Rare-earth Information Center INSIGHT

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Galfan Revised

The article concerning Galfan in the December 1, 1989 issue of RIC **Insight** provoked a number of responses especially with regard to the amount of mischmetal used per year. The main problem was that tonnage values quoted for 1988 and projected for 1989 were the cumulative total values and not the yearly values, as implied in an article written by the President of the International Lead Zinc Research Organization (ILZRO), who stated "Galfan has shown exceptional growth - from 1,600 tonnes in 1982, its first year of commercial production, to 365,000 tonnes in 1988, with 565,000 tonnes forecast for 1989". These were the numbers quoted in last month's **RIC Insight**. A letter dated December 13, 1989 by M. P. Roman, Director of GALFAN Technical Resource Center, ILZRO informed me that these were cumulative numbers and that the worldwide total for 1988 was 145,000 tons while the latest 1989 forecast is 240,000 tons which would make the cumulative 1989 total 610,000 tons, up 45,000 tons from the earlier projection.

The other confusing thing is that these numbers refer to the amount of "steel coated with Galfan" and not the amount of Galfan alloy or zinc that is used in their application. Unfortunately all of the statistical data we have seen strongly suggests that these values are the amount of Galfan. This distinction was intitially pointed out by V. Willemart of Sassoon Metal and Chemicals SA in Brussels and later confirmed by Mr. Roman, who is responsible for these data. RIC thanks both of them for their comments and assistance in this matter.

Using the latest data supplied by Mr. Roman of ILZRO we make the following estimates for the amounts of Galfan and mischmetal used in 1989, all units are metric tons.

Country(ies)	Amount of Steel Coated with Galfan	Amount of Galfan[a]	Amount of Mischmetal[b]
North American	30,000	1,500	0.8
Europe	100,000	5,000	2.5
Japan	110,000	5,500	2.8
Totals	240,000	12,000	6.1

[a]Assuming an average of 5% of the steel tonnage is Galfan.
[b]Assuming an average mischmetal content of 0.05%.

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Thus the amount of mischmetal used in the Galfan application is significantly smaller (by a factor of about fifty) than what we had suggested in the December 1, 1989 issue of **RIC Insight**. We apologize for any inconvenience this may have caused our readers.

Furthermore, Mr. Roman was kind enough to point out that the major portion of the growth of the Galfan market is due to the opening of new markets for zinc alloy coatings replacing non-zinc coatings or plastics, uncoated steel or wood, due to the exceptional properties of Galfan. Furthermore, he believes Galfan's potential for painting has not been fully realized.

High-Definition Television

Today we hear a lot about high-definition television (HDTV) and there is no doubt that it is coming, and for the rare earth industry, especially those involved in color TV phosphors, it cannot come any too soon. The HDTV sets will be larger and the aspect (width to height) ratio will be 16 to 9 compared to today's 12 to 9 aspect ratio. This obviously means that the amount of rare earth phosphors used in a TV set will be larger. The HDTV pictures will be significantly sharper because the number of scan lines will nearly double, going from 525 (625 in European sets) to 1000 and the number of dots per scan line will more than triple from 300 to 1000. The growth of the HDTV sets will be slow because the initial cost will be over $2000 per set with the first ones expected to be available in the U.S.A. at the retail level in 1992. The cost is expected to drop below $2000 toward the late 1990's.

Third U.S.A. Rare Earth Mine Opens

Imperial Mining Co. began production of a mixed heavy mineral sands concentrate at its Marion, North Carolina gold mine last summer. The concentrate's major constituent is monazite with lesser amounts of zircon and xenotime. This deposit is the first U.S.A. source known to have produced commercial quantities of xenotime. At the present time about 2 mt per day of the concentrate are being recovered, but this is expected to increase in the future.

TiN Coatings

TiN coatings are used in a variety of high technology applications, especially as a hard surface coating. Chinese scientists have found that yttrium can improve the adhesion between the base metal and the ion plated TiN coating. The wear resistance of the yttrium containing coating is about the same as that of the standard TiN coating. From x-ray diffraction and electron microscopy studies, Jin et al. [**Acta Met. Sinica**, 25 [1], B55 (1989)-in Chinese] conclude that the yttrium reacts with the TiN to form free Ti and YN. These reaction products plus some of the TiN and Ti_2N phases form an intermediate layer between the base metal and the outer layer of TiN plus Ti_2N.

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