



THE SFP CADMIUM PRESS REVIEW

18th April 2005

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by Roland Chavasse

SFP Research

SFP Metals (UK) Ltd
25 Grosvenor Street, London, W1K 4QN
Tel: +44 (0) 20 7629 8887
Fax: +44 (0) 20 7629 9622
Email to: roland@sfp-metals.co.uk
www.sfp-metals.co.uk



Cadmium Metal Quotes

LMB Free Market 18th April 2005

\$/lb in warehouse	Low	High
Min. 99.99%	0.90	1.00
Min. 99.95%	0.85	0.95

Metal Pages 14th April 2005

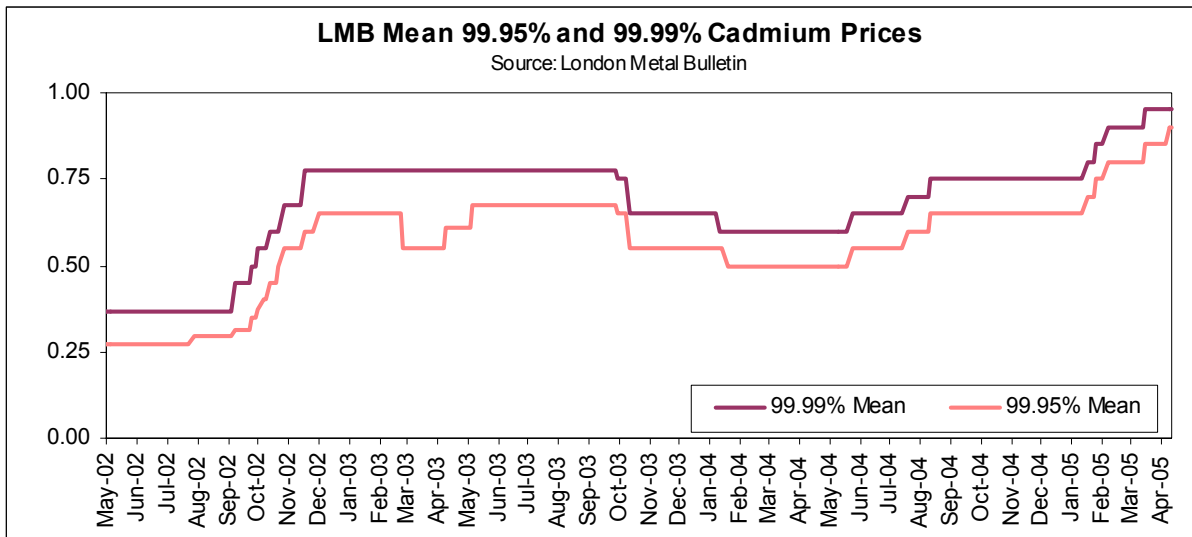
\$/lb in warehouse	Low	High
Min. 99.99%	0.90	1.05
Min. 99.95%	0.80	0.90

Platt's Metals Week 11th April 2005

\$/lb in warehouse	Low	High
Free Market HG	0.95	1.05
MW NY Dealer	0.90	1.00

Ryan's Notes 8th April 2005

\$/lb in warehouse	Low	High
Min. 99.95% (Rotterdam)	0.90	0.95



WBMS World Refined Cadmium Production and Consumption 2001 - 2004

(all in MT) Full Year	2001	2002	2003	2004
Production	17,547.0	16,195.3	17,126.8	18,057.0
Consumption	18,062.1	19,204.9	20,053.1	17,273.9
MARKET BALANCE	-515.1	-3,009.6	-2,926.3	783.1

Currencies and Commodities

Financial Times Currency Market Data: 15 th April 2005	
Euro (€) per US Dollar (\$)	0.78
Pound Sterling (£) per US Dollar (\$)	0.53
Japanese Yen (¥) per US Dollar (\$)	108.25



Cadmium Market Executive Summary

MARKET ROUND UP

1) Cadmium prices are beginning to merge as buyers snap up lower grades, causing with 99.95% metal rising on Chinese purchasing of scant material to convert into cadmium oxide for battery production. The price of 99.95% cadmium has nudged up five since last week, closing in on 99.99\$ metal which is said to be trading up to \$1.10. "The Chinese have returned to the market quite heavily, which is driving the price up slightly," a source said.

[Metal Bulletin 13/04/05. Read source article? – See page 6]

2) Cadmium remains firm with prices for 4N material hauling themselves over the \$1/lb level and 3N5 material is in the upper 80 cents though more bullish sources claim the market is over 90 cents. Traders report that Chinese buying has returned to the market although they are resisting offers over \$1/lb. As demand increases for the growing battery industry in China, the Chinese will have no choice but to come to terms with the higher prices.

