

# FLUORSPAR

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**W**orld fluorspar production output is estimated at 4.22 Mt - marginally higher than that in 1999 (4.20 Mt). This comprised 2.63 Mt acid-grade mainly for the fluorochemical and aluminium industries, and 1.59 Mt metspar predominantly for the steel industry. This output compares with the record high of 5.48 Mt in 1989 ahead of the impact from the Montreal Protocol on CFCs, and the low of 3.74 Mt in 1994 following the subsequent phase-out of CFC manufacture.

The market continued to be dominated by China with an output estimated at 2.2 Mt (52.2%) of which 1.2 Mt were reported exports. The other major producers with outputs in excess of 100,000 t, accounting for a further 36% of the total were: Mexico (15.1%), South Africa (5.0%), Russia (4.3%), Mongolia (3.7%), Spain (3.2%), France and Morocco (2.4% each).

Output increased significantly from Mexico, and also from CIS but reduced from all other geographic areas. The principal consumers were estimated broadly as Europe (1.0 Mt), North America (1.0 Mt), China (1.0 Mt) – 40% as low-grade for the construction industry, Japan (500,000 t) and CIS (500,000 t).

Supply and demand continued well-balanced with low stocks. There was an increase in reported imports to both the US and Canada; whilst those to Japan reduced. On the limited information at the time of writing, overall imports to Europe remained similar to 1999 but with a reduction to Germany and the UK and an increase to Italy.

Average prices for the year hardened, particularly in the second half, reflecting the tight stocks and an apparent shortage of available Chinese material. US recorded prices of imported acidspars averaged US\$128/t for the year against US\$124/t in

1999. By early 2001 acidspars prices quoted by *Industrial Minerals* magazine for Chinese imports to Europe showed a US\$10-US\$15/t increase reflecting the much higher export license prices announced in December for the initial 75,000 t tranche of the 2001 total 1.15 Mt quota.

The former Buffalo mine in South Africa, which was shut down in 1994, was purchased by International Metals Processing (Pty) Ltd (IMP) in May and commenced flotation reprocessing of old dumps in October with an anticipated output of some 60,000 t/y. There were no other changes in ownership, closures or announcements of new operations.

In the downstream market ICI sold their Klea fluorochemicals business in US, Japan and UK to Ineos Group plc in December. There were several investments announced during the year for fluorochemicals production increases - by Daikin expanding their output by 50% in Europe, Japan and US by 2004; and also by Atofina in France, Honeywell in the US; and Solvay in Germany (with a doubling of their worldwide 134A production). Ineos also announced an extension of HFC product range at Runcorn, UK. Pechiney announced a feasibility study in 2001 for a new 450,000-500,000 t/y aluminium smelter

Fluorspar production output ('000t)			
	1998 <sup>r</sup>	1999 <sup>r</sup>	2000 <sup>p</sup>
Asia - China	2,350	2,250	2,200
- Other	56	53	70
N America	598	557	635
S America	77	79	72
Western Europe	447	405	381
CIS and Mongolia	480	385	396
Africa	449	468	461
<b>Total</b>	<b>4,457</b>	<b>4,197</b>	<b>4,215</b>

<sup>r</sup> revised.

<sup>p</sup> provisional

to be located in either Australia, South America or Southeast Asia.

### North America

Mexico remained the only producer in the region. Reported output was sharply up at 635,200 t (557,100 t in 1999) of which 335,000 t was acidspar (323,000 t). Output was primarily from Las Cuevas, with a similar acidspar output also from Fluorita de Mexico; and smaller quantities from Minera Muzquiz and Minerales y Productos Metalurgicos' (MPM) operations in Zacatecas and Durango. The reported increase follows provisional figures from the Mexican Chamber of Mines lower than 1999. These later figures show the increase to be mainly metspar from Las Cuevas, with the increased acidspar coming from all the producers.

