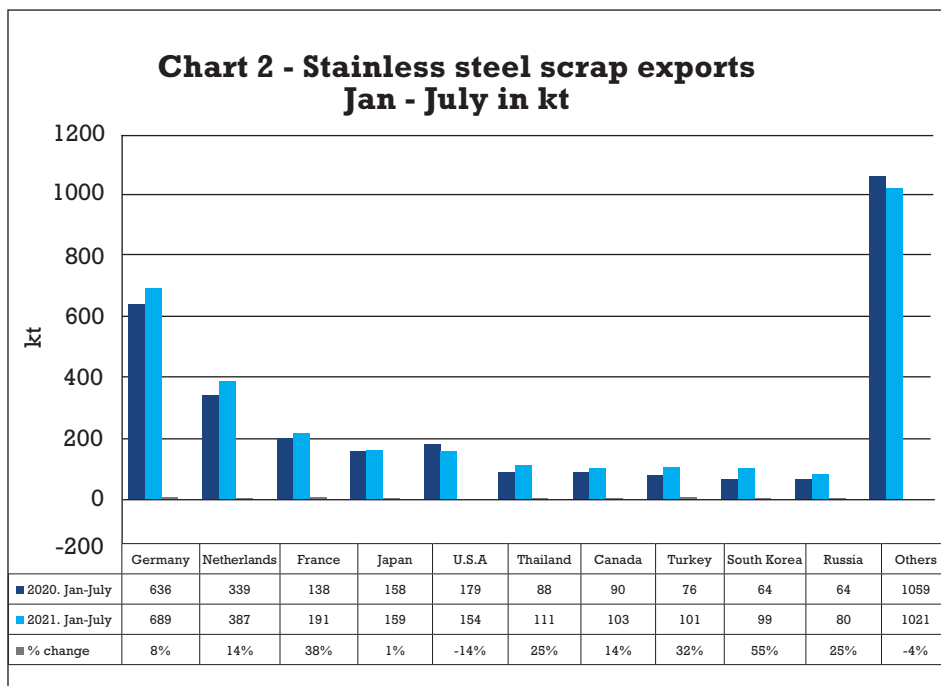
Chart 1 - Stainless steel raw materials - primary versus secondary



be shipped back to the mill from where it came. In many cases, new scrap will end up at a scrap processor. Again, the more advanced computer-controlled production processing today tends to reduce the amount of scrap arising. Obsolete or old scrap is an interesting resource to try to quantify. Firstly, you need to calculate the likely lifetime use of stainless by application. For a stainless steel auto muffler, that could be 5 to 10 years; for stainless curtain walling on a skyscraper it could be 50 years. Secondly, one needs to calculate the percentage of obsolete scrap recovered, and how much is lost to landfill or is remelted in carbon steel. Although it is likely that home scrap is rather less than 15%, it is also likely obsolete scrap is now somewhat higher than 15%

Chemical composition

The stainless scrap industry uses a sophisticated process to test the chemical composition of the scrap they purchase, and to prevent harmful contamination. Some scrap may be sorted and directly resold when the origin and composition are clear. A large part is processed into what is known as artificial scrap. For example, a rectangular bale of scrap may contain grindings or fine particles of stainless or nickel alloy or chrome alloy scrap. The overall specification will be AISI 304, but it will be a carefully controlled mix of several materials. This is one of the strengths of stainless steel: it can be produced from nickel and chrome scrap as well as stainless scrap.



Global scrap production

Global stainless steel production is of the order of 50Mt/a. If we assume new and obsolete scrap combined is around 30%, then purchased scrap is around 15 Mt/a. We can see in Charts 2 and 3 that the recorded global trade is about 3 Mt in 7 months, suggesting about 5 Mt annually or 33% of purchased scrap. So most of the scrap appears to be used locally (67%), although some of the trade may be under-recorded. Chart 2 shows exports of stainless scrap in January to July 2021 compared with the corresponding period of the previous year. The global total increased by 7% from 2.9 to 3.1 Mt. Germany and The Netherlands accounted for nearly 1 Mt between them.

The traditionally large global stainless scrap dealers (ELG, Cronimet and others) are based in those countries, and much of the trade goes through Rotterdam and the Rhine. The other main exporters do produce stainless but are large users of stainless so have an export surplus of scrap. Canada is a significant user but no longer has stainless meltshops. Both Thailand and Turkey are significant end-users of stainless and also have their own cold rolling facilities based on imported hotband.

Global scrap imports

Global imports increased by 17% from 2.7 to 3.1 Mt over the seven month period for January to July 2021 (Chart 3). Both India and Belgium, the main importers, have large meltshops, as does Spain. So none of these come as a surprise. There is no stainless production in The Netherlands, so these imports may be for the use of the local scrap processors or for onward shipment to meltshops in Belgium or elsewhere. The only significant decline is into Taiwan, where stainless slab production has fallen. 'Others,' which accounted for one-third of exports, accounts for only 15% of imports, demonstrating the industry concentration in stainless melting in recent years. Unusually for most metals analysis, China does not feature as a major player in the international trade in stainless scrap.