[Metal Pages 08/04/05. Read source article? – See page 6]

3) The cadmium market is said to be steady with business reported in the mid 90 cents to over \$1/lb for 4N material and 3N5 in the 80 cent range.

[Metal Pages 25/03/05. Read source article? – See page 6]

4) Cadmium has reached eight-and-a-half-year highs and could go further, spurred by strong demand and short supply. High grade 99.99% metal is presently changing hands at between 90 cents and \$1 per lb, while lower grade 99.95% can be picked up for around 80–90 cents. An industry source said "I'm seeing a lot of demand for material at the moment. Even the Chinese consumers are willing to pay higher prices to ensure delivery." One large European consumer said cadmium prices have benefited from the rises that other minor metals such as selenium have seen.

[Metal Bulletin 23/03/05. Read source article? – See page 7]

5) Cadmium continues to hold firm, with 4N business reported over \$1 last week. Western trade sources confirmed European business took place at \$1.04/lb, basis in warehouse Rotterdam and are now indicating a market for 4N material at 95-105 cents/lb, with 3N5 at 90-95 cents lb and even bearish traders admit that producers are holding out for the higher numbers. One western producer official said that although his company was out of the spot market he was pretty happy with the way prices have been going. "We're covering our costs now," he said. Just being able to sell cadmium is a major plus for zinc producers, who would otherwise have the costly and onerous burden of land filling it.

[Metal Pages 21/03/05. Read source article? – See page 7]

6) Cadmium prices remain firm around \$0.75-0.85 for 3N5 material and \$0.90-1.00/lb and rising for 4N material. A sale to a European consumer of 4N balls was reported at just under \$1.05/lb.

[Metal Pages 18/03/05. Read source article? – See page 8]

7) Cadmium is currently 75-85 cents for 99.95% material and 85-95 cents for 99.99%. "We've traded at close to and on \$1 for higher grade metal and it looks strong at the moment," said a trader and another source agreed, adding that a tightness of material coming out of Peñoles in Mexico — along with its planned maintenance closure set for April — will only add to the shortage. "It's looking a little more exciting and is moving up," the second said. A dissenting voice was heard to say "cadmium has never been sexy and probably never will be," perhaps a little harsh?

[Metal Bulletin 03/03/05. Read source article? – See page 8]



SUPPLY

Budel

8) Dutch zinc smelter Budel, one of Europe's biggest suppliers, expects strong global zinc prices over a long period and forecasts continued market deficit beyond 2005. Budel plans to boost capacity to 260,000 mt by 2006 and did not envisage a bigger rise, despite surging prices. Last week, Budel's owner, Zinifex, forecast zinc price to reach \$1,570/mt. Zinifex did not provide a profit forecast for Budel, which increased its production to some 230,000 mt last year from 212,000 mt in 2003. The plant receives all of its zinc concentrates from Zinifex's Australian mines.

[Reuters.com 24/02/05. Read source article? – See page 8]

Electrozinc

9) Russian zinc producer Electrozin has unveiled plans for an across the board output hike this year, as well as a major investment programme. On the back of a strong recent market, in volume terms cadmium is set to show the most notable increase, seen rising 18.9% to 189 mt. Zinc output is forecast at 88,000 mt, 8.5% higher than 2004, while lead is seen up 3% to 26,210 mt.

[Metal Pages 10/03/05. Read source article? – See page 9]

Espanola del Zinc

10) The loss widened for troubled Espanola del Zinc last year, on the back of lower sales and production. The Madrid based firm, who incurred charges of €0.5m as a result of filing for bankruptcy last month, has reported a net loss of €21.3m (US\$27.9m) for 2004, compared to the €4.4m loss seen in the previous year. Total zinc production of 32,807 mt was 19.5% below 2003, with a raw material shortage and the stoppage at its Cartagena facility taking their toll. The company also produces cadmium.

[Metal Pages 04/03/05. Read source article? – See page 9]

Huludao Zinc

11) China's leading zinc, cadmium and indium producer will restart 80,000 mt of zinc capacity for the first time in four years next quarter, provided it can acquire enough raw materials. Huludao Nonferrous Metals, through its wholly owned subsidiary Huludao Zinc, halted a 130,000 tpy zinc plant in 2001 amid low prices and an ore shortage. In August last year 50,000 mt of this capacity was bought back on line, and now, with zinc prices hitting a seven year high and the outlook positive, the company has confirmed plans to resume the remaining 80,000 mt, from May onwards. The firm has not been affected by the power problems that have plagued other domestic zinc producers, such as Zhuzhou. Russia has been mooted as a possible source of ore feed.

[Metal Pages 02/03/05. Read source article? – See page 10]

Serbia

12) Serbia is proposing the tender of several mineral deposits rich in copper, gold and cadmium. The Serbian government said sites at Crni Vrh in eastern Serbia are also said to hold silver, lead, and zinc. The government will be entitled to 3% of annual earnings from ore exploitation, it said. Copper giants Rio Tinto, Phelps Dodge and BHP Billiton are expected to bid for the concessions.

