

THE AMPHIBOLESINTRODUCTION

The commercially significant amphiboles are Crocidolite and Amosite and I will deal only with them.

Slide 1

The amphiboles have the same monoclinic crystal structure. The main difference between them is that Amosite has a high magnesium content which in Crocidolite has been replaced by sodium.

HISTORYCHANGING USAGEREASONS FOR USAGE IN  
ASBESTOS CEMENT

Crocidolite was first produced in 1892 and Amosite in 1907 and have been in continuous production since then.

The pattern of usage over the years has changed substantially and the historical sales pattern is worth looking at. I shall deal with Crocidolite first.

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1965 - 1971 : Demand increased in line with the overall demand for asbestos internationally.

1972 - 1977 : There was a sharp increase in demand from 1972 to 1974 in line with the upturn in the asbestos cement industry and demand remained high in 1975 to 1977 with considerable overstocking taking place.

1977 - 1980 : Initially destocking contributed to declining sales while in the latter years, decline in demand was the result of lower economic activity in developed economies and lack of funds in many developing countries.

Crocidolite is now almost exclusively used in asbestos cement pipes.

While there is a view that Crocidolite is only essential in large diameter pipes, the fact is that the value of Blue in many different aspects of pipe and sheet production is so great that it would be badly missed by those who have come to rely on Blue for all types and diameters of pipes and by those using Blue in sheets. The reasons for Blue's importance to the asbestos cement furnish are :

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- (1) It adds strength - Blue has the highest tensile strength of all types of asbestos and relatively it has the highest average reinforcing strength.
- (2) It improves filtration and therefore rates of production.

(3) / ...

- (3) It improves the wet strength, and thus reduces the tendency of newly-formed pipes to deform in the early stages of curing. This is very much a matter of control of the moisture content of the green product which is achieved through the de-watering properties of the amphiboles.

The use of Blue for other applications has decreased substantially over the years and has become relatively unimportant :

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- (1) Blue is no longer used in spray for heat and accoustic insulation or in air filtration and gas masks.
- (2) There has been a decline in the use of Blue in sealants and textiles and the tonnages used in these fields are in any event small.

Slide 5 / ....

Slide 5      Now, looking at the historic picture of  
Amosite sales :

1965 - 1975 : Demand increased steadily  
with growth of the Amosite-based, low density,  
fire-resistant, insulation board increasing  
to replace loss of consumption in general  
insulation.

1975 - 1979 : Decline in sales reflects  
the introduction of non-asbestos insulation  
board and the worldwide recession.

1980 : Demand has again increased despite  
the recession because restraint on real price  
increases assisted by a concerted technical/  
marketing drive has led to increased demand  
for Amosite in asbestos cement products.

Slide 6      Amosite is now mainly used in asbestos  
cement, sheet and pipes, although  
historically it's main use was in low  
density, fire-resistant, insulation  
boards.

Slide 7

The reasons for it's increasing usage in asbestos cement, despite the fact that it's reinforcing strength is less than Crocidolite, and only in the middle range of Chrysotiles, are that :

- (1) It's filtration rate is very much higher than Chrysotile, and indeed Blue; in fact up to 5 times the filtration efficiency of Chrysotile.
- (2) As in the case of Blue, wet strength is improved.
- (3) It aids in the dispersion, or even distribution of Chrysotile fibre in the product, thereby maximising the cost effectiveness of the fibre furnish.
- (4) It makes for cleaner back-water by reducing the quantity of solids passing from the sieve cylinder into the back-water, thereby improving yield, productivity and cost effectiveness.

(5) / .....

- (5) The high bulk volume of Amosite has been the major reason for its use in light-weight, insulation products and the same property can be made use of in asbestos cement sheet manufacture to control density which is especially important in a short Chrysotile fibre furnish.

## HEALTH

### PROBLEMS

#### Slide 8

Of crucial importance to the amphibole mining industry, and indeed to the asbestos cement industry, is the question of whether Crocidolite and Amosite represent a relatively greater hazard than Chrysotile.

