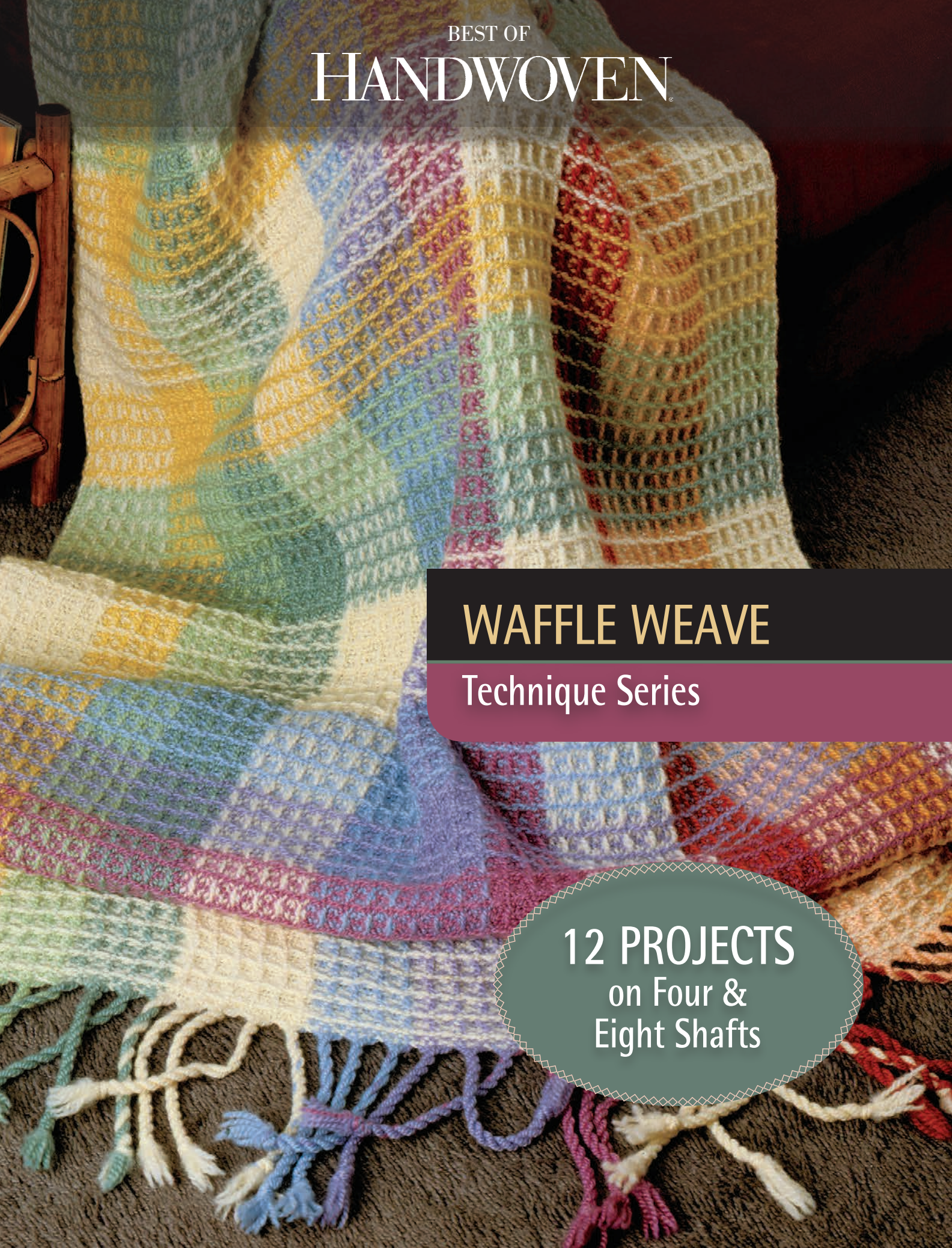
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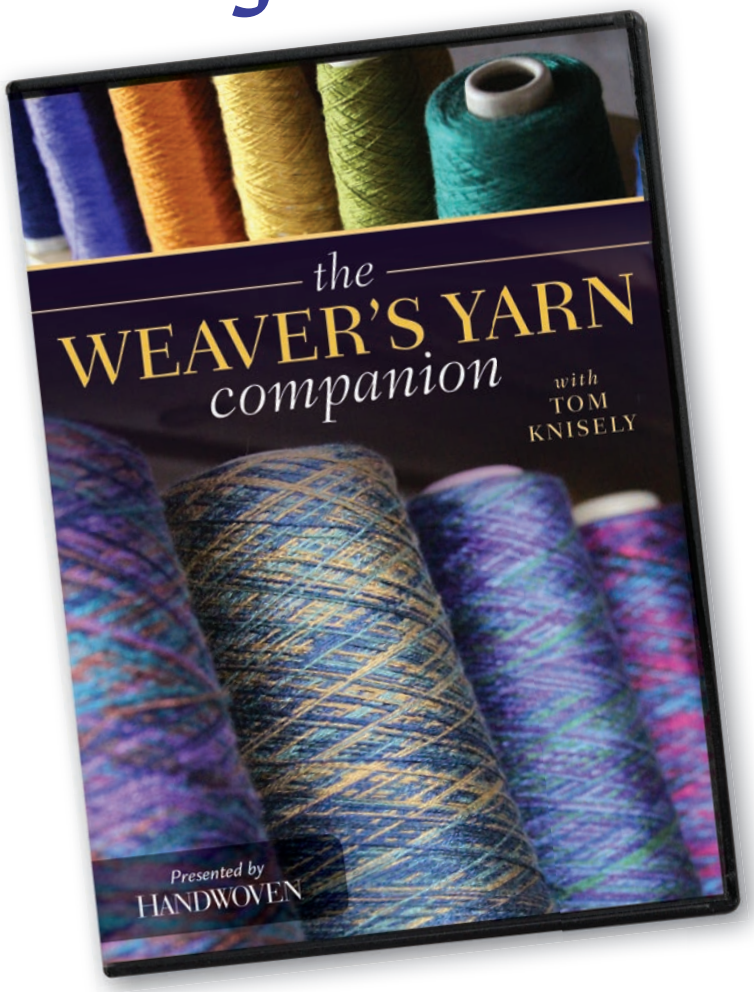


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Waffle weave is an unusual weave structure in that its name evokes images of the cloth itself (summer and winter? overshot?—not so much!). Some waffle-weave fabrics have as much depth and shape as an actual Belgian waffle. This depth is especially appreciated by weavers because most of the fabrics we weave are so very flat. Creating such marvelous texture by crossing the warp and weft in their flat plane on the loom seems like magic. Even better, waffle weave can be woven on simple looms. Two of the projects in this book are woven on a rigid-heddle loom, seven on four shafts, one on six, three on seven, and one on eight. You'll especially appreciate the"Waffle-Weave Handbook," by Kathryn Wertenberger Meile, which gives thirteen threading, tie-up, and treadling drafts for different numbers of shafts—plus waffle-weave tips. The projects in this book use a wide range of yarns and setts (from fine cottons to thick, soft wools) so that you can mix and match drafts and materials for original fabrics. You'll discover that the special texture of waffle weave gives more absorbency and/or insulation than almost any other handwoven fabric.

Madelyn

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Sunny towel set *by Margaretha Essen-Hedin*

These bright, absorbent towels are woven in an unmercerized cotton using a variation of 5-shaft waffle weave that produces relatively short floats. The bath towel is white with yellow stripes that coincide with single repeats of the waffle cell. The position of the colors is reversed for the hand towels.

Fabric description Waffle weave.

Finished dimensions One hemmed bath towel 41" by 62" and two hemmed hand towels 20" by 29" each.

Warp and weft

8/2 unmercerized cotton at 3,360 yd/lb: for the bath towel, 5,050 yd white and 378 yd bright yellow; for the hand towel, 162 yd white and 2,480 yd bright yellow.

Notions

Matching white or yellow sewing thread.

Total warp ends Bath towel 1,137; hand towels 561.

Warp length

3 yd (allows for take-up, shrinkage, and 27" loom waste).

E.P.I. 24.

Width in reed Bath towel 47⅜"; hand towel 23⅜".

P.P.I. 20.

Take-up and shrinkage 15% in width and length.

Weaving

Warping note: Notice that the 9-thread narrow contrasting-color warp stripes should each include one threading repeat plus the first thread of the next repeat on shaft 1 (this will make them symmetrical and the stripe will coincide with the cells of the waffle).

