

A S B E S T O S B U L L E T I N

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PART 1. ASBESTOS MINING.

CANADA

1 EXPORTS OF ASBESTOS FROM CANADA, JULY 1970.

Unmanufactured Asbestos:	Crude	Short Tons		
		Milled Gp3	Milled Gp 4&5	Shorts Gp 6-9
Western Europe	..	562	33,888	12,922
Eastern Europe	..	30	986	243
Middle East	..	105	2,046	211
Africa	..	..	992	590
Asia	7	236	7,810	9,620
Oceania	..	..	7,583	1,812
So. & Cen. America & Antilles	..	70	9,066	3,840
United States	1	1,549	12,428	33,029
	8	2,532	74,799	62,267

The total amount of unmanufactured asbestos exported in July 1970, was 139,606 short tons, valued at \$21,070,000.

2 CANADA - AUGUST 1970 ASBESTOS SHIPMENTS

August 1970 shipments amounted to 140,961 tons (116,107 tons from Quebec and 24,854 tons from Newfoundland, Ontario, British Columbia and the Yukon). The total for the previous August was 139,196 tons.

3 GOLDEN GATE EXPLORATIONS LTD., according to a filing statement with the Vancouver Stock Exchange, is seeking the financial backing of a major company to conduct further drilling on its asbestos prospect near Haines Junction, Yukon Territory. It is hoped that an incline shaft will be sunk into a known asbestos zone from which shaft drifting and cross-cutting will be carried out. As stated in a report by P.H. Sevensma, Consulting Engineer, diamond drilling has indicated 3,000,000 tons of commercial Grade asbestos. (The Northern Miner).

4 HIGH ASBESTOS ENDOWMENT - According to an interesting article entitled "Mineral Endowment of the Canadian Northwest-A Subjective Probability Assessment" that appeared in the September 1970 issue of the CIM Bulletin, "... Favorable rocks for the occurrence of asbestos are commonly very small intrusive bodies, some less than a mile long in their largest outcropping dimension. The currently expressed opinion is that the entire belt from the headwaters of the Stikine River (and possibly farther to the southeast) to the Clinton Creek deposit and beyond to recently discovered occurrences in Alaska has a high asbestos endowment. This is supported by the response pattern. This central belt" which comprises about 45,000 square miles, has a forecast asbestos endowment of approximately \$50,000 per square mile, value of fibre content in rock. (Asbestos November.1970).

U.S.S.R.

- 5 ANTOPHYLLITE ASBESTOS FROM METAULTRABASITES OF THE REGION OF THE MOKRA MOSKOVKA RIVER. O.Ya.Khmara and V.V.Bairakov. *Dopovids Akad.Nauk.Ukr.R.S.R.*, 1969, B, No.7, 602-606.

Veins of antophyllite asbestos (thickness 2-12 cm.), were found in contact zones between granites and plagiomigmatite. The chemical composition of the asbestos is (in %): SiO_2 56.96, TiO_2 0.02, Fe_2O_3 1.51, Cr_2O_3 . The asbestos was formed by the cation² of siliceous hydrothermal³ solutions on dunites

- 6 NEW OCCURRENCE OF AMPHIBOLE ASBESTOS IN NORTHWESTERN PART OF THE BALKHASH REGION. I.I.Bok and D.Kh.Khairutdinov. *Vestnik Akad.Nauk.Kazakh. S.S.R.*, 1969, No.4, 56-58; *Ref.Zh. Geol.*, 1969, 11 V 253.

In this region, asbestos was formed in fissures in epidiorite and at its boundaries with associated rocks. The asbestos fibres are positioned perpendicularly to the fissure, or at an angle of 70-80°: they are soft, but elastic. Chemical composition (in %): SiO_2 44.6, Al_2O_3 4.30, Fe_2O_3 8.70, TiO_2 0.42, MnO 0.73, CaO 18.2, MgO 13.62, BaO traces, Na_2O 0.62, K_2O 0.32, CO_2 6.18, H_2O - traces, H_2O^+ 3.56, $\text{Ng} = 1.658$; $\text{Np} = 1.643$; $\text{ZV} = 45 - 60^\circ$, $\text{cNg} = 7^\circ$. Chemical composition indicates that this is actinolite asbestos.

- 7 OCCURRENCE OF AMPHIBOLE ASBESTOS IN THE KREMENCHUG FERRUGINOUS REGION. M.O. Kornilov. *Dopovidi Akad. Nauk Ukr. RSR*; 1969, B, No3, 202-206.

veins of amphibole asbestos were formed in ferriferous quartzite mined at Gorishni-Plavnik. The chemical composition of the asbestos is (in %): SiO_2 50.25, Al_2O_3 0.50, Fe_2O_3 2.70, FeO 31.13, MnO 0.30, CaO 0.4, MgO 11.29, Na_2O 0.11, SO_3 0.24, CO_2 0.37, H_2O^+ 2.43, H_2O 0.24; $d = 3.25$; $\text{Ng} = 1.688$, $\text{Np} = 1.654$. The DTA curve shows three exothermic effects due to the oxidation of Fe^{2+} , and endothermic effects due to the liberation of water. The asbestos belongs to the cummingtonite group and contains 60 mol.% of grunerite.

- 8 CHARACTER OF ASBESTISATION IN THE AKTOVRAK CHRYSOTILE ASBESTOS DEPOSIT. A.V.Gal'yanov. *Izv. Vysch. Ucheb.Zaved. Gorn.Zh.*, 1969, 12, No.10, 25-28.

This deposit is covered with ellipsoidal peridotite bodies, and their concentration being related to the size of asbestos veins. The distribution of asbestos in the deposit is very irregular.

- 9 FINE STRUCTURE OF DZHETYGARA CHRYSOTILE ASBESTOS.
L.V.Bubeleva and L.S.Zevin. Tr.Nauch-Issl.Inst. Asbesta,
Slyudy. Asbestotsement. Izdelii Proekt.Stroit.Predpr.
Slyudyanoi Prom., 1968, No.24, 13-18.

The fibril size of the Dzhetygara asbestos is about the same as in Bazhenovo deposits, but the packing is different. In the Dzhetygara upper horizon there is no close order in the fibril packing. In the 130m. horizon the radius of the interfibril pores is greatly reduced. The specific surface area of the Dzhetygara asbestos is about twice that of the Bazhenovo asbestos. The destruction of the packing is due not only to the action of mechanical factors, but is also connected with the fine structure of asbestos.

- 10 OCCURRENCES OF ALKALINE-AMPHIBOLE ASBESTOS AND VERMICULITE
MINERALISATION IN SOUTHERN ALTAI. O.B.Beiseev. Khim.
Gornorud. Syr'e Kazakh., 1968, 81-87.

