LLETIN

A S B E S T O S B U L L E T I N
Vol.5. No.2

March - April, 1964.

Editor: C. Z. Carroll-Porczynski.

C O N T E N T S

PART 1. ASBESTOS MINING.

102 WORLD PRODUCTION OF ASBESTOS BY COUNTRIES IN METRIC TONS.

Country	1959	1960	1961	1962
North America:				
Canada	952,928	1,014,641	1,064,753	1,109,943
U.S.A.	41,239	41,025	47,912	48,253
Total	994,167	1,055,666	1,112,665	1,158,196
South America:				
Argentina	290	300*	300*	300*
Bolivia	152	60	52	51
Brazil	11,181	13,236	16,950*	17,000*
Venezuela	4,622	3,931	590	-
Total	16,245	17,527	17,900*	17,350*
Europe:				
Austria	-	195	512	456
Bulgaria	1,000	1,100	1,100	1,000*
Finland	8,690	9,556	9,379	9,860
France	21,192	26,002	27,692	25,000
Italy	45,158	51,412	56,986	55,550
Portugal	36	131	19	-
Spain	17	4	10	-
U.S.S.R.*	545,000	600,000	800,000	1,000,000
Yugoslavia	4,307	5,416	6,086	6,714
Total*	630,000	690,000	900,000	1,100,000
Asia:				
China*	80,000	80,000	80,000	80,000
Cyprus	13,085	21,152	14,703	18,137
India	1,328	1,711	1,468	1,547
Japan	12,368	15,460	17,054	14,107
Korea	80	671	309	1,209
Philippines	51	33	75	941
Taiwan	136	440	40	476
Turkey	373	216	450	643
Total	107,000	120,000	114,000	117,000

continued next page.

Country	1959	1960	1961	1962
Bechuanaland	1,279	1,163	1,745	2,155
Kenya	39	106	137	140*
Morocco	-	-	-	-
Mozambique	34	20	147	100
S.Rhodesia	108,589	121,529	146,609	128,997
S.Africa	165,474	159,543	176,750	200,761
Swaziland	22,504	29,054	27,934	29,783
U.A.R.(Egypt Region)	455	450	230	230*
Total	298,374	311,865	353,552	362,166
Oceania:				
Australia	16,216	14,164	15,192	16,685
New Zealand	581	289	338	340*
Total	16,797	14,453	15,530	17,025
World Total	2,060,000	2,210,000	2,520,000	2,770,000

* Estimate

Source: U.S.Bureau of Mines, May 27, 1963.

AFRICA.

SOUTH AFRICA. Mineral Trade Notes No.6, 1963, p.10. Developments in the asbestos industry in the Republic of South Africa during 1962 included the following:

103 A new 1,356-foot shaft was sunk at the Penge mine of Asbestos (Pty.) Ltd., the only amosite producer in the Republic. Production was expected to increase to 90,000 tons in 1963.

104 Msauli Asbestos Mining & Exploration Co.Ltd., the largest chrysotile producer, lowered prices in October and ended the year with an unsold stockpile at its mine on the Swaziland border. Barberton Chrysotile Asbestos Ltd., the second largest producer, suspended operations at the end of the year because of market conditions. African Asbestos Cement Corp.Ltd., modified its plant at the Kalkkloof chrysotile mine to produce a higher grade and cleaner product to meet buyers' requirements. The mine, capable of expansion, was to be kept at the 4,000-ton-per-year level until market conditions improved.

U.S.S.R.

111 PHYSICO-CHEMICAL INVESTIGATIONS OF ASBESTOS FROM VARIOUS DEPOSITS. N. I. Toker, L. K. Abend and E. P. Kraineva. Nauchn.tr.Vses. n.-i. in-t.asbest. prom-sti, 1962, Vyp.3, 62-103; Ref. Zhur.Khim., 1963, 23M247.

Methods of the X-ray, chemical and thermal analyses of asbestos fibres are outlined. Results are given of the investigations of asbestos fibres of various origin carried out by the Institute NIIAsbest. These data can be utilised for the evaluation of asbestos from newly discovered deposits.

AUSTRALIA.

112 THE MINERALOGY AND PARAGENESIS OF THE CROCIDOLITE VEINS AT WITTENCOM GORGE, W.A. N. A. Trueman, Proc.Aust.Inst. Min. Metall. No.206, Melbourne, June 1963, pp.113-121.

The relationship between the paragenesis and the loss of fibres during processing is discussed. The presence of magnetite in asbestos veins prevents complete fiberisation. There is a marked similarity between the veins described and those in the Koegas-Westerberg area of South Africa.

GREECE.

113 GREEK ASBESTOS. Mining Journal, London, February 1964, No.6703, p.103.

The American Climax group is reported by "Hellenews" to be interested in the Kozana Asbestos field, which is controlled, through Kozanasbestos S.A. by the U.S. Kennecott Corp. A representative of American Climax has been collecting information on the asbestos deposit in Greece.

The deadline for the investment by Kennecott in the Kozani asbestos deposit expired on December 31 last, and Kennecott's intentions regarding their investment the future of the concession agreement with the State are not disclosed. Under the agreement Kennecott had the right to exploit these asbestos deposits until their depletion. An investment of £14 million had been approved under the law for the protection of foreign investments for exploiting this deposit, and setting up an asbestos processing plant. The initial agreement was signed in 1956, and extensions have since been granted. The Company has purchased the area, and carried out a survey of the extent and grade of the deposits which has so far absorbed a total of about £1 million but no further plans have been announced.

YUGOSLAVIA.

114 THE PROCESSING AND UTILIZATION OF ASBESTOS FROM THE STRAGARI DEPOSITS, YUGOSLAVIA. M. Ferjan. Rud.Glasnik, 1962, No.2, 28-35; Ref.Zhur.Khim., 1964, 1 M249.

A wet process was applied for dressing chrysotile asbestos from Stragari deposits, which occurs in the form of strongly interwoven fibrous aggregates. Enriched asbestos was first kept for two weeks in a concentrated $MgSO_4$ solution. Then the softened asbestos was subjected to the action of a turbulent stream of water with the introduction of air, followed by a mild defiberation process (by mutual friction). The process yields undamaged asbestos fibres suitable for various industrial applications.