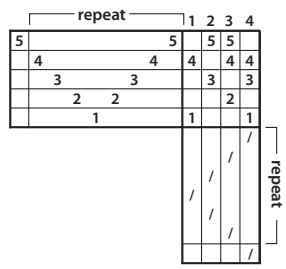
Warp the loom and weave the towels following the Draft. Use the white weft for the large bath towel for a total woven length of about 69". Use the yellow weft for the smaller hand towels for a total woven length of about 33½" each towel. Separate hand towels with 1 or 2 picks of a contrasting color.

You can experiment with other treadling orders of the colors. For example, you can reverse the colors and make crosswise stripes that coincide with the cells—in this case, make sure you use the stripe color for one or more full treadling repeats plus the first pick of the next repeat on treadle 4.

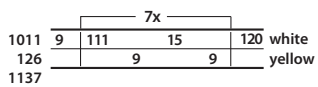
Finishing

Machine zigzag or staystitch the ends of each towel. Cut the hand towels apart between stitching lines. Turn each end under ½–¾" twice; sew hems by hand. Machine wash and rinse on warm, gentle cycle; machine dry.

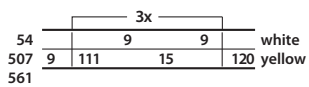
Draft



Warp color order: bath towel



Warp color order: hand towels



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Bath set in natural cottons *by Karen Tenney*

Nearby, in a renovated barn on my rural upstate New York road, the McGillicuddy family makes lovely, all-natural-ingredient soaps. I stopped one day to buy a hostess gift and left an hour later with a plan to weave some all-natural-cotton facecloths to go with Debbie McGillicuddy's beautiful soaps.

A 4-shaft waffle weave and 10/2 organic cotton seemed just right for facecloths, but I could not stop there. A heavier (3/2) organic cotton in a spot weave provided a thick, absorbent texture for an invigorating bath towel. For hand towels to complete the set, I found "Breaks and Recesses" in *A Weaver's Book of 8-Shaft Patterns*. The photographed sample was woven by Diane Ferguson, who discovered the draft in G. H. Oelsner's *A Handbook of Weaves*. Oelsner classifies this weave as one in which "perpendicular and horizontal breaks or recesses occur at intervals with adjacent warp and weft threads stitched in opposite order" (see Resources, page 6). In 8/2 unmercerized cotton, it provides just the texture I was looking for; see page 6.

The bath set makes a lovely group when gift-boxed with a bar of handmade soap or hung on the towel bar in the guest bathroom. You can choose to weave just one of the items in the set or enjoy weaving all three.

Fabric description for facecoths
Waffle weave.

Finished dimensions
Six hemmed washcloths 12½" by 12½" each.

Warp and weft
10/2 organic unmercerized cotton at 4,200 yd/lb, 2,577 yd natural (Thantax, available from A Touch of Twist, www.atouchoftwist.net, or Fox Fibre, from Vreseis, www.vreseis.com or New World Textiles). 20/2 pearl or unmercerized cotton at 8,400 yd/lb, about 400 yd for hems.

Total warp ends
387 (includes 2 floating selvedges).

Warp length
4 yd (allows for take-up, shrinkage, and 27" loom waste).

E.P.I.
24.

Width in reed
16⅛".

P.P.I.
24.

Take-up and shrinkage
22% in width and length.

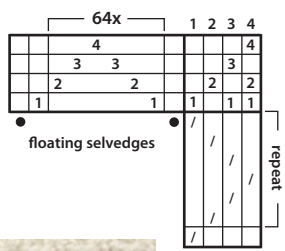
Weaving and finishing the facecloths
Wind a warp and thread the loom following the Draft. Note that floating selvedges are necessary to ensure catching the edge threads of the waffle weave. The Thantex organic cotton is particularly soft and absorbent, and it has a deep, rich natural color. You can substitute other 10/2 unmercerized cottons, but avoid pearl cotton for this project, if possible. Pearl cottons are less absorbent than unmercerized cottons and tend to produce a smoother, more polished surface. Another option is to choose 8/2 unmercerized cotton in natural and change the sett to 20 epi.

Since waffle weave draws up considerably during finishing, a plain-weave hem tends to spread out and ripple. Facecloth hem sections are woven in waffle weave to avoid spreading, and a finer weft is used than in the rest of the fabric to reduce hem bulk.

Begin the first facecloth by weaving 1½" with 20/2 cotton for the hem. Then weave 14½" with 10/2 organic cotton for the body of the cloth and end with 1½" using 20/2 for the other hem. Weave 2 picks of waste yarn in a contrasting color to separate the cloths and then repeat these steps for a total of six facecloths.

Remove the fabric from the loom and machine zigzag both ends of each cloth just inside the contrasting-color marker threads. Cut the cloths apart and machine wash, warm water, gentle cycle. Machine dry, regular cycle. Turn under each end ¼" and then another ½" inch and machine zigzag for a secure hem. Press hems.

Draft for facecloths



4-shaft waffle weave



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Fabric description for the hand towels
Crepe weave.

Finished dimensions
Six hemmed towels 15" by 25" each.

Warp and weft
8/2 unmercerized cotton at 3,360 yd/lb, 4,230 yd, natural.

Total warp ends 360.

Warp length
6¼ yd (allows for take-up, shrinkage, and 27" loom waste).

E.P.I. 20.

Width in reed 18".

P.P.I. 20.

Take-up and shrinkage
17% in width, 10% in length.

Weaving and finishing the hand towels
Wind a warp and thread the loom following the Draft. If you don't have an 8-shaft loom, you can weave the hand towels in plain weave or a spot weave like huck. An interesting draft to try would be "Joseph France Huck-A-Back" from Marguerite Davison's *A Handweaver's Pattern Book*, treadling #VII (see Resources). Your goal is a sturdy structure that can stand up to regular laundering. Structures with secure floats, such as spot weaves and huck textures, add absorbency.

For the 8-shaft hand towels, a plain-weave hem provides a nice contrast with the float texture and is a suitable weight (the structure draws in only slightly with finishing). Begin the first towel by weaving 2" plain weave for the hem (alternate treadles 1 and 8), and then weave 26" of pattern, followed by 2" of plain weave for the other hem. Weave 2 picks of waste yarn in a contrasting color to separate the towels, and then repeat for a total of six towels.

Remove the cloth from the loom and machine zigzag both ends of each towel just inside the contrasting-color marker threads. Cut the towels apart and machine wash, warm water, gentle cycle. Machine dry.

Turn under each end ¼" and then fold again to the first row of the pattern; machine zigzag hem. Press.

Fabric description for bath towels
Spot weave with warp and weft floats.

Finished dimensions
Three towels 24" by 53" each plus 1¼" fringe.

Warp and weft
3/2 organic unmercerized cotton (Thantex Mills, available from A Touch of Twist, www.atouchoftwist.net), or 3/2 pearl cotton at 1,260 yd/lb, 5,612 yd natural.

Total warp ends 398.

Warp length
7½ yd (allows for take-up, shrinkage, and 27" loom waste).

E.P.I. 12.

Width in reed 33⅛.

P.P.I. 12.

Take-up and shrinkage 27% in width, 25% in length.

Weaving and finishing the bath towels
The draft for these bath towels is a 6-shaft weave with allover alternating warp and weft ("turned") spots, separated vertically and horizontally by plain weave. If you don't have six shafts, use the alternate 4-shaft draft. An important feature of both drafts is the plain weave between floats (there are more plain-weave threads in the 4-shaft draft than in the 6-shaft draft so take-up and shrinkage may be less with the 4-shaft draft; see draw-downs). The plain-weave threads keep the floats from pulling away from each other to make lacy holes. After finishing, the fibers relax and move, and the surface takes on the appearance of a woven basket.

Since this fabric draws in considerably, hemstitching and a short fringe are used for the towels instead of hems (hem areas would be wider than the towel body and would therefore "ruffle").

Wind a warp and thread the loom following the 4-shaft or 6-shaft draft. Allowing 2–3" of warp for fringe, leave a tail of weft for hemstitching and weave 6 picks plain weave and one pattern repeat (12 or 14 picks). Hemstitch across the first three weft rows, encircling 4 warp threads in each stitch.

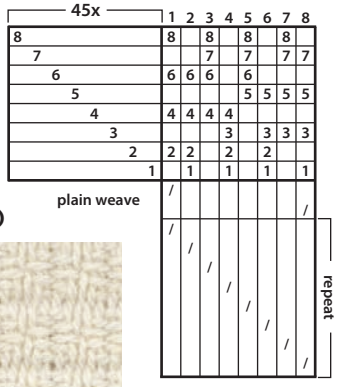
Continue, weaving the pattern repeat until the towel measures 71½". Weave 6 picks plain weave and repeat the hemstitching. Allow 2–3" for fringe, throw 2 picks contrasting waste yarn to separate towels, and repeat for two more towels.