#### Slide 9:

Many medical experts (particularly in the UK) and Legislators in the EEC have the view that Blue represents a particular hazard.

However, many other "equally expert" experts do not agree.

One must bear in mind the particularly uncontrolled and high exposure circumstances that gave rise to the unfortunate statistics which were experienced and upon which much of current opinion is based.

Slide 10

The suppliers or fibre producers cannot give a ruling on the scientific findings and hypotheses.

However, we take the position that Blue and Amosite can be used safely in asbestos cement, and such specialised uses that remain, if precautions are applied and a 2 fibre standard is achieved. There should be no discrimination of one fibre against another as it is not proven that fibre for fibre (i.e. at the same exposure level) Blue is more or less dangerous than Chrysotile.

CROCIDOLITE - EFFECT  
OF REGULATION

Slide 11

A general 0,2 f/ml limit or a ban (even with some dispensation) does represent a serious threat to the industry.

It also would be a serious handicap to asbestos cement producers across all pipe diameters.

Slide 12 Some major manufacturers have developed highly successful asbestos cement, pipe and sheet technology around Chrysotile and Amosite, using Amosite's particular properties, while some use a mix of Blue and Amosite for the amphibole portion of the furnish as originally suggested some 35 years ago by an Italian manufacturer as the ideal fibre blend for pressure pipes.

AMOSITE - EFFECT OF  
REGULATION

Slide 13 The 0,5 f/ml standard suggested in some quarters would also be a severe limitation on the use of Amosite.

This must be resisted not only because it is not warranted, but if only on the entirely logical grounds that it would not be possible to monitor this level with any precision.

FUTURE

Slide 14 The future of the amphibole industry is entirely dependent on the future of the asbestos cement industry, which in turn is dependent upon the environmental issue.

The amphibole production industry believes in the future of the asbestos cement industry. Asbestos cement is forecast to grow as it becomes more cost effective against energy hungry competitive products and as developing countries expand their infrastructures. At the same time there is a greater awareness of the benefits of Amosite, and of course of Blue, in producing a more cost effective end product.

Slide 15 It must be stressed that asbestos cement products cannot be manufactured from amphiboles only and, therefore, we are an additive industry, complementary to Chrysotile, the main element of an asbestos cement furnish.

However, there is a degree of inter-dependence in that without amphibole the asbestos cement industry would become less cost effective which, in the increasingly substitute oriented and competitive end product market, would reduce Chrysotile demand.

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I believe that Amphibole and Chrysotile producers should work closely together on production technology and dust suppression, on development of the asbestos cement industry against competitive substitutes, and also in the defence of asbestos in the current war against asbestos as a whole and amphibole in particular.

The industry must take a more aggressive and active role in defending its product.

To let Crocidolite go to the wall as the UK has done is not going to help anyone - end product costs will increase in most cases - environmentalists will not cease their campaign against asbestos even if all the Crocidolite mines in the world closed permanently.

After all, it would remove only 2% of the world's production, ~~and the rest of the world's production would remain unaffected.~~

It is unjustifiable to eliminate a useful material to the community because of the sins of the past.

While asbestos is a hazardous material, it can be handled and used safely.

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The Blue mining industry as a whole has substantial reserves to face the future, and indeed expand production further, should demand warrant it.

Our Amosite mine at Penge also has an extremely long life at current production levels and indeed production will be expanded as demand dictates.

