Dornbirn: spinning and polypropylene dominate

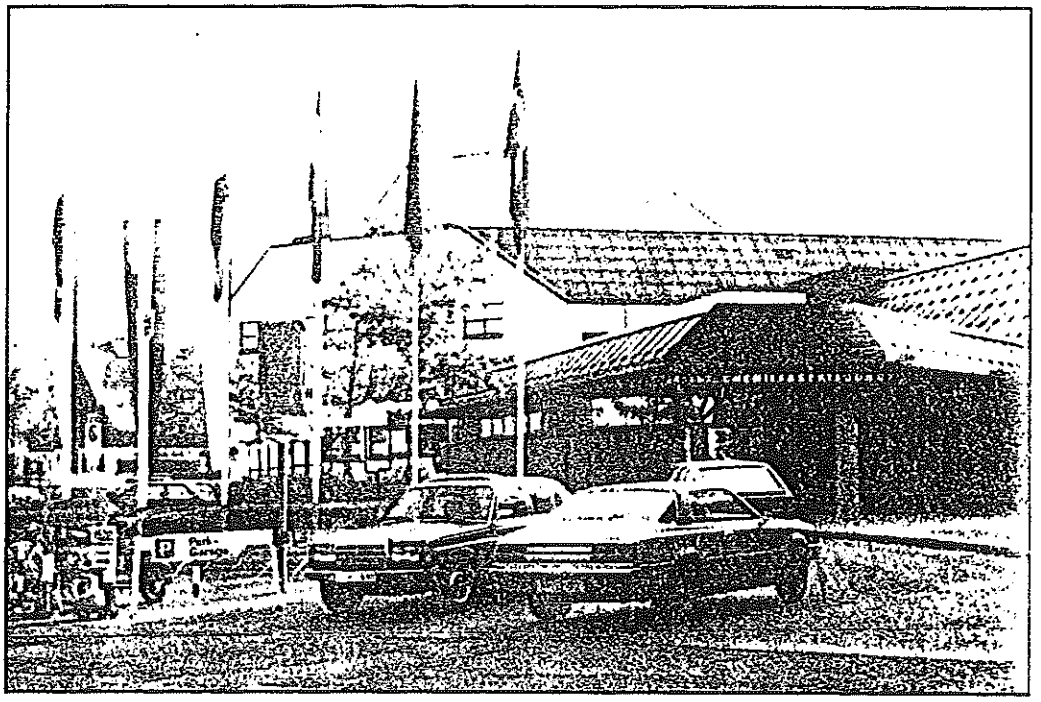
Derek Ward reports from Austria on the International Man-Made Fibres Congress

Global output of man-Made fibres in 1984 reached 15.3 million tons and provided roughly half of the world's supply of textile raw materials, according to Rudolf H. Seidl, president of the Austrian Man-Made Fibre Institute. Stressing the "over-riding importance of man-made fibres in the continuing progress of the international textile industries," he said production figures increase year by year "thanks to the development of new fibres and better qualities conforming to market needs."

Mr. Seidl was opening the twenty-fourth International Man-Made Fibres Congress which took place recently in Dornbirn, Austria. More than 700 delegates attended from 32 countries. Twin topics discussed at this year's event were progress in staple fibre spinning and polypropylene advances.

Many of the speakers dealing with the former topic viewed the subject from a stage halfway between the last and next ITMA (International Textile Machinery Exhibition). H. Rachmann (Rieter AG, Switzerland), for example, speaking about investment in spinning equipment, said that every ITMA sets new standards as far as textile machinery is concerned. The trend towards more costly plant of higher productivity continues. The capital requirement for investment is thus also increasing."

This speaker said that under normal circumstances investment usually means machinery is purchased, erected and commissioned, and buildings have to be planned and constructed. Because technical progress is constantly being made, it



This year's International Man-Made Fibres Congress attracted 700 delegates to the picturesque Dornbirn venue.

management to follow progress carefully so as to be able to take the right investment decision at any given time.