OTHER NEWS.

115 JAPANESE PATENT 20832/63. PROCESS FOR REFINING CRUDE ASBESTOS. K. A. Oesterheld.

A suspension of crude asbestos in a liquid is forced along spirral curves and introduced under pressure between friction surfaces. The fibres are subjected to kneading and bending action in alternative directions.

116 SOUTH AFRICAN PATENT 63/2587. AUTOMATIC MIXING OF ASBESTOS FIBRES. Amiantifera di Balangero S.p.A.

This process comprises subdividing a constant volume of asbestos fibre mixture in two portions which are weighed on a scale having different arms with additional weight.

117 SUBSTITUTE FOR ASBESTOS: The Financial Times, Feb.7, 1964, p.11.

Synthetic Fibres which may substitute for asbestos have been produced economically by researchers of the U.S.Bureau of Mines, Interior Department Building, Washington 25, D.C. The silicon carbide fibres are made by decomposing natural silicates to produce green and white threads up to 1.5 millimetres long. They will resist oxidation it is stated at up to 930 degrees Fahrenheit in air.

118 SAFETY AND HEALTH REGULATIONS FOR ASBESTOS PREPARATION PLANTS. U.S.S.R. Gosudarstvennyi komitet po delam stroitel'stva. Moscow, Gosstroiizdat, 1963, 36p. Monthly Index of Russian Accessions. Dept.1963, 16, No.6, 1584.

ASBESTOS CEMENT

119 THE EFFECT OF THE ADDITION OF GYPSUM TO CEMENT IN THE FROST-RESISTANCE OF ASBESTOS CEMENT. T. M. Slavina, G. S. Blokh and P. N. Sokolov. Tr.N.-i asbesta, slyudy, asbstsement. izdelii i proektir. str-va predpriyatii slyud. prom-sti, 1963, No.16, 145-155; Ref. Zhur.Khim., 1963, 21M225.

The loss in strength, ultimate deformation (in thickness) and changes in external appearance were determined for asbestos cement samples, with or without gypsum, upon subjecting them to 50 and 75 freezing-thawing cycles during 28 days. It has been found that the addition of gypsum improves the frost-resistance of asbestos cement, especially when it contains a high-alumina cement. The optimum amount of gypsum depends on and increases with the C_3A content of the clinker and the dispersibility of the cement. However, when the specific surface of a high-alumina cement exceeds 4000 cm^2/g, even the addition of gypsum cannot prevent some decrease in the frost-resistance of the asbestos cement products.

120 INVESTIGATIONS ON THE DEFORMATION OF ASBESTOS CEMENT ON HARDENING UNDER VARIOUS MOISTURE CONDITIONS. T. M. Berkovich, N. G. Nakeeva & R. V. Medvedeva. Tr.N.-I. Inst. asbesta, slyudy, asbestotsem.izd. i proektir. str-va predpr.slyud.prem-sti, 1961, No.12, 3-17. Ref.Zh.Khim, 1963, 2M222.

It has been found that with the prolongation of air-drying the shrinkage and elongation of asbestos cement tiles are reduced. The deformation of autoclave asbestos cement is much less than that of ordinary asbestos cement. The shrinkage of ordinary asbestos cement increases with increasing C_3A content and finer grinding of the cement. In autoclave asbestos cement the change of the C_3A content in the range of 5% to 11% does not significantly influence the shrinkage.

121 JAPANESE PATENT 26482/63. COLLARED ASBESTOS CEMENT PIPES. Nippon Eternit Pipe Co.

A collar made of asbestos cement has at one end a recess of a diameter increasing towards the interior of the collar. In order to join the collar with an asbestos cement pipe, the collar is immersed in water, optionally warmed, to produce swelling, an unhardened pipe is inserted in the collar and pressure is applied from the inside to the pipe end so that its diameter is enlarged and the pipe end, conically expanded, fills the recess in the collar. Then the assembly is cured to produce a collared asbestos cement pipe.

122 THE EFFECT OF THE QUALITY OF RAW MATERIALS ON THE FROST-RESISTANCE OF AUTOCLAVE ASBESTOS CEMENT. T. M. Berkovich, G. S. Blokh, G. A. Berzemishvili and M. M. Levicheva. Tr. N.-i. asbesta, slyudy, asbestotsementn. izdelii i proektir, str-va predpriyatii slyud. prom-sti, 1963,No.16, 99-107: Ref. Zhur.Khim, 1963, 22M219.

The effect of the quality of asbestos and sand, used in the production of sand cement, on the frost resistance of asbestos cement products has been investigated. It has been found that the frost-resistance increases with increasing content of semi-rigid asbestos and is reduced when soft asbestos fibres are used. The frost-resistance does not depend on the SiO_2 content of sand used in the production of sand cement. The frost-resistance increases with the increase of the content of sand grains smaller than 0.1 mm. This can be ascribed to the formation of a large number of very small pores in which water does not freeze.

123 AGGREGATE SM 898A IN SERVICE. V. A. Vladimirov. Strcit. Mat. 1964, 10, No. 1, p.20.

Experience gained with aggregate SM 898A in the production of asbestos cement sheets is briefly described. Aggregate SM 898A (developed by N. I. Ershov) is an automatic machine for forming corrugated asbestos cement sheets and stacking them. The process is continuous, saves much manual work, and gives better products than conventional machines.

124 RUSSIAN PATENT 155,424. MANUFACTURE OF ASBESTOS CEMENT PRODUCTS. I. I. Bernei.

The customary application of high pressures (100kg/cm^2 or more) in the manufacture of asbestos cement products causes elastic deformations in the sheets resulting in undesirable effects when the pressure is removed. According to the invention, asbestos cement sheets are produced with the use of moderate pressures (of the order of 10 - 15 kg/cm^2), which are maintained until the sheets are completely set, i.e. for 3 - 4 hours. In this way, elastic deformation and the resulting relaxation are eliminated.

125 BRITISH PATENT 946,776. WATERPROOFING ASBESTOS-CEMENT BOARDS. U.C.B.

This patent describes the method of water-proofing asbestos-cement boards (containing free lime) with special silicone emulsion.