[Reuters.com 24/02/05. Read source article? – See page 10]

Zinifex Ltd

13) Production at Zinifex's Century lead and zinc mine in Queensland, Australia, has been halted after an electrical fault in the SAG mill. The plant, which has a nominal capacity of 500,000 tpy of contained zinc and 65,000 tpy of contained lead in concentrate, will be shut for 11-18 days and Zinifex is likely to lose 15,000-25,000 tonnes of contained zinc production, according to a company spokesman. "We will be able to catch up a little bit, but not the majority of that," he told MB. Zinifex owns and operates the Century and Rosebery lead-zinc mines in Australia, as well as four smelters in Australia, the USA and the Netherlands.

[Metal Bulletin 21/03/05. Read source article? – See page 10]



DEMAND

Batteries

14) In 2004 battery maker Saft saw turnover up by 5.5% and earnings up by 28%. The year was marked by strong growth in operational performance. The Specialty Battery Group division (48% of turnover), Industrial Battery Group division (35% of turnover) and the Rechargeable Battery Systems division (17% of turnover) all saw good growth. In 2004 Saft provided Li-ion batteries for Hispasat's Amazonas satellite, built by EADS Astrium, announced a new plant in China, and signed a major contract for batteries with BAE Systems. Looking forward Saft say they are confident of further growth.

[Saft Press Release 06/04/05. Read source article? – See page 11]

15) Saft's high-power rechargeable nickel-cadmium batteries are powering 15 new trams in Nottingham, UK . The Saft SRX 24V batteries, which save weight and space on the trams, are mounted on the roof due to the low floors and will provide back-up power for the 24V DC circuits controlling the brakes, doors, lights, air-conditioning and heating, communications and CCTV systems. In the event of a mains power failure, these batteries can also provide emergency power. They can function in temperature from -50 deg C to +70 deg C.

[Metal Pages 08/03/05. Read source article? – See page 12]

16) Gadget-maker Solar-Powered have designed a new torch that runs off solar-power stored in nickel-cadmium batteries. Recharged automatically during the day by the sun the NiCd batteries for up to 3 hours' of flashlight use. The torch can also be used as a bicycle light. It also runs on regular batteries, should you live in England and can't rely on any sunlight.

[Lehmans.com March 2005. Read source article? – See page 12]

IN OTHER NEWS

Intelligent Machines?

17) A special low-melting point alloy of bismuth, lead, tin and cadmium that can be squirted from a heated syringe has allowed for the first time three-dimensional (3D) printers build objects from scratch. The new printers could vastly reduce the cost of 3D models, paving the way for a future where broken objects and spare parts are simply "re-printed" at home. Previously automated 3D printers could only model using plastic, and the possibility of using metal is creating waves. Matt Moses, a consultant on self-replicating robots to NASA, said the idea was "very plausible" and could one day be used to construct machine parts in space.

[NewScientist.com 18/03/05. Read source article? – See page 12]



Source Press Articles

1) Cadmium prices begin to merge as buyers snap up lower grades

Metal Bulletin 13/04/05

The price variation between low and high grade cadmium has lessened with 99.95 percent metal rising on Chinese purchasing of scant material to convert into cadmium oxide for battery production. The price of 99.95 percent cadmium has nudged up five cents to 85–95 cents per lb since last week, closing in on 99.99 percent metal, which is still trading at between 90 cents and \$1 per lb. “The two grades have really started to merge into the same price bracket. With 99.95 percent very short on the ground it’s almost as cheap to get higher grade cadmium,” said a London-based trader, who claimed sales for lower grade material as high as \$1.10. A second trader agreed, saying that he is starting to offer at higher prices. “The Chinese have returned to the market quite heavily, which is driving the price up slightly,” he said. Not all agree with these bullish sentiments, claiming that there is ample material around. “I don’t think there is a shortage of 99.95 cadmium and metal can still change hands at the lower numbers as opposed to the \$1 that some people are claiming,” said a trader who had sold material at 85 cents per lb.