Much of the acidspar was converted domestically to hydrofluoric acid and aluminium fluoride. Exports included 109,100 t to Japan (113,100 t), 73,100 t (46,000 t) to Canada and 60,400 t (59,400 t) to the US. There was also significant export of mainly metspar to Europe, South America and Asia; and some tonnage for use in cement clinker manufacture both domestically and in South America.

US imports were much increased at 522,700 t (477,700 t in 1999 and 503,000 t in 1998) of which 484,000 t (419,000 t) was acidspar for the hydrofluoric acid and aluminium industry. However, reported consumption for the year, at 509,000 t, was very similar to the 503,000 t of 1999. The year was the first with no further sales from the now depleted National Defense Stockpile, although reprocessing of previously sold materials continues to feed the market. Some synthetic fluorspar continued to be used to supplement domestic consumption of the order of 5,000-10,000 t. There were recorded US stockpile material exports of 13,200 t (28,900 t) to Italy and 7,500 t (13,400 t) to Canada.

Canadian demand continued to be totally met by imports which increased to 180,100 t

(170,200 t) of which 160,800 t was acidspar (150,100 t). Imports were 41% from Mexico, 23% from China, 23% from Morocco, 7% from the US stockpile and 3% from Spain. The plans, by Burin Minerals, to reopen the Newfoundland mine and mill made no further progress.

### South America

The only reported output from the region was 72,000 t for Brazil (79,000 t) with no production from Argentina (7,000 t in 1999). All of this production was consumed domestically supplemented by imports mainly from Mexico and also from Europe.

### Western Europe

Production output decreased to 381,000 t (405,000 t). The reduction was due to lower production from Sardinia and the UK.

Most production was consumed within Europe apart from 13,800 t (11,500 t) of the continuing shipments from France to the Tunisian aluminium industry and smaller quantities of acidspar for speciality applications.

Imports continued to supplement the estimated 1 Mt consumption requirement with some 295,000 t from China (289,000 t), estimated 220,000 t from Africa (190,000 t) and significant tonnage from Mexico. German imports continued strong at 266,700 t (296,800 t) and also Italy 195,300 t (173,000 t). The other significant importer continued to be Norway with an estimated requirement for 48,000 t (47,700 t) for the Noralf aluminium fluoride operation. This plant was purchased by Outokumpu in April 2001.

### CIS and Mongolia

Output is assessed to have increased to 396,000 t (385,000 t). Some 85% of this production is attributed to the Yaroslavsky Mining Complex near Vladivostok in Russia, and to the Mongolian-Russian joint enterprise Mongolrostsvetmet in Bor-Undur, Mongolia. Yaroslavsky now appears to be the only Russian producer and the regional output is

entirely due to an increase in their reported production. In April it installed a new briquette plant and a larger 100,000 t/y unit is scheduled shortly.

Other production is reported in Uzbekistan and small quantities in Tajikistan and Kyrgystan. Production has been entirely for domestic consumption. Additional imports of material for internal demand have been obtained mainly from China.

### **Asia and Australasia**

The total production output fell slightly to 2.27 Mt (2.3 Mt). This was almost entirely from China with the Democratic Republic of Korea and Iran contributing some 65,000 t together and small quantities reported from Thailand and Pakistan. The Hadavi Corporation of Iran have reportedly doubled output and some material is being exported, including a 5,000 t shipment to Japan.

Of the assessed Chinese total production of 2.2 Mt (2.25 Mt) published exports were reported down at 1.2 Mt (1.22 Mt) but once again were in excess of the official 1.0 Mt quota. Domestic consumption has been estimated at 1 Mt comprising – 300,000 t of acidspar, 300,000 t of metspar and 400,000 t as sub-metallurgical grade for the construction industry.

The licence fee for exports remained fixed at around US\$39/t throughout the year. There was a reported shortage of material in the second half resulting in some price increases. Bidding for the first 750,000 t of the 2001 total of 1.15 Mt was held in December and 395,000 t were released under agreement bids at US\$39/t and 350,000 t under open bid at about US\$50/t-US\$84/t or US\$21/t higher than the 2000 average. Bidding for the remaining 400,000 t is expected in June or July 2001.