126 FRENCH PATENT 1,346,849. PROCESS FOR HARDENING ASBESTOS CEMENT PIPES. S.A. Eternit.

A soft asbestos cement pipe, after removal from the former, is placed inside a rigid tube of a larger diameter and rotated within it during the hardening period in such a way that it turns on the inner wall of the rigid tube and so remains straight. Also the cross-section of the pipe, which is slightly oval after the removal from the former, becomes perfectly circular.

127 FRENCH PATENT 1,337,083. DEFIBERISATION OF ASBESTOS IN A ROD MILL. F. L. Smidth & Co. A/S.

Asbestos fibres suitable for the manufacture of asbestos cement are produced by adding 10 - 50% of water to crude asbestos and milling the mixture in a continuously operated rod mill. The mill comprises a cylindrical rotary body filled with loose rods occupying 25 - 45% of the mill volume. The feed end of the cylinder has one central inlet, while the outlet end is provided with several apertures.

128 SOUTH AFRICAN PATENT 62/1944. MANUFACTURE OF FIBRO-CEMENT ARTICLES. Sirera S.B.

Hollow moulding bodies provided with water-permeable walls are introduced into a moulding chamber and the chamber is filled with a mixture of cement, asbestos and water in such a way that the hollow bodies are fully submerged. Pressure is applied to the mixture so that water penetrates into the hollow bodies and is evacuated from them continuously. The bodies are subjected to oscillations and, optionally, are rotated. Rotational movements may also be imparted to the cement-asbestos-water mixture, if orientation of the fibres in the direction perpendicular to the rotation axis is desire. The chamber is being continuously fed with fresh mixture in order to compensate the volume of the water evacuated.

129 JAPANESE PATENT 23785/63. LAMINATED INSULATION BOARD. Oriental Metal Seizo Co.

These are prepared by filling up crevices in a porous cemented "excelsior" board with a special insulating composition, pasting up a flexible asbestos board or an asbestos cement plate, using a heat-resistant adhesive, and curing the resulting laminate under pressure of 20-30 kg/cm^2. The insulating composition comprises calcined vermiculite, perlite or asbestos powder, and a polyester or polyvinyl acetate resin.

PITCH FIBRE PIPES

In view of great interest shown in pitch fibre pipes by the asbestos-cement industry and the great potentiality of pipes, the editor of "Asbestos Bulletin" decided to review this material and its manufacture. It is also interesting to note that cheaper grades of this unique material-asbestos are being added by some manufacturers in their fibre blends, and that pitch covered asbestos-cement fittings are sometimes employed in the applications of pitch fibre pipes.

The main advantages claimed for pitch fibre pipes are as follows: low water absorption, resistance to hot liquids, high crushing strength, good resistance to parrafin, high beam strength, lightness, flexibility, faster laying with no concreting required, lower laying costs, no wasted pieces, resistance to corrosion and root penetration.

A. HISTORY.[1]

It may come as a big surprise to many users of pitch fibre pipes, who regard them as a comparatively new material, to learn that their first known use was as long as 157 years ago. They were then, in 1806, carrying water at a monastery at Hardenburg, in Germany. In the 1850s pitch fibre gas mains were laid at Uelzen and were used until 1901, when they were dug up and showed no signs of deterioration. At about the same time - around 1856 - pitch fibre water mains were put down in Hamburg: these also were found to be in a satisfactory condition when uncovered in 1914.

We next hear of pitch fibre pipes across the Atlantic in the 1890s. The main use in the U.S.A. was then for electrical conduit, though the material was applied in minor degree to other purposes such as gas mains, drains and sewers. The early 1900s saw a great expansion of the electrical industry and from then until the 1930s pitch fibre continued to be used chiefly for electrical purposes. In 1932, a new manufacturing technique was introduced - vacuum impregnation - which resulted in improved quality and strength. After than, pitch fibre was used increasingly for drainage.

During the Second World War, other materials in North America were scarce and at a premium. The pitch fibre industry made rapid progress.

Meanwhile, in Europe, the United Kingdom had been importing American and Canadian pitch fibre products since about 1903. After 1939, difficulties arose over shipping space and dollar currency with the result that, ten years later, conditions were ripe for the start of manufacture in Britain. In the following decade,

four firms started making pitch fibre in this country. Within the last year, a fifth has indicated its intention of so doing.

British and American producers alike have developed a healthy export business with obvious opportunities in non-producing parts of the world.

B. APPLICATION.

It is unlikely that pitch fibre pipes will again be used for gas or water mains. However, in drainage and electrical work, the future appears as rosy as ever. In the home market, there are the economic and practical advantages for drainage, coupled with continued large-scale development of the electrical supply industry. The same applies in the other economically advanced countries. In the less developed parts of the world, drainage services have still to be provided on an enormous scale, while electrical supply must also be expected to make steady progress. Expansion of pitch fibre usage in these circumstances must still be the keynote.

C. MANUFACTURE.[2, 3]

The schematic layout of pitch fibre making plant is shown in Fig.1.

Mass production of pitch fibre pipes confronts the manufacturers with the same basic problem that has to be faced in most other sections of modern industry: the need for efficient means of quality control. Most products are now customarily made to comply with standards laid down by an independent authority, or to comply with requirements self-imposed within an industry to secure and retain the confidence of those it serves.

Pitch fibre drain and sewer pipes manufactured in the United Kingdom comply with the requirements of B.S.2760 : 1956. Production processes and controls are designed to ensure that the provisions of this British Standard are fully met and that appropriate qualities for other pitch fibre materials are consistently achieved. A short summary of the processes involved - basically the same for all British producers, though differing in points of detail - will serve to indicate what is done, day in day out, to make certain that the pipe and conduit turned out will withstand all the rigours of its eventual use.

Manufacture begins with the preparation of a pulp stock, controlled as to the length of the cellulose fibres and degree of wetness before it is fed to the pipe-forming machine. Where temporary storage of the stock is involved, provision is made for continuous agitation to ensure a mix of even consistency and character. Since the raw material includes excess runs of newspapers and periodicals, refinements such as a magnetic separator

may be incorporated to remove metal pins and staples.

Automatic operation.