I used an end-feed shuttle rather than a boat shuttle for these towels. Because the yarn is relatively thick and a pirn holds more yarn than a bobbin, I didn't have to begin and end wefts as often as with a boat shuttle. Also, since the warp is relatively wide, the regular but light drag of an end-feed shuttle helped produce smooth selvedges.

Remove the towels from the loom and cut apart at contrasting-color threads. Machine wash, warm water, gentle cycle; machine dry. Trim fringe evenly.

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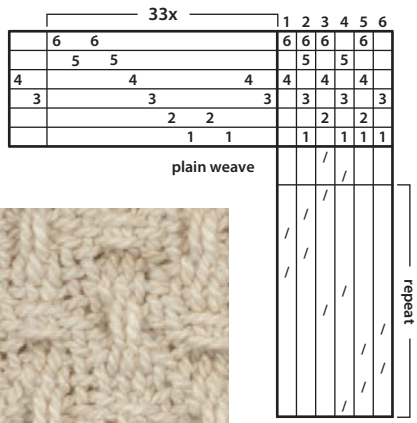
Draft for hand towels



8-shaft Breaks and Recesses (Oelsner)



6-shaft draft for bath towels



6-shaft turned spots



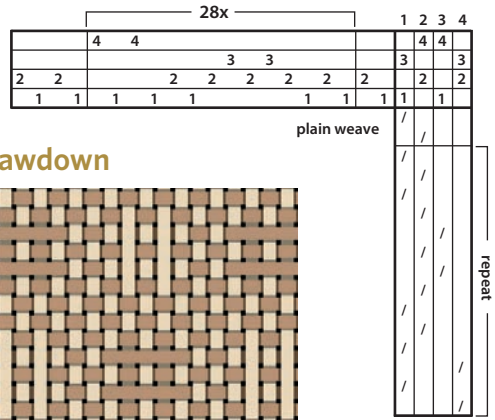
Resources

Davison, Marguerite. "Joseph France Huck-A-Back," *A Handweaver's Pattern Book*. Swarthmore, Pennsylvania: Marguerite Davison, 1977. Alternative 4-shaft draft for facecloths, p. 81.

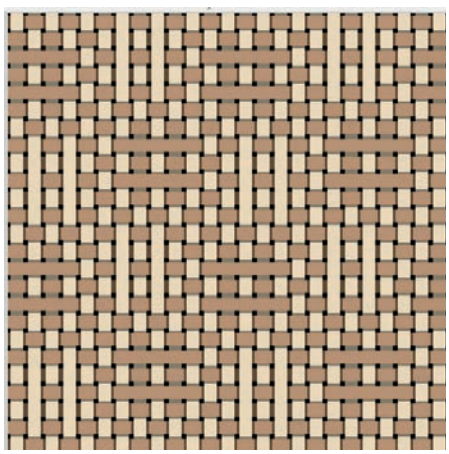
Oelsner, G. H. *A Handbook of Weaves*. New York: Dover Publications, 1952. (Republication of Samuel S. Dale's 1915 translation.) Draft for hand towels (Breaks and Recesses), p. 164.

Strickler, Carol, editor. *A Weaver's Book of 8-Shaft Patterns*. Loveland, Colorado: Interweave Press, 1991. Draft for hand towels p. 17, #47, originally from Oelsner.

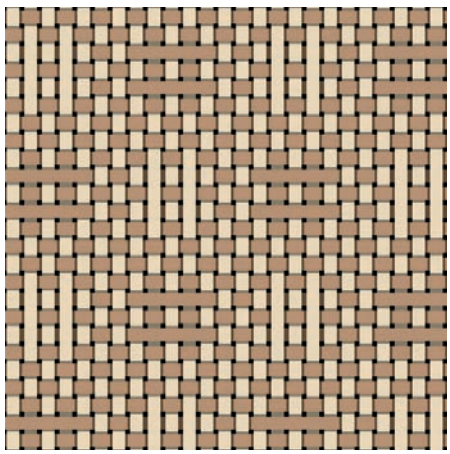
4-shaft draft for bath towels



6-shaft drawdown



4-shaft drawdown



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Cushy placemats and coasters *by Joan Torgow*

A medium-weight cotton yarn (5/2 pearl cotton) produces an incredibly thick, spongy cloth when woven in 7-shaft waffle weave. Although the fabric appears flat as it's being woven on the loom, the waffle cells contract and deepen into an amazingly dimensional shape with wet finishing.

Fabric description Waffle weave.

Finished dimensions Three placemats 13½" by 11½" each and six round coasters 6" in diameter each including ½" fringe on all edges of all pieces. (Before cutting apart the pieces, the finished fabric measures 13½" by 53". Consider putting on a longer warp and weaving more pieces!)

Warp and weft

5/2 pearl cotton (UKI) at 2,100 yd/lb: 605 yd Cayenne #131 (red), 507 yd Persian Green #106 (olive), 352 yd Safari #140 (taupe), and 591 yd Pacific Blue #125 (blue).

Notions

Red sewing thread.

Total warp ends 415 (includes 2 floating selvedges).

Warp length

3 yd (allows 6" for take-up, shrinkage, and 33" for loom waste; allow 22" warp length for each additional placemat).

E.P.I. 20.

Width in reed 20¾".

P.P.I. 18.

Take-up and shrinkage 35% in width and length.

Weaving

Wind a warp following the Warp Color Order and thread the shafts following the Draft. Using the treadling order in the Draft, weave 2 repeats red, 3 repeats olive, 2 repeats taupe, 1 repeat red, 3 repeats blue, and repeat this order for about 69" at 18 ppi. (Each waffle cell will appear slightly elongated warpwise under moderate tension on the loom.) To minimize buildup at weft color changes, start each new color at the opposite selvedge from the previous color and turn the new tail into the second pick of its treadling repeat.

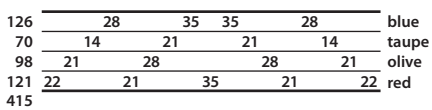
Finishing

Remove the fabric from the loom and machine wash, warm water, regular cycle. Tumble dry until nearly dry; gently shake out the fabric and lay flat to dry completely.

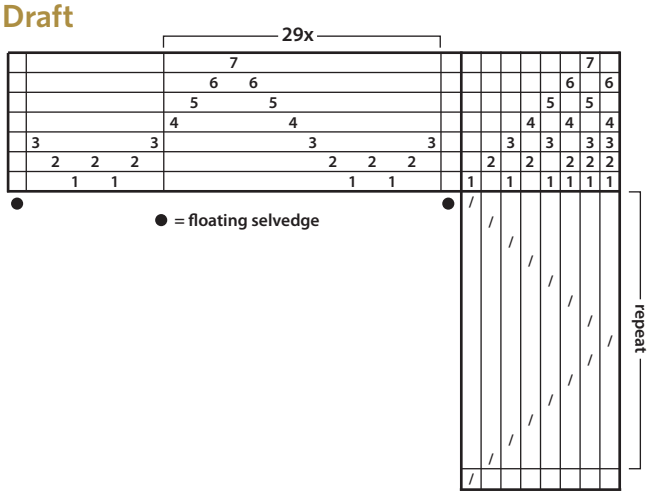
Assembly

Before cutting out the pieces, use paper templates pinned to the fabric to keep the fabric from shifting as you stitch the edges of each piece. To do this: For each mat, cut a paper rectangle 13½" by 11½", rule a stitching line ½" from each edge, and make rounded corners by tracing around a cup or bowl. For each coaster, trace a stitching line around a 5" bowl and cut the paper ½" larger all around this circle. Pin the templates to the waffle-weave fabric. For each piece: With the paper side up, stitch twice along the stitching line through both paper and fabric, trim the excess cloth beyond the edge of the paper, and pull away the paper (cut a narrow strip from any remaining selvedges to release weft threads). Ravel all threads up to the stitching line of each piece. Tease out interwoven threads and trim all fringes evenly.

Warp color order



Draft



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Serendipity waffle-weave towels

by Connie Westbrook

I seem to end up with lots of little bits of yarn after I have finished my projects. And on trips to my local yarn shop, I can't leave without one or two skeins or balls I just *have* to have. After a while, they all accumulate! I've found that "random" warps are an economical and serendipitous way to use many small amounts of yarn.