A new genetic type of alkaline amphibole asbestos was found in Azutan area, south of Lake Markakol. It chemically resembles magnesioriebeckite. The veins are 2-3m. long and up to 0.5m. wide. Three varieties have been distinguished, viz. and elastic greyish blue, a friable dark blue, and an intermediate variety.

- 11 - SERPENTINISATION AND FORMATION OF ASBESTOS IN THE ESHKIOIMES
ULTRABASIC MASSIF. Yu. I. Kruglyakov. Khim. Gornorud. Syr'e
Kazakh., 1968, 88-97.

Genetics of the ultrabasic massif (12-14 x 2-3 km) northeast of the Ulutan (Karaganda) region are discussed in detail. Mineral occurrences of industrial importances include chrysotile asbestos and serpentinite. Chemical compositions are given.

SOUTH KOREA

- 12 CONCRETE AND ASBESTOS-CEMENT PRODUCTS PLANT AND A
REFRACTORY PLANT PROPOSED. Mineral Trade Notes, Vol.67,
No: 10, pp. 51-52.

The Tong Yang Cement Mfg. Co., Ltd., Seoul, Korea, a leading producer of portland cement, proposes to establish a concrete and asbestos-cement products plant and a refractory plant, both in 50-50 joint ventures with one or two separate firms. The concrete and asbestos-cement products plant will produce ready-mixed concrete, concrete pipes (both reinforced and non-reinforced), piles and beams, and asbestos products (corrugated sheets and roofing slates), for both the domestic and export markets.

AUSTRALIA

13 PACIFIC ASBESTOS/WOODSREEF MINES - Upon his return from a business visit to Pacific Asbestos Ltd's new Australian subsidiary, Woodsreef Mines Ltd., Mr. R.H.Bullied, President of Pacific Asbestos, informed shareholders that concrete pouring will begin in November for the foundation of the company's 5,000 ton per day asbestos plant near Barraba, in New South Wales, Australia. The \$18 million plant is expected to be in production by the end of 1971 and will have the capacity to annually produce 70,000 tons of asbestos fibre. Mr Bullied also advised that because of increased market potential for asbestos in the Pacific Basin, consideration is already being given to enlarging the capacity of the plant.

14 NEW ASBESTOS MINE. Gummi-Asbest-Kunststoffe, 1970, 23, No.11, 1297.

Southern Cross Asbestos (subsidiary of Woods Reed Mines) plans to mine asbestos deposits in the northern part of New South Wales (Australia) estimated at about 27 mill. short tons. The production should start by the end of 1972 (capital outlay 14 mill. A\$).

15- AUSTRALIAN ASBESTOS CONTRACT. Mining Journal, Vol. 276, No. 7065, January 15, 1971.

The Marubeni-Iida Company of Japan has recently negotiated a \$ A23 million contract to import Australian asbestos from the Chrysotile Company of Australia. Under the terms of the contract the Japanese concern will provide financing for the Chrysotile Co's development and expansion plans and will become Chrysotile Co.'s sole agent for asbestos in South-East Asia as well as in Japan. This Australian concern aims to boost asbestos production in New South Wales by some 50% to about 110,000 ton/year by 1973. Japan needs to import about 250,000 ton/year asbestos which to date has come largely from Canada and South Africa. This latest contract initiates imports of white chrysotile asbestos from Australian sources.

REPUBLIC OF CYPRUS

16 The annual Report of the Senior Mines Officer, Nicosia, Cyprus, for the year 1969 has been issued. There were 5 permits in force at the close of the year for asbestos prospecting, covering an area of 5 square miles.

17 CYTECHNO CO. LTD.

Cytechno continued its prospecting activities for asbestos. A team of experts from Russia and another from Canada carried out, indepently, the first phase of an exploration program.

18 CYPRUS ASBESTOS MINES LTD.

No prospecting was done by Cyprus Asbestos Mines as its known ore reserves are estimated to last for many years to come. Operations continued smoothly and there was sufficient unskilled labour available for the company's needs. During last year 4,452,599 tons of rock were quarried at the Amiandos Mine. Three mills were in operation that treated 1,460,500 tons of raw material and produced 12,033 tons of long Grade fibre and 9,330 tons of short Grade fibre. At year end, 3,093 tons of long Grade and 2,608 tons of short Grade fibres were held in stock. Shipments totaled 22,146 tons, valued at £997,829 and included Grades designated as 3S, HSH, 6F and P50. Major destinations included the countries of the United Kingdom, Denmark, Belgium, Sweden, Austria, West Germany and Ireland.

MEXICO

19 Mexico, which does not currently produce asbestos, imported about 30,000 metric tons in 1969 valued at Mex\$86 million (US\$6.9 million) to meet its requirements. It is hoped that two new developments during the year will substantially decrease the need for imports. In August 1969 the Secretary of National Patrimony announced that the Government had formed Cia. Nacional de Asbestos, S.A., to exploit a deposit of chrysotile asbestos at Canon del Novillo west of Ciudad Victoria, Tamaulipas. Reserves were estimated at 1.2 million tons of ore. Operations were expected to begin in late 1970 at the rate of 300 tons of ore per day. A detailed description of the deposit was reported in the November 1969 issue of Mineral Trade Notes. Cia. Minera Pegaso, S.A., a joint subsidiary of Penoles and Freemex, S.A., reported in late 1969 the discovery of a chrysotile asbestos deposit north of Miuberrima, Oaxaca, considered to be "one of the most important in the world and the largest in Latin America". About 12 drill holes have found asbestos bearing rock ranging in thickness from 93 to 385 feet. The deposit is still being evaluated, but production may begin in about 2 years.

Source: Foreign Service Despatch A-280, June 25, 1970 - Mexico City.

REPUBLIC OF SOUTH AFRICA

20 MSAULI ASBES LIMITED, Johannesburg, Republic of South Africa, for the financial year ending June 30, 1970, removed 2,042,787 tons of overburden and crushed 415,147 tons of ore to produce 30,181 tons of fibre. The percentage of fibre recovered was 7.27%. Sale of fibre was valued at R2,114,345 and the estimated profit figure was R93,290. Capital expenditure during the twelve-month period reached R1,094,224.

21 The low production cost of South African asbestos makes it highly competitive in the world market and resulted in a steady expansion of the industry in 1969. Total world production increased 9 per cent in 1969.

22 Production and sales of asbestos, South Africa.

	1968		1969	
	Short tons	Value, R	Short tons	Value, R
Production:				
Amosite	97,251	-	99,151	-
Cape blue.....	114,370	-	132,368	-
Chrysotile.....	42,540	-	48,012	-
Transvaal blue....	6,369	-	5,056	-
Total.....	260,530	-	284,587	-
Exports				
Amosite	99,329	9,749,290	96,766	9,715,395
Cape blue.....	132,407	16,370,570	130,835	16,466,593
Chrysotile.....	23,035	1,594,218	24,422	1,828,742
Transvaal blue....	7,387	1,013,298	5,639	790,167
Total.....	262,158	28,727,376	257,662	28,801,897

Note: 1 South African rand equals US\$1.40.