A mat of fibre is then picked up on the fine wire mesh of the making drum, excess moisture being removed by vacuum process before the mat is transferred to the pipe-forming mandrel. The pipe is built up continuously, the operation being automatically controlled according to the time cycles and wall thickness required for various diameters. The process is such that the fibres in successive laminate are closely bound together to form a homogeneous pipe, consistent in quality throughout its length and thickness.

At this stage the "white" pipes are still damp and have to be dried. This is a process comprising three uninterrupted stages carefully adjusted so that the pipes are eventually of the highest possible quality. First of all the moisture is heated but retained within the fibres. Secondly, the heat is gradually increased to disperse the moisture. Finally, the hot dry pipe is gradually cooled. Humidity, heat and air velocity are controlled throughout entirely by instrumentation.

Critical Factors.

In the impregnation of the pipes with pitch there are three critical factors: the quality and viscosity of the pitch itself, the pressures employed and the time cycles. The coal tar pitch must be refined to eliminate impurities and the specification has been improved in recent years to this end. The degree of viscosity depends on the maintenance of high temperatures and influences the penetration of the pitch throughout the wall thickness of the pipe. Both vacuum and applied pressures are used. The impregnation period varies up to several hours according to the wall thickness of the pipes under treatment, which is also the deciding factor in the number of vacuum cycles for any one batch.

Subsequent processing is concerned with the machining of pipes to fine tolerances. Similar care is exercised in the production of the wide range of fitments.

The Pitch Fibre pipe making machine manufactured in the United Kingdom has been specially designed for the production of pipes direct from Wet Stock.

The unit develops a new principle in pipe production and eliminates the felt. The prepared stock is fed into a specially designed Vat working on pro-flow and overflow, in which is revolving a 24" diameter Hollow Cylinder Mould. Revolving upon

the Cylinder Mould is an 18" diameter mesh covered Suction Couch Roll and the vacuum value of which is approximately 6" of water. The drive can be either off the Cylinder Mould or off the Couch.

The film picked up by the Suction Drum is couched off the Suction Couch and is in turn transferred to a Hollow Mandrel of the appropriate diameter acting as a Making Roll. The wall thickness is variable, and can be pre-set, warning of make-up being given by a signal.

Incorporated in the design is a "Head Unit" which allows automatic feeding of the mandrel to the making position, and ejection after the pipe has been formed. The cylinder mould and the suction couch are hollow and are of Patent Geodetic construction. This ensures perfect rigidity and a constant periphery, and the whole unit can produce pipes up to 8'0" long.

The machine, run as a separate unit, operates on a closed water circuit, and the white water is returned to the stock for re-use. Using 3" diameter as a basis x $\frac{1}{4}$" wall the machine should produce at the rate of one per minute. This speed can be increased with experience. The power used is 5 H.P. with a suitable reduction unit.

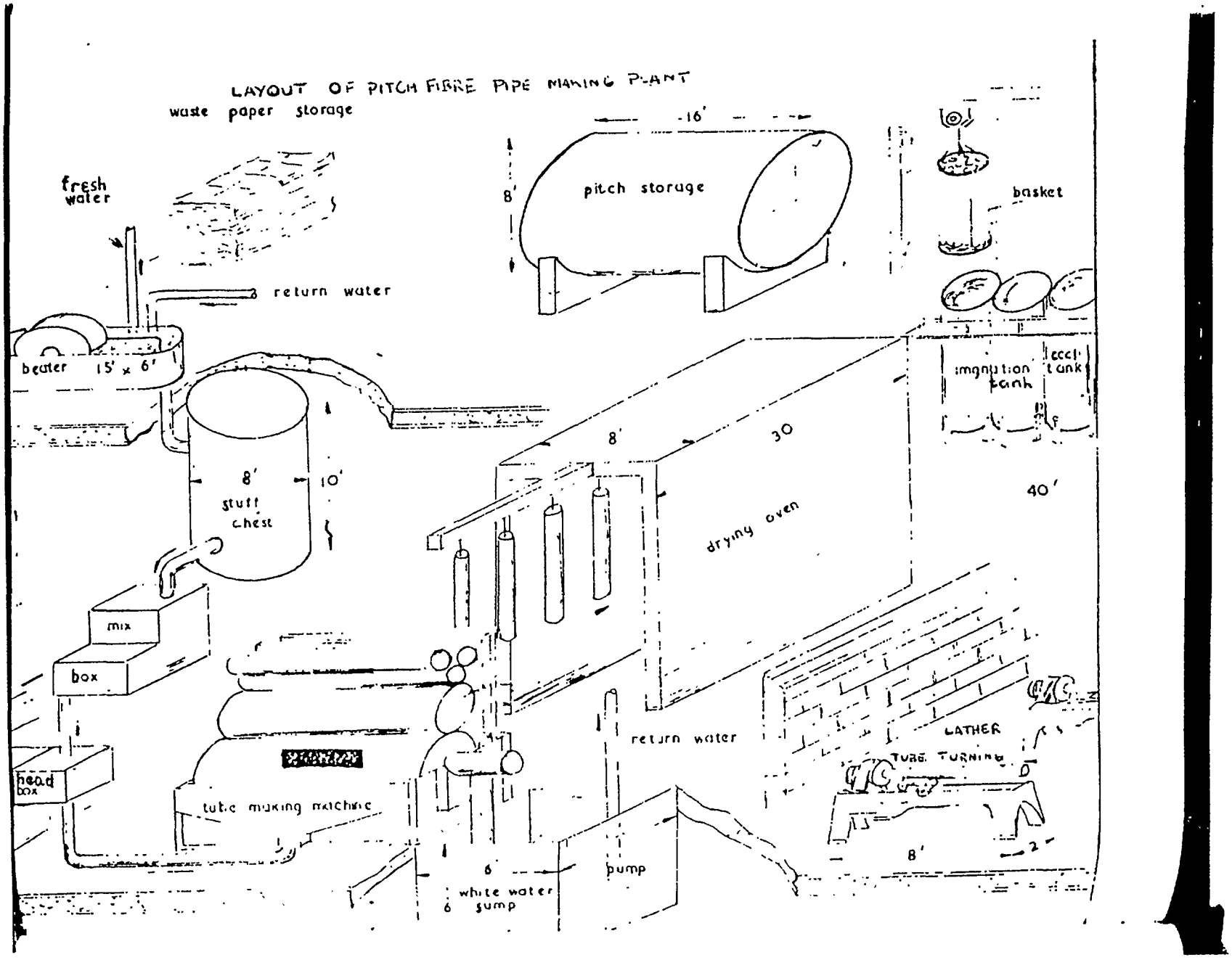
A complete plant consists of the following units.

