A S B E S T O S B U L L E T I N
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Editor: C. Z. Carroll-Porczynski

C O N T E N T S

PART 1. ASBESTOS MINING.

CANADA.

532 ASBESTOS PRODUCTION. Dominion Bureau of Statistics, Ottawa.

Total asbestos production for the first five months of 1966 was 525,503 tons compared to 443,100 for the same period in 1965.

533 MCADAM'S ASBESTOS DEVELOPMENT. Mining J., July 1, 1966, p.500.

A large asbestos deposit is being investigated by McAdam Mining Corp. in the Chibougamau district of N.W.Quebec. Total tonnage so far indicated through diamond drilling has been estimated at little over 165 million tons, with an average fibre content 4%. With respect to mill feed beneficiation, some 110.5 million tons with fibre content is envisaged.

534 ABITIBI ASBESTOS MINING COMPANY LTD. Asbestos. Sept. 1966, p.32.

At last report, the first hole to be put down by Abitibi at its Maizerets Township property in Northwestern Quebec, Canada, was at 330 feet. Asbestos fibre was stated to be present in 220 feet of core.

535 ADVOCATE MINES LIMITED.

Advocate Mines Limited reported net income of $1,473,400 for the first half of 1966, more than double of that for the corresponding period of 1965.

536 ASBESTOS CORPORATION LIMITED.

Asbestos Corporation Limited net income for the six months ending June 30, 1966, was $1,588,725, up 77% from $896,250 for the first half of 1965.

537 CASSIAR ASBESTOS CORPORATION LIMITED.

Sales of asbestos fibre for the first half of the year were $9,156,240 compared with $8,085,300 for the same period in 1965. Net profit amounted to $1,902,421 against $1,648,535.

538 PHILIP CAREY.

Net earnings of The Philip Carey Manufacturing Co. and subsidiaries for the first six months of 1966 were $1,240,283 compared with $867,499 for the same period of 1965.

U.S.A.

539 ASBESTOS. T.C.May. Bull.Bur.Mines, 1965,No.630,81-90.

Main world's asbestos deposits are listed and applications of asbestos are described. The asbestos industry of the U.S.A. is discussed, particularly with respect to the scarcity of raw materials. Data are given relating to the asbestos trade and the activity of more important asbestos research organisations.

540 ASBESTOS: PRODUCTION AND TRADE IN THE U.S.A. AND OTHER COUNTRIES. Oil, Paint and Drug Reporter, Chemical Marketing, 5. 9. 1966. p.59.

U.S. production of asbestos jumped in 1965 by 17% with a value increase of 25% (sales of domestic material amounted to 118,275 short tons), compared with world production which increased by about 2%. Production in other countries was (in short tons): Canada 1.4 mill. (down 2%) U.S.S.R. estimated at 1.3 mill.(constant), South Africa 240,752 (up 12%), Rhodesia 172,400 (up 12%).

U.S.S.R.

541 MOLODEZHNOE CHRYSOTILE ASBESTOS DEPOSIT. N.E.Zamashchikov and K. G. Bashta. Razvedka: Okhrana Nedr, 1966, No.5, 5-9.

A new chrysotile asbestos deposit has been discovered in the area north-east from Baikal Lake. It has a high content of high grade textile asbestos; the total asbestos content is about 10%. It is estimated that the total asbestos reserve there amounts to 15-17 mill.tons. The deposit is associated with a lens-shaped hyperbasite massif. The conditions of mineralisation in this zone favoured the formation of high grade asbestos.

542 EXPORT OF ASBESTOS FROM THE SOVIET UNION IN 1965. Vneshnaya Torgovlya SSSR za 1965 god, 28,74.

Export of asbestos from SSSR in 1965 amounted to 248,400 tons (1964 - 212,200 t., 1960 - 146,100 t.) The main importers were West Germany, France, East Germany, Poland, Japan etc.

543 CONTRIBUTIONS TO THE MINERALOGY OF GEORGIA. (PYROXENES AND AMPHIBOLES). G. V. Gvakhariya et al. Tr.Geol. In-ta, AN Gruz.SSR, 1965, No.6, 1-87.

In Georgia, amphiboles are represented by actinolite asbestos, hornblende and barkerite.

AUSTRALIA.

544 ASBESTOS IN AUSTRALIA. Z. Kalix. Austral. Mineral. Ind.1965, 18, No.1, Part 1, 14-18.

The bulk (97%) of Australian asbestos output consists of crocidolite from Western Australia (10,782 tons in 1964). Small quantities of chrysotile asbestos are mined in New South Wales and Western Australia; tremolite asbestos occurs in South Australia.

545 INFRA-RED ABSORPTION STUDY OF CROCIDOLITE AND ASSOCIATED ROCKS FROM WITTENOOM GORGE, W.A. D. J. O'Connor and J. H. Patterson. Proc.Australas. Inst.Min. Metall.No.217, Melbourne, March 1966, 29-31.

The spectrum of the country rock is appreciably different from those of crocidolite and the magnetite-rich host rocks which are closely similar. A process for the separation of crocidolite-bearing ore from the country rock, based on infra-red emission, is thus possible in theory.

NEW ZEALAND.

546 MARTINS BAY: SHEET S105, GEOLOGICAL MAP OF NEW ZEALAND. Wellington, N.Z. Geological Survey, July 1965.

General, structural and economic geology of the area is described. Nickel, chromium, asbestos, gold and cassiterite occurrences are noted.

AFRICA.

547 AN INVESTIGATION OF AMPHIBOLE ASBESTOS DEPOSITS IN THE CHOMA HILL AREA, NCHEU DISTRICT. I. M. Kirkpatrick. Rec. geol. Surv. Malawi, Zomba, 5, 1963 (1965), 100-120.

The main deposits of amphibole asbestos occur in the vicinity of Choma Hill and near Bayani village. Investigations have revealed that the deposits are of very limited extent and that the bulk of fibres are of inferior quality.

