

# ZINC : Problems with coated Steel

- Vaishnavi Naik



## Introduction

The most widely used metallic coating for the corrosion protection of steel is a zinc (galvanized) coating. It offers a very good combination of galvanic and barrier protection. Its excellent performance for many applications is well documented. However, in the quest to find even better products, researchers have continually attempted to develop improved coatings for steel that can be commercially applied. Often, the target has been to find an improved product for specific end uses, e.g. one having superior corrosion resistance or better coating formability. Most often these attempts met with little success, either due to an undesirable product attribute, or because it was too expensive or difficult to manufacture.

One hot-dip product that was successfully developed is a 55% aluminum-zinc alloy coated steel sheet. This product is known by many different trade names throughout the world, viz.; Galvalume® (a registered trademark of BIEC International Inc., and some of its licensed producers, and a trademark of Dofasco Inc. in Canada), Z-NAL® (a registered trademark of Steelscape Inc.), ZINCALUME® (a registered trademark of BHP Steel (JLA) Pty Ltd.), ZINTRO-ALUMTM (a trademark of Industrias Monterrey S.A.), and GALVALTM (a trademark of Galvak, S.A. de C.V.).

Following its introduction in 1972, it has been well received in the marketplace, especially for metal building roofing and the cumulative worldwide production now exceeds 70 million tons, with an annual production level currently approaching 7 million tons. A 55% aluminum-zinc alloy (55% Al-Zn) coating is comprised of 55% aluminum, 43.5% zinc, and 1.5% silicon. Steel sheet with a 55% Al-Zn coating has proven to be an excellent product for long-life roofing sheets, especially low slope roofing on industrial buildings. It has been widely applied as bare (unpainted) sheet with the coating being directly exposed to the atmosphere. The product is also used as a substrate for prepainted sheet when a more decorative finish is desired and this use has recently shown significant rates of growth. When used for low slope roofing, 55% Al-Zn coated sheet has performed extremely

well for over 30 years and in some cases over 35 years, without failure.

## ZINC : Problems with coated steel

Output from numerous smelter projects globally will boost second-half supply, but that's not why pricing may be dragged down. Global consumption of refined zinc may not grow as well as last year. Reason: Sales of galvanized products for manufacturing and construction may be depressed in the second half.

Price-inflating zinc-market fundamentals leaned toward high prices in 2004 when global use rose by 5.6%, well ahead of the 4.8% forecast. But 2005 has become a question mark. The projected 5.8% demand growth forecast is in jeopardy. In fact, even the more conservative 4.3% demand increase projected by the International Lead Zinc Study Group did not occur. Reason: The possibility that high crude-oil prices cut economic growth in the U.S. and Europe, two major world zinc-consuming regions. The experts foresee continued reduced purchasing of galvanized steel sheet by the automakers and auto parts producers.

World production was expected to expand slowly, anyway, due to short supply of concentrates, the raw materials smelted into metal. So, say the mavens, the world's refined zinc market should continue to exhibit a deficit. In addition, Chinese exports kept moving downward in 2005, and some analysts are even suggesting that China will be a net importer. The report from the Ministry of Natural Resources and Wildlife for the province of Quebec adds: "Buoyancy of market fundamentals for zinc should allow the average annual price to rise again in 2005, although more modestly than 2004."

World consumption grew by 4.2% in 2004. For 2005, some bullish analysts forecast world consumption growth of 5% with China, Russia and North America leading end-use demand. That's why most mavens initially expected the market deficit to widen in 2005. However, full-year consumption appears to be stuck at the 4.2% growth rate of 2004 and, with expanded output evident worldwide, the deficit is now projected to shrink to about 90,000 metric tons. Increased usage of galvanized (zinc-coated) steel in

China is a given since demand has benefited from investment in infrastructure projects such as the construction of new roads, railways and power transmission facilities and the rapid expansion of the housing, automotive and white-goods sectors. It still is expected that Chinese use of refined zinc will increase by 10-11% again this year. But, in the U.S., especially, the reduction in automotive production in the first half is causing economists to downplay earlier views that increased shipments of galvanized steel this year will be the main influence on a predicted rise in demand of 6-7%. And, now, the market watchers are reinforcing their views that zinc demand in Europe will rise by 1.5%.

World zinc prices increased by a dime to 48¢/lb in 2004, when demand did surge, and the early consensus forecast had suggested another nickel hike in 2005. Instead, the midyear LME price of 59¢ is just what the experts now are looking for as the full-year average. In effect, while the rate of demand growth and the increase in pricing was healthy in the first half, the mavens now are suggesting no improvement either in the second six months. Even the most bullish forecasters are projecting only 60-61¢ as the annual average, and only if there are smelter shutdowns caused by fires or floods.

The zinc metal market recorded a deficit of almost 207,000 metric tons in 2004, the first global supply shortfall since 1996. The global zinc mine supply increased by 5% to 10.27 million metric tons in 2005. Decreases in supply in Australia and Peru in 2004 was balanced by increases in Canada, China, India, Ireland, Sweden, the U.S. and Namibia, where output at Anglo American's

Skorpion mine is nearing full capacity. Refined production only rose 2.7% last year and is expected to be in slow-growth mode again this year. However, the London-based International Lead Zinc Study Group reckons a 4.7% increase in world production—the accumulated total of expansions in places as far flung as China, Australia, India, Ireland, Mexico, Namibia, Peru, Sweden, Norway and the U.S. Production increases also are expected from Canada, South Korea, Kazakhstan, where Kazakhmys's new Balkhash plant is expected to be running at close to full capacity.

Economist Mothersole at Global Insight explains that expansion in mine capacity during the 1990s was excessive and placed zinc in a chronic surplus condition. The industry has taken corrective measures since then; mine production rose a small 2.6% in 2003 but then fell 7.0% in 2004. Slab (refined) production reflects the relative scarcity of concentrates and grew just 2.7% in 2004. Mothersole explains the key to any 2005 forecast is whether refiners will continue to restrain production to a modest 2.5%. However, other analysts believe restraint isn't in the cards because merchants need the money.

	2003	2004	2005	2006
Supply	21,755	22,443	23,325	24,669
Demand	21,680	22,899	23,865	24,868
Balance	75	(456)	(540)	(198)
Price (¢/lb)	38	48	59	52

## SMS Meer delivers its eighth section mill to China



Jiexiu Xintai Iron & Steel Co. Ltd., in the province of Shanxi, China, has placed an order with SMS Meer, a company of the SMS group, Germany, for the supply of a section mill for the rolling of beams in the dimensional range of 200 to 1,000 mm. The mill is designed for 1.2 million t per year. It will further increase China's capacity for parallel-flanged beams and thus satisfy the high domestic demand. The supply scope includes the planning and engineering, the technological core equipment, the training of the customer's personnel and the supervision of erection and commissioning.

Hot commissioning of the mill is scheduled for 2009. The heavy beam mill is equipped with modern universal stands of the CCS® type. Thanks to the hydraulic adjustment control system and the highly rigid mill stand design, the final dimensions can be rolled within a narrow tolerance range. The 9-roller CRS® compact roller straightener with straightening rollers mounted in bearings on both sides, with hydraulic adjustment and automatic straightening roller changing allows high flexibility and straightening quality with minimal residual stresses. Program changing on the mill train takes no more than 20 minutes. The rolled stock is divided up into finished lengths by means of the proven SMS Meer cold saw technology, which is characterized by its low cutting costs. This heavy beam mill also uses SMS Meer's patented XH® universal beam rolling principle. This economical rolling method has already been implemented by SMS Meer in 16 new mills since its introduction in the early 90s.