(1) Hollander type beater.
(2) Stuff Chest.
(3) Tube Forming Machine - Tubes 8'0" long standard 10'0" long can be supplied.
(4) Aluminium Mandrels 2000 approx. Diameters according to production requirements.
(5) Continuous Drying Oven.
(6) Impregnation Tanks.
(7) Coal Tar Pitch Tanks.
(8) Intermediate Tanks.
(9) Cold Water Tank.
(10) Lathes for turning pipes.
(11) Small Drying Oven for couplings.

On request, the editor of "Asbestos Bulletin" would be pleased to send some further information to all interested in the great potentiality and the production of Pitch Fibre Pipes.

Bibliography.

1. Extract from Pitch Fibre Pipe Association, News Letter No.12.
2. Extract from Pitch Fibre Pipe Association, News Letter No.8.
3. Private communication with Knowles Trotman.



PART 3. ASBESTOS TEXTILES.

131 BRITISH PATENT 946,567. PROTECTIVE COVERING MATERIALS FOR PIPES AND BUILDING COMPONENTS. S.A. Francaise du Percdo.

The use is made of asbestos fibrous material such as paper, felt or fabric which have outer surface coated with coal pitch containing aluminium flakes and the inner with strongly adhesive composition.

132 BELGIAN PATENT 631,234. VINYLHALIDE RESIN COMPOSITIONS. General Electric Co., N.Y.

Vinylhalide resin-base compositions (preferably PVC) contain curing agents and plasticisers, heat stabilisers (esp.$PbCO_3$) and lubricants. Curing can be accelerated by heating. The cured compositions are suitable as electric insulations. Solutions of the resins can be used as binders for heat-resistant fabrics such as glass fibre or asbestos fabrics.

133 U.S. PATENT 3,111,719. FIBRE OPENER AND CLEANER (FOR MINERAL WOOL, ASBESTOS, ETC.) Edison H. Novotny, (to Johns-Manville Corp.) (Nov.26, 1963).

A process and apparatus are claimed for opening, cleaning and felting of fibrous materials to produce a uniform felt having an internal laminar structure and to reduce the unfiberised particles present in the final material.

134 BRITISH PATENT 946,686. ELECTROLYTIC PRODUCTION OF DIALKYL MAGNESIUM. K. Ziegler.

In carrying this process the anode space from the cathode is separated by e.g. asbestos diaphgrams.

135 BRITISH PATENT 939,512. 16.10.63 (26.5.60 GERMANY 26.5.59) METHOD OF PREPARING FIBROUS SHEET MATERIAL. Wacker Chemie G.m.b.H.

A method is given for the production of sheet material by adding a slurry of asbestos fibres or particles, or the dry asbestos materials, to an aqueous disperson of a silicone resin having low emulsifier content and curing catalysts, such as dibutyl tin dilauarate or dibutylin dimaleate.

PART 4. FRICTION MATERIALS.

136 BRITISH PATENT 920,196. DISC BRAKES. Automotive Products Co.Ltd.

137 BRITISH PATENT 927,890. BEARINGS. Ford Motor Co.Ltd.

138 BRITISH PATENT 932,713. DISC BRAKES. Dunlop Rubber Co.Ltd.

139 INBOARD DISCS KEEP COOL UP FRONT. Machine Design. 19.12.63, p.116.

The front disc brakes fitted to the Auto-Unions GmbH DKW F12 have the discs mounted inboard along the front axle next to the differential. Disc size is thereby independent of the road wheel size and 10.63-in diameter discs are fitted, which is considerably larger than would be possible with outboard mounting. An additional benefit is direct cooling of the brake assemblies brought about by their position directly in the main airflow. The brakes are manufactured by Alfred Teves (Germany) under licence from Dunlop. Photograph and diagram.

140 BRITISH PATENT 931715. BEARING ASSEMBLY. Engineering Productions (Cleveland) Ltd., IG. L. Donnellan) Priority 14.11.60. Pub. 17.7.63.

In a specified bearing assembly at least two non-metallic bearing bushes, e.g. of nylon, polypropylene, isocyanate condensation products, or material incorporating PTFE fibres are used. A plastics sealing ring may also be included.

141 BRITISH PATENT 945911. GRAPHITE FIBRE-LAMINATES. Ford Motor Co.Ltd. Priority 24.4.61(U.S.A.) (Patent of addition to B.P. 928627) Pub. 8.1.64.

A laminated structure includes layers of graphite fibre adhered together with a heat-cured adhesive. It may contain alternate layers of graphite fibre and other material such as glass fibre adhered together.

142 BRITISH PATENT 936,741. PLAIN BEARING. Glacier Metal Co.

The bearing (its surface) is made up essentially from a mixture of an elastomer, bronze or a solid phosphate, and lead, lead oxide or graphite. A typical mixture consists of 60 vol.% silicone rubber, 25 vol.% polytetrafluoroethylene, 10 vol.% lead monoxide and 5 vol.% bronze.

143 RUSSIAN PATENT 154,354. ANTIFRICTION MATERIALS. I. V. Kragelskii et al.

A white filler is added to an antifriction material, based on a phenol-formaldehyde resin and asbestos, in order to reduce the coefficient of friction. A typical composition consists of 40% of a phenol-formaldehyde resin, 50% white filler and 10% asbestos. The material is prepared by mixing together the constituents, cold forming briquettes under a pressure of 300 kg/cm^2, and then forming articles from the briquettes by applying pressure of 600 - 1000 kg/cm^2 at temperatures of from 160 to 170°C. Alternatively, the articles can be made by hot-moulding the mixture under pressure. The product can be used at pressures up to 50 - 60 kg/cm^2, and temperatures of 250 to 300°C. The coefficient of friction with a metal, under dry conditions, is 0.11, and both surfaces have a long service life.

PART 5. REINFORCED PLASTICS.