Designing a random warp

The idea is to wind a number of different threads (colors, sizes, fiber types) together on the warping board, keeping them separate with your fingers but placing them together in the cross. Spread the warp in a raddle and wind it on the beam with lease sticks placed in the grouped cross. To thread the shafts, just select the colors randomly from each group. A mixed cotton warp of 3/2, 5/2, and cotton flake is my favorite random warp "recipe," but you can use almost any combination of fiber color, size, and type, depending on the fabric's intended use and desired hand. Random warps look wonderful in plain weave; the result is always a surprise. Random warps can be even more effective with the varying float lengths of waffle weave.

Fabric description Waffle weave.

Finished dimensions

Four hemmed 4-shaft towels 16" by 22" each or four hemmed 8-shaft towels 15¾" by 20½" each.

Warp and weft

8/2 unmercerized cotton at 3,360 yd/lb.

Warp and weft for 4-shaft towels: 585 yd each of six colors, Beige, Dark Green, Ivory, Rust, Marine, Burgundy. Warp for 8-shaft towels: 480 yd each of four colors, Natural, Rust, Dark Green, Dusty Teal. Weft for 8-shaft towels: 1,590 yd Beige.

Total warp ends 480.

Warp length

4 yd (allows for take-up, shrinkage, and 27" loom waste). Add 30" to warp length for each additional towel.

E.P.I. 24.

Width in reed 20".

P.P.I. 24.

Take-up and shrinkage

20% in width, 12% in length for 4-shaft towels, 22% in width, 18% in length for 8-shaft towels.

Weaving

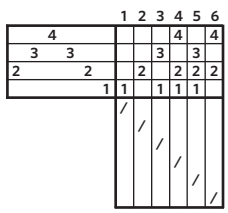
Wind a warp of 480 ends holding 6 ends (1 of each color) together for the 4-shaft towel, 4 for the 8-shaft towel; keep the threads separate with your fingers. Place lease sticks in the cross, spread the warp in a raddle, and beam. Thread the shafts, selecting colors randomly from each group and using the first and last warp threads as floating selvedges (the last repeat will not be a complete repeat).

Weave four towels each 27" long. For the 4-shaft towel, weave with six shuttles (start all from the same side) in the color order given under Warp and Weft. Separate towels with 2 picks in a contrasting color.

Finishing

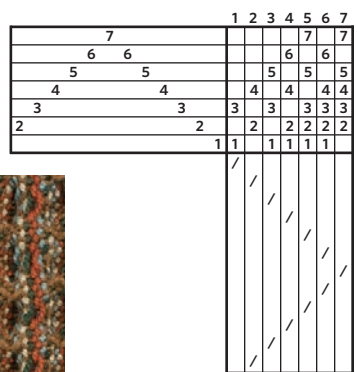
Remove the fabric from the loom; machine zigzag raw edges. Machine wash, warm; machine dry. Cut towels apart, turn hems under ⅜", turn again, and sew hems by hand or machine.

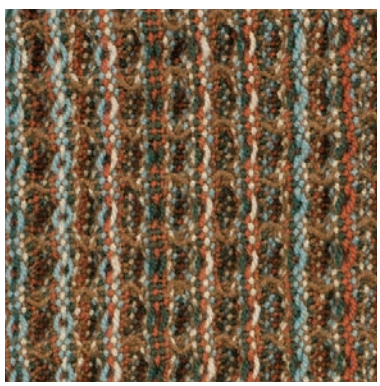
4-shaft waffle weave





8-shaft waffle weave





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Thirsty waffle-weave bath set *by Sharon Alderman*

Both sides of a waffle-weave cloth look the same, with squares outlined in the longer warp and weft floats that ensure its absorbency. Using waffle weave and an absorbent yarn such as unmercerized cotton results in a super-absorbent cloth. Waffle weave is the perfect weave structure for a thirsty, cushy, crinkly bath set. It's all in the finishing! Notice that washing makes the waffle cells smaller in smaller items (the cells in the washcloth are smaller than the cells in the bath towel).

Finishing observations

Wet finishing a waffle-weave cloth produces a dramatic change in dimension and texture. These cloths and cells can become anywhere from 25 to 40 percent smaller with washing. Much of that "loss" is not yarn shrinkage (it is instead a result of the waffle structure), because in use when the towel gets wet, it stretches out only to draw back up as it dries.



You can weave plain weave on this threading, but plain-weave hems will ruffle. If you use plain weave for the hems instead of the basketweave variation used here, weave deeper hems than these. Using a finer weft, such as 20/2 cotton, also minimizes ruffling.

Warp and weft amounts provide two washcloths, two hand towels, and two bath towels using three separate warps. (Cutting smaller pieces out of a large fabric makes securing the cut edges problematic, though it can be done.)

Fabric description

Waffle weave.

Finished dimensions

Two hemmed washcloths 10⅞" by 10¾" each, two hemmed hand towels 16" by 26½" each, and two hemmed bath towels 32" by 49⅛" each.

Warp and weft

6/2 unmercerized cotton (2,520 yd/lb, I Love Yarn, www.iloveyarn.com), bleached white. Washcloths: 1,025 yd; hand towels, 2,900 yd; bath towels, 8,900 yd. If 6/2 unmercerized cotton becomes unavailable, substitute 8/2 cotton and change the sett to 24 epi, adding to warp width as needed. Weft for hems: 20/2 pearl cotton (8,400 yd/lb), white, 330 yd total.

Total warp ends

Washcloths 341, hand towels 501, bath towels 871.

Warp length

Washcloths 2 yd (32" loom waste), hand towels 3⅓ yd (28" loom waste), bath towels 5½ yd (33" loom waste).

E.P.I.

20.

Width in reed

Washcloths 17¹⁄₁₀", hand towels 25¹⁄₁₀", bath towels 43⅗".

P.P.I.

20 (25 in 20/2 cotton basketweave hem sections).

Take-up and shrinkage

For the washcloths and hand towels, 37% in width, 35% in length; for the bath towels, 26% in width, 34% in length.

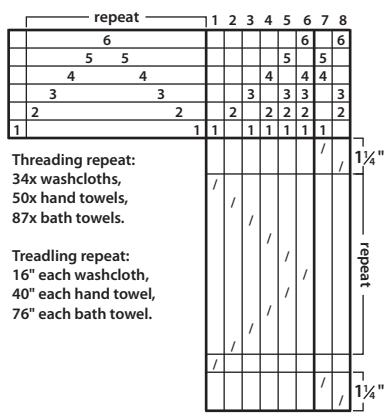
Weaving

Thread the loom following the Draft. Begin and end each piece with 1¼" in 20/2 cotton (treadles 7 vs 8) for hems. With 6/2 weft, weave 16" waffle weave for each washcloth, 40" for each hand towel, 76" for each bath towel. Separate pieces with 2 picks of a contrasting color.

Finishing

Cut the cloth from the loom and serge along contrasting-color picks (or zigzag and cut pieces apart). Turn raw edges under twice and machine stitch close to fold. Machine wash, regular cycle, hot water, and machine dry, regular.

Draft



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A family blanket *by Terry Collard*

Let's say everyone in your house has gone away for the weekend and you get to do anything you want: no food to fix, no chauffeuring to do, no games to supervise, no sleepovers to chaperone. You're Home Alone!

How about diving into a pool of yarn and color and surfacing two days later with a finished blanket? This blanket would also make a great project for a weekend workshop; its beautiful colors and the magical texture of waffle weave will keep everyone mesmerized at the loom until the last pick brings the joy of a big, glorious, tangible reward.

Waffle weave

Waffle weave is especially thrilling to weavers because without any special effort on our part, the fabric takes on dimension before our very eyes. Its name is perfect—when the fabric is removed from the washing machine, something as unlikely as yarn has turned into the deep cells of a Belgian waffle. The waffle-weave draft used for this blanket requires seven shafts, although a similar blanket can be woven on four. The difference between the two versions is only that seven shafts produce bigger and deeper waffle-weave cells.

Fabric description

Waffle weave.

Finished dimensions

One blanket 32" by 62" plus 3½" fringe at each end.

Warp and weft

2-ply Harrisville Shetland wool at 1,800 yd/lb, 495 yd each of Peacock, Plum, Poppy, Iris, and Topaz.

Total warp ends

480.

Warp length

3 yd (allows for take-up, shrinkage, and loom waste; loom waste includes fringe).

E.P.I. 12 Width in reed 40". P.P.I. 12

Take-up and shrinkage

20% in width, 18% in length.