23 The country's largest asbestos mining company, Cape Asbestos Ltd., was taken over in 1969 by Charter Consolidated Ltd., a London affiliate of the Anglo American Corporation. Cape Asbestos operated the only large amosite asbestos mine in the world at Penge in the northeastern Transvaal as well as blue asbestos mines in northwest Cape Province. The company exported about 140,000 tons of asbestos fibre per year. Other important producers are General Mining's Msauli chrysotile mine and Gefco crocidolite mines and the South African Trading Company's blue asbestos mine at Kuruman, Cape Province. The Msauli mine had an expansion program underway during 1969 and by December reported a fibre recovery rate of 6.75 percent, compared with 5.93 percent in 1968. The company was planning to spend an additional R160,000 on expansion of its facilities. The demand for blue asbestos, which had been in a decline, picked up in 1969. As a result Gefco was planning to exploit new reserves and raise its milling capacity. Modification and exploitation of ore bodies within an economic distance of the present mills was planned for 1970 and 1971.

Source: Foreign Service Despatches A-101 in 1969 and A-59 and A-95 in 1970 - Johannesburg.

PART 2. ASBESTOS CEMENT.

- 24 PRODUCTION OF ASBESTOS CEMENT ARTICLES IN GERMAN DEMOCRATIC REPUBLIC. E.A. Valynkov, I.Z. Volchek and Yu. B. Molodtsov. In Russian.

The production of asbestos cement sheets in East Germany increased 2.5 times since 1965, and of asbestos cement pipes 2 times. Asbestos cement sheets (flat and corrugated) are produced in Hardelegen and pipes in Magdeburg. Technology of the processes used is described.

- 25 ADVANCES IN THE MANUFACTURE OF ASBESTOS CEMENT PRODUCTS AT THE SEBRYAKOV COMBINE. V.S. Shein, Stroit, Mat, 1970, 16, No.9, 2.

Recent mechanisation and automation of the machinery at the Sebryakov combine are described. The present annual production of the combine is 230 mill. of tiles and 2000 km. of pipes.

- 26 BUILDING MATERIAL INDUSTRY IN KAZAKH SSR. B.V. Parimbetov. Stroit, Mat, 1970, 16, No.9, 3-5.

The first factory of asbestos cement products in Kazakh SSR was put in operation in 1960 at Karaganda; later, factories at semipalatinsk and Chimkent were erected. Their total production in 1969 amounted to 500 mill of tiles and 3700 km. of asbestos cement pipes. In 1965 a mining-dressing combine at Izhetygara was made operational, its annual capacity is 600,000 t, of asbestos.

- 27 SOVIET STANDARDS FOR WALL- ROOFING- AND INSULATING MATERIALS. Izdatelstvo Standartov, 1970, Stroit, Mat, 1970, 16, No.10, 39.

This collection comprises 55 standard specifications including corrugated asbestos cement sheets; hollow asbestos cement plates; roofing materials such as ruberoid, isol, etc, mastics, heat insulations such as sovelit, asbestos-vermiculite materials, etc.

- 28 USE OF MINING WASTES FOR THE PRODUCTION OF BUILDING MATERIALS. R.L.Shuster and P.M.Reznichenko. O.Kompleksn. Ispobzov.Nefelin. Porod Kirgiz, 1968, 58-62.

Alkali rich wastes of asbestos and nepheline dressing can be utilized for the production of mineral wool and container glass. Asbestos wastes were mixed with 30% dolomite limestone and melted at 1300°C to produce mineral wool. For the manufacture of glass, asbestos wastes were mixed with 5% CaCO₃, 15% Na₂CO₃, and 15% quartz sand. Dark brown or dark green glass was obtained, depending on the iron oxide content in the wastes.

- 29 DEFIBERISATION OF ASBESTOS. E.S. Dolinskaya and T.M. Berkovich. Tr. Nauch.-Issl. Inst. Asbesta, Slyudy, Asbestotsem. Izdelii Proekt. Stroit. Predpr. Slyudyanoi Prom. 1968, No. 24, 3-13.

The effect of the degree of comminution of asbestos on physico-mechanical properties of asbestos cement was studied. The Bazhenovo asbestos was divided into fractions according to the length and cross section of the fibres. The fibres were worked on laboratory roll mill and in propeller mixers. It was found that the rolling of the fibres to increase their cross-section results in a spatially coagulated structure of the fibres in suspensions, thus affecting the physico-mechanical properties of the products and the output of the sheet-forming machine.

- 30 CZECHOSLOVAKIAN PATENT NO. 132898. ASBESTOS CEMENT CONTAINING MAGNESIUM FLUOSILICATE. K. Klement et al.

Asbestos cement products (asbestos: portland cement weight ratio being 1:6) are improved by the addition of 3-5% (with respect to the weight of the cement) of $MgSiF_6$; the bending strength of the product is increased by 80%, and the alkalinity of the surface is eliminated, whereby the dye receptivity is improved. The lime liberated during the hydration of the cement reacts with $MgSiF_6$ forming insoluble compounds CaF_2 and $Mg(OH)_2$, and colloidal silica, which fills the pores and binds the excess $Ca(OH)_2$.

- 31 GERMAN PATENT NO. 1917706. ADDITIVE FOR CEMENT MORTAR USED IN PRESTRESSED CONCRETE CONSTRUCTIONS. Lechler Bautenschutzchemie K.G.

Properties of cement mortar, used for filling space between reinforcing elements of prestressed concrete and their tubular envelopes, are improved by the addition of an aqueous suspension of finely divided calcium and/or barium hydroxide and, optionally, asbestos fibres. Colloidal particles of calcium (barium) hydroxide and asbestos fibres prevent the settling of cement particles. Moreover, calcium (barium) hydroxide protects the reinforcing elements against corrosion.

- 32 BRITISH PATENT NO. 1,163,955. MINERAL FIBREBOARD. Wood Conversion Co.

Mineral fibreboards having high strength and hardness are produced from a mixture based on slag wool and comprising about 17% of starch, 2-3% of colloidal chrysotile asbestos fibres and optionally, small additions of polyacrylamide and china clay.

- 33 CYPRUS ASBESTOS CEMENT WORKS.

The asbestos-cement factory at Moni utilized 191 tons of asbestos to manufacture 29.9 tons of flat sheets, 1180.2 tons of corrugated sheets and 265.0 tons of molded goods. Sales of manufactured goods totaled 1371.4 tons, valued at £52,728. Asbestos, November 1970.

34

SYSTEM OF AUTOMATIC CONTROL OF PIPE-FORMING MACHINES.