144 SELECTION OF PLASTIC MATERIALS FOR EXTREME TEMPERATURE ENVIRONMENTS. Plastics Des. Processing, 1963, No.6, pp. 14-19.

The method by which asbestos reinforced phenolic resin materials are able to resist very high temperatures as obtained on the surface of rockets and missiles is discussed. The ablati ve properties of phenolic resins containing a variety of fabric fillers are compared. The other high temperature plastic materials considered include PTFE silicone resins and the newer polybenzimidazoles. (5 references).

145 FRENCH PATENT 1,346,551. ELECTRICAL INSULATORS. Comp. Franc. Thomson-Houston.

Asbestos base laminates suitable for electrical insulators are produced by impregnating asbestos sheets with a solution of aluminium monophosphate, drying the impregnated material until it looses tackiness, compressing the dried material to reduce its thickness by 25-45%, and rolling the compressed material to prepare the laminate. The products are hard and have good dielectric properties.

146 BRITISH PATENT 945,202. FILLED POLYPROPYLENE. Avisun Corp.

Sustained heat resistance is very important in such application as for example in distributor caps under the hood of an automobile. Properties of a crystalline polypropylene-anthophyllite asbestos composition containing 40% asbestos by weight and superior to same polypropylene containing no filler.

147 BRITISH PATENT 946,324. FILLED ETHYLENE POLYMERS. The Metal Box Co.Ltd.

Asbestos may be used as a filler in such composition developed for adhesive bonding of one metal surface to another. This is effected by disposing a composition between the surfaces, heating the metal surfaces and the composition to 160°C-200°C with or without pressure and allowing the metal and composition to cool.

148 FRENCH PATENT 1,338,819. ELEMENTS FORMED BY MOULDING UNDER PRESSURE. Chr.Lechler & Sohn Nachf.

Elements having a surface layer different from the bulk of the body are produced by placing a layer of the surface material on the bottom of a mould, filling the mould with the bulk material, and applying pressure. The surface material may comprise impregnated paper, glass fibres, asbestos fibres, mineral fibres etc. Suitable resins include synthetic polyamides, polyesters and polycarbonates.

149 GERMAN PATENT 1,161,202. PRODUCTION OF LAMINATES FROM INORGANIC FIBROUS MATERIALS. Westinghouse Electric Corp.

Laminate product, suitable for use as parts of aircraft or guided missiles, e.g. rocket nozzles, are manufactured by a process comprising impregnating several layers of an inorganic fibrous material with an aqueous suspension containing an aluminium compound, phosphoric acid and a solid, inorganic, finely divided filler. The mass is then dried and hardened at an elevated temperature and under pressure. In an example, asbestos paper is impregnated with a suspension consisting of 40 parts of an aqueous mixture containing 15% $AL(H_2PO_4)_3$, 15% $H_4P_2O_7$ and 70% water, and of 60 parts of a finely divided filler (particle size of 75 microns) containing equal amounts of silica and aluminium silicate. The impregnated asbestos paper is dried at 100°C, wound on a mandrel to form a tube of a desired thickness and hardened by heating at 285°C for 3 hours. The product can be used, e.g. in a transformer at 500°C.

PART 6. JOINTING, SEALING & COATING.

150 FRENCH PATENT 1,337,577. SELF-HARDENING, COATING OR SEALING MATERIALS. Chem. Fabrik Grunau.

Materials suitable for coating structural materials, or filling, or sealing hollows, cracks or joints therein, are produced from a mixture of monomeric and polymeric methylmethacrylates, inorganic fillers and known adjuvants. For special purposes, asbestos fibres can be used as a sole filler, or applied in admixture with other fillers.

151 SELECT AND APPLY GASKETS EFFECTIVELY. J. J. Whalen. Chem. Eng. (U.S.A.), 1st Oct. 1962, 69, No.20, pp.83-88.

The factors affecting the selection and application of gaskets are discussed with emphasis on installation bolt force and seating stress. The minimum gasket seating stress values are given for lead and lead-asbestos. It is concluded that the compatibility of the gasket material with the fluid to be sealed must be checked as well as the pressure-temperature limits, the installation bolt force, seating stress andhydrostatic end force.

152 BELGIAN PATENT 634,104. COATING MATERIAL. Moltofill GmbH.

Coating or filling is made from plaster of Paris ($CaSO_4$, $\frac{1}{2}H_2O$), asbestos (up to 8%) and a mixture of methylcellulose and sodium carboxymethylcellulose as a water-soluble binder (0.07-5%). It may also contain a silicone (0.04 - 1%). The grain size of plaster of paris should be below 0.2 mm; preferably 70-80% should pass a 0.05 mm. sieve and nothing is held on a 0.10 mm. sieve. The plaster should have a setting time of at least 15 (measured according to DIN 1168-2.62 with a mixture of 65 parts of water and 100 parts of plaster).

153 GERMAN PATENT 1,1,159,712. HOLLOW PACKING RING OF AN ELASTIC MATERIAL. Kupfer - Asbest - Co. Gustav Bach.

The cavity of the ring is divided into at least two compartments, one of which is filled with a gas to increase the elasticity of the ring, whereas another compartment is filled with a heat-conducting liquid to ensure good heat conductance. The ring is made from rubber or an elastomer, e.g. neoprene, fluon, or a silicone elastomer. The material can be reinforced with glass fibres, asbestos fibres, flaked asbestos or the like.

PART 7. BUILDING MATERIALS & PLASTIC PIPES.

154 BIGGEST USE OF PVC PIPE IN WATER CHLORINATION. Rubber and Plastics Weekly, 1963, 144, No.24, 864, 886.

Over 7000 ft. of rigid unplasticised PVC pipe, up to 12 in.size, has been used in what is claimed to be the most extensive chlorination scheme in Britain to employ this type of pipe. The insulation is to protect the swimmer at London's Lido from health hazards of water pollution. The method adopted to lay the piping is briefly explained and illustrated.

155 PLASTIC PIPES: THEIR CONSTRUCTION & USE. D. Strachan (Bristol Aeroplane Plastics Ltd.) Resin News, 3, 9, Sept.1963, pp.7-9.