Warping and weaving

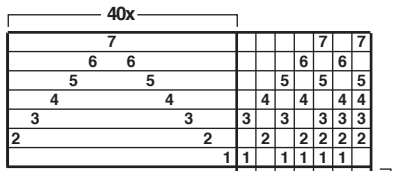
Wind a warp of 480 ends following the selected color order. Thread following the selected draft, beaming the warp under firm tension, packing carefully with paper or sticks. Unthread the last warp end on each side to use as a floating selvedge and weight. Weave a header to space the warp. Insert separators (1" wide cardboard strips) to allow 6" for fringe.

Begin and end the blanket with a few picks of scrap yarn. Weave the blanket following the same color order in the weft as in the warp. There are 840 picks in the blanket! Estimate the time it will take you to weave the blanket by timing your first 24 picks or so. Tuck weft tails around the floating selvedge and back into the shed 2–3" leaving about 1" extending from the cloth to trim after washing. Alternate sides as you begin each color.

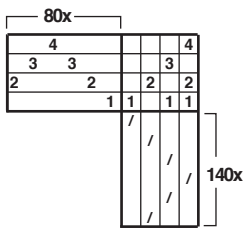
Finishing

Allowing 6" for fringe, remove the fabric from the loom. Prepare a twisted fringe with two groups of 6 ends in each fringe removing scrap yarn as you go. Fill the washing machine with barely warm water and a small amount of liquid Dawn. Immerse the blanket and let soak 15 minutes. Do not agitate, skip to rinse cycle, rinse, and spin dry. Trim fringe and weft tails evenly.

7-shaft draft



4-shaft draft



Warp and weft color orders

7-shaft threading

8x

96	12	Topaz
96	12	Iris
96	12	Poppy
96	12	Plum
96	12	Peacock
480		

4-shaft threading

16x

96	6	Topaz
96	6	Iris
96	6	Poppy
96	6	Plum
96	6	Peacock
480		

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Waffle-weave pullover *by Betty Linn Davenport*

This pick-up technique for waffle weave on a rigid-heddle loom is easy and fun to do. Waffle weave provides a decorative accent in the sleeves and yoke of this warm wool pullover. Although the project appeared in *Handwoven* thirty-five years ago (in the very first issue), it has timeless appeal as a comfortable winter garment and shows off the versatility of the rigid-heddle loom.

Fabric description

Waffle-weave variation, supplementary weft patterning, and plain weave on a rigid-heddle loom.

Finished dimensions

Fabric 16⅔" by 108" for a medium- to large-size top, measuring about 24" from shoulder to hem with a circumference of about 44" (the circumference can be adjusted to fit).

Warp and weft

Warp: Harrisville Shetland at 1,800 yd/lb, 700 yd Rust.
Weft: Harrisville Shetland, 285 yd Rust, 330 yd Teak, and 50 yd Black. Allow 10 yd Rust for finishing neckhole.

Notions and other equipment

4 shuttles and 2 flat pick-up sticks 2" wide and 20" long each (Pattern Stick A and Pattern Stick B).

Total warp ends 175.

Warp length

4 yd (allows for take-up, shrinkage, and 24" loom waste).

E.P.I. 10. Width in reed 17½".

P.P.I. 10 (20 in black band; 10 tabby, 10 pattern).

Take-up and shrinkage 10% in width and length.

Preparing to weave

Thread a rigid-heddle loom so that the first thread on the right is in a slot. Weave a ½" plain-weave heading in scrap yarn.

Weaving the lower front, back, and side pieces

With Teak, weave 19" plain weave; end with an up shed (a pick made with the heddle up). To weave the black band: Place the heddle in the down position (all slot threads up). In the area behind the heddle using a pick-up stick (Pattern Stick A) and working with only the raised slot threads, pick up 1 slot thread, go over the next, pick up 1, go over the next (i.e., 1 up, 1 down) all the way across the warp. Slide Pattern Stick A to the back beam when it is not in use.

Step 1 With the heddle in the middle (neutral) position, slide Pattern Stick A forward to just behind the heddle and turn it on edge. Weave with the Black yarn through the shed in front of the heddle.

Step 2 Move Pattern Stick A to the back. Put the heddle in the down position and weave with Teak.

Step 3 Repeat Step 1 with Black.

Step 4 Move Pattern Stick A to the back. Put the heddle in the up position and weave with Teak.

Repeat these four Steps for 3" to complete the black band. Weave 1 pick of a contrasting yarn to mark a cutting line.

Repeat the 19" and black band for the lower back piece just as for the front.

Repeat the 19" and black band again for two narrow (8¾" wide each) lower side pieces using 1 shuttle with Teak on each side for the plain-weave section and 2 shuttles on each side (1 Black, 1 Teak) for the black band (the slit down the center of the warp divides the two side pieces). Remove Pattern Stick A.

Weaving the yoke and sleeves (waffle weave)

With Pattern Stick A and the heddle down, pick 3 slot threads up and then repeat 2 down, 2 up all the way across the warp; end with the last 3 up. Slide Pattern Stick A to the back. With Pattern Stick B and the same slot threads, pick 1 down, 2 up and then repeat 2 down, 2 up all the way across the warp; end with 1 down. (The only difference between the pick-up on the two sticks is the outer slot thread on each side is up for Pattern Stick A, down for Pattern Stick B.)

The yoke is woven with Rust throughout. Begin by weaving ½" plain weave (both pattern sticks at the back). Then, using the Rust weft:

Step 1 With the heddle in neutral, bring Pattern Stick A forward and turn on edge. Weave 1 pick.

Step 2 Move Pattern Stick A to the back. Weave 1 pick with heddle up.

Step 3 Repeat Step 1.

Step 4 Move Pattern Stick A to the back. Weave 1 pick with heddle up.

Step 5 Weave 1 pick with heddle down.

Step 6 With the heddle up, slide Pattern Stick B forward to the heddle but leave it flat. Weave 1 pick.

Step 7 With Pattern Stick B still forward, weave 1 pick with the heddle down.

Step 8 Move Pattern Stick B to the back. Weave 1 pick with the heddle up.

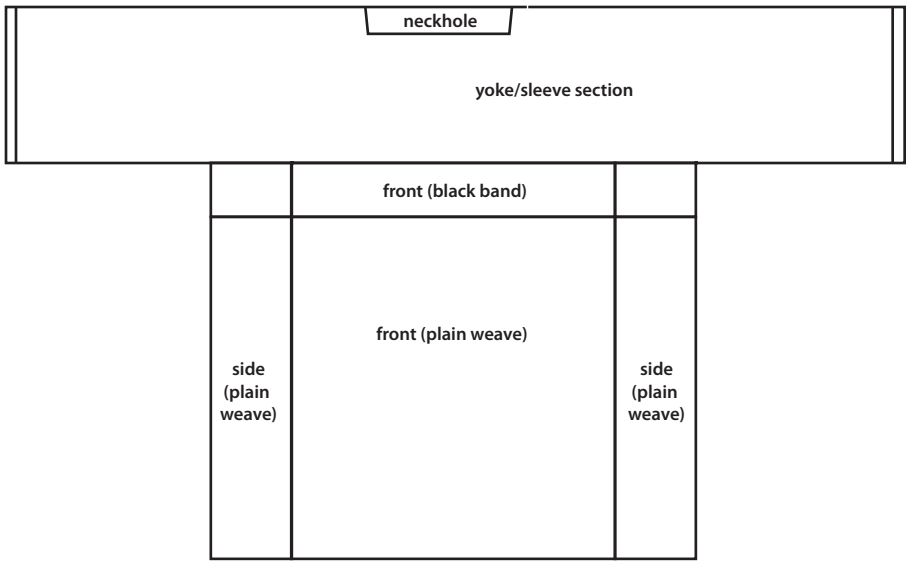
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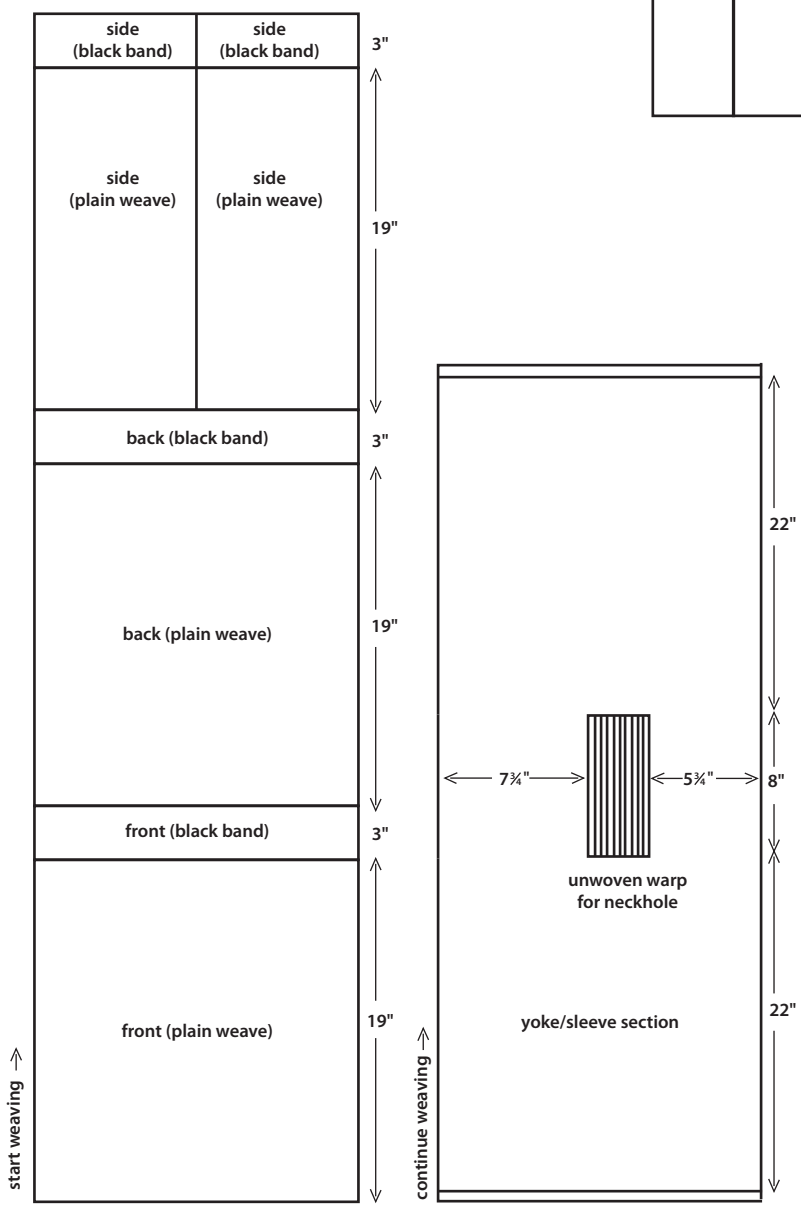
Originally published in *Handwoven*®, Fall/Winter 1979, pp. 21, 55.