548 SOUTHERN RHODESIA. Mineral Trade Notes,Vol.63,No.1, July, 1966, p.6.

Statistics on Rhodesian mineral production for the last quarter of 1965 have not been released;output of asbestos during the first 9 months of the year reached 129,308 short tons,compared with 112,961 tons in the corresponding period of 1964 and 153,451 tons

in the full year 1964.

A Rhodesian affiliate of Cementation Co. of South Africa was scheduled to complete a 20-foot-diameter shaft to a depth of 1,460 feet at the Gaths-King mines by mid-1966. The Company also was awarded a contract to deepen the shaft at the Birthday section of the Shabani mine. The rectangular shaft will be converted to a 23-foot-diameter circular shaft, 2184 feet deep. A haulageway was completed in 1964 connecting the Nil and Birthday sections to permit ore to be treated at the latter section. Dump ore was being treated at the Nil Desperandum unit.

Source: Foreign Service Despatch A-375, Mar.10,1966 - Johannesburg.

549 REPUBLIC OF SOUTH AFRICA. Mineral Trade Notes, Vol.63,No.2, August 1966, p. 4 and 5.

Production of asbestos increased to 240,752 short tons in 1965 compared with 215,592 tons in 1964. The Cape blue (crocidolite) variety accounted for most of the increase in output. A sharp rise in local sales from 11,545 tons in 1964 to 22,428 tons in 1965 was accompanied by a slight decline in exports. (A breakdown of exports by varieties and countries for 1964 was published in Mineral Trade Notes, August 1965). Data on countries of destination for 1965 are not available.

		Local Sales		Exports	
1964 Variety	Production short tons	s.tons	Value R.	s.tons	Value R.
Amosite	77,276	1,795	125,713	81,763	7,761,940
Chrysotile	35,921	7,444	417,093	28,573	2,103,864
Cape blue	92,091	1,479	154,113	97,135	12,770,140
Transvaal blue	10,304	827	96,752	10,709	1,235,129
Total	215,592	11,545	793,671	218,180	23,871,073
1965 Variety					
Amosite	80,735	2,759	194,827	75,981	7,540,503
Chrysotile	38,895	12,610	820,940	25,299	1,836,633
Cape blue	112,329	5,855	645,385	98,217	12,837,564
Transvaal blue	8,793	1,204	128,056	10,078	1,204,739
Total	240,752	22,428	1,789,208	209,575	23,419,439

Note: 1 South African rand equals U.S. $1.40

Source: Rep. of S.Africa, Dept.of Mines. Quarterly Information Circular, Minerals, Oct-Dec.1965, Pretoria.

550 THE POSSIBILITES OF USING MINERAL WOOL IN THE MANUFACTURE OF ASBESTOS CEMENT SHEET PRODUCTS.

I. Z. Volchek, E. O. Barbakadze, A. V. Zagrebneva.

(Translation from Russian)

The main purpose of employing other reinforcing fibres in the manufacture of asbestos cement products is to reduce the consumption of asbestos and to improve certain qualities of the product. In this connection special attention was given to mineral fibres, such as glass, basalt and mineral wool.

As early as 1941 P. N. Sokolov and I. I. Pen tried to introduce glass wool into the Hatchek asbestos cement making process and their experiments demonstrated the feasibility of a partial replacement of asbestos by glass fibre in the manufacture of asbestos cement, but the strengths of the resulting product diminished with age.

Later a method of partially replacing asbestos by mineral wool was suggested and tried out (1) during the years 1951-1955 by the Scientific Research Institute for Asbestos Cement at the Krasnyi Stroitel, Kramatorsk, Sukhalozhsk and Novorossiisk asbestos cement factories. However, its practical use proved impossible mainly because of the bead content in the mineral wool. This caused a lowering of the impact strength and cracking of the product. The efficiency of the sheet making machines using mineral wool have also been lowered.

Czechoslovakia and Poland are partially replacing asbestos by basalt wool in their asbestos cement manufacturing processes(2,3).

In recent years the manufacturing processes for mineral wool and the wool's quality have been greatly improved. The bulk density and the bead content have been lowered, whilst the length of the fibres has been increased. Since the economic aspects of asbestos in asbestos cement products have not lost their importance, the manufacturers in the asbestos cement industry are endeavouring to find ways of reducing its consumption.

As is well known, the tensile strength of asbestos fibre is high (285-365 kg/mm^2 for crude fibre and 60-80 kg/mm^2 for the opened fibre); it possesses a high absorption power for the hydration products of Portland Cement (lime) during the early stages of hardening; it produces a strong bond with the hardened Portland Cement (according to the data of P. N. Sokolov and T. M. Berkovich: 40-65 kg/cm^2); its chemical resistance to the hardening cement

is high. Asbestos is capable of precipitating and holding a large amount of cement on its surface and of forming an homogenous suspension in water, which is necessary for a normal filtration process.

Man-made mineral fibres also possess considerable mechanical strength. However, because of their brittleness, the strength of the mineral wool in the product is lower than that of asbestos. The mineral wool is capable of absorbing lime, but compared with asbestos this process takes place very slowly in the early stages. Later, at the age of 1-3 months, the absorption of lime increases rapidly and as a rule surpasses asbestos (Fig.1).

By an interaction of the mineral wool with $Ca(OH)_2$ a chemical process takes place which leads to the formation of new hydration products, and in many cases to the destruction of the fibre.(4).

The bond between the man-made mineral fibre and the cement mortar is weaker than that of asbestos; (according to the data of a number of investigators it varies from 9 to 23 kg/cm^2).