"Entrepreneurial decisions as a rule are based on a large number of factors reflecting the market expertise with which a particular company operates. Normally a R.O.I. (return-on-investment) is calculated to ensure the decisions are based on sound facts." He said there are established methods for calculating an R.O.I. and that the latter should answer the following questions: What means are necessary to carry out the investment?; What is the effect of the investment on total capacity?; Is the planned investment economical?; Which of the alternatives results in highest return?; What write-off periods may be expected?

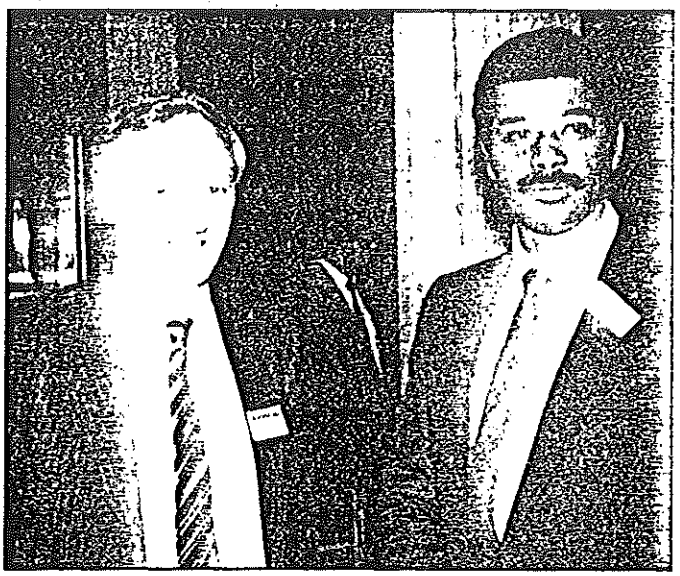
Friction

Air-jet and friction

understandably the subjects of several speakers, although it was generally agreed that no paper presented radically new information. Karl-Josef Brockmanns (Aachen Institute of Textile Technology, West Germany) even went so far as to state that "owing to its complexity, it is difficult to judge the chances of the OE-friction spinning system." He said that this is because a large number of different variations of the basic system exist and that their economics depend very much on individual energy consumption. "The advantages of OE-friction spinning systems compared to those of OE-rotor spinning are that yarns made on the former systems have an outer structure similar to that of a ring spun yarn and that higher production speeds are possible . . . A further advantage,

with air-false-twist spinning is the width of fibre spectrum which can be processed." However, the complex processes involved in forming the fibres and strengthening dynamometrical values so far general obtained represent the weakest links in the chain of this spinning system's parameters.

In a paper on the influence of different draft parameters and blend components in air-jet spun polyester/cotton yarns, Dr. P. Artzt (Denkendorf Institute of Textile Technology, West Germany) explained that, like rotor spinning, this system circumvents the need for a roving passage. "The draft is made by a roller draft process. It is preferable to use sliver weights in a 3.3-4 grams/metre range; this means that for fine yarn counts a draft range of 165-200 times. With the standard



Two members of UMIST (UK) — Dr. Gordon Cusick (left) and Dr. Carl Lawrence — were speakers at the Congress. Their papers are reviewed on this page.

it is impossible to run with such high draft. The lower liver weight needed for air-processing cannot be produced on such frames (sliver weights of 2.5 grams metre would involve an ...ter CV % which would be ... high)."

This speaker said that trials on yarns produced by ...ree and four roller draft ...stems indicated that the ...our roller versions have pronounced advantages. ...ith the latter systems, a ... % heavier sliver can be ...ed, and this means it will be practical to use an air-jet system in spinning mills.

As far as yarn strength is ...ncerned, the principal fibre characteristic is binding rigidity. This ...aracteristic is much less in ...olyester fibre than in ...ton. He said that this creates better wrapping of t... f... ends from polyester f...es on the yarn surface. "...bres with high binding rigidity give less wrapping intensity and prduce less y...n strength. That is the m... in reason for the use of polyester/cotton — yarns made from cotton alone have a... arn strength comparable t... hat of friction spun yarns." He suggested that 50% polyester should be u...d in poplyester/cotton y...ns, and said that the air-jet technique offers advantages in spinning acrylic fibres — and also for w...at he described as "...nsitive fibres such as polypropylene."