Production continued to be dominated by Zhejiang province (around 50%), with increases in Fujian and Jiangxi. In recent years closures and consolidations have seen

the number of flotation mills reduce from some 125 in 1997 to currently around 80.

Export destinations were primarily Japan, 360,000 t (410,000 t), the US, 320,000 t (300,000 t), Western Europe, 330,000 t (290,000 t) and elsewhere in Asia, 130,000 t (150,000 t), with significant shipments to Canada, Tunisia, and Australia.

Japan imports were up to 554,200 t (535,400 t) including 282,900 t acidspar (288,000 t). Of the total, 78.0% (75.9%) came from China, with 19.7%, from Mexico (21.1%) and small 2,000-6,000 t shipments from Kenya, Iran and Vietnam.

### **Africa**

Total production showed a further slight decrease to 461,000 t from 468,000 t in 1999. South Africa continued as the dominant player with a reported output of 212,000 t (217,000 t) followed by Morocco and Kenya with outputs of the order of 100,000 t each and Namibia 55,000-60,000 t; and a very small metspar output from Egypt. Solvay's Okorusu mine in Namibia continued to increase its output steadily and all production was exported to the parent fluorochemical business in Germany.

The first shipments from IMP's reopened Buffalo operation were made in the first quarter of 2001. They report sufficient stocks of dumps and stockpiled materials to produce at the rate of 60,000 t/y for some three to four years before resuming mining operations. The two other South African producers, Witkop and Vergonoeg, are scheduling production increases as are Kenya and Namibia.

Apart from servicing a small domestic fluorspar need in South Africa, all output was exported to world markets except the 30,000 t/y African aluminium fluoride operation in Tunisia which continued to import all its requirements from France, China and Mexico. South African exports were primarily to the US and Europe, Moroccan exports to

Canada and Europe, and Kenyan exports to Europe and Japan.

**Outlook**

The indications are stronger than in recent years that the fluorspar market has stabilised. Stocks are tight and prices have hardened giving some encouragement and optimism to producers. The Chinese have set more realistic quotas for 2001 and the first tranche has been marketed at a licence fee some US\$20/t higher than in 2000. This increase is more than the indicated price rise up to May 2001 of US\$10-15/t so further modest increases might be anticipated to enable the Chinese producers to obtain net returns similar to the 2000 levels.

Consumption also appears to have stabilised, and there appears to be potential for some modest growth in both the aluminium and fluorochemicals business, and a continued growth in the cement industry. A growth in fluorspar consumption of 1-2% in aluminium fluoride has been suggested and the potential threat from the new FSA (fluosilicic acid conversion) process from Kvaerner is considered unlikely in the medium term. The announced investment in new HFC and fluorochemical capacity in Europe, North America and Japan is also encouraging for

the industry. The possibility also now exists of further expansion of HFC output and markets in North America following the US abandonment of the Kyoto agreement. Europe, however, is committed to phase-outs due to the inclusion of HFC's and other fluorine-based compounds as deemed contributors to global greenhouse gas emissions. (Denmark is looking for an HFC ban by 2002 and similar early phase-outs are being considered by other EU states).

The expected supply shortfall in the market of some 100,000 t to 150,000 t/y following the completion of the US stockpile sales will be met by the new output from Buffalo in South Africa and by the intended increases indicated by several other producers in Africa and Europe.

The anti-dumping measures against Chinese acidspar were renewed for a further five years in Europe, effective September 19, 2000, following a sunset review of the measures which were due to lapse after five years in March 1999. Similar measures are also in place in Mexico and Russia.

**Fig 2 Prices (US\$US/t)**

	1999	2000	2001 (Feb-May)
US imports - acid grade	124	128	136
cif - metspar	87	84	76
Chinese acidspar wet filtercake cif Rotterdam, December <sup>1</sup>	127-138	130-135	140-145

<sup>1</sup> *Industrial Minerals* quotation