

## Why Worsted?

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Students of the Janet Phillips Master Class have been doing research into worsted spun yarns in collaboration with Weavers Bazaar who supplied the yarns. The project had the dual aims of undertaking in-depth research into the types of woven fabric most appropriate for the properties of the yarns, and weaving a finished project based on the research done.

## What is worsted?

Worsted yarn is most commonly produced from a long staple fleece and it is distinctive because of the combination of the way fibres are prepared for spinning and the actual spinning process.

*Worsted preparation* involves combing the long wool fibres several times over ensuring they all lie parallel to each other. These combed fibres are formed into long 'ropes' called tops. *Worsted spinning* keeps the fibres parallel as they are twisted into a yarn by the spinning process. Hand spinners would use a short-draw spinning technique to produce a worsted yarn. The result is a firm, hardwearing yarn, usually with a high level of twist, which has been traditionally used for weaving furnishing fabrics and carpets, outer clothing material and for tapestry weaving. Worsted wool has been produced for over six centuries and in the mystical world of wool counts it has its own system: the Worsted Count (WC).

(The original Bradford Worsted Count (WC) is where a count of one is a single strand of worsted yarn that measures 560 yards and is 1lb in weight)

## A past glory?

Worsted yarn is said to have originated in East Anglia, possibly even in the village of Worstead and the surrounding area, in the mid fourteenth century. Traditionally woollen cloth was finished through a process known as 'fulling', which using fast flowing streams to drive *fulling* mills. Fulling causes the cloth to shrink and firm up ready for use. Because the East Anglian landscape had no hills to create the fast flowing streams, the distinctive worsted preparation and spinning process evolved so that the resulting cloth, also called worsted, would not require fulling. The production of worsted yarn and worsted cloth in East Anglia dominated the worsted trade for four hundred years.

In the late 1700s a new fibre started to appear in Britain – cotton. The demand for cotton was insatiable. Manufacturing innovations, developed during the Industrial Revolution to feed this demand, enabling all aspects of fibre processing to be dramatically scaled up. It was not long before the techniques used for producing cotton were also being used to spin and weave worsted wool. As water was a key component of these technological advancements it caused the worsted industry to shift from East Anglia to Yorkshire, Scotland and Somerset.

However, by the late 1900s the dominance of oil-based synthetic fibres had driven the wool industry – both in the UK and across the world – into decline. The production of fleece had become unviable and farmers had turned to more lucrative markets. The quality long stapled wool and the skills needed to produce a good worsted yarn were disappearing and the worsted spinning industry in Britain has reverted to a cottage industry. Some of the remaining mills of the UK's former glorious wool industry are able to spin worsted but only as a specialist order. The fleeces used are unlikely to be British. What a tragedy, when the use of worsted yarn can result in stunning cloth –

as the students on Janet Phillips' Master Class in Weaving found out when they started to explore its potential.

### **Understanding your yarn**

If a yarn is labelled 'worsted' it should have certain characteristics: it should be firm, hardwearing and have a high level of twist. The distinctive worsted preparation enables these yarns to be spun very fine, in which case they will be lightweight and reasonably cool to wear. The amount of twist put into a yarn during the spinning process can change these inherent characteristics. Worsted spun yarns are normally plied for both knitting and weaving. Because of the variable qualities of both the yarn and the resultant fabric the designer needs to develop sensitivity to the raw material.

The three types of plied worsted yarns used had the following counts: 18/2 nm (2/16 WC; 9,000 metre per kilogram: 4,480 yds/lb ), 8/2 nm (2/7 WC; 4,000 metres per kilogram: 4,000 yds/lb) and 6/2 nm (2/5 WC; 3,000 metres per kilogram: 1,540 yds/lb ). They have a very distinct visual appearance. They all have a subtle sheen to them. They are all slightly hairy. They all have a tighter than average balanced twist to them. (18/2: 9.87 twists per inch on singles and on the ply. 8/2 and 6/2: 4.95 twists per inch singles; 3 twists per inch plied.)