...aple yarns

On... of the few speakers d...ling with marketing a...ects of staple spun yarns, D... Robert A. Barnhardt (Charlottesville Institute of Textile Technology, USA) s...gested that, as far as c...petition between industrialised and developing countries is c...erned, markets can be di...ided into three main sectors. These are: the market for yarns consisting of ...soteric or specialised fi...es which have frequently b...en engineered for highly individual industrial applications; the sector for ya...ns consisting of unique bl...ds of natural and/or man-made fibres which often perform a function of fabric st...ing or design (and which as...ach are cyclical in

yarns made from commodity fibres — used either alone or in blends with other fibres. Dr. Barnhardt stated that each category presents a different type of problem for both industrialised and developing countries. Some problems are technical in nature and others are a function of market response time. Additionally, the impact of limiting legislation has to be considered.

In a paper on factors affecting the properties of friction-spun yarns, Dr. G.E. Cusick (UMIST, UK) considered the delivery orientation and direction of flight of fibres and their effect on the yarn itself. He explained how the rotational speed profile in the spinning zone effects the radial distribution of twist in the yarn, illustrating the effect with experimental results. Methods for adjusting the rotational speed profile were suggested.

A technician from Dr. Ernst Fehrer AG (Austria), G. Gsteu, outlined the potential for yarns spun on the Dref friction system for use in high performance textiles, in various types of industrial constructions, outerwear, military and civil protective clothing, and speciality decorative and home textile fabrics. He also mentioned the acceptance of the Dref technique for making yarns of such speciality fibres as aramid, pvc and carbon items.

Mr. Gsteu, after outlining how both Dref 2 and Dref 3 versions of the friction suggested that key points for the future of the technique lie in its potential for making speciality core yarns for specific purposes and in the facility it offers for recycling secondary raw materials. "Not only in developing countries but also for highly industrialised nations, the problem of waste re-cycling is getting more and more important. A flexible, economical and short system for the relatively simple and direct spinning of yarn at high speed for subsequent use (without re-winding) offers many advantages."

Jens Harmstorf (hoechst AG, West Germany) explained a method which has been developed to determine the mechanical stress imposed on fibre during its passage through various stages in open-end rotor spinning. The method is based on the assumption that any stress can be seen as a reduction in crimp: measurement of crimp makes possible conclusions about the stress.

According to R. Kampl (Lenzing AG, Austria), viscose fibre has been able to hold its position in the market in spite of distressing forecasts in the past.

He said that the industrial production of cellulosic fibres has been flexible enough to react positively — through the use of new technology and modification techniques — to the constantly changing demands associated with changing manufacturing trends and end-products. Sales have indicated a strong movement towards finer denier items, and further technological development will favour this movement.

Mr. Kampl discussed the production of both viscose and modal fibre. He said that such items not only give good results when used alone, but are also very effective when used in blends with cotton. However: "It is important that machinery makers carry out some innovations to their equipment to ensure the effective use of various fibres which are very different in their characteristics."

OE study

Another speaker from UMIST (UK), Dr. Carl A. Lawrence, described a study of the way in which fibres processed on open-end spinning systems leave the pin-clothed roller and are transported to the twisting device. The study involved high speed photographic observations of the fibres in flight during processing on a Platt-Saco Lowell rotor spinning unit and a Dref-2 unit. Double image photographs permitted detailed analysis of three-dimensional configurations of fibres in flight (previous work by other researchers has been confined to two-dimensional views).

From these three-dimensional studies an empirical equation has been derived to give fibre extent and orientation to direction of airflow as a function of the transport channel, and this equation has been used to optimise a novel design of channel. The new design, said Dr. Lawrence, considerably improves the straightening and alignment of fibres during their transfer to the twisting device.

The UMIST work has led to the invention of a new friction spinning system. Although the work, sponsored by the British Technology Group, is still in its early stages, results show that staple yarns and filament core yarns can be made successfully.

F. Leifeld (Trutzschler GmbH, West Germany) explained that investigation of the influence of throughput quantity in spinning preparation lines on the