The majority of the types of glass fibre so far investigated are destroyed in the medium of hardening Portland Cement, thus leading to an eventual lowering of strength. Moreover, some types of fibres are insufficently water resistant and lose strength even in distilled water. Mineral wool of a definite chemical composition and basalt wool are more resistant to destruction, but even they are inferior to asbestos. Investigations proved (5,6.) that mineral wool with a modulus of acidity $= \frac{SiO_2 + Al_2O_3}{CaO + MgO}$ not less than 1.4 and an index of stability $= \frac{SiO_2}{Al_2O_3}$ not less than 3.4 are of increased stability in the medium of hardening Portland Cement.

Concerning its capability of precipitating and holding cement grains on its surface and of forming stable suspensions, mineral wool is inferior to asbestos, but these suspensions dewater more easily and filter faster.

The reinforcing qualities of mineral wool, irrespective of its chemical composition, are low, but are somewhat increased with the length of the fibre. For example, the bending strength of 7 days old samples, made by the Scientific Research Institute was only 5-15% higher than that of unreinforced cement mortar, while the ultimate strength of samples made with 15% of asbestos (using normal asbestos cement grades of fibre) were 250% higher than for unreinforced cement mortar.

The introduction of mineral wool has also negligible influence on the impact strength of cement mortar, while 15% of asbestos increases it 3-4 times.

It is well known that when lowering the asbestos content, without supplementing it by mineral wool, the thickness of the film reduces, but partial substitution of asbestos by mineral wool improves the filterability of the asbestos cement suspension, and helps to retain the thickness of the film and, hence, the productivity of the sheet forming machines. In this respect the mineral wool is a useful additive.

Asbestos cement in which the asbestos is partially replaced by mineral wool of a definite chemical composition, as a rule does not weaken with age. The explanation of this feature is that the $Ca(OH)_2$ which is formed during the hydration process of the C_3S is in the first instance taken up by the asbestos, the absorption capability of which is higher than that of the mineral wool. Because of this, the latter is protected to a considerable degree from the aggressive action of the lime. At relatively small mineral wool contents the increase of strength with age is determined by the prevalent influence of the system 'asbestos-cement'.

The strength figures of asbestos cement depending on the asbestos content are shown in the table.

From these figures one can see that by replacing (up to 33%) of the asbestos by mineral wool, the strength of the asbestos cement in the limits of the investigated periods (six months) increases. Asbestos cement made at the Sukholozhsk factory, by replacing 10, 15 and 25% of the asbestos respectively with mineral wool, developed 7 day strengths which were near to the standard. At the Novorossiisk, Kramatorsk and 'Krasnyi Stroitel' factories, 25% of the asbestos was replaced by mineral wool and the strength dropped considerably below the standard. However, asbestos cement products approaching the standard strengths were made at the Kramatorsk and 'Krasnyi Stroitel' factories when 10% of the asbestos was replaced by mineral wool.

It has been observed that the density of product increases whilst the water absorption and the impact strength decrease.

Experimental work on replacing asbestos was carried out recently at the Ahan-Garansk factory. The mineral wool used was of the following composition (in %):- SiO_2-44.78; Al_2O_3-11.37; Fi_2O_3-2.47; MaO-0.11; CaO-35.71; MgO-2.6; SO_3-0.62; Oils-0.68; and the Portland Cement characterised by a chemical and mineralogical

composition (in%):- SiO_2-22.49; Al_2O_3-4.52; Fe_2O_3-4.74; CaO-65.14; MgO-2.55; C_3S-19; C_3A-4; C_4AF-14; $CaSo_4$-4.

The mineral wool, which contained 12% of beads measuring over 0.5 mm., was introduced instead of P/5/65 grade asbestos, replacing 10, 15 and 20% of the latter. The amount of fibre in the slurry was 13.3%. The quality of the asbestos cement made with 10 and 15% of mineral wool at 7 days old conformed with the requirements of the All-Union Standard 378-60. When using these amounts of mineral wool, there was no noticeable influence, at the age of six months, either in density, frost resistance or impact strength. When increasing the mineral wool content to 20% of the fibre content, all strength indices are reduced, especially the impact strength.

At the asbestos cement factory in Riga, introduction of 15% mineral wool resulted in a product which at 7 days age was equal in density and water absorption to one containing no mineral wool. Film thickness during experiments and also production was kept at 0.7 to 0.8 mm.

The Scientific Research Institute for Asbestos Cement and its Ukranian Branch - 'Institute of Glass Wool' investigated the use of basalt wool in asbestos cement. The wool, measuring 4, 12 and 20 microns in diameter was made from basalt from the Isachkov quarry. The experiments showed that even by substituting 10% of asbestos the strength of the product at 7 days was somewhat lower than the standard.

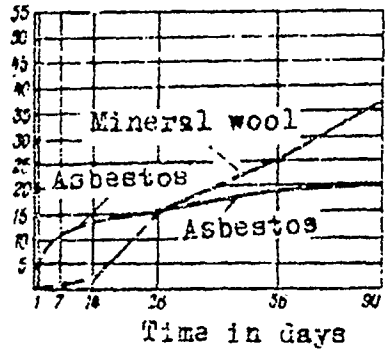
Asbestos cement products from the Kiev asbestos cement factory, made by substituting 20% of asbestos with basalt wool of average diameter 15-17 microns (from basalts of 'Yanova Dolina' quarry) were 15% weaker than the standard ones and did not conform with the All-Union Standard 378-60.

Experimental data obtained from the experiments carried out at different times, form the basis of the following conclusions; the reinforcing quality of the mineral wool is lower than that of asbestos and it cannot be regarded as an equivalent substitute for asbestos.

Partial replacement of asbestos by mineral wool leads to a regular change of physical and mechanical qualities of asbestos cement. Bending and impact strengths are lowered, but density increases and water absorption consequently decreases. As the asbestos is replaced by more mineral wool so the more pronounced these changes become. At some factories if the percentage is 10-15 the asbestos cement which is produced, conforms with the existing

Fig.1.

The amount of absorbed CaC in mg. per 1g. of fibre.