By F.M. Kholov, V.N. Bykhovskii and A.M. Fuks.

The control of some important parameters of pipe-forming machines is carried out manually. For instance, the stop of the main drive after reaching the required wall thickness of the pipe is ensured by the operator on the basis of indications by the mechanical indicators of thickness. The low accuracy of the indicators as well as the errors of the operators lead to "overwinding" of the pipes, and thus to significant losses of raw materials, and reduction of machine output. The "overwinding" by 1 mm of pipes with inside diameter of 100 mm reduces the output of the set by 6-8%, which costs about 50000 rubles per annum. This makes evident the expediency of developing an automatic control system for the wall thickness of products made with pipe-forming machines. The basis of the system is an instrument of continuous automatic control of pipe wall for all standard types manufactured during the formation process in various machines. The thickness meter and the automatic control of the machine, type ATM-3, were developed by the VIASM Institute in 1966-1967. They are employed successfully at several asbestos cement plants. The realisation of such a system for other types of machines is in its final stage. The block diagram of the automatic control system is shown in Fig.1. It comprises a thickness meter and a relay circuit controlling the main drive of the machine. The pipe thickness meter includes two transducers, control unit and three secondary instruments DSR 1-04, and measures and controls the wall thickness at the end of the articles (at two points), as well as determines the thickness variations. The range of measurements is 0-20 and 0-30mm, class of accuracy of thickness instrument - 2. The measurement is carried out on the basis of vertical displacement of the pressure carriage which takes place during the process of forming, and which is converted into an electric signal. The converter used is made up of a linear differential transformer. The transducers include four measuring systems comprising a cam and a linear differential transformer. The motion of the sprocket is transmitted by the cams by a pair of spur gears, and the cams displace the plungers of the linear differential transformers.

The control unit comprises two isolating transformers and a switch permitting the change over of the instrument measurement range. The system of automatic control operates in the following manner. The transducer (Fig.2) is mounted on the upper platform of the machine, and a chain links it to the pressure carriage. Vertical displacement of the latter during forming of the asbestos cement pipe is transformed into the rotation of the transducer cam. At the same time, plunger LDT2 changes the output voltage of the linear differential transformer. The signals of the transducers are fed to the secondary instruments via the control unit. The indicator of the predetermined size of the positional control unit of each DSR 1-04 instrument is set on the scale marking corresponding to the pipe thickness required.

When this value of thickness is reached during the process of forming (at the left and the right), a signal from the thickness meter is fed to the control circuit of the pipe forming machine via a system of electromagnetic relays. This results in stopping the main drive of the machine, and starts the lift of the pressure carriage which is controlled by an upper limit switch. After the operation of the switch, the pressure carriage is moved down towards the lower limit switch.

The operation of the system during three years demonstrates its high reliability, and simplicity of its servicing. The approximate saving due to the introduction of a single unit is 15-20000 rubles. The period of cost recuperation is 3 months. The productivity of the machine increased by 2.5 - 4%.

The automatic control system of thickness of formed pipes was introduced in the ATM-3 sets at Bolgorod, Sebryakov and Dushanbinsk combines of asbestos cement articles.

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CAPTIONS OF FIGURES.

- Fig. 1. Block diagram of an automatic control system.
 1 - pipe-forming machine; 2 - relay circuit;
 3 - secondary instruments; 4 - control unit;
 5 - transducers.
- Fig. 2. The design of the kinematic linkages between the transducer and the pipe-forming machine.
 1 - transducer; 2 - linear differential transformer;
 3 - upper belt; 4 - pressure carriage; 5 - pipe;
 6 - lower belt; 7 - support shaft.

- - - - -

35 AUTOMATIC CONTROL OF DIMENSIONS OF ASBESTOS CEMENT SHEETS DURING THEIR FORMATION. By K.V. Artamanov and M.I. Shuster. Translation from Russian.

The All-Union R & D. Institute of automation in plants of building materials industry (VIASM) has designed, produced and introduced into operation in Dushanbinsk and Belgorod combines of asbestos cement articles installations of the type UKN-1. These are intended for continuous automatic control of thickness as well as thickness variation of sheets during their formation.

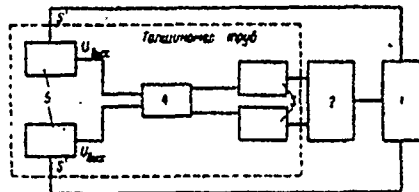


Figure 1

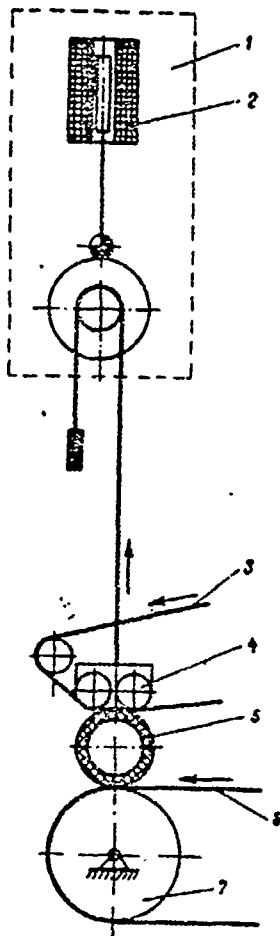


Figure 2

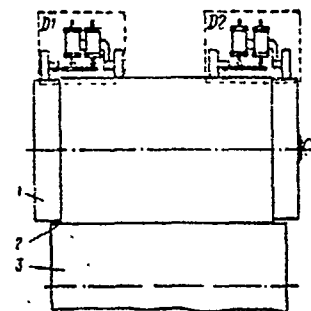


Figure 3

Measurement of the mean rolled layers, determination of the number of layers which form a sheet per work cycle, and the forming of a command signal for automatic sheet cutting are also included. The installations may be applied in systems of automatic control of sheet forming machines.

From design point of view the installation is made up of individual units protected against dust. Eleven modifications are designed to be used in accordance with the functions performed and types of the secondary instruments. For the execution of all functions, the installation includes two transducers, control unit, two switching units, control unit, illuminated sign board, and three secondary instruments. As secondary instruments of measuring the thickness and thickness difference, indicating, controlling and recording meters of the type DSR1-04 are used, or indicating and controlling instruments of the type MR-1-02. In the last case, two normalising converters of the type NP-P1, and voltage stabilizer type S-0.9 are comprised additionally in the set.

Thickness control is ensured by one of the transducers D1 or D2 (see the drawing) set along the edges of the sheet forming drum, and by the secondary instrument. The preset thickness is fixed on the illuminated sign board. The value is predetermined with the secondary instrument. The circuit is based on linear differential transformers of the transducer. The transducer comprises two rollers, one of which moves over the sheet forming drum of the machine, while the other one rolls on the formed sheet. One roller is connected to a plate against which plungers of two linear differential transformers are bearing, whereas the coils of these transformers are rigidly linked to the other roller. The rollers are shifted with respect of one to another during an increase of rolled sheet thickness, and this results in plunger displacement proportional to the measured thickness. The adopted design of transducer kinematic eliminates the effects of sheet forming drum runout.

