

# CSIRO mill gives cotton a new spin

By Geoff Naylor, Cotton Textile Research Unit, CSIRO Textile and Fibre Technology

The Cotton Textile Research Unit at CSIRO Textile and Fibre Technology has commissioned a new state-of-the-art short staple spinning mill at its Geelong facility.

This major investment in infrastructure by CSIRO of over \$1 million is indicative of CSIRO's long term commitment to working with the Australian cotton growing industry to maintain its position as a supplier of high quality cotton suitable for processing on modern textile machinery.

The new spinning mill is important for several reasons, not the least of which is Australia's position as the world's third largest exporter of cotton as well as a major producer of high quality cotton product.

Australia grows 16 per cent of the world's high-grade medium staple cotton, which means that Australian cotton increasingly tends to be the major cotton used in mills across South East and East Asia. Then, too, Australia can also produce around 200,000 bales of Pima-type cotton that is sold to European mills for conversion into high quality fine count yarns.

The three main short staple spinning systems typically used in industry — namely ring, rotor and Vortex spinning — are included in the new mill. Table 1 lists the range of yarns that can be produced and the productivity of the three spinning systems installed at CSIRO.

Once the yarn is produced it can be knitted or woven through to finished dyed fabric using the existing facilities at CSIRO in Geelong.

For the technically minded, in the new mill, fibre preparation starts with a Truetzschler Bale Opener. The opened fibre is transported via ducts to a Truetzschler Fine Cleaner where opening continues along with cleaning of the fibre. Fibre is then transported to a Truetzschler Reserve Hopper before being fed into a Truetzschler DK903 cotton card for further cleaning and fine opening and the production of a sliver.

Card sliver is then blended and the fibres made parallel in up to four successive drawings on a HSR1000 Truetzschler drawframe that is fitted with an auto-leveler. Depending on the spinning system to be used, drawn sliver can then be converted into roving or fed directly into the rotor or Vortex spinner to produce yarn.

Already commissioned is a 48 spindle Zinser roving frame, a 192 spindle Zinser ring frame with both 38 mm and 40 mm rings and a 48



Dr Stuart Gordon taking yarn samples from the new ring spinning frame at CSIRO.

**TABLE 1: Yarn count range and productivity of new CSIRO spinning systems**

System	Yarn count range	Yarn delivery speeds
Ring	Ne* 15/1 – Ne 60/1	12 – 25 m/min
Rotor	Ne 5/1 – Ne 40/1	90 – 140 m/min
Vortex	Ne 15/1 – Ne 50/1	300 – 400 m/min

**\*Ne, the English Cotton Count, is the common measure of yarn thickness used by the cotton spinning trade. The first number is the number of 840 yard lengths formed from a single strand that would weigh one pound and the second number is the number of strands plied together to form the yarn.**

rotor Schlafhorst open end frame with SE11 Coroboxes. We expect the 16 spindle Murata Vortex Spinner to be operational by the time this article is published.

The new short staple spinning plant is already processing short staple fibre for external clients. One major advantage of this new mill over the larger plants used by industry is that we are able to efficiently spin lots down to as little as 30 kg of raw fibre. This is ideal for quality control testing and small niche spinning lots as well as research projects.

In addition to this facility's technological benefits, the Cotton Textile Research Unit also has skilled and experienced people capable of not only ensuring proper plant operation, but also providing invaluable expertise in interpreting results and offering advice on future projects. In this respect a key person is Dr Stuart Gordon who has both a cotton textile research background and also many years 'hands on' practical experience in commercial spinning operations. In fact Stuart has largely masterminded the design and installation of the new mill and will be actively involved in many of the ongoing research projects using the new facility.

This new spinning facility will figure prominently in our efforts to ensure that Australian cotton is the preferred option for superior technical performance by international mills producing high quality cotton products. At the Cotton Textile Research Unit characterisation can now include all the processing steps from ginned lint through yarn and fabric formation to final product.

A major role for the facility will be as a research tool, allowing scientists and industry alike to complete full experiments under careful quality controlled conditions. For example, in a project sponsored by the Australian Cotton CRC, with the support of the Australian Cotton Shippers Association, we hope to undertake comparative spinning trials with various international spinners in an effort to better understand how Australian cotton stands up once it leaves our shores.

In closing, we believe this short staple spinning mill will become an integral component in the Australian industry's drive to maintain its position as one of the world's finest cotton producers.

For more information on this and other research taking place at CSIRO Textile and Fibre Technology, go to: [www.tft.csiro.au](http://www.tft.csiro.au) or contact Dr Geoff Naylor on ph: 03 5246 4000.