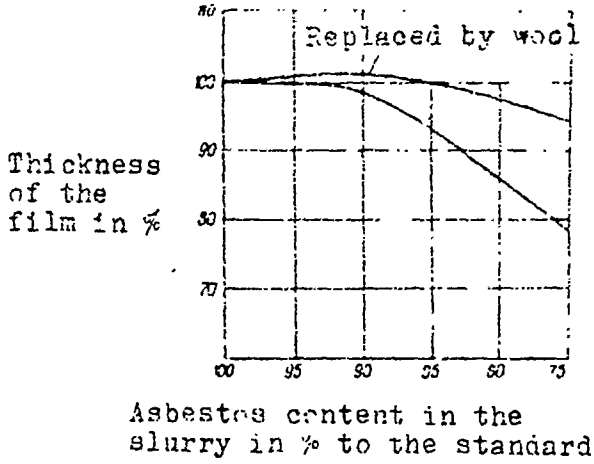


Fig. 2. Thickness of the primary asbestos cement layer (film) when lowering asbestos content and substituting it by mineral wool. (Sukholozhsk Factory)

standard. Moreover, the filterability of the suspension is improved, which furthers the preservation of the film's thickness and consequently the productivity of the sheet making machines.

Thus, a partial replacement of the asbestos by mineral wool is permissible only after experiments have been carried out in each particular case, which ensure that the quality of the product will conform with the requirements of the existing standard. The argument for using mineral wool must also be supported by economic considerations.

The price of it in some regions is higher than that of asbestos cement grades of asbestos and the use of mineral wool also causes the deterioration of the cylinder meshes and felts.

The mineral wool for substitution of asbestos must possess a modulus of acidity, Ma, not less than 1.4; an index of stability, not less than 3.4; CaO absorption after 24 hours not more than 20 mg/g and an amount of non-fibrous inclusions not more than 10%. The lowering of the amount of beads can be achieved by preliminary cleaning of the mineral wool.

FACTORY	The amount of Asbestos replaced by Mineral Wool in %	Relative Strength of Samples to the Strength of the standard in %	Relative Strength of Experimental Samples at the age of 18 days to the Strength of the standard in %
Sukholozhsk	10	110	109
	15	98	123
	25	100	101
Novorossiisk	25	88	166
Krasnyi Stroitel 1951	25	89	120
Kramatorsk	10	94	129
	15	97	123
	25	90	133
	33	94	127
Krasnyi Stroitel 1951	10	96	-
	15	93	-
	20	87	-
	25	87	-

NOTE: The age of the standard samples was 7 days

551 EXPLOITATION CHARACTERISTICS OF ASBESTOS CEMENT PIPES. Yu.Danilevich and N.I.Belous.

The use of asbestos cement pipes for the transportation of gases or liquids under higher pressures, especially when hydraulic impacts must be taken into account, is hindered by several factors. The most important of these factors is the relative weakness of the pipe joints. The Authors describe improved asbestos cement muffs developed by NIIAsbestsement; still better results can be obtained using cast iron muffs. The machining of asbestos cement pipes (for the application of muffs) considerably reduced their strength (especially in the case of small diameter pipes). A great reduction in pipe strength(up to 70-90%) may result from impacts during their transportation, due to minute cracks. On the other hand, ageing of asbestos cement pipes for one year increases their strength 1.5 - 4.5 times. Ageing results in increase in the length of the pipes (up to 0.2%) and in their diameters.

552 LARGE ASBESTOS CEMENT SHEETS OF STANDARDISED PROFILE. G. S. Blokh et al. Stroit Mat.,1966, 12, No.7, 36-38.

Dimensions and mechanical properties are tabulated for two new standard corrugated asbestos cement sheets, UV-6 and UV-7.5, designed for roofing dwelling and industrial buildings respectively. Production scheme is given. Comparison is made between the specifications of the new standard sheets and the corresponding old types VO and VU.

553 MUFFS FOR ASBESTOS CEMENT TUBES USED IN WATER PIPELINES. M. E. Chechenin and G. A. Pugachev.

Two new types of muffs for asbestos cement pipelines, SAM-1 and SAM-2, for the transportation of water under pressure (up to 15 atm. for SAM-1 and up to 40 atm. for SAM-2) have been developed by INIAsbestsement. They are made of asbestos cement and provided with self-sealing rubber rings. Production methods are described.

554 AUSTRIAN PATENT 242,259. PROCESS FOR THE APPLICATION OF FIBROUS, GRANULAR OR FLAKY MATERIALS ONTO ASBESTOS CEMENT SURFACES. Eternit-Werke Ludwig Hatschek.

This process comprises applying onto an asbestos cement surface layer a layer of an ethoxylic resin or a polyisocyanate, or a mixture of the latter with a polyolefin. Then a comminuted solid material such as sand, optionally coloured, is spread over the coating, which is subsequently allowed to harden at room temperature.

555 BRITISH PATENT 1,032,557. APPARATUS FOR MANUFACTURING CORRUGATED ASBESTOS-CEMENT SHEETS. Pont A Mousson Co.

A machine specially designed for discontinuous manufacture of sheets having small corrugations.

556 THE CONTRIBUTION OF THE ASBESTOS CEMENT INDUSTRY TO THE NATIONAL ECONOMY. Yu. S. Grizak. Stroit.Mat.1966, 12, No.9, 9-11.

Details are given of the targets for the asbestos cement industry set in the current five year plan (1966 - 1970). The planned rate of growth is exceedingly high (about 100% in five years). Figures are given relating to the current and future production of asbestos cement plates and pipes, and specifications of the products. Renovation and large extension of production facilities are planned.

557 TECHNICAL AND ECONOMIC IMPROVEMENTS IN THE MANUFACTURE OF ASBESTOS CEMENT ARTICLES AT THE KIEV COMBINE. N.V.Belous.

Technical improvements briefly described in this article included automatic lubrication of the metal supports in the production of asbestos cement tiles, addition of polyacrylamide when using low grade asbestos, use of radioactive isotopes for controlling conveyance of the materials, use of capronic monofilaments nets etc.