The thickness is controlled by the null-balance circuit. For the attainment of the required thickness of the sheet, contacts in the control unit of the secondary instrument are closed for initiating the operation of the cutting machine and the signalisation. The illuminated board indicates the end of the winding cycle, and allows manual control of the cutting operation if required.

Thickness difference is controlled by transducers D1 and D2 as well as the secondary instruments, while deviation from the predetermined limit is signalled by the illuminated board. The predetermined size "on the left" or "on the right" is set on the secondary instrument. The circuit comprises one linear differential transformer for each transducer. Series connection of the transformer primaries, and the connection in opposition of their secondaries allows the thickness difference of the rolled material to be judged from voltage difference.

The mean thickness of the layer is measured by transducers D1 and D2, control unit, switches I and II, and the secondary instrument. The circuit comprises one of the linear differential transformers of the transducers.

The control unit is designed to convert the signal of the linear differential corresponding to the sheet thickness into a signal proportional to the mean layer thickness of the formed sheet, and to store it till the beginning of the following measurement. The moment of transmitting the signal to the control unit is determined by switch I which fixes the speed of the forming drum. The duration of the signal transmission is controlled by a limit switch mounted on the machine. The circuit provides the possibility of automatic sheet cutting by the number of revolutions of the forming drum controlled by switch II. The control unit represents an electronic instrument comprising an amplifier unit, switching elements and supply. Switches I and II are formed by stepper scanning unit in a metal housing with cover. Longer service life is ensured by immersion of the stepper into transformer oil.

Counting of the layers number is carried out by the control unit, switches I and II, and the illuminated board. A limit switch is operated after each turn of the forming drum, while the rotor of the stepper scanning unit of switch I is shifted into position corresponding to the number of forming drum turns. At the instant of cutting the sheet by the blade the second limit switch is closed, while the stepper of the switch II is transferred to a position which is identical to the position of stepper of switch I, and the latter returns to its initial position. Consequently, the number of layers which formed into a sheet is determined by switch II as far as the succeeding cycle is concerned. During the latter period, switch I takes count of each turn of the forming drum. The illuminated board monitors the number of layers forming a sheet (from 5 to 16).

Technical specification of UKN-1

Overall dimensions in mm:

sheet thickness	0-10
differential thickness of sheet . . .	2-0-2
layer thickness	0.2-1.6

Ambient air temperature. from +5 to + 50°C

Relative humidity at a temperature of +35°C..... up to 98%

Characteristics of vibration:

frequency	up to 25c/sec
amplitude	0.1 mm

The long-term operation of the installation at Dushanbinsk and Belgorod combines of asbestos cement articles confirmed their high reliability. Economical saving due to their introduction - 5000 rubles per annum. The cost of the unit is recovered in 6 months.

Figure 3. Mounting of transducers for control of thickness of the asbestos cement sheet.

PART 3. ASBESTOS TEXTILES.

- 36 LAMINATES WITH INORGANIC SUPPORT FOR USE IN ELECTROTECHNIQUES. G. Nicola, Mater. Plast. (Rumania), 1969, 6, No.2, 92-96.

Sixlotextolit and asbotextolit are electrical insulating materials produced by impregnating glass fibres or asbestos fabrics respectively with a cresolformaldehyde resin. These materials can be used at elevated temperature and in a humid atmosphere.

- 37 NEW ASBESTOS YARN ELIMINATES DUST. So. Textile News 25: 22 (Sept 7, 1970).

Properties of an asbestos yarn called Nicolon, which is claimed to virtually eliminate the dust problems encountered in weaving, knitting, or braiding asbestos, are described. This yarn is manufactured by Nicotex Inc., Ambler, Pennsylvania.

- 38 BRITISH PATENT NO. 1,169,194. COMPOSITE YARNS. BBA Group Ltd.,

Yarns suitable for weaving into fabrics for heat and flame resistant clothing are produced by core-spinning into normal 32s or 40s asbestos yarn (having a Z or S twist) a wool sliver or roving (in an S or Z twist respectively). The asbestos yarn serves as a carrier and forms most of the surface of the product. Clothing made of the composite fabric are especially suitable for steel foundry work, as they char only slightly when molten steel is splashed thereon.

PART 4. ASBESTOS FRICTION MATERIALS.

- 39 GERMAN PATENT APPLICATION NO. 1807468. FRICTION MATERIAL FOR BRAKES AND CLUTCHES. Jurid Werke G.m.b.H.

This material is produced from a mixture containing (in parts by weight) asbestos 5, phenolic resin 2, lead particles coated with magnesium oxide 3.5, and polytetrafluoroethylene particles coated with copper 4. The mixture is cured by heating at 190°C for 8 hrs.

- 40 BTMA ACCELERATOR FOR THE VULCANISATION OF ASBESTOS FRICTIONAL MATERIALS. N.A. Bykova and E.S. Popova. Kauchul i Rezine, 1970, 29, No.7, 24-26.

Replacement of conventional accelerators, such as Captax or thiuram, by BTMA in rubber-base asbestos containing frictional materials improves their wear resistance and thermal stability, the maximum friction coefficient is shifted from 240°C to 284°C. Pressure vulcanisation is considerably accelerated. The materials are especially suitable for brake linings.

- 41 FRENCH PATENT OF ADDITION NO. 94766/1457036. FRICTION MATERIAL CONTAINING ASBESTOS AND SULPHIDE BINDER. S.A. Francaise du Ferodo.

Friction materials are produced by forming sulphide binders for asbestos fibres in situ, namely by reacting sulphur with iron and, optionally with copper or cupric sulphide. The sulphide(s) represent 10-50% by volume of the composition. The material is subjected to a pressure of 300-3200 atm., at 80-600°.

- 42 U.S. PATENT NO. 3,492,262. FRICTIONAL MATERIAL. Abex Corp. A composition for use in the manufacture of railroad brake shoes having excellent resistance to wet fading out, comprises 14-24% by wt., of a phenol-formaldehyde or a similar thermosetting resin, 12-30% of particulate cast iron, 20-55% of natural graphite, 8-17% of asbestos fibres and up to 30% of a friction modifier, such as powdered coke or ground barite or corundum.

PART 5. ASBESTOS REINFORCED PLASTICS.

- 43 ALTERNATIVE REINFORCEMENTS. British Plastics, December 1970. p.85.