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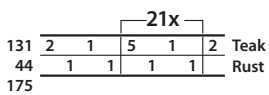
Assembling the pullover



Weaving the fabric



Warp color order



Note

The instructions in this article called for a single color in the warp and the waffle-weave weft (Rust) as did the instructions in the original article. However, the pullover was actually woven using two colors in the warp and two colors in the waffle-weave weft. To do this, wind the warp as shown in the Warp Color Order above. When you thread the heddle, all Rust warp threads should be slot threads. When you weave the waffle-weave section (yoke and sleeves), use Rust for Steps 1 and 3, Teak for the other Steps. For this, plan warp and weft colors as below.

Warp and weft yarns

Warp: Harrisville Shetland at 1,800 yd/lb, 524 yd Teak, 176 yd Rust

Weft: Harrisville Shetland, 105 yd Rust, 510 yd Teak, 50 yd Black. Allow 10 yd Rust for finishing neckhole.

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The three fabrics: plain weave, the black band, and the waffle-weave variation.







Follow Steps 1 to 8 for 22". To form the neckhole: Wind a 2nd shuttle with Rust. For 8", weave following the same steps but with 2 shuttles, 1 shuttle on each side of the warp so a section 5¾" wide is formed on one side of the warp and 7¾" on the other side with 4" of unwoven warp threads in the center for the neckhole. Bind off the weft from one of the shuttles and weave 22" with a single shuttle as before; end with ½" plain weave (the entire sleeve/yoke section is about 53" long).

Finishing

Remove the fabric from the loom. Machine zigzag raw edges and on on both sides of each place the fabric will be cut (between sleeve/yoke and side-piece sections and on both sides of the cutting-line at the end of each black band). Cut and needle-weave the unwoven warp ends back into the cloth around the neckhole. Using some of the warp yarn, reinforce the neckhole with a blanket stitch around the edge. A crocheted edge would also work well.

Wash the fabric gently by hand in warm water, mild liquid soap. Rinse well; squeeze out water. Roll in a large bath towel to blot out any remaining water. Lay out on a flat surface and smooth out wrinkles. When almost dry, press the plain-weave areas using a damp cloth and a steam iron. It is important to do this before the fabric is completely dry to remove wrinkles. Do not press the yoke/sleeve piece or the waffle texture will be flattened.

Assembly

To assemble: Cut pieces apart. Machine stitch the side pieces to the lower front and and lower back (for four side seams). Garment circumference can be adjusted by the depth of these seams. Fold the yoke/sleeve section in half lengthwise and place its selvedge edges over the black band around the top of the pullover body and machine stitch to join. Sew underarm sleeve seams (abut selvedges and join by hand with a figure-eight stitch). Turn up a 3–4" hem in each sleeve (so that the sleeves can be turned up as a cuff) or choose a different hem treatment. Turn up a 1½" hem around the bottom of the pullover and sew by hand.

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Waffle-weave table runner

by Kati Reeder Meek

This runner would not exist if I hadn't been challenged to figure out how an ancient linen cloth with checkered "cells" mentioned in the Old Testament might have been woven. It was a bit of a jump from a warp-weighted loom to a rigid-heddle loom with a pick-up stick (and it involved the help of a book on 3-shaft weaves; see Resources), but the result was very rewarding. I found myself drawn away from my twenty-four shafts to succumb to the charms of the surprisingly easy-to-use rigid-heddle loom.

3/2 pearl cotton is the basic yarn used in this runner. Two strands of cottolin are threaded with each 3/2 thread that outlines the waffle cells (every fourth working thread in both warp and weft) to add texture and absorbency.

Fabric description Waffle-weave variation.

Finished dimensions 9½" by 48" plus 1" fringe at each end.

Warp and weft

3/2 pearl cotton at 1,260 yd/lb, 585 yd natural, 47 yd blue; 22/2 cottolin (60% cotton/40% linen) at 3,200 yd/lb), 325 yd natural, 26 yd blue.

Other supplies or equipment

1 pick-up stick (for rigid-heddle loom only), 2–4 shuttles.

Total warp ends 151 working ends (225 total ends).

Warp length

Rigid heddle loom: 2 yd (allows for take-up, shrinkage, and 18" loom waste). Shaft loom: 2½ yd (allows for take-up, shrinkage, and 32" loom waste).

E.P.I. 12. **Width in reed** 12⁷⁄₁₂". **P.P.I.** 12.

Take-up and shrinkage 25% in width, 14% in length.

Weaving

Wind the warp following the Warp Color Order. Thread the rigid heddle starting and ending with a hole (the 3 cottolin/pearl cotton ends are in every other slot) or thread following the 3-Shaft Draft.

To weave on the rigid-heddle loom: With the heddle in the down position (slot threads up) and working behind the heddle, slip the pick-up stick (I used a large stick shuttle and tied a cord end to end to secure it) under all the cottolin/cotton slot threads (every other slot thread). Slide the stick to the back of the loom.

Wind a stick shuttle with 1 strand natural 3/2 and a second shuttle with 2 strands natural cottolin. For the accent stripes, wind 1 strand blue 3/2 and 2 strands blue cottolin into butterflies or onto 2 other shuttles. With the heddle down, weave 1 pick with 3/2 natural cotton, leaving a tail four times the width of the warp. With heddle up, weave 1 pick with 3/2 and then weave the runner repeating the 6-pick Waffle-Weave Sequence following the Weft Color Order. Using the weft tail, hemstitch over the first 3 rows including 4 ends in each stitch; repeat hemstitching at end. To weave the runner on three shafts, follow the treading in the 3-Shaft Draft and the Weft Color Order.

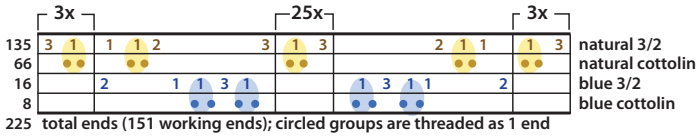
Finishing

Remove the fabric from the loom and trim fringe to 1". Machine wash, warm water with a bit of plain shampoo. Rinse twice, spin out excess water, tumble in the dryer briefly, and line dry.

Resources

de Ruiter, Erica. *Weaving on 3 Shafts*. Nijmegen, the Netherlands: Erica de Ruiter, 2002, p. 28.