558 GERMAN PATENT 1,223,501. MOULDING AND COATING COMPOSITIONS. Henkel & Cie.

Compositions especially suitable for casting moulds are manufactured from finely divided inert fillers or pigments and alkali-free silicate binders, such as tetraethanolammonium silicate or tetraethanolpiperazinium silicate. Suitable fillers include silica, alumina, zirconia, carbon black, asbestos etc. In one example, the composition was used for coating asbestos cement plates.

559 BELGIAN PATENT 676,909. COATING OF ASBESTOS CEMENT BUILDING MATERIALS. Pennsalt Chem.Corp.

The surface of asbestos cement building materials, such as panels, is heated to 54 - 135°C, and a thin layer of "coating mixture H" is applied onto it and cured under the action of heat. Then a further layer of the "coating mixture H" is applied and cured to give an impermeable coating having a thickness of 10 microns. The mixture "H" is an aqueous dispersion of a resin, which also contains a hexavalent chromium compound and a reducing agent capable of reducing the chromium to the tetravalent state when the mixture is heated to 120-245°C. The mixture may also contain a coloured inorganic pigment.

560 INDIAN PATENT 95,918. ASBESTOS CEMENT PRODUCTS. Johns-Manville Corp.

Asbestos cement products are manufactured by forming on a moving support a thin layer of a slurry comprising asbestos fibres and an hydraulic cement, applying an aqueous solution of sodium silicate to the wet sheet formed, removing the wet sheet from the support, superimposing several such sheets and forming a laminate product.

561 GERMAN PATENT 1,226,476. COLOURED, SHAPED, ASBESTOS CEMENT PRODUCTS. Soc.Anon.Eternit.

Shaped asbestos cement articles are provided with a surface layer inhibiting the growth of parasitic organisms, which contains coloured fibres of amphibole asbestos, especially of crocidolite or amosite asbestos.

PART 3. ASBESTOS TEXTILES.

562 FRENCH PATENT 1,423,845. PYROMETER. Soc.des Forges et Ateliers du Creusot.

A pyrometer for continuous measuring of the temperature of molten cast iron comprises a thermocouple placed in a silimanite tube, closed at its lower end and contained in a protective quartz sheath, which is sealed above the immersion level, to a coaxial sheath holder protected by a layer of asbestos fabric.

563 AUSTRALIAN PATENT 252,612. PIPE INSULATIONS. Australian Asbestos Prop.Ltd.

A heat insulation material for lagging pipes is produced by wrapping an interliner, e.g. a thin plastic sheet, around a cylindrical former or mandrel, spraying or brushing the interliner with sodium silicate or another suitable adhesive, wrapping a mat of asbestos fibres around it (applying pressure) and coating the assembly with further layers of the adhesive and asbestos fibres until the required thickness is reached.

564 BRITISH PATENT 1,023,575. COATING OF OBJECTS. British Ropes.

Asbestos fabric may be coated with electrostatically charged powder.

565 BRITISH PATENT 1,036,600. POLYMERIC MATERIALS. Albright & Wilson (Mfg.) Ltd.

Asbestos cloth or glass fibre mat can be used to provide a heat shield

PART 4. ASBESTOS FRICTION MATERIALS.

566 CANADIAN PATENT 727,004. FRICTION MATERIAL. Johns-Manville.

Friction compositions having a high friction coefficient, a low wear rate and some polishing ability comprises 30 - 60 wt.% of Grade 7D or comparable asbestos fibre, 20 - 50% of a thermosetting resin, rubber or elastomer having a good thermal resistance, 15-25 wt.% of comminuted expanded perlite and, optionally, other friction components such as litharge, zinc oxide etc.

567 BRITISH PATENT 1,031,397. BEARING MATERIALS. C.S.White.

Asbestos mentioned as a filler.

PART 5. ASBESTOS REINFORCED PLASTICS.

568 ASBESTOS-REINFORCED PLASTICS. EFFECT OF FIBRE ORIENTATION. E. O. Ohsol and P. L. McWhirter. Gummi-Asbest-Kunststoffe, 1966, 19, No.8, 969-971.

A summary is given of a lecture delivered by the authors at the 19th Annual Conference of the Reinforced Plastics Division of SPI in Chicago in February 1964. The effect of fibre orientation on the mechanical properties of asbestos-reinforced plastics is discussed in detail on the example of amphibole asbestos-phenol resin composites. The parallel orientation greatly improves the mechanical properties of the products. (figures are tabulated).

569 FRENCH PATENT 1,439,952. KETONE-ALDEHYDE-PHENOLIC RESINS AS BINDERS FOR COMPOSITE MATERIALS. Socony Mobil Oil Co.

Superior binders for composite materials containing fibrous, granular or flaky fillers are produced by reacting e.g. acetone, and an aldehyde e.g. formaldehyde, with one or several phenolic compounds. Fibrous materials mentioned include asbestos.

570 FRENCH PATENT 1,447,029. MOULDING COMPOSITIONS. Cape Asbestos Co.

Moulding compositions comprise a partially polymerised epoxy resin, having an epoxy index of 160 - 450 and a viscosity (at 23°C) from 4 poises to a solid state, a hardening agent for the epoxy resin, and asbestos fibres.

571 BRITISH PATENT 1,041,851. IMPRESSION MOULDING COMPOSITION BASED ON POLYSILOXANES. A. Kattenbach.

Asbestos mentioned as a filler.

572 BRITISH PATENT 1,039,501. HEAT STABLE ORGANOSILICON ELASTOMERIC COMPOSITIONS. Dow Corning Corp.

Chrysotile asbestos is used as a filler increasing tensile properties of the product.

