

the aluminium project, much of the physical work on product development has been carried out on the shop floor and the costs aggregated with and absorbed by those of production. Such costs cannot be quantified. Costs which can be identified as relating specifically to research and development, however, amounted to £52,998 in the year ended March 1966, £45,300 of which was in respect of salaries and wages. The company's research and development department consists of four sections (electrical, mechanical, metallurgical and chemical) and the company states that, although the types of work carried out in these sections vary, the main lines of development are as follows:

'Improvements to the manufacturing process both by the introduction of new methods and by the consideration of new materials.

Design and development of new cables to meet customers' requirements.

Research into new applications for existing cables.

Design of improved cable terminations, accessories and tools.

The long term electrical testing of any new component or cable.

Investigations into failures of cable and accessories in the manufacturing process and on installations.'

CHAPTER 3

British Insulated Callender's Cables Ltd

Origins and development

43. British Insulated Callender's Cables Ltd. was formed in May 1945 for the purpose of merging British Insulated Cables Ltd. and Callender's Cable and Construction Co. Ltd., which were then among the largest electric wire and cable manufacturing companies in the United Kingdom. Both companies owned subsidiaries in the wire and cable field, both at home and overseas, and all of these were brought into the BICC group on its formation. The chairman of BICC told us that the basic reason for the merger of these two companies and the formation of BICC was the belief that size and efficiency were important, and that it was necessary to create a bigger unit that could stand up better not only to British but also to world competition.

44. Since 1945 the BICC group has expanded, and it states that it is now 'the largest and the leading organisation of its kind in the world with complete facilities for research, manufacture and contracting in transmission and distribution of electrical energy for power and communication purposes'.

45. The group is concerned principally with the making of all kinds of electrical cables, but companies within the group are also engaged in construction activities, and in the processing and fabrication of metals. British Insulated Callender's Construction Co. Ltd. is engaged on, for example, installation of mains cables, overhead line construction, the erection of radio masts and towers, and railway electrification. This company has recently taken on certain wiring contracts, some of which involve the use of mineral

insulated cable. Among the subsidiaries engaged in the production of metals and metal products are British Copper Refiners Ltd. and Thomas Bolton & Sons Ltd. Until recently the latter supplied BICC with the copper tubes used in the manufacture of mineral insulated cable.

Present organisation of the group

46. In 1955 BICC adopted a divisional organisation with a number of 'largely self-contained and autonomous operating Divisions and Group Companies [such as those mentioned in paragraph 45] with closely defined spheres of activity'. The divisions, which are not incorporated as separate companies, operate under divisional boards of directors, and the group companies under their own boards, all the operating activities of both being the direct responsibility of their general managers.

47. At present the operating divisions of the group are the following :

- Accessories
- Capacitors
- Mineral Insulated Cables
- Power Cables
- Telephone Cables
- Winding Wires
- Wire Mill
- Wiring and General Cables.

In addition there are the Home Sales Division and the Export Division. The Home Sales Division acts as a selling agent in the United Kingdom for all the operating divisions, and is responsible for the policy and administration of the group's branches (see paragraph 48). The division treats each operating division of the group as a separate organisation and its policy is to do its best to maximise the profits for each separately. The operating divisions fix their own selling prices ; there is no co-ordination of prices by the Home Sales Division, but in fixing their prices the operating divisions do so in consultation with the Commercial Director, who has experience of, and information on, the whole cables market. The Export Division's functions in relation to overseas sales are broadly similar to the Home Sales Division's functions in relation to home sales. It is responsible for the general administration of overseas sales staff through regional sales managers, and also maintains contact with the group's overseas agents.

48. BICC has branches in over forty towns in the United Kingdom, which hold stocks of all kinds of cable that can be sold off the shelf. The branches are supported by a technical sales force which is controlled by the Home Sales Division. The various manufacturing divisions do not have complete sales organisations of their own.

49. Overseas, BICC has subsidiary companies engaged in cable manufacture (though not of mineral insulated cable) and marketing in Africa, Australia, Canada, Malaysia, Portugal and Spain ; it also has subsidiary construction companies in Ghana, Nigeria, Portugal and Venezuela. There are associated companies in Africa, Germany, India, New Zealand and Pakistan. In addition the group is represented in over a hundred countries throughout the world.