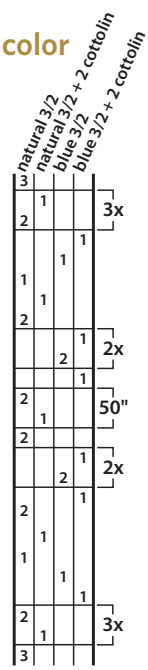
Warp color order



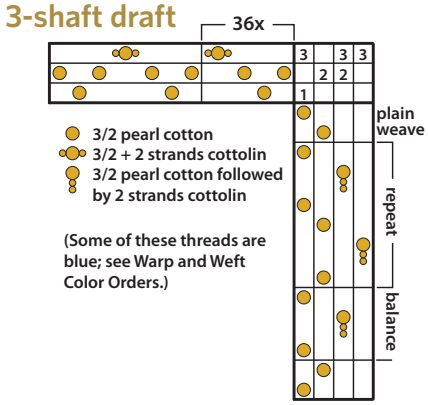
Rigid-heddle waffle-weave sequence

1. Heddle down: Weave with 3/2 cotton.
2. Heddle up: Slide pattern stick forward to just behind the heddle, leaving it flat. Weave with 3/2 cotton, then with doubled cottolin. Press in both picks firmly with edge of stick shuttle. Push the pattern stick to the back of the loom.
3. Heddle down: Press preceding picks again. Weave with 3/2 cotton; press.
4. Heddle up: Weave with 3/2 cotton.
5. Heddle in neutral: Bring pattern stick forward and turn on edge behind the heddle. Weave with 3/2 cotton and cottolin as in Step 2. Push stick to back.
6. Heddle up: Press in preceding picks firmly and weave with 3/2 cotton.

Weft color order



3-shaft draft



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Waffle-weave table linens *by Hector Jaeger*

This matched set of eight placemats, eight napkins, and a table runner are all woven on the same warp. The colors combine neutrals with warm peachy tones. The photo on page 22 shows the runner (on top), woven using the eight warp colors in weft stripes, and one placemat (underneath the runner), woven with Tangerine weft. Amounts given in these instructions are for enough yarn to weave the runner as shown and each coordinating placemat and napkin pair using a different one of the eight warp colors as weft.

Fabric description
Waffle weave and plain weave.

Finished dimensions
One hemmed runner 13½" by 27", eight hemmed placemats 13½" by 18" each, and eight hemmed napkins 14½" by 14½" each.

Warp and weft
16/2 linen (Newport Linen by Halcyon Yarn) at 2,400 yd/lb, 940 yd Coffee #104, 920 yd Natural #102, 900 yd each Off White #212 and Camel #113, and 630 yd each Tangerine #115, Dusty Rose #206, Watermelon #117, and Raspberry #119. 16/2 linen is available in 1 lb cones (2,400 yd) or 300 yd minicones.

Notions
Matching sewing thread.

Total warp ends
290.

Warp length
10½ yd (allows for take-up, shrinkage, and 27" loom waste).

E.P.I.
18 (2-1 in a 12-dent reed or 3/dent in a 6-dent reed).

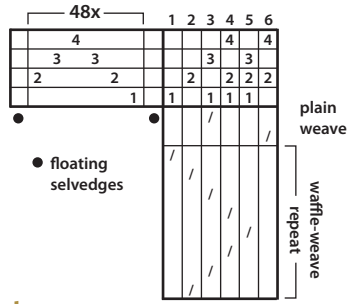
Width in reed
16⅛".

P.P.I.
18.

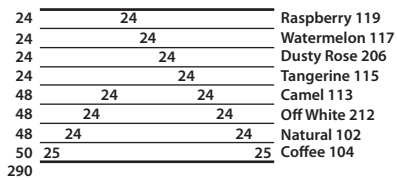
Take-up and shrinkage
15% for waffle-weave placemats and runner, 10% for plain-weave napkins.

Weaving
For waffle-weave sections, follow the treadling repeat in the Draft. For hems and plain-weave sections, alternate treadles 3 and 6 following the Weft Color Order for the runner. Weave each placemat and napkin pair using a different one of the eight warp colors. Begin and end the runner and placemats with 1" of plain weave for hems in the color used

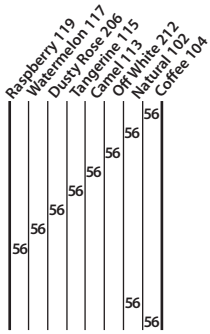
Draft



Warp color order



Weft color order for the runner



adjacent section of waffle weave. Weave the waffe-weave section of each placemat for 20". For variety, you can weave border stripes of plain weave in the waffle weave (remember that plain weave will tend to spread wider than waffle weave). Weave each napkin in plain weave for 17" using a different one of the eight warp colors. I added a band of waffle weave in different widths to the napkins for decorative borders. I kept a spray bottle of water handy to moisten the warp as I wove. Damp linen handles more easily and allows the weft to beat in more closely than dry linen. Separate the pieces with 2 picks in a contrasting-color weft to mark cutting lines.

Finishing
Remove the fabric from the loom. Machine wash the length of fabric for 5 min and machine dry; remove from the dryer while still damp. Press with a steam iron on a linen setting, adding moisture as necessary.

Machine staystitch on each side of cutting lines. Cut pieces apart. Fold hem sections under ½" two times and sew hems by hand.

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Wool waffle-weave throw *by Hector Jaeger*

Waffle weave is an ideal weave structure for warm throws in wool. The yarns that were used for this one are not available anymore, but Halcyon Yarn recommends Botanica, which comes in a wide range of luscious colors and fulls beautifully to create deep, insulating waffle cells. Use the color order suggested here (following the color arrangement in the original blanket), or choose your own.

Fabric description
Waffle weave.

Finished dimensions
One throw 36" by 66" with 7" twisted fringe on each end.

Warp and weft
2-ply wool at 640 yd/lb (Botanica, Halcyon Yarn), 775 yd natural #004; 165 yd each gold #041, sage #300, jade #037, sky blue #015, cobalt #016, and violet #017; 75 yd each garnet #021, light red #023, and melon #005.

Total warp ends
362 (includes 2 floating selvedges).

Warp length
3 yd (allows for take-up, shrinkage, and 27" loom waste; loom waste is used for fringe).

E.P.I.
8.

Width in reed
45¼".

P.P.I.
8.

Take-up and shrinkage
20% in width and length.

Warping and weaving
Wind a warp of 362 ends following the Warp Color Order. Thread the shafts following the Draft. Allowing 9" for fringe including the amount used to tie on, weave the blanket following the treadling in the Draft using the Weft Color Order.

Numbers in the color order indicate the number of times to weave the 8-pick repeat. Measure carefully as you go to be sure that your picks per inch equal ends per inch (8, measured under tension).

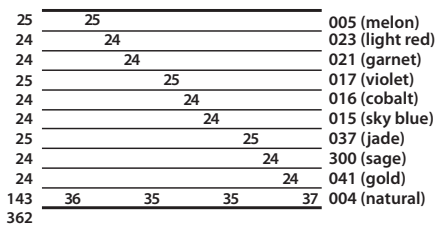
It is a good idea to check to be sure that this number creates square waffle cells. To do this, relax warp tension after a few inches or so and leave the loom this way overnight. Check in the morning to see that the cells are square and adjust as necessary if you need to weave slightly fewer or slightly more picks per inch. Warp tension can vary from weaver to weaver and loom to loom, and the goal is to achieve square cells.

You will be beginning and ending weft threads often. To keep the joins from showing, pull one of the plies from the tails of the new and old yarns, overlap the remaining plies, and twist them a bit together as you place them in the shed.

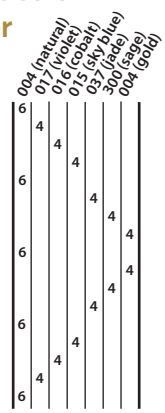
Finishing
Remove the fabric from the loom, again allowing 9" for fringe. Work a twisted fringe including 8 ends in each fringe (two groups of 4 ends). Secure with an overhand knot. If you like the look, you can finish the selvedges with a row of single crochet or by slipstitching.

Machine wash, warm water, gentle, allowing agitation for only about 2 min. Then rinse, spin out water, and air dry.

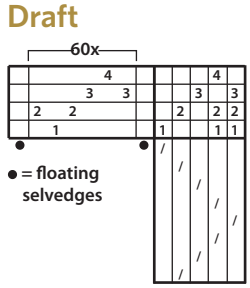
Warp color order



Weft color order



Draft



Numbers in the weft color order = the number of times to do the 8-pick repeat (6 = 6 x 8 or 48 picks).