573 BELGIAN PATENT 677,209. REINFORCED PLASTIC COMPOSITION. Koninklijke Nederlandsche Machinefabrik.

A process is described for the preparation of extrudable compositions comprising polymers, such as polyester resins, and fillers, such as vegetable or mineral fibres, by heating and kneading. In an example, asbestos is used as a filler.

574 FRENCH PATENT 1,401,495. FIBRE-REINFORCED EPOXY RESINS. Union Carbide Corp.

Epoxy resins, produced from solid and liquid isomers bis - (2:3-epoxycyclopentyl) ether in the presence of a curing agent, are reinforced with a fibrous material, such as asbestos, glass fibres, metallic fibres etc., in an amount of 25-90 per cent. based on the weight of the composition. The products can be used as electrical insulators, castings, binders for laminates or abrasive articles, etc.

575 CROCIDOLITE ASBESTOS AS A REINFORCING FIBRE IN SYNTHETIC RESINS. A. Bennett. Reinforced Plastics, Sept.1966, 11, No. 1, 18,20,22.

The properties of crocidolite asbestos are compared with those of other asbestos varieties and comparative tables of tensile strength and Young's modulus are given. Applications of crocidolite fibres in reinforced plastics are discussed in detail, and mechanical and electrical properties of various crocidolite-reinforced plastic products are tabulated.

PART 6. BUILDING MATERIALS.

576 CANADIAN PATENT 729,252. LIGHTWEIGHT FIBERED BUILDING PRODUCTS. Union Carbide Corp.

Asbestos short fibres of the type mined at Coalinga(Calif.) are mixed with water and phosphoric acid, the resulting slurry is foamed, and the foam product is poured into moulds and steam-autoclaved. The product is then dried at 325° to 350°F. A resin or hydraulic cement can be used as a binder, and fillers may be added.

577 BRITISH PATENT 1,029,827. PANELS FOR WALLS FOR BUILDINGS. Tensile Products Ltd.

The outer layer of sandwich construction may be formed from asbestos board and the inner layer from wood wool.

578 AUSTRALIAN PATENT 236,585. FIBERLD MORTARS, PAINTS AND PLASTERS. Tile Council of America Inc.

Compositions which do not lose water when placed on a dry backing base comprises asbestos fibres, portland cement urea, methyl cellulose, polyvinyl alcohol and, usually, a fine sand and another inert filler. Setting shrinkage is reduced compared with conventional portland cement mortars. The composition forms strong bonds with various substrate materials.

579 FRENCH PATENT 1,444,915. LIGHT-WEIGHT ASBESTOS BASE MATERIAL. S. A. Francaise du Ferodo.

Light-weight structural materials, such as panels, blocks or insulating coating, having a cellular structure are produced from a mixture of asbestos fibres and a cement or another binder, using a blowing agent at low or moderate temperatures. . The products are fireproof, acid resistant and do not rot.

580 JAPANESE PATENT 16,179/66. HEAT-RESISTANT STRUCTURAL MATERIAL. Musashiono Kagaku Kenkyu-Sho K.K.

Heat-resistant structural material is produced from a porous inorganic powder, granular or fibrous material, such as graphite, asbestos etc., and a copolymer comprising 45 - 75 wt.% of triallylcanurate and 25 - 55 wt.% of styrene or and - methylstyrene.

581 BRITISH PATENT 1,037,677. CEILING TILES. Pertonit Ltd.

A fireproof ceiling tile consists of a layer of semi-rigid asbestos based board and a layer of mineral fibre board, the two layers being secured together by an adhesive and having metal plates sandwiched between them, each metal plate having opening for fastening.

582 BRITISH PATENT 1,043,015. STRUCTURAL AND PAVING PRODUCTS USING CALCIUM SILICATE HYDRATE BONDING MATRIX. The Colonial Sugar Refining Co.

The asbestos blend may contain amosite, chrysotile and crocidolite mixed in proportion to impart suitable filtering properties to the slurry and optimum strength characteristics to the autoclaved products.

PART 7. ASBESTOS SEALING, COATING COMPOSITIONS.

583 BRITISH PATENT 1,029,570. PROTECTIVE COATING. Dorit Aktiengesellschaft.

Asbestos mentioned as a filler.

584 U.S.S.R. PATENT 179,660. MASTICS FOR FLAT ROOF COVERINGS. M. I. Povalyaev and others.

Mastics for flat roof coverings, consisting of bitumen, asbestos of 6-7 grade with a moisture content not exceeding 5%, or chalk, diatomaceous earth or other finely comminuted fillers, comprise in addition Monuron (0.3 - 0.5%), simazine (0.5 - 0.8%) or sodium salt of 2,4 - dichloro - phenoxyacetic acid (1,5 - 1.7%), as biocidal agents.

585 JAPANESE PATENT 14749/66. CEMENT PRODUCTS CONTAINING INORGANIC FIBRES. Sanriku Dengyo K.K.

The title products are manufactured by adding a copolymer of butadiene and styrene having good adhesive properties and a copolymer of carboxymethylcellulose and acrylamide to mixture of cement and inorganic fibres, such as rock - or glass - wool, asbestos or the like. The products have good workability and are suitable as heat - and sound - insulators, fire-resistant structural elements etc.

586 BRITISH PATENT 103,734. LATEX PAINTS COMPRISING DISPERSIONS OF MODIFIED STYRENE-BUTADIENE COPOLYMERS. Chemische Werke Huls Aktiengesellschaft.

587 INDIAN PATENT 96,788. FIRE-RETARDANT BITUMINOUS COMPOSITION. Hooker Chem. Corp.

Fire-retardant bituminous coatings are produced from molten asphalt, mineral spirits and asbestos fibres, with addition of pentachloropentadienoic acid and of antimony oxide.

588 BRITISH PATENT 1,042,931. MANUFACTURE OF ASBESTOS SHEET PRODUCTS. Turner Bros. Asbestos Co.Ltd.

This invention relates to asbestos sheet product comprising asbestos fibres bound together with a polymer of styrene, butadiene and unsaturated carboxylic acid.