A detailed account of the construction and uses of epoxy resin filament wound pipes is followed by a brief comparison of other plastic pipes. 1 table, 4 figures.

156 PLASTICS IN BUILDINGS: PRESENT & FUTURE APPLICATIONS. W. B. Brown (Monsanto Chemicals Ltd.) Paint Journal, 16, 128, January 1964, pp.647-649. (Lecture given recently at the Birmingham Building Centre).

The properties of the plastics materials chiefly used in building applications are described, and the range of these applications is surveyed. Future possibilities, including the increasing use of reinforced plastics for certain types of buildings, are discussed.

157 BUILDING EXHIBITION REPORT. British Plastics, 36, 12 December 1963, pp.662-667 (See also Plastics, 28, 314, December 1963, pp.57-58, 61).

A variety of recent building applications of plastics are featured. 21 photographs.

158 JAPANESE PATENT 23786/63. LIGHT-WEIGHT GYPSUM BOARD. Toyo Koatsu Inds. Inc.

A foamed slurry is prepared from calcined gypsum and an aqueous urea-aldehyde resin solution, with the addition of a surface-active agent and, optionally, an insoluble light-weight filler, such as sawdust or perlate, or reinforcing agent such as glass fibre, rock wool, asbestos fibre and the like. The slurry is foamed by bubbling through it an inert gas, such as air. The foamed slurry is moulded between two sheets of paper board. The resulting light-weight gypsum board has a density of from 0.4 to 0.8, and is useful as a structural material having excellent properties, especially heat resistance.

159 BRITISH PATENT 943,158. IMPROVEMENTS IN FLOORING. The Rubberoid Co.

Asbestos based grease resistant flooring is covered by this patent.

160 PLASTIC PIPING. Intern. Pipes & Pipelines. January 1964, p.42.

Progress review includes corrugated PVC pipe for land drainage.

161 FRENCH PATENT 1,347,401. VINYL RESIN TILES. Carlisle Chem. Works.

Floor tiles are produced from: (a) a vinyl chloride-base resin containing at least 80% of polymeric vinyl chloride, the rest being an ethylenically unsaturated organic compound capable of copolymerising with vinyl chloride: (b) asbestos and (c) a discolouration stabiliser, for instance a compound having the general formula X (NH)CN(R^1)R^2 are hydrogen, alkyl or aryl).

162 GLASS-FIBRE REINFORCED PLASTIC PIPE. Chem. Eng. 1962, No.17, p.160, and No.18, p.18.

The production and uses of glass fibre reinforced plastic piping are discussed.

PART 8. ASBESTOS PAPER & INSULATING MATERIALS.

163 JAPANESE PATENT 25158. PAPER. Shimure Nickel Mfg.Co.

Asbestos having a high magnesia content is used as a basic material to an additive in the manufacture of asbestos-containing paper. Suitable asbestos has the following composition: SiO_2 40%, CaO below 25%, Al_2O_3 below 15%, FeO or Fe_2O_3 below 8%, MgO above 13%. The ratio (SiO_2 + Al_2O_3): (CaO + MgO + FeO) should be from 0.7 to 1.1.

164 BRITISH PATENT 949,329. THERMAL INSULATION FOR PIPES. Bell's Asbestos & Eng. Ltd.

165 FRENCH PATENT 1,346,499. INSULATING MATERIALS. General Tire & Rubber Co.

Heat insulating material consists of a vulcanisable elastomer containing asbestos fibre of such dimensions that it is retained on Tyler screen No. 325 (0.044mm.apertures); 3-200 weight parts of asbestos fibres are used 100 weight parts of the elastomer.

166 U.S.PATENT 3,037,895. REINFORCED PIPE LINE FELT. Johns-Manville Corporation.

In the manufacture of a reinforced pipe line felt having one or more elongated longitudinal edges, several asbestos papers are laminated, and a number of glass strands are embedded between adjacent inner papers so that the glass strands are paralled to the longitudinal edges.

167 JAPANESE PATENT 7/63. PREVENTION OF THE OXIDATION OF CARBON ANODE IN THE ELECTROLYTIC PRODUCTION OF MAGNESIUM. Sumitamo Chem Co.

In order to prevent oxidation, carbon anode above the level of the molten salt is covered with a protective pipe made of a heat-resistant and chlorine-resistant material, such as china clay. The space between the carbon anode and the clay pipe is filled with materials which also are resistant to heat and the action of chlorine, e.g. a carbon paste or a mixture of asbestos powder and water glass. The top of the pipe is covered with coal tar pitch or silicone oil, and the foot of the pipe is sealed with asbestos cloth, powdered Na Cl or KCl.

168 GERMAN PATENT 1,159,840. HEAT INSULATING MATERIAL. Philip Carey Mfg. Co.

Heat-insulating material, which is formed by pressing and has the ability to retain its form, consists of 45 - 94 weight % of expanded perlite, 5 - 20% of a montmorillonite clay (e.g. bentonite) as a primary binding agent, 1 - 20% of an organic material as a secondary binding agent, and up to 15% of a fibrous material. The organic secondary binder must be resistant to boiling water (this property can be imparted by the addition of 0.2 to 1 wt. % of a silicone). The product has good mechanical strength, high heat-insulating properties in the temperature range of from - 212 to + 927°C, and is resistant to the attack by moisture or boiling water.

PART 9. REFRACTORY FIBRES.

169 ZIRCONIA FIBRES. Plastics Des. Processing 1963, No.4, p.36.

The development of zirconia fibres as a high temperature reinforcement for plastic materials is considered briefly and some properties of phenolic resins containing these fibres are given.

170 FRENCH PATENT 1,344,836. MULTI-COMPONENT CONTINUOUS FIBRES. Owens-Corning Fiberglass Corp.

Composite fibres are manufactured by heating a mineral material to the softening point, flowing the stream of this material in the form of a cone, introducing a metallic body into the cone and heating it to the softening point and drawing the two materials to form a composite filament in which the metal forms a continuous core.

177 METAL FIBRE CONTACTS RESIST ARC EROSION. The Financial Times, February 5, 1964.

High-current electrical contacts made by commonly used powder metallurgy techniques often show severe metal losses through arc erosion. Work done by two U.S. scientists, C. Deibel and J.Evanicsko, now of Advanced Concepts Inc., Jeanette, Pennsylvania, U.S., shows that if the contacts are made of fine refractory metal (tungsten) fibres embedded in a highly conductive metal such as copper or silver, arcing resistance is significantly superior.