Slide 18

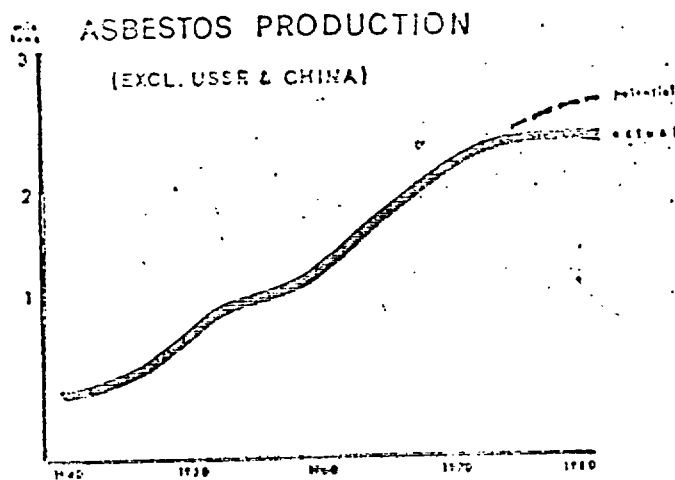
In order to confirm and demonstrate confidence in amphiboles, I would like to show you two slides of our new mill at Pomfret which was brought on stream in 1978. This mill has a capacity of 30 000 tons.

Slides of  
Pomfret New Mill

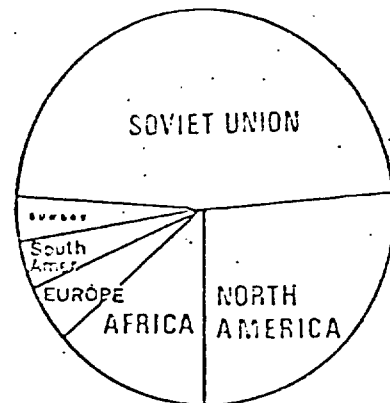
Despite the present recession, this mill is currently being expanded and will ultimately have a capacity of between 70 000 - 80 000 tons, all of which will be produced at a less than 2 f/cc fibre concentration. This expansion will more than replace the capacity lost in closing down Pomfret's old mill.

The project will be completed early next year.

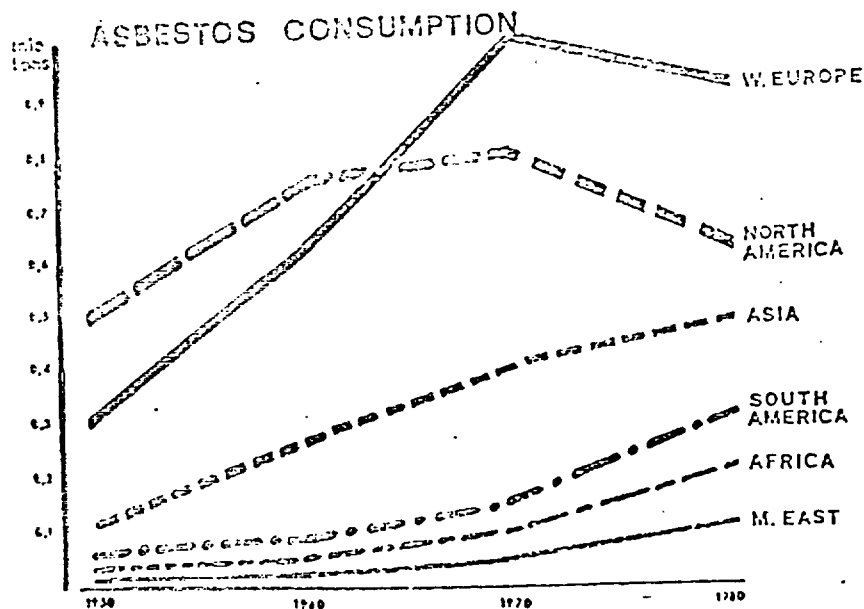
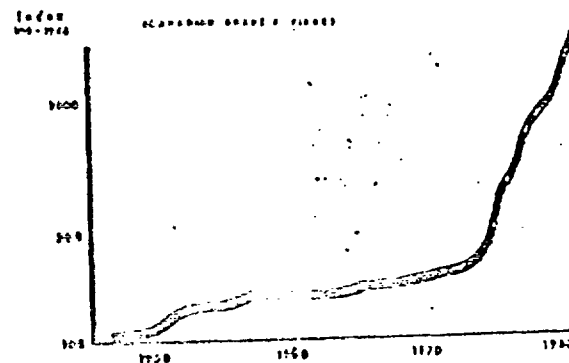
Slide of Penge Mine