2) MARKET ROUNDUP – is this the beginning of ‘super spikes’

Metal Pages 08/04/05

The recent buzz expression in the press has been ‘super spike’ after Goldman Sachs said in a research report that oil markets have entered a ‘super-spike’ period that could see prices rising as high as \$105 a barrel. According to an analyst from Goldman, a super spike period is defined as a multi-year trading band of prices high enough to meaningfully reduce consumption and recreate a spare capacity cushion only after which lower prices will return. These spikes occur under exception conditions when supply cannot or is not increased to meet demand so driving prices up to heights never experienced before. If current market conditions continue, and it is widely accepted that China’s booming economy will run for some years yet, even if at a slightly slower rate of growth, this scenario could in fact be applied to some metals in the future [...] A market that continues to be of little interest is antimony being summed up by participants as ‘dead’ and with prices softer, but considering the poor demand the price is holding up quite well supported by the belief in the strong fundamental by the major Chinese producers. Cadmium remains firm with prices for 4N material hauling themselves over the \$1/lb level and 3N5 material is in the upper 80 cents though more bullish sources claim the market is over 90 cents. Traders report that Chinese buying has returned to the market although they are resisting offers over \$1/lb. As demand increases for the growing battery industry in China, the Chinese will have no choice but to come to terms with the higher prices. Prices for indium have drifted back under \$1,000/kg for 4N material in thin trading due to the current slow demand having reached about \$1,050/kg in mid March. [...]

3) MARKET ROUNDUP

Metal Pages 25/03/05

Selenium supplies remain tight and prices extremely firm around \$55/lb and expected to continue to rise. The cadmium market is said to be steady with business reported in the mid 90 cents to over \$1/lb for 4N material and 3N5 in the 80 cent range. The indium market is still waiting for the Japanese ITO producers to come into the market and until then prices will remain unchanged to slightly softer purely on the lack of demand. [...]



4) Cadmium at eight-and-a-half-year high

Metal Bulletin 23/03/05

Cadmium prices have risen to eight-and-a-half-year highs and could go further, spurred by strong demand and short supply. High grade 99.99 percent metal is presently changing hands at between 90 cents and \$1 per lb, compared with 70-80 cents at the start of the year, while lower grade 99.95 percent can be picked up for around 80-90 cents, up from 65-70 cents. Cadmium prices haven't been this high since October 1996, when high-grade material was trading at around \$1.10 per lb, a trader said. "I'm seeing a lot of demand for material at the moment. Even the Chinese consumers are willing to pay higher prices to ensure delivery," said a trader in the UK. A third trader was even more bullish, claiming that cadmium could move higher still. "There is hardly any 99.95 percent material around and higher grade material is being consumed in bigger quantities as a result," he said. Other traders in the UK are more sceptical about further increases and some have said that current prices are too high and do not reflect the current market. One large European consumer said he has had no difficulty obtaining material. "I am being offered metal all the time and can easily make purchases," he said. "I think the price has been talked up." Cadmium prices have benefited from the rises that other minor metals such as selenium have seen, but the strength of the rally is harder to see, he said.

5) Cadmium sale above \$1

Metal Pages 21/03/05

Cadmium continues to hold firm, with 4N business reported over \$1 last week. Western trade sources confirmed European business took place at \$1.04/lb, basis in warehouse Rotterdam and are now indicating a market for 4N material at 95-105 cents/lb, with 3N5 at 90-95 cents/lb. Other traders remain unconvinced that the market is straddling \$1. They put 4Ns at 85-90 cents and 3N5 at 75-80. "The bulls have pushed the market up on hardly any business," said one of the more bearish traders. He admitted, however, that producers are holding out for the higher numbers. Some producers, meanwhile, are having to turn away business, as they are well sold and tied in to long-term contracts. One western producer official told Metal-Pages that although his company was out of the spot market he was pretty happy with the way prices have been going. "We're covering our costs now," he said. Just being able to sell cadmium is a major plus for zinc producers, who would otherwise have the costly and onerous burden of land-filling the toxic by-product. Toxicity and environmental issues surrounding cadmium could put several European producers out of operation in the coming months or years. The move towards a partial ban on cadmium batteries is a "warning for the metals industry", a leading industry association told Metal-Pages in December. The European Environment Council has proposed a new directive on batteries and accumulators, with the primary aim to have all waste batteries collected and recycled, preventing their incineration and disposal. It also included a key amendment by the Council to the original proposal which would see a partial ban on portable cadmium batteries. It is this aspect which has provoked criticism from within the industry. "It creates a very bad precedent," said Jean-Pol Wiaux, manager of RECHARGE, the international association for portable rechargeable batteries. The Brussels based association – whose members include Bosch, Inco and Sanyo – had been part of a long term risk assessment study into nickel-cadmium batteries. "Unfortunately they have totally ignored the results," said Wiaux. The negative impact of any ban is obvious. Inco's Welsh subsidiary Inco Nickel Works warned in December that it could go out of business if such a measure was imposed. Xstrata's cadmium plant at Nordenham in Germany is in a similar position. The plant is Metaleurop's former zinc and cadmium operation. The plant is currently producing around 400 tpy – the same as when Metaleurop operated it. However, this material could well go next year if Xstrata is forced, by European environmental considerations, to close the cadmium circuit. Sources close to the plant expected to be heard how the ground lies around October, when the latest round in EC environmental talks takes place. "The plant will continue to operate as long as possible," said the sources. With 4N prices now pushing \$1 they will be more than happy to do just that, covering costs and, perhaps, even pocketing the change.