Glass in various grades, is the most common fibre reinforcement, asbestos, a naturally occurring whisker material, is enjoying increasing use. It is believed that as this fibre breaks down in processing the length/diameter (aspect) ratio does not alter, thus the strength of the bond between fibre and matrix - partly a function of the aspect ratio - is maintained to a greater extent than with glass fibres for example. In polypropylene the inclusion of 40% long fibre asbestos increases the flexural modulus by almost four times, the tensile strength by almost twice, reduces the coefficient of thermal expansion to 1/5th of that of the homopolymer but stiffens the melt flow index rather severely.

- 44 BRITISH PATENT NO. 1,176,693. MODIFIED ASBESTOS FIBRES. Union Carbide Corp.

Highly fiberised asbestos is treated with an unsaturated organic acid, such as acrylic or methacrylic acid under esterification conditions at 80-120°C for 15 mins, to 3 hrs. The product is separated by filtration, washed to remove the unreacted acid and dried. The product is especially useful as a reinforcing material for unsaturated polyesters.

- 45 GERMAN PATENT APPLICATION NO. 1,939,728. AGGLOMERATED FIBRE-RESIN MATERIALS. Bakelite Co.

Fibres in the form of felts or wads are agglomerated with powdered adhesive resins, such as phenol - or urea formaldehyde resins, and then thermally consolidated. Suitable fibres include, inter alia, asbestos fibres.

- 46 U.S. PATENT NO. 3,474,048. FIBRE REINFORCED POLYMER FOAMS. Monsanto Co.

Insulating materials useful in many applications are produced by mixing granular styrene with asbestos or glass fibres, extruding the mixture, chopping the extruded rods, treating them with methylene chloride, and foaming. The products have high tensile and tearing strength.

- 47 COMPARISON OF THE ABLATION PERFORMANCE OF ASBESTOS PHENOLIC WITH SILICA PHENOLIC. P.B. Brandt. Tenth AIAA/ASME Struct, Dyn. Mater, Conf, Collect, Tech Pap., 1969, 69-77.

Comparative ablation tests of asbestos phenolic and silica phenolic heat-shield materials were carried in CAL wave superheater. The effective heat of ablation for the asbestos phenolic at a stagnation point pressure of 52 atm. is 969 Btu/lb. Various problems connected with ablation of these materials are discussed.

PART 6. BUILDING MATERIALS.

- 48 COMPOSITE ROOFING. British Plastics. November 1970. p. 95.

A new 800,000 ft³ concrete framed brick in-fill panel warehouse built by AVF Developments Ltd., at Charlton, London, for the Thorn Group has been roofed with asbestos and GRP sheeting laid at a 5 degree pitch. The building was erected complete, including piling, in less than four months. Architects, R.Siefert and Partners, have used three 75ft roof spans over a gross area of 90,000ft², giving an unobstructed clear headroom of 27ft. Over one-fifth of the roof area consists of Cascalite glass fibre reinforced translucent plastic sheeting profiled to match Major Tile asbestos sheeting supplied by the Atlas Cement Co. Ltd., which is supplied by BXL expanded Rubber and Plastics Ltd., Croydon. The sides and end laps of both asbestos and plastic sheeting are sealed with mastic sealing strip.

- 49 U.S. PATENT NO. 3,466,354. PRODUCTION OF ASBESTOS BASE TILES. Vermiculite Manufacturing Co.

Tiles for flooring or other structural applications are produced by a rapid process comprising preparing a mixture of 50-70% by wt. of sodium silicate, 2-3% of exfoliated vermiculite, 28-35% of asbestos fibres, the balance being other fillers, forming the mixture into a sheet, moistening it and perforating, and subjecting it to a radiant heat source to dry and cure.

- 50 U.S. PATENT NO. 3,466,221. FOAMED ALKALI METAL SILICATE INSULATIONS. Philadelphia Quartz Co.

A composition comprising 80-90% by wt. of sodium silicate (SiO_2 , $\text{Na}_2\text{O} = 2.5$ to 3.2), 3-6% of asbestos fibres, 0.2-0.6% of elemental Si, 6-15% Na_2SiF_6 and, optionally, minor amounts of borax and a sodium acid phosphate, is heated to produce a foam, which is moulded into boards.

- 51 FRENCH PATENT NO. 1,582,087. NON-FLAMMABLE ROOFING MATERIALS. S.A. Francaise du Ferodo.

A non-flammable roofing pasteboard is produced by rolling a paste based on asbestos, bitumen and fillers. In an example the paste consists of (in parts by weight), asbestos 54.5, bitumen emulsion 11, ultramarine blue 1.5, slate powder 26, carbon black 3, Marseille soap 3, and water 15. The pasteboard can be applied by nailing and battening.

- 52 ANTI-SLIP PLASTIC ASBESTOS FLOORING FOR VEHICLES. Gummi-Asbest-Kunststoffe, 1970, 23, No.11, 1298.

Ferodo Ltd developed a special anti-slip flooring for buses, railway carriages, etc., which consists of a plastic material reinforced with asbestos. It is 2.3 mm thick and can be applied onto the floor by glueing.

- 53 INFLUENCE OF THE ROLLING METHOD ON THE STRUCTURE AND PROPERTIES OF POLYVINYL CHLORIDE FLOORING MATERIALS. V.S. Fadeeva, N.L. Sirotkina and T.M. Shapiro. Stroit, Mat, 1970, 16, No.12, 21-22.

Rheological characteristics, physico-mechanical properties and microstructure of flooring materials prepared by rolling under different conditions compositions based on polyvinyl chloride latex, plasticised with dioctyl phthalate, and filled with asbestos (up to 32%) were investigated. Factors participating in the rolling process are discussed.

PART 7. ASBESTOS PACKING, SEALING & COATING COMPOSITIONS.

- 54 BRITISH PATENT NO. 1,185,330. FLAME-RETARDANT HARDBOARD. Bowaters United Kingdom Paper Co.Ltd.

A layer of wet asbestos or a mica-wood fibre blend is continuously laid onto a wood-fibre layer as it is formed, and the two layers are bonded together by removing water. Starch is preferably used as a binder. The asbestos or mica-wood fibre layer is treated with an aqueous flame-retardant composition comprising, e.g. "Polybor", urea, and formalin. This solution penetrates into the wood fibre layer.

- 55 FRENCH PATENT NO. 1,564,946. ELASTIC IMPREGNATED ASBEST. FELTS FOR USE AS GASKETS OR FILTERS. Brown Boverie & Cie, A.G.

These materials are produced by soaking asbestos felt with a solution of a metal salt, drying, thermally decompressing the salt to a metal oxide or reducing the salt to a metal in a reducing atmosphere, moulding the product to the desired shape and sintering under a uniform or nonuniform pressure. When a low pressure is applied a gas-permeable product is obtained, under high pressures, gas-impermeable materials are produced. When the salt was reduced to metal, the material is electroconductive.