### WORLD ASBESTOS PRODUCTION

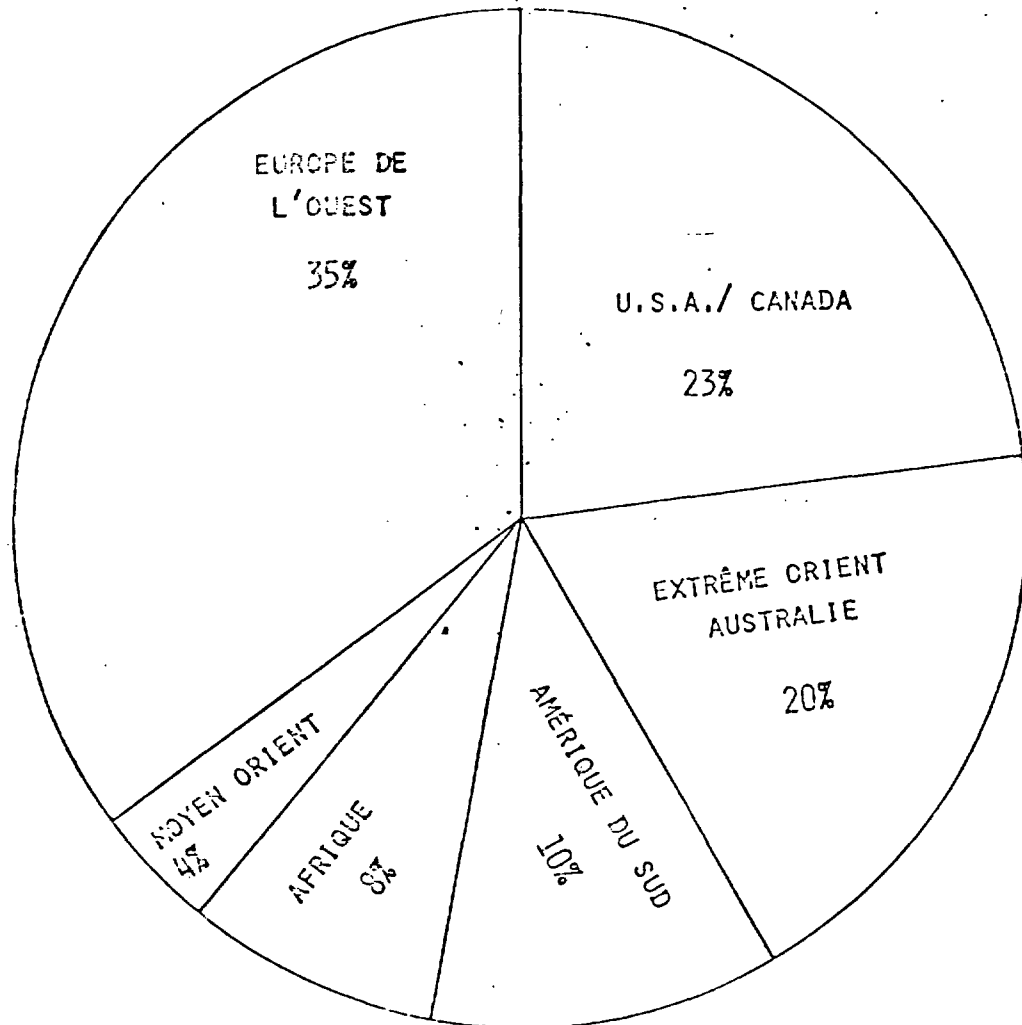


### ASBESTOS PRICES



- 1981 -

CONSOMMATION D'AMIANTE DANS LE  
MONDE



50% - CONSOMMATION EN U.R.S.S. ET EUROPE DE L'EST

- 1981 -

RÉPARTITION DES VENTES LAQ

PAR USAGE