PART 10. MISCELLANEOUS.

178 BRITISH PATENT 945,512; 945,513. FILTER MATERIAL. Comp. de Saint-Gobain.

Filters for hot industrial gases are made by dispersing cellulose, glass fibres and asbestos in an aqueous solution of sodium silicate so that the cellulosic swelled by the latter, and by adding calcium chloride to the dispersion to precipitate calcium silicate and treating the suspended mass to obtain the filter material in sheet form. The normal paper manufacturing techniques are applied.

179 FRENCH PATENT OF ADDN. NO.80,601 (TC NO.1,326,302) IMPROVEMENTS IN FILTER MATERIALS. Etat Francais.

Filter materials containing a mixture of glass fibres and asbestos fibres bound by means of neoprene or polyvinyl acetate is prepared in a alkaline medium. In an example, an aqueous slurry containing glass -, asbestos - and, rilsan fibres is made alkaline (pH 8.5 - 9)by the addition of caustic soda, a neoprene latex is added to the slurry and neoprene is precipitated onto the fibres by the addition of aluminium sulphate.

180 GERMAN PATENT 1,157,201. PROCESS FOR THE PREPARATION OF A FILTER LAYER. Seitz-Asbest-Werke Theo & Ceo Seite.

The preparation of a filter material layer by the settlement of a mixture of organic and inorganic fibres (natural or synthetic), having a diameter of 10 microns or less, from a liquid medium comprises rolling the upper surface of the layer, during the wet stage of the process, using rollers provided with ribs or other protrusions. The rolling results in the densification and consolidation of the filter layer, the orientation of the fibres, and the increase of the surface area.

181 FRENCH PATENT 1,337,606. LUBRICATING COMPOSITIONS. Montecatini.

Lubricating compositions which may be applied on metallic surfaces wetted or coated with a phosphate or oxalate, or pretreated in a bath containing, for instance, NaCl, lime, borax, sodium silicate etc., comprise a mixture of polyethylene-polypropylene glycols and an inorganic compound, e.g. asbestine.

182 FRENCH PATENT OF ADDITION 81448 (TO No.1,304,683) DEHYDRATING ELEMENT. Dydra S.A.R.L.

A dehydrating element is described comprising an absorbing substance reinforced with a fibrous material, such as paperboard, paper, asbestos or rock wool. The diagram of the apparatus is shown.

183 CHRYSOTILE FIBRES - FILLED OR HOLLOW TUBES. Chem.Eng.News. Sept. 30, 1963, 41, No.39, pp.34-35.

The controversy is reviewed and the latest work by Dr. E. J. W. Whittaker is reported. He presented his mathematical interpretation of the results to the VIth Congress of the International Union Crystallography in Rome recently.

PART II. REVIEW OF JOURNALS.

"ASBESTOS", January 1964.
837 Western Saving Fund Bldg., Philadelphia 7, Pa., U.S.A.

184 GREETINGS, page 2.
185 M. J. MESSEL, Election as President of Lake Asbestos of Quebec, page 16.
186 VICISSITUDES IN ASBESTOS MARKETS, page 16.
187 PROPOSED ASSOCIATION CLASSIFICATION OF CAPE BLUE ASBESTOS, page 28.
188 AUTOMOBILE SALES, page 32.
189 MARKET CONDITIONS, page 34.
190 PRODUCTION, page 40.
191 IMPORTS & EXPORTS, page 42.
192 INDUSTRY NEWS, page 44.
193 CURRENT RANGE OF PRICE, page 52.
194 ASBESTOS STOCK QUOTATIONS, page 54.
195 ASBESTOS PATENTS, page 56. This item covers four patents related to Treatment of Asbestos, Sealing Composition, Coating Composition and Asbestos Paper Manufacture.

###

SESSION 4, PAPER 4

ROENTGENOLOGICAL STUDIES OF PLEURAL CALCIFICATION IN ASBESTOSIS

by
I. J. Selikoff
The Mount Sinai Hospital, New York, N. Y.

Although scattered instances of pleural calcification had been noted 25 years ago (Gloyne, Vigliani), these were considered coincidental or ignored. Such evaluation was strengthened by the negative findings of A.R. Smith in 1952.

Recently, attention has again been called to the association of pleural calcification with exposure to asbestos under industrial conditions (Jacob, Bohlig, Muller) and following environmental community exposure (Kiviluoto).

Data are presented here which demonstrate that pleural calcification is frequently found among asbestos insulation workers and suggest that asbestosis is perhaps the most common cause of pleural calcification in industrial countries at present, especially when such calcification is bilateral.

1. Analysis was made of the results of x-ray examinations of 1,117 asbestos insulation workers (see Selikoff, Churg and Hammond, this conference).

Pleural Calcification on X-Ray Examination of 1,117 Asbestos Insulation Workers

Lapsed time from onset of exposure	No. Examined	Pleural calcification			
		Extent of calcification			
		0	1	2	3
40+ years	121	51 (42.1%)	37	20 (57.9%)	13
30-39 "	194	127 (65.4%)	46	15 (34.5%)	6
20-29 "	77	69 (89.6%	8	0 (10.4%)	0
10-19 "	379	374 (98.9%)	5	0 (1.1%)	0
0-9 "	346	346	0	0	0
	1,117				

Data is presented to indicate that both total exposure in yaars and lapsed time from onset of exposure are of importance, with the latter probably of greater consequence.

2. Almost half of the instances of calcification were bilateral (73 of 150). This tendency especially noted in more extensive calcification (29 of 35 Grade 2 and 19 of 19 Grade 3). When radiologically unilateral, the left side was more commonly involved (49) than the right (28).

3. Illustrations will be given of the variable location of plaques (diaphragm, costal, anterior and posterior mediastinal, pericardial, apical, interlobar fissures), their appearance and radiological demonstration.

4. Attention is called to two simple x-ray maneuvers which have been found valuable: oblique projections and use of higher penetration kilovoltages. Both were routinely used in addition to the standard PA projection, in this investigation.

###