6) MARKET ROUNDUP – markets pause, but not vanadium

Metal Pages 18/03/05

[...] The antimony market has pretty much ground to a halt again with recent enquires covered and the market still waiting and hoping for better demand. Prices remain steady and with most Chinese material in strong hands suppliers are declining to accept bids under \$3,100/tonne though there are some parcels reported to be available at \$3,050/tonne for material without bismuth levels guaranteed. Business has been reported in the States at around \$3,310/tonne delivered and in Europe at \$3,130/tonne in warehouse. There is growing frustration on all sides in this market as consumers resist higher prices and many Chinese are immovable on price, resulting in ever tightening margins for traders. Prices in Japan are reported to have risen to a range of \$3,000-3,200/mt CIF Japan with tight supplies being cited as the reason. Cadmium prices remain firm around \$0.75-0.85 for 3N5 material and \$0.90-1.00/lb and rising for 4N material. A sale to a European consumer of 4N balls was reported at just under \$1.05/lb. Electrolytic manganese metal continues to weaken in a lacklustre market with prices in Rotterdam in the low \$1,600s and material for shipment offered at \$1,600-1,650/tonne CIF. [...]

7) Mercury revs up on increasing tightness

Metal Bulletin 03/03/05

Mercury is rapidly approaching \$1,000 per flask as continuing tightness adds further upward pressure on prices, although only small volumes are being traded, with consumers reluctant to incur the higher costs. Flasks of mercury are being traded at around \$850-950, an increase of around \$50 from previous levels, with reports that small quantities of mercury are being released from Kyrgyzstan after production halted temporarily. "There are little bits coming out of Kyrgyzstan and, if China grabs all of the excess, then the price will no doubt hit \$1,000," said a UK-based trader. Material can be picked up at around \$900, the trader claims, but the price moves out to \$1,000 for delivery in late April/early May. "There is already resistance to these figures because people simply can't afford the prices," he said. "Consequently, there isn't so much business going on." Elsewhere, some traders are talking up cadmium, which is 75-85 cents for 99.95 percent material and 85-95 cents for 99.99 percent, while others claim there is no change in the current price. "We've traded at close to and on \$1 for higher grade metal and it looks strong at the moment," said trader in London. A second agreed, adding that a tightness of material coming out of Peñoles in Mexico — along with its planned maintenance closure set for April — will only add to the shortage. "It's looking a little more exciting and is moving up," they said. But others disagreed: "People are talking it up but in reality they are unwilling to pay 85 cents for high-grade or 75 cents for 99.95 percent material. Cadmium has never been sexy and probably never will be," said one dissenter. Elsewhere, indium has steadied between \$1,000 and 1,050 per kg, while rumours of Russian's not being issued export licenses for antimony ore until May have failed to move the price, which remains at \$3,100-3,200 per tonne.

8) Dutch Zinc Smelter Budel Sees Mkt Deficit Beyond '05

Reuters.com 24/02/05

Dutch zinc smelter Budel, one of Europe's biggest suppliers, expects strong global zinc prices over a long period and forecasts continued market deficit beyond 2005, a company official said on Thursday. Martin McFarlane, manager investor relations at Budel's owner, world No. 2 zinc producer Zinifex, told Reuters Budel would stick to plans to boost capacity to 260,000 tonnes by 2006 and did not envisage a bigger rise, despite surging prices. London Metal Exchange zinc futures surged to fresh 7-1/4-year highs this week as stocks tumbled and power-related output cuts in China added to a global supply deficit. "The more recent forecasts indicate that the zinc market should remain in deficit beyond 2005. We believe that this is positive and should support prices