589 BRITISH PATENT 1,042,587. METHOD OF MAKING LATEX-BONDED ASBESTOS FIBRE SHEET. U.S.Rubber Co.

590 BRITISH PATENT 1,042,552. FIBRE COMPOSITION AND METHOD OF PRODUCTION. Japan Synthetic Rubber Co.

This invention relates to a method for producing fibre composition (e.g. asbestos) consisting of fibrous materials and rubber latex.

591 EAST GERMAN PATENT 45,562. JOINT FILLING COMPOSITION. W. Franke and A. Harnish.

A composition for filling joints or fissures in building constructions of concrete, reinforced concrete and steel, in roads, dams etc., comprises epoxide resins and/or their combinations with bitumen, asphalt, tar or rubber, and, optionally, pre-impregnated or otherwise pre-treated, inorganic or organic fillers, fibres or fibrous inserts. Suitable charges include comminuted rubber, wastes, slate flour, asbestos etc. Suitable inserts include, inter alia, asbestos cords. The composition is suitably applied in two layers, viz., a ground coat and a hard covering, which may contain various adjuvants, such as hardeners, solvents etc.

PART 8. ASBESTOS PAPER AND INSULATING MATERIALS.

592 CANADIAN PATENT 729,515. ASBESTOS PAPER. Johns-Manville.

Paper suitable for making moulded articles, such as dielectic laminates is produced by mixing about 97% of a harsh asbestos fibre (chrysotile, crocidolite or amosite) with about 3% of a water-insoluble polymer and the mixture is formed into sheets by conventional methods and cured.

593 GERMAN PATENT 1,224,139. PRODUCTION OF PAPER, PASTEBOARD OR THE LIKE FROM INORGANIC FIBRES. Wacker-Chemie G.m.b.H.

Process for producing paper, pasteboards etc., based on inorganic fibres, comprises preparing a mixture of the fibres and, optionally, powder fillers with a silicone resin emulsion containing emulsifiers based on polyethylene glycol, forming the mixture while removing water, and finally drying and curing the product. The fibres are preferably asbestos fibres; but glass fibres or slagwool may also be used. If fire-resistance is not required, organic fibres may be added. Suitable powder fillers include, inter alia, asbestos flour.

594 BRITISH PATENT 1,028,844. CELLULAR INSULATING MATERIAL. Turner Bros. Asbestos Co.Ltd.

Thermal or acoustic insulation based on asbestos fibres.

595 GERMAN PATENT 1,224,653. PRODUCTION OF HEAT - AND SOUND - INSULATING CELLULAR MATERIALS BASED ON ASBESTOS. Turner Brothers Asbestos Co.

The title process comprises forming a film from an aqueous dispersion containing asbestos fibres, optionally with addition of other fibres, a surface active agent which serves as a binder for asbestos fibres, and a coagulating agent capable of precipitating the said surface active agent, breaking the film and shaping the mass and finally removing water to obtain a dry, cellular structure.

596 GEOLOGY OF DEPOSITS OF INDUSTRIAL MINERALS. NO.1. PETROGRAPHY AND GENESIS OF DEPOSITS OF BRITTLE CHRYSOTILE ASBESTOS. by N. D. Sobolev and V. Ya. Volochaev. "Nedra", Moskva 1966, 80 pp., ill.

597 FRENCH PATENT 1,437,175. ANTITHERMIC MATERIALS. Protherma Co.

Cryogenic and endothermic, fire-resistant materials useful as fire-barriers are produced from two ingredients each containing at least one substance able to spontaneously start a chemical reaction, at least one of the ingredients containing a foam producing constituent. In an example, the first ingredient consists of (in %): gypsum 60-65, methylcellulose 3.5 - 5, asbestos or mica powder 1.4 - 5, magnesium carbonate 17, sodium bicarbonate or carbonate 13-13.1: The second ingredient comprises 99 - 99.85% of anhydrous citric acid and 0.15-1% of a colourant.

598 BELGIAN PATENT 678,518. HEAT-INSULATING REFRACTORY CONCRETE. Commissariat a l'Energie Atomique.

Refractory concrete is produced by mixing an aluminous binder, which sets when treated with water (e.g. aluminous cement) with expanded clay and asbestos powder.

599 SOUTH AFRICAN PATENT 65/4824. INSULATING FIBROUS MATERIAL. Sittil A.G.

A porous, flexible, heat-insulating material is obtained by foaming a liquid dispersion of asbestos fibres, moulding it to the desired shape and solidifying the product.

PART 9. REFRACTORY FIBRES.

600 BRITISH PATENT 1,030,232. REFRACTORY FIBRES. I. Thompson Fibre Glass Co.

Fibres made from oxides of zirconium, zirconium silicate, aluminium oxide.

601 BELGIAN PATENT 676,054. SHAPED CARBON ARTICLES. F.M.C.Corp.

Shaped carbon articles suitable for use as filters for gases and liquids, catalysts etc., are produced by shaping a mixture of microcrystalline cellulose with finely divided carbon, cellulose fibres, asbestos, a glass-forming oxide, a metal or a metallic compound, and then heating the mixture in reducing conditions until the cellulose is carbonised.

602 THE DIFFUSION OF ZINC IN THREAD-LIKE CRYSTALS OF COPPER. B. S. Bokshtein and others. Doklady Akad.Nauk.SSSR, 1966, 169, No.2, 320-323.

Diffusion of zinc in copper whiskers (5 and 20 microns) and in very thin copper wires produced by various methods have been studied. The activation energy is the smallest in 5 micron whiskers and so is the temperature coefficient of diffusion.

603 RELAXATION PROPERTIES OF COPPER-IRON WHISKERS. V.S.Postnikov et al. Fizika Metalov i Metallovedenie, 1966, 21, No.5, 770 - 774.