- 56 CANADIAN PATENT NO. 828725. COATINGS FOR WOOD ARTICLES. PPG Industries Inc.

Wood or plywood substrates are coated with an adhesive film and an asbestos sheet material is applied thereon. Subsequently, the asbestos sheet is covered with a thermo setting resin. The resin can be baked at an elevated temperature without substantially affecting the wood substrate. A highly durable coating is obtained.

- 57 CANADIAN PATENT NO. 824,047. COATING COMPOSITION. Benjamin Foster Co.

Composition for the formation of water-resistant and incombustible coatings over thermal insulations comprises sodium silicate as a binder, magnesium aluminium silicate as a suspending agent, a chalking agent, micromised mica and/or Canadian chrysotile asbestos as a filler, and water. The resulting coating is resistant to impact and abrasion.

- 58 U.S.S.R. PATENT NO. 269655. SEALING COMPOSITION. N.Z. Zhorno and Yu.M. Kopylov.

Hermetic sealing composition contains (in % by wt.); colophony 10-55, paraffin 1-28, mineral oil 1-10, felspar 20-80, asbestos 1-16, and graphite 1-12. The composition has good plasticity and can be used at temperatures up to 200°C.

- 59 U.S. PATENT NO. 3,519,594. ASBESTOS PARTICLES COATED WITH POLYMER. Amicon Corp.

Defibrillated chrysotile asbestos can be provided with a continuous polymer coating by mixing a fibre dispersion in an aqueous monobasic acid (e.g. acetic acid) with styrene or methyl methacrylate, ammonium persulphate and, optionally, benzoyl peroxide, and effecting the polymerisation of the monomeric components.

- 60 FRENCH PATENT NO. 1,566,484. ASBESTOS CONTAINING PAINTS.
P.A. Gendre.

Chrysotile asbestos fibres are added to a conventional paint base to obtain a thickened decorative paint, which can be applied in one or a few thick layers.

PART 8. ASBESTOS PAPER & INSULATING MATERIALS.

- 61 EAST GERMAN PATENT NO. 66578. FIBRE REINFORCED MORTAR.
R. Trautvetter et al.

A mortar used for building purposes, as a wall plaster or a component of insulating gypsum panels, consists of a mixture of at least 85% by wt. of calcined gypsum or anhydride, and up to 15% of a mixture comprising about 45 parts by wt., each of chopped glass fibres and cut mineral wool and 10 parts of asbestos fibres. When mixed with water, the mortar does not separate into components for a considerable period of time.

- 62 U.S. PATENT NO. 3,472,668. INSULATING MATERIALS BASED ON
CALCIUM SILICATE. Owens-Corning Fiberglas Corp.

Insulating material having high strength and resistance to impact is produced by preparing an aqueous dispersion of asbestos fibres, quicklime, diatomite or another silica component, resin coated glass fibre strands (up to 3 ins), and a thermally activated blowing agent, forming the mixture into the desired shape, effecting the setting of the resin, and drying the product at a temperature not exceeding 350°F.

- 63 GERMAN PATENT APPLICATION NO. 1,817,535. PRODUCTION OF
NON-INFLAMMABLE PAPER. Papierfabrik Schenfelen.

Paper which does not burn even in pure oxygen is produced from a composition, whose fibrous compounds comprise 20-70 parts by wt, of non-inflammable fibres (asbestos, glass fibres or polyvinylidene chloride fibres) and 8-30 parts of cellulose fibres. A wet-strength agent (PVC, Polyvinylidene chloride or the like) is added. The composition may contain 10-30 parts by wt, of a filler such as TiO_2 or $MgCO_3$. The paper is impregnated with a 30-50% solution of a fireproofing compound, such as diammonium hydrogen phosphate or its mixtures with urea. The fire resistance of the paper may be increased by applying onto it a thin foil of polyvinylidene - or polyvinyl halide, such as polyvinyl fluoride.

- 64 U.S. PATENT NO. 3,450,547. EXPANDED SILICATE INSULATION.
Philadelphia Quartz Co.

Heat insulation, having good dimensional stability and resistance to moisture, is produced by heating sodium silicate of specified composition and mixing it with diatomaceous earth and a small amount of asbestos fibres. The product is heated to intumescence, and the particles are recovered.

PART 9. REFRACTORY FIBRES.

- 65 BORON/EPOXY COMPOSITE BLADES FOR THE SIKORSKY HELICOPTER.
Rubber and Plastics Age, 1969, 50, No.6, 449.

In this material boron filaments produced by deposition from the gas phase on tungsten wires are used. The tensile strength of the boron/epoxy composite material is 200,000 psi; the fibre; resin volume ratio is 1:1; Young's modulus 30×10^6 . The material has an outstanding fatigue strength. The use of this composite in the manufacture of other aircraft parts is planned.

- 66 FILAMENTARY IRON CRYSTALLITES. V. Ya. Bulanov. V.V. Pluzhnikov and A.V. Sinyukhin. Poroshkovaya Metallurgiya, 1968, 8, No.8, 98-99.

Iron whiskers can be produced by reducing iron chlorides. They are composed of Fe, have a microhardness of 162-187 dynes/mm.² (1.5 - 1.6 times the microhardness of conventional iron powders) and the tensile strength of up to 72.0 dynes/mm.². They reach a length of 2-40 mm, their diameters being between 200 and 400 m.

- 67 FILAMENT-REINFORCED METALLIC COMPOSITES. N.D. Greene and N. Ahmed. Mater. Prot., 1970, 9, No.3, 16-18.

The resistance of filament-reinforced metallic composites to attack by aggressive chemicals and their tendency to galvanic corrosion have been studied. Both the matrix and filament can be attacked. For instance, copper matrix is attacked by conc. HNO₃ or an oxidising NH₄OH solution, whilst tantalum reinforcing filaments are dissolved by HF. Similar effects occurred in the Ni-W system. In these systems any strong galvanic effect is improbable, it may occur with boron.

- 68 ADVANCES IN THE FIELD OF TEMPERATURE-RESISTANT FABRICS.
S.M. Atlas. Nuova Chim., 1969, 45, No.1, pp. 27-31.
In Italian. (Through Chemical Abstracts, 1970, 73, No.8, abstract 36382.)

The article reports on the preparation and properties of various types of fibres developed for use in the production of high-strength, heat-resistant materials. Developments in polymer, metal, ceramic, and boron nitride fibres are described.

- 69 STRUCTURAL EVALUATION OF LONG BORON COMPOSITE COLUMNS.
J.W. Goodman and J.A. Gliksman. Amer.Soc.Test.Mater.,
Spec.Tech.Publ., 1969, ASTM STP 460, 460-469.

Tubes made from an epoxy resin reinforced with boron filaments were evaluated for use as long columns in spacecraft. It was found that weight saving compared with Al tubes of the same strength was 33-45%. Hand lay-up techniques were adequate for producing 3 - and 4- ply composites.