over a longer period," McFarlane said in a written reply to Reuters questions. "The signs we see of a very tight zinc concentrate market and increased zinc metal premiums for metal, support the views of the professional market commentators that 2005 should be a good year for zinc," he added. Last week, Australia's Zinifex forecast zinc price to reach \$1,570 a ton this year, from about \$1,403 on Thursday, underpinning a projected net profit of A\$190 million in the year ending June 30, nearly double its estimate in late 2004. Zinc, along with aluminum, both laggards in 2004's blistering price rally, were seen the hottest base metals in Reuters semi-annual base metals poll conducted in January. In the survey of 28 analysts, the median price forecast for LME cash zinc in 2005 was 53.5 cents/lb or \$1,180 a tonne. For 2006 the median forecast fell to 50.8 cents/lb (\$1,120 a tonne). Zinifex did not provide a profit forecast for Budel, which increased its production to some 230,000 tonnes last year from 212,000 in 2003. The global zinc market ended in deficit in 2004 after three years of oversupply as demand flourished in China on the back of its booming economy. Zinc is used mainly as an anti-corrosive coating on steel for the car, construction and household appliance sectors. McFarlane said Budel was on track to raise its production capacity to 260,000 tonnes by January 2006 or the first quarter of next year from the current maximum annual capacity of 232,000 tonnes. "The timing and the increase in zinc capacity at Budel have not changed ... despite the improved zinc prices," he said. Zinifex has said that it would soon divert some shipments of Budel's high grade zinc to China. The smelter, which is located in southeastern Netherlands and became operational in 1973, sells around 85 percent of its produce in an area including the Netherlands, Germany, Belgium, Norway and France, the plant has said. McFarlane said he did not expect the capacity expansion at Budel to lead to a significant increase in production of cadmium, which has also seen an increase in global demand. Budel also produces zinc alloys, sulphuric acid, copper cake and cobalt cake. Another by-product is a special leach product, which contains lead and silver and is sold to secondary European smelters that recover lead and precious metals. The plant receives all of its zinc concentrates from Zinifex's Australian mines.

9) Investment and output hike for Russian major

[Metal Pages 10/03/05](#)

Russia's second largest zinc producer has unveiled plans for an across the board output hike this year, as well as a major investment programme. Electrozinco is targeting overall production value of RR2.43 billion (US\$88.4 million) for 2005 as a whole, which would represent an increase of 60% year on year. On the back of a strong recent market, in volume terms cadmium is set to show the most notable increase, seen rising 18.9% to 189 tonnes. Zinc output is forecast at 88,000 tonnes, 8.5% higher than 2004, while lead is seen up 3% to 26,210 tonnes. Owner Urals Mining and Metal Company (UGMK) will invest RR328 million in the North Ossetian firm this year, an increase of 140%, on buying new equipment and construction.

10) Loss widens for bankrupt Zn firm

[Metal Pages 04/03/05](#)

The loss widened for troubled Espanola del Zinc last year, on the back of lower sales and production. The Madrid based firm, who incurred charges of €500,000 as a result of filing for bankruptcy last month, has reported a net loss of €21.3 million (US\$27.9 million) for 2004, compared to the €4.4 million loss seen in the previous year. This was despite a stronger first half showing, which saw the company, who also produces cadmium, post a €1.5 million net profit. The Euro's mounting strength against the weak US dollar was cited as offsetting the gains from a 26.6% rise in zinc prices last year. Turnover dropped by 3.8% year on year, to €37 million. Total zinc production of 32,807 tonnes was 19.5% below 2003, with a raw material shortage and the stoppage at its Cartagena facility taking their toll. Zinc sales fell by 22.8%, to €10.2 million.



11) Restart for Zn major after 4 years

Metal Pages 02/03/05

Asia's number one zinc producer will restart 80,000 tonnes of capacity for the first time in four years next quarter, provided it can acquire enough raw materials. Huludao Nonferrous Metals, through its wholly owned subsidiary Huludao Zinc, halted a 130,000tpy zinc plant in 2001 amid low prices and an ore shortage. In August last year 50,000 tonnes of this capacity was bought back on line, and now, with zinc prices hitting a seven year high and the outlook positive, the company has confirmed plans to resume the remaining 80,000 tonnes, from May onwards. The firm has not been affected by the power problems that have plagued other domestic zinc producers, such as Zhuzhou. Output for 2005 as a whole is targeted at least 320,000 tonnes of zinc, which would represent an 8.8% increase on the 294,000 tonnes reported last year. Huludao, which is also a leading domestic producer of cadmium and indium, will have to up its imports of zinc concentrate due to shortages within China. Russia has been mooted as a solution to the problem, and Huludao is understood to be considering investing in a mine in the far east of the country.

12) Serbia to offer mining concessions

Reuters.com 24/02/05

Serbia will call within 60 days tenders for the exploration and exploitation of copper, gold and boron deposits, the government said in a decree published in the Official Gazette. Three concessions will be granted for copper and gold exploration and exploitation at Crni Vrh in eastern Serbia near Bor, the home of troubled state-owned copper group RTB Bor. The three sites are also said to be rich in silver, lead, zinc, cadmium, rhenium, germanium and selenium. Another concession will be granted for boron exploration and exploitation in Baljevac na Ibru, southern Serbia. Boron is used in a wide variety of materials from cosmetics to fertiliser, fibre optics, textiles and rocket fuel. The government will be entitled to three percent of annual earnings from ore exploitation, it said. The government had earlier said copper giants Rio Tinto, Phelps Dodge and BHP Billiton were expected to bid for the Crni Vrh concessions.