### **The Project**

Each student was given 250 grams of 18/2 nm, 8/2 nm or the 6/2 nm yarn and the simple task of weaving sett samples in Plain Weave and 2/2 twill weave structures, as the first step to establishing what types of fabric could be woven with these yarns. They wove three setts in each weave structure: a slightly loose sett; an average sett and thirdly with a firm sett (see Figs 1-3 for details). Four metres of warp was put onto the loom, threaded with a straight threading and then sleyed and woven at the loose sett. Particular attention was paid to weaving an accurate weft sett to ensure a balanced square sett (where picks per inch equals ends per inch) was woven. A square of cloth was woven in both plain weave and 2/2 twill before the warp was cut, in front of the reed, and then re-sleyed to a closer sett. Again an accurate square of cloth was woven in this new sett in both plain weave and 2/2 twill. The whole process was then repeated with an even higher sett. All cloths were measured in width and length before washing to record any shrinkage.

The project highlighted the impact that sett has on the handle, drape and finished quality of a fabric and that the end use of the fabric would determine which was the correct sett to use for any given project.

### **Impact of the project**

All the students really liked the worsted yarn, which was easy to use. No breaks occurred in the warp and the yarn dyed well with acid dyes. Scissors were needed to cut the yarn as it was difficult to break with the hands. The wraps per inch (wpi) given by the producer were considered to be very low in respect of the good average setts that our research found, ie closer setts were found to be more appropriate than the wpi suggested.

There was normal take up during weaving on both plain weave and twill setts (about 10%) but virtually no shrinkage on finishing.

Finishing was undertaken both by hand washing and in a washing machine using a 40°C wool wash. Both types of finishing caused a 'crazing' effect to occur on the plain weave cloths no matter how tight the sett was. Crazing occurs when the tightness of the twist in a thread causes a plain weave

structure to shrink irregularly. It is fact an easy way of designing a 'crepe' fabric. The 'crazing' effect was lessened with hand washing. The samples softened slightly on washing. It was felt that machine spin-drying creased the fabrics and they would have been better drip dried and then ironed. The fabrics did not felt even after boiling and agitating the material.

The overall conclusion was that the worsted yarns were all ideal for furnishing and interior fabrics as well as coating and suiting fabrics for clothing, although they would not be suitable for clothing worn next to the skin. The crispness and sheen of the finished cloths meant that weave structures were clearly visible.

Following the results of the basic sett samples the students and tutor were able to decide what type of finished items they could weave. They all decided to weave functional furnishing fabrics. Janet Phillips wove a simple 4-shaft huck-lace curtain. Marilyn Burton wove a bag in shadow weave. Maggie Roberts wove dining room chair covers in an 8-shaft twill. Sue Briggs wove two weft faced plain weave cushions and Janet Phillips also wove a set of tablemats, which combined the classic 4-shaft herringbone twill with a textured, 4-shaft herringbone twill. A further project has since been undertaken by other Master Class students into weaving cloths combining Weavers Bazaar yarns. The most noticeable conclusion being that the three yarns shrink at different rates and therefore add texture to resultant woven cloths.



Janet Phillips - Table mats.



Maggie Roberts - Dining chair covers



Sue Briggs - Loom bench cushions



Janet Phillips - Lace curtain



Marilyn Burton - 'Aqua Reflections' bag

Joan Scriven wove 2/2 twill with a combination of three threads of the 18/2nm yarn with 2 threads of the 6/2nm yarn in warp and weft. The resultant fabric made an extremely functional furnishing fabric. Janet Phillips wove a networked diversified plain weave combining the 18/2nm yarn with the 8/2nm yarn. Christine Wheeler made a blanket with all three Weavers Bazaar yarns. Gillian Militis wove a pique fabric and made it into jacket using the finer 18/2 nm yarn for the face of the cloth and the thick 6/2nm yarn floating on the reverse side.



Gillian Militis – 'Fir Trees' jacket fabric



Christine Wheeler 'Goose Neck' blanket



Janet Phillips - 'Candelabra' cushions



Joan Scriven - 'Mediterranean Sunset' foot stool

## The future

Why worsted then and why this project? What the project shows is that good worsted yarn has qualities and uses that earn it a place in the future of hand weaving, tapestry and contemporary textiles. The yarn used in this investigation is spun outside the UK from fleeces sourced mainly from New Zealand and, in some case, South America. The skills and capabilities in the UK to produce worsted yarn are nearly extinct - but not quite. However no skill will endure without being utilised. So we want to raise the profile of good worsted yarn, encourage makers to try it and to explore how it can be used - if you like it, keep using it! For it is only through stimulating interest that the commercial value of re-establishing the production of a viable UK worsted industry will be evident. This means rearing enough of the right sheep to give the pure white, long staple fleeces and having enough demand for the yarn to justify the mills routinely turning over their equipment to worsted spinning.

Why worsted! Why not!

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