- 70 ADVANCED COMPOSITE MATERIALS IN SPACECRAFT. J.D.Forest
(Gen.Dynamics). Modern Plastics 47, pp. 136-137, 140
(Sept. 1970).

Properties and types of filament reinforcements are discussed. Fabrication techniques for manufacturing resin-based composites are described together with various end uses.

- 71 OPTIMIZATION OF A BORON FILAMENT-REINFORCED COMPOSITE -
MATRIX. P.W. Juneau, L.H. Shenker and V.N. Saffire.
Am.Soc.Test.Mat., Spec. Tech.Publ., 1969, ASTM STP 460,
170-181.

Boron filament-resin laminates were evaluated for use in short-time, high-temperature applications in the aerospace field. Toughness was the main property required for the resin matrix, rather than high modulus and strength alone. A phenolic resin modified with epoxy and polyvinyl showed optimum properties for a 500°F application.

- 72 GERMAN PATENT APPLICATION NO. 1,950,023. CHRYSTAL
WHISKERS OF SILICON NITRIDE. N.V Philips' Gloeilampen-
fabrieken.

Chrystal whiskers of Si_3N_4 , having a diameter of 5-10 microns and a length of 1-4 cm., are produced by the vapour-liquid-solid mechanism at 1290°C. The gas phase contains 20% or more of N_2 , the remainder being Si and H_2 . The substrate (e.g. graphite) is locally covered with a liquid metal (e.g. iron).

PART 10. MISCELLANEOUS.

- 73 CANADIAN PATENT NO. 833066. PURIFICATION OF SEWAGE. Union
Carbide Corp.

Domestic sewage or another polluted waste liquid is passed through a primary classifier where it is treated with lime, asbestos fibres and return bacterial sludge (from the second classifier), and then passed to a reactor containing an aerobic bacteria culture, where it is subjected to additional treatment with oxygen, carbon dioxide and asbestos fibres, as an aid to bacterial growth. The liquid is then subjected to secondary classification, flocculation, and possibly other purification operations.

- 74 NETHERLANDS APPLICATION NO. 6,609,685. TUBULAR HEAT-TRANSFER SYSTEM. S. Moore & Co.

A heat-transfer system, comprising a tube for conveying gaseous or liquid substances and a tube for heating the former, is provided with a common heat insulation suitably consisting of an asbestos polyester tape, which is surrounded by a flexible sheet of a polymeric material.

- 75 NETHERLANDS APPLICATION NO. 6,709,679. BINDER FOR FIBROUS COMPOSITIONS. Princeton Chem. Res. Inc.

Lattices, suspensions or solvents of copolymers of methacrylonitrile are used as binders for compositions containing a fibrous material. Suitable fibres include asbestos, glass, natural or synthetic organic fibres etc.,. The composition may be used, e.g. as a backing for asbestos tiles.

- 76 NETHERLANDS APPLICATION NO. 6,706,538. RELEASE COMPOSITION. Soc. Ind.Des. Silicones.

A long-life composition used for releasing from moulds plastic or ceramic articles consists of: (a) a polymerisable or cross-linkable silicone (polysiloxane); (b) a cross-linking monomer or polymer (alkyl monosilicate or polysilicate); (c) an anti-adhesion agent (silicone of a fatty acid ester, a silicone fluid, a polyalkylene glycol or a heat-exchange liquid); (d) a regulator which extends the life of the composition (wood flour, asbestos or a powdered polymer); (e) a catalyst (e.g. dibutyltin dilaurate, t.-butyl peroxide, or the like), and (f) a siliceous filler.

- 77 GERMAN PATENT NO. 1,297,585. OIL-ABSORBING COMPOSITION. Chemie-Technik. G.m.b.H.

A composition absorbing up to 100% of fuel oil (with respect to its own weight) consists of 25-40% of asbestos, 10-30% of a resin, 10-20% of rubber, and 15-40% of inorganic fillers. The oil can be removed from the composition by heating. If the inorganic filler contains iron, the composition can be collected from the surface of water by means of a magnet.

- 78 FRENCH PATENT NO. 1,560,611. LINING MATERIAL FOR INGOT MOULDS. Doittan Products Metallurgic.

A basic exothermic composition for mould linings comprises 67-69% by wt, of pulverised limestone, 3-6% of an alloy of silicon with calcium or aluminium, 3.5 - 10% of manganese dioxide, 4-9% of asbestos fibres, 4-15% of wood flour, and 4-9% of a water insoluble grog.

- 79 FRENCH PATENT NO. 1,564,946. PRODUCTION OF ASBESTOS POWDER. Brown, Boven & Cie. A.G.

Asbestos powder having improved filtering properties is produced by soaking an asbestos felt in a solution of a metal salt; drying the soaked felt; heating it in a controlled atmosphere to decompose the metal salt; grinding the product; shaping the powder as desired; and calcining under pressure. The metal is selected according to the desired catalytic properties.

- 80 BRITISH PATENT NO. 1,146,926. THICKENING COMPOSITION CONTAINING ASBESTOS. W.R. Grace & Co.

An improved thickener for plastisols, organosols, resins, latexes, paints, etc., is produced by suspending a mixture of asbestos fibres and silica in a gaseous medium in a micronizer or another fluid energy mill, heating the mixture and grinding it with extreme turbulence until the particles size is reduced to 2-10 microns.

- 81 U.S.S.R. PATENT NO.227481. FILLER FOR ACETYLENE CYLINDERS. A.N. Shashkov. et al.

A porous filler for acetylene cylinders consists of 30-50% by wt, of activated carbon, 10-20% of chrysotile asbestos fibres, and 30-60% of expanded perlite. Use of finely divided perlite instead of the usual silica sand reduces the bulk density of the product and decreases the costs.

PART 11. REVIEW OF JOURNALS.

"ASBESTOS", October 1970.

131, North York Road, (P.O.Box 471) Willow Grove, Penn.19090,U.S.A.

- 82 QAMA HOSTS YOUR EDITOR, p. 2.
83 THE HISTORY OF THE ASBESTOS TEXTILE INDUSTRY IN THE UNITED STATES- CHAPTER III: H.K. PORTER COMPANY. RUSSELL WORKS,p.1C.
84 CONTROL AND SAFETY GUIDES, p.20.
85 ASBESTOS IN BITUMINOUS CONCRETE, p.26.
86 MARKET CONDITIONS, p. 32.
87 CONSTRUCTION NEWS, p.38.
88 PRODUCTION-IMPORTS-EXPORTS, p.42.
89 INDUSTRY NEWS, p. 48.
90 NOTES FROM 1969 ANNUAL REPORTS, p.52.
91 ASBESTOS STOCK QUOTATIONS, p. 55.
92 ASBESTOS PRICES, p.56.