50. Total sales by the group in the years 1961 to 1965 were as follows:

			<i>£m.</i>			
			United Kingdom	Direct exports	Sales by overseas companies	Total group sales
1961	...	...	105	26	20	151
1962	...	...	106	25	22	153
1963	...	...	108	24	52	184
1964	...	...	127	27	62	216
1965	...	...	137	40	77	254

51. The group's profits over the same period were as follows:

			Average capital employed ⁽¹⁾	Trading profit ⁽²⁾	Trading profit as percentage of capital employed
			<i>£m.</i>	<i>£m.</i>	%
1961	...	...	78	7	9
1962	...	...	83	8	10
1963	...	...	111	13	12
1964	...	...	118	16	14
1965	...	...	128	19	15

(1) Capital employed includes fixed assets described as 'at cost or as valued'; intangible assets and investments have been excluded.

(2) Trading profit is stated before tax.

52. The group's net assets employed at 31st December 1965 were £136,805,000.

Mineral insulated cable

Development by BICC

53. BICC told us that in 1937 or 1938 both British Insulated Cables Ltd. and Callender's Cable and Construction Co. Ltd. were separately offered an interest in Pyrotenax, which had then been only recently formed to develop mineral insulated cable in this country. We understand, however, that mutually acceptable terms could not be agreed upon and neither company accepted the offer made to it. We have not made any detailed investigation of these offers, but we understand that British Insulated Cables, at any rate, was interested and that it had talks with Pyrotenax at the time.

54. In 1948, when Pyrotenax was the only manufacturer of mineral insulated cable in the United Kingdom, the then Rubber Cable Manufacturers' Association, of which BICC was a member, reached the conclusion that steps should be taken to enter the mineral insulated cable field. The Association considered that it might be uneconomic for too many cable manufacturers to embark on the manufacture of mineral insulated cable, and it therefore proposed that BICC should undertake experimental work

which would lead to the manufacture of mineral insulated cable on behalf of all the then members of the Association. The members were to contribute a total of £2,000 towards the expenses of this experimental work during the first year.

55. In 1952 the Association recommended that BICC should go ahead with the manufacture of mineral insulated cable, the members being asked to share development charges, but not being expected to participate in the capital expenditure.

56. In 1953 BICC installed a production unit for mineral insulated cable. In the same year the Association suggested that BICC should draw up heads of agreement for consideration, covering sales of mineral insulated cable to interested members of the Association and contributions to BICC's development expenses to date. Draft heads of agreement were in fact prepared, and protracted negotiations on them followed. However, no agreement had been signed when the Restrictive Trade Practices Act 1956 came into force. At that point the negotiations were abandoned, the matter was allowed to drop and no agreement was ever signed. We understand from BICC that the members, who had agreed in 1955 to pay further sums amounting to some £10,800, paid these towards BICC's development expenses, which by that time had reached some £96,000. No agreement was reached about the supply of mineral insulated cable by BICC to other cable manufacturers.

57. In the meantime, despite the restriction imposed by certain patents, development had progressed successfully and the first sales of mineral insulated cable had been made by BICC in 1955. In the same year the mineral insulated cable production was transferred to the newly-formed Mineral Insulated Cables Division. Profits on sales were first achieved in 1957.

Purchases

58. The copper billets required for conversion into the tubes used in the manufacture of mineral insulated cable are supplied by BICC's subsidiary company, British Copper Refiners Ltd. Conversion into tubes was, until the end of 1964, done by another subsidiary company, Thomas Bolton & Sons Ltd. Since 1964, however, conversion has been carried out in a newly built special-purpose tube mill at Prescot, which is part of the Mineral Insulated Cables Division and which BICC told us cost about £½m. Immediately before the change Thomas Bolton & Sons was charging an average of £110 a ton for conversion, which included a profit of about £20. The tube mill at Prescot, however, is able to supply tubes at £57 a ton, including a profit of £12 a ton (see paragraph 109). The lower conversion cost at the Prescot mill is said to be due partly to the fact that the mill is a special-purpose mill making nothing but the tubes required for mineral insulated cable, and partly to the fact that a different process is used. The Prescot mill uses a rotary piercing machine imported from Germany, which is said to be much faster than the Bolton system and to require less labour. The Prescot mill was set up with reserve capacity and prior to the merger this was not being used.