13) Problems shut Zinifex plant

Metal Bulletin 21/03/05

Production at the Century lead and zinc mine in Queensland, Australia, has been halted after an electrical fault in the SAG mill forced owner Zinifex Ltd to stop its concentration circuit. The plant, which has a nominal capacity of 500,000 tpy of contained zinc and 65,000 tpy of contained lead in concentrate, will be shut for 11-18 days and Zinifex is likely to lose 15,000-25,000 tonnes of contained zinc production, according to a company spokesman. "We will be able to catch up a little bit, but not the majority of that," he told MB. "We are going to bring forward some scheduled maintenance, but the reality is that we will lose some production." While repairs have begun to the SAG (semi-autogenous grinding) mill, what the financial impact of the closure will be on Zinifex is still being determined. "It is rare to have a failure like that," said a mining expert in Brisbane. "Something went amiss big time," he added. Century, which is Zinifex's flagship mine, reported lower than expected lead production in the fourth quarter of 2004 because of low grade ore and was already expecting to see its lead concentrate production fall 15,000 tonnes below forecast for the full year to June 2005 before this latest incident. The mine was also hit by bad weather in December when 200mm of rain fell, causing mining disruptions. Mining at Century is continuing, with ore being stockpiled in preparation for the restart of the concentration plant, according to the Zinifex spokesman. Zinifex is the reincarnation of Pasminco, which entered voluntary administration on the back of some poor currency hedging. The company's share price has rocketed in the last few months and was barely checked by the news that the company's main mine was experiencing production problems. "Investors realise that it is not a management issue, but is just an unfortunate



event,” said the Zinifex spokesman. Zinifex owns and operates the Century and Rosebery lead-zinc mines in Australia, as well as four smelters in Australia, the USA and the Netherlands. Its focus is shifting towards the mine segment of its business and away from smelting, where low TC/RCs are cutting into its profitability. Zinifex does not hedge any of its metal or currency and is seen by investors as a pure zinc play.

14) Saft group's 2004 results

Saft Press Release 06/04/05

Turnover up by 5.5%. Earnings up by 28%. Saft, the world's leading manufacturer of high-end batteries for industrial applications, announces its consolidated results 2004 for the fiscal year ended December, 31. The year was marked by strong growth in operational performance.

- Turnover reached 586.9 million euros, compared with 557.3 million euros in 2003, the equivalent of a 5.5% increase (9.5% at constant exchange rates).
- Earnings increased by 28% before depreciation/amortisation.
- Market development was very favourable to the group. Growth was robust in the metering sector. Strong return to growth was also registered in the aviation and oil and gas infrastructure industries.

The group's divisions performed well. The increase in the group's turnover resulted from the combined growth of its three divisions:

- The Specialty Battery Group division (48% of turnover) designs specific batteries (lithium, silver, etc.) for industrial, space and defence applications. 2004 saw strong growth.
- The Industrial Battery Group division (35% of turnover) serves the industrial battery market for aerospace, rail, industrial applications and telecommunications. Growth in this division in 2004 was particularly strong in the aviation and stationary battery markets.
- The Rechargeable Battery Systems division (17% of turnover) is the world leader in rechargeable batteries for safety lighting and alarms and serves the market for batteries used in professional electronics applications. This division's turnover was stable, despite the significant impact of several external factors, including the weaker dollar and metal prices remaining high.

2004 highlights: continued international deployment and new contracts.

- The launch in August 2004 of Hispasat's Amazonas satellite, built by EADS Astrium with Saft lithium-ion (Li-ion) batteries on board. Amazonas is the second communication satellite in the world to be launched equipped with new generation lithium-ion batteries.
- The announcement in October 2004 of the opening of a new manufacturing site in China in 2005. This site, which will be Saft's 17th around the world, should begin operating at the beginning of 2006, with an initial 150 employees. The batteries produced by this new factory are destined for the Chinese market. Saft is reinforcing its presence on two market segments with strong potential in China: primary lithium batteries for water, gas and electricity meters, where Saft is already world leader, and where growth is estimated by the group at around 20% per annum, and batteries for railway applications, which is also a growth sector, due to the many projects for new metros.
- The inauguration in October 2004 of a new production unit at Saft's Poitiers site, to serve the needs of a 48 million euro contract with BAE Systems. The contract is to build batteries for the Sting Ray Mod1 torpedo propulsion. They equip the British armed forces' helicopters, planes and ships and are an anti-submarine weapon. Deliveries began in September 2004 and will continue until the end of 2010.

Outlook for 2005: Saft is confident that the group's development will continue in 2005 and that its financial situation will enable it to accelerate its investments. John Searle, Chairman and CEO, declared, "I am very pleased with Saft's performance in 2004 and have confidence in its growth perspectives, particularly considering our leadership position on our main markets and the growth potential of our activities."