Internal friction, shear modulus and some other properties such as electric resistivity have been determined for mixed copper-iron whiskers produced by simultaneous reduction of mixtures of chlorides of copper and iron with hydrogen. Only monocrystalline whiskers with uniform structure and without any external layer of a different material have been investigated. Such whiskers are obtained when the Cu:Fe ratio is not less than 5: 1; they consist of a solid solution of iron in copper.

604 INDIAN PATENT 96363. METHOD OF COLLECTING METAL WHISKERS Gen.Electric Co.

Whiskers grown on a substrate are removed from it by immersing the substrate with the whiskers in mercury, applying vibrations, admixing an inert liquid, in which the whiskers accumulate and separating the whiskers by filtration.

PART 10. MISCELLANEOUS.

605 FRENCH PATENT 1,447,951. FIBRE MAT SHEETS. W.H.W.Schuller.

Sheets are produced from non-woven fibres or strands of glass fibres, mineral wool, asbestos or organic fibres, bonded with a binding agent. Reinforcing elements are arranged longitudinally, transversely or in both directions, and the sheets may be perforated.

606 EFFECT OF THERMAL TREATMENT ON MECHANICAL PROPERTIES OF NATURAL AND SYNTHETIC AMPHIBOLE FIBRES. E.M.Nadgornyi, L. F. Grigor'eva and A. P. Ivanov. Izv.Akad.Nauk.SSSR, Neorg. Materialy, 1966, 2, No.4, 761-3.

Synthetic fluoroamphibole fibres and crocidolite fibres were subjected to thermal treatment at 200 - 800°C. It has been found that the strength of crocidolite asbestos fibres sharply decreases after heating at temperatures above 250°C. A similar decrease in the strength of synthetic fluoroamphibole fibres results from heating at and above 400 - 450°C. Causes of this effect could not be established by crystallo-optical, chemical and x-ray analyses. Investigations of this problem are confirmed.

607 FRENCH PATENT 1,438,783. BATTERY SEPARATORS. W.R.Grace & Co.

Battery separators are produced from microporous sheets consisting of a polyolefin, a filler and a plasticiser, by wetting the sheets with water, heating them with infrared radiation to the softening point and moulding them to obtain the desired shape. Suitable fillers include silica, carbon black, mica, montmorillonite, asbestos, portland cement, wood fibres, glass particles etc.

608 NETHERLANDS APPLICATION 6,501,218. FOIL FOR WRAPPING TOBACCO PRODUCTS. E. Gerlach G.m.b.H.

Foil for wrapping tobacco products, especially cigars and cigarettes, is produced from an insoluble cellulose derivative, being preferably a natural or synthetic cellulose either or ester and containing inorganic fillers. In an example, a foil is made of 850 parts methylene chloride, 150 parts methanol, 25 parts methyl cellulose, 24 parts TiO_2, 50 parts mica, 15 parts asbestos meal, 10 parts asbestos fibre, 1 part KNO_3 and 20 parts diethylene glycol.

609 CANADIAN PATENT 655,380. ACETYLENE CONTAINER FILLER. Union Carbide Corp.

Containers for dissolved acetylene are filled with a porous, stabilised solid mass obtained from an aqueous mixture comprising slaked lime, diatomite or another source of silica, aluminium sulphate and asbestos fibres. The mixture is charged into an evacuated cylinder, preferably while bumping or otherwise agitating the cylinder. The completely filled cylinder is heated first to a temperature above 212°F and then to 375-450F with autoclaving to cause the ingredients to react and harden the resulting product.

610 CANADIAN PATENT 642,585. MOULDED ARTICLES. Rostone Corp.

Strong moulded articles having high electrical resistance, good resistance to erosion by electric arcs, pronounced tendency to suppress arcing and the capability to being moulded to accurate dimensions are produced by preparing an aqueous mixture of minus 200-mesh dead-burned magnesia, asbestos fibres and/or other reinforcing fillers, and alumina, forming the mixture into desired shape, treating the shapes with carbon dioxide to convert the magnesia into magnesium carbonate and converting the latter into the hydrate form by treatment with steam under pressure.

611 FRENCH PATENT 1,446,770. ASBESTOS-BASE MATERIALS. Carey Mfg.Co.

Asbestos-base materials, especially suitable for the manufacture of guide rolls in the glass production, consist of asbestos fibres and a minor proportion of a heat-resistant binder. The fibres comprise at least 30% of a hard highly resilient amphibole asbestos of the paper-making quality. The binder is a mixture of a hydraulic cement and a plastic montmorillonite clay.

PART 11. REVIEW OF JOURNALS.

"ASBESTOS", September 1966.
807 Western Saving Fund Bldg., Philadelphia, Penn. 19107.

612 BRITISH ASBESTOS INDUSTRY - PART 2A: GREATER USE OF MOULDED GOODS. By C.Z. Carroll-Porczynski. A general review of recent progress in various branches of the asbestos industry, p.2.

613 W. E. CLARK (1905-1966), p.16.

614 MARKET CONDITIONS, p.24.

615 PRODUCTION, p.32.

616 IMPORTS AND EXPORTS, p.34.

617 INDUSTRY NEWS, p.40.

618 U.S.PATENT 3,262,165. HEAT-INSULATING COMPOSITIONS AND THEIR USE, A.J. Ingham. Production of a low-cost, low-density material suitable for use in insulating, p.52.

619 U.S.PATENT 3,262,800. ASPHALTIC PAINT COMPOSITION, E. Baxter, p.52.
A smooth-flowing, quick drying road-marking paint having excellent adhesion and flexibility characteristics comprises at least 50% by weight of a conventional paint base, 6-25% of a lead pigment, 1-10% of silica powder, 3-10% of shellac, 1-5% of an asphalt thinner, 0-5% of zinc oxide, and 1-5% of any one of the following mixtures.