59. Magnesium oxide powder used as the insulant in mineral insulated cable is supplied to the Mineral Insulated Cables Division by Washington Chemicals Ltd., Scotland.

60. A large part of the accessories used with mineral insulated cable, particularly the metal accessories used for making terminations, are purchased by BICC outside the group.

Distribution and sales

61. Unlike Pyrotenax, which is concerned only with mineral insulated cable, BICC has no distribution or sales organisation specifically for mineral insulated cable. Home sales of mineral insulated cable are made either direct from the factory or through the branches referred to in paragraph 48, and selling is in the main the responsibility of the general sales force under the Home Sales Division. However, the Home Sales Division has six specialist technical salesmen, who are based on the larger branches and who are concerned with the sale of mineral insulated cable only ; in addition the Mineral Insulated Cables Division itself has five salesmen engineers, based on the factory, who are concerned with converting potential customers to the use of mineral insulated cable.

62. Overseas, BICC has agents in most countries of the world who generally act on behalf of every manufacturing division and sometimes also for associated and subsidiary companies. The company states that in the main the agents are responsible for all products of all the divisions, but that in the case of the Mineral Insulated Cables Division there are specialist agents in Europe and Japan as follows :

Country	Product
Belgium ...	Mineral insulated cable
France ...	Mineral insulated thermo-couples
Germany ...	Mineral insulated thermo-couples
Holland ...	Mineral insulated cable except for use in shipwiring
Japan (2 agents)	Mineral insulated cable and accessories, and mineral insulated thermo-couples

In addition to exports by BICC to its overseas agents and in some cases direct to overseas users, some of BICC's mineral insulated cable is sold overseas by other United Kingdom companies (mainly cable makers), and cable being shipped direct to their order by BICC. Sales of this kind are included in the export figures given in the table in paragraph 63. In 1965 such overseas sales by other companies amounted to 40 per cent. of the export figure in the table for that year.

63. During the four and a half years ended 2nd July 1966 the value of sales by the Mineral Insulated Cables Division (after deducting all trade discounts and rebates—see paragraphs 78 to 86) was as follows :

				£'000
Year ended		Total	Home	Export
31st December				
1962	... ..	3,285	2,962	323
1963	... ..	3,355	3,013	342
1964	... ..	3,800	3,442	358
1965	... ..	4,418	3,969	449
1966 (first 26 weeks)	... ..	2,543	2,276	267

In addition BICC has a £750,000 contract for the supply of plant to the USSR for the manufacture of mineral insulated cable, and in 1966 sales under this contract amounted to £400,000.

Research and development

64. BICC's basic research is centralised in the laboratories of its Central Research and Engineering Division, where research in all fields of the group's activity is carried on. Total annual expenditure on research alone is about £1½m., of which the company estimates that about £36,000 is concerned with mineral insulated cable. In addition, the company states that annual expenditure on the development of mineral insulated cable within the Mineral Insulated Cables Division is about £65,000.

Overseas manufacture

65. BICC does not at present manufacture any mineral insulated cable overseas, but in 1964 it entered into an agreement with the Furukawa Electric Company of Japan, under which Furukawa became BICC's agent for the sale of mineral insulated cable and accessories in Japan, China, Korea and other South-East Asia countries. When sales reach the required economic figure, a joint manufacturing unit is to be set up in Japan to supply the area.

66. BICC told us that before the merger it had plans for establishing factories for mineral insulated cable in Australia and Canada.

CHAPTER 4

Sales, Prices, Discounts and Profits

Sales

67. An indication of the extent to which the United Kingdom market for mineral insulated cable has grown since 1956 is given in paragraph 20 and Appendix 2(a). The contributions to this growth made by Pyrotenax and BICC are illustrated in Appendix 2(b). In a period of 9½ years to 2nd July 1966 BICC increased its sales volume of standard cable more than ten times but it has to be borne in mind that 1956 was BICC's first full year of commercial production of mineral insulated cable. In much the same period Pyrotenax more than doubled its production in the United Kingdom. In paragraphs 37 and 63 we have given figures showing the value of total sales of mineral insulated cable by the two companies in recent years. In paragraphs 68 and 69 below we give analyses of sales by types of customer and product in the latest available accounting years.