15) Saft saves space on Nottingham Express

[Metal Pages 08/03/05](#)

Saft has recently supplied high-power rechargeable nickel-cadmium batteries to Nottingham, UK for a fleet of 15 new trams for the town's Express Transit system. The Saft SRX 24V batteries, which save weight and space on the trams, are mounted on the roof due to the low floors and will provide back-up power for the 24V DC circuits controlling the brakes, doors, lights, air-conditioning and heating, communications and CCTV systems. In the event of a mains power failure, these batteries can also provide emergency power. SRX batteries were designed for rail applications requiring short-duration high-current discharges of up to one minute and up to five times capacity. They have sintered positive and plastic-bonded negative electrodes which make them up to 40% smaller and lighter than a conventional battery of similar size, said Saft. They can be used globally as they can function in temperature from -50 deg C to +70 deg C. Saft is a leading manufacturer of industrial and military non-lead batteries and in 2003 purchased the non-lead batteries business of Exide Holdings Europe, SA primarily consisting of primary lithium batteries, secondary nickel-cadmium (Ni-Cd) batteries and primary and secondary silver-zinc batteries for military and industrial applications.

16) SolarVerter Solar-Powered Flashlight.

[Lehmans.com March 2005](#)

The windowsill is the place to store your flashlight, apparently. During the day, the sun's rays recharge the Solar-Powered Flashlight's (\$24.95) NiCd batteries for up to 3 hours' of flashlight use. It's also environmentally friendly since it uses renewable energy, and could come in handy for mounting on a bicycle (mounting bracket included), travelling and camping. A hard plastic case should protect the solar panels, it's waterproof up to 60-feet, and it floats. It also comes with two spare bulbs and runs on two AA batteries, should you live in England and can't rely on any sunlight.

17) 3D printer to churn out copies of itself

[NewScientist.com 18/03/05](#)

A self-replicating 3D printer that spawns new, improved versions of itself is in development at the University of Bath in the UK. The "self replicating rapid prototyper" or RepRap could vastly reduce the cost of 3D printers, paving the way for a future where broken objects and spare parts are simply "re-printed" at home. New and unique objects could also be created. 3D printing - also known as "rapid prototyping" - transforms a blueprint on a computer into a real object by building up a succession of layers. The material is bonded by either fusing it with a laser or by using alternating layers of glue. When it first emerged in the mid-1990s, futurists predicted that there would be a 3D printer in every home. But they currently cost \$25,000 (£13,000) and so have not caught on as a household item, says Terry Wohlers, an analyst at Wohlers Associates, a rapid prototyping consulting firm in Fort Collins, Colorado, US. Instead, they are used by industry to develop parts for devices such as aircraft engines, spaceships and hearing aids. Now Adrian Bowyer hopes to change that by making the first 3D printer capable of fabricating copies of itself, as well as a wealth of everyday objects. He reasons that prices would plummet to around \$500 if every machine was capable of building hundreds more at no cost beyond that of the raw materials. Better still, the machines could evolve to be more efficient and develop new capabilities, says Bowyer. Once he has the software to guide the self-replicating process, he plans to make it freely available online, allowing users to contribute improvements, just like the open-source Linux computer operating system, he says. Bowyer dreamt up the idea of the RepRap in February 2004. But now he has he figured out how to print conducting materials in three dimensions without using a laser, a key step if the machine is ever to make copies of itself. "We are very constrained in our access to materials," he explains. They must be sturdy enough to make up the body of the machine and yet simple enough to be fabricated entirely by the machine. "We have to avoid any design needing lasers and high precision measuring systems," he explains. 3D printers normally build circuits by fusing



together a powdered metal with a laser. But Bowyer plans instead on using a low-melting point metal alloy of bismuth, lead, tin and cadmium that can be squirted from a heated syringe to form circuits. Bowyer has already produced an electronic circuit by squirting the alloy inside a plastic autonomous robot, which itself was created using a commercial 3D printer. Because the heated syringe he used is very similar to the nozzle that deposits plastic layers in the printer, he envisions squirting both plastic and metal from the same nozzle in future self-replicating machines. The machine need not be capable of assembling itself, he says, only producing all the necessary parts, with the exception of the microprocessors and the lubricating grease. These could later be added and the various parts clipped together, Bowyer says. "People are quite capable of assembling things if they want to," he adds. "I am not interested in self-assembly, just self-copying." Whether such a machine would work has experts sharply divided. "I think Dr Bowyer's idea is very plausible," says Matt Moses, a consultant who has built a small self-replicating robot and advises NASA on research into self-replicating machines for space. But Wohlers disagrees: "[Bowyer] is referring to something that does not exist and has not been demonstrated. Will it develop in the future? Unlikely." He adds that even if all its components could be replicated by the machine, the concept does not make economic sense. "Many of the components could be produced much faster and cheaper by other machines," he says.

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