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Originally published in ***Handwoven***®, November/December 1985, p 54; Instruction Supplement, pp. 13–14; also in *Top Ten Blankets and Throws on Four Shafts* (eBook), pp. 7–8.

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Chenille evening jacket *by Teresa Kennard*

Cherry-red rayon chenille teams up with waffle weave in this classic tailored jacket. The waffle-weave draft provides enough plain weave to secure the chenille floats. The structure, therefore, is unusual in the way it shows off a chenille yarn; structures with floats are usually avoided with slippery chenille. Because washing would change the fabric significantly, this garment is designed to be dry cleaned only. Since there is no shrinkage, the yarn is sett slightly denser than if the cloth were to be washed. The jacket is accented with a satin cord edging and lined with matching silk. Note that a dot of white weft peeks through the center of the waffle cells.

Fabric description
Waffle weave.

Finished dimensions
Fabric 23" by 111", enough for a medium size jacket (chest circumference 41", length from shoulder 22", sleeve length from center back 33"). Check your pattern package to determine finished fabric width and length allowing for take-up of 12% in width, 10% in length.

Warp and weft
Rayon chenille at 1,400 yd/lb, 3,420 yd red. 3/2 pearl cotton at 1,260 yd/lb, 315 yd white (used in the weft only).

Notions and other supplies
Jacket pattern (Simplicity 8760 was used for this jacket), 2 yd red silk lining, 4 yd white satin rope, any other notions required by pattern, matching sewing thread.

Total warp ends
417 (includes 2 floating selvedges).

Warp length
4¼ yd (allows for take-up, shrinkage, and 27" loom waste).

E.P.I.
16.

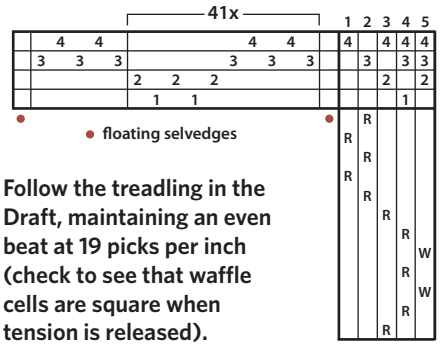
Width in reed
26$\frac{1}{12}$".

P.P.I.
19.

Take-up
12% in width, 10% in length.

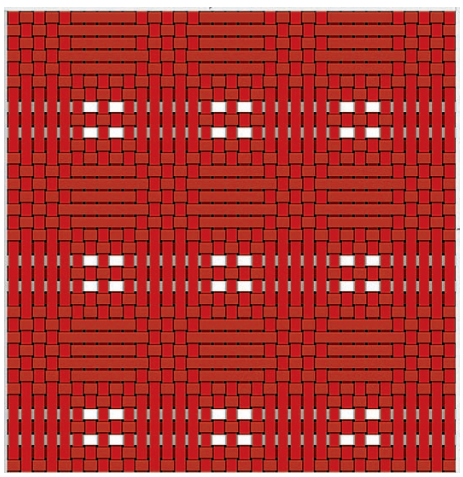
Weaving
Weave the fabric for 125" following the treadling in the Draft maintaining an even beat of 19 ppi (note that more picks per inch are needed than ends per inch in order to square the waffle cells).

Draft



Follow the treadling in the Draft, maintaining an even beat at 19 picks per inch (check to see that waffle cells are square when tension is released).

Waffle-weave interlacement



Finishing
Staystitch the ends of the fabric. Place fabric wrong side up on a thick bath towel, cover with a damp cloth, and hold the iron just above the cloth with lots of steam. Do not allow the iron to rest directly on the cloth.

Assembly
Lay out pattern pieces using a napped layout. (Napped fabrics have texture, pile, or are shiny. Colors can look different when viewed at from different directions, so lay out the tops of all pattern pieces facing in the same direction.) Cut out and staystitch all pieces. Follow pattern directions for a lined jacket, stitching the white cording (if desired) around sleeve, neck, and front edges before attaching facings or lining.

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Warm waffle-weave jacket *by Becky Menlove*

In deep winter, the fragile colors of spring are in my mind. They inspired the fabric for this jacket—icy gray and palest sage green, along with blue and a spark of bright magenta. In my climate, this medium-weight jacket can be worn in all but the warmest months of summer.

The pattern I used is no longer available and no really in style, so choose a jacket pattern and consult the package to plan finished fabric width and length. Although I dyed the weft yarns, commercially dyed yarns will work as well. Study the drawdown on page 29 to see where the different colors fall in the waffle cell and choose your own. Note that the single strands of magenta weft fall in the centers of the cells.

This 4-shaft waffle draft is especially suitable for clothing, producing waffle cells that give a wonderful texture but are shallow enough to allow smooth seams and tailored lines.

Fabric description

Waffle weave and plain weave.

Finished dimensions

Finished waffle-weave fabric 31" by 144" and finished plain-weave fabric 33" by 45" for a women's size 14 jacket.

Warp and weft

18/2 JaggerSpun Zephyr wool/silk (50% wool, 50% silk) at 5,040 yd/lb, 3,012 yd Pewter and 3,012 yd Sage (both are used doubled in the warp). Harrisville Shetland wool at 1,800 yd/lb, white if you are dyeing the yarn or choose a blue (Bermuda Blue), green (Seagreen), or violet (Periwinkle), 3,260 total yd (or 1,100 yd per color if you mix three colors randomly); 375 yd 3/2 pearl cotton (UKI, Magenta #30) or 5/2 silk (Halcyon Yarn, color #114) or use Harrisville Shetland Magenta.

Notions and other supplies

Dyepot, syringe, and stirring stick for dyeing if you dye the Harrisville); jacket pattern (I used McCall's #5090 Four Hour Jacket); 1⅛ yd medium-weight, woven fusible interfacing (or amount required to fuse to your pattern pieces); lining fabric (optional); button and/or other materials listed in selected pattern. Dyes: PRO Washfast from PRO Chemical Company, blue #440, blue #490, green #725, green #728, magenta #349, Synthrapol.

Total warp ends

432 (216 Harrisville Shetland, 108 doubled strands of Pewter, 108 doubled strands of Sage; 216 actual ends each of Pewter and Sage).

Warp length

7 yd (allows for take-up, shrinkage, and 27" loom waste).

E.P.I.

12 working ends (note that each Sage and Pewter working end is a doubled strand).

Width in reed

36".

P.P.I.

12 (plain weave), 15 (waffle weave).

Take-up and shrinkage

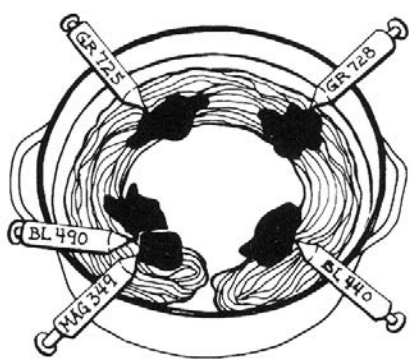
9% in width and length for plain weave, 14% in width and length for waffle weave.

Dyeing the yarn

Follow all safety precautions included with dyes (wear a disposable dust/mist respirator and rubber gloves). Mix dyes following dye-package instructions in a 1.5% stock solution. Make yarn skeins about 2 yd across, using all the yarn in a ½ lb cone for each skein (some of the yarn on the last cone will be left over). Wet the skeins in a warm water bath to which is added 1 Tbsp of Synthrapol.

Dye the skeins one at a time to allow thorough dye penetration. Fill the dyepot with just enough water to barely cover the yarn and mix in 3 Tbsp vinegar (I used an enamel canning kettle). To dye, place each skein in the dyepot, folded in half and arranged so that it encircles the pot as shown. When water is almost boiling, apply the colors directly with a syringe using about 30 cc stock solution of each color in a regular pattern on the coiled yarn. Add only 20 cc magenta on top of the blue #490 to create a small violet area. I found that if I used a stiring stick, I could urge the dye to migrate a little to blend with its adjacent color. Don't stir too vigorously or the colors will mix too much. Keep the temperature just below the boiling point for 30 min. Then rinse the skeins in hot water. When all are dyed, do a final wash with Synthrapol and warm water. To speed up drying, spin out using a washing-machine spin cycle. Dye the magenta yarn with the magenta dye.

Using syringes in the dyepot



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Weaving

Weave 47" plain weave with the dyed yarn (or commercial color of Harrisville Shetland). Following the treadling and color order in the Draft, weave the rest of the warp in waffle weave (about 170"); beat firmly to square waffle cells. Note that Pewter and Sage are used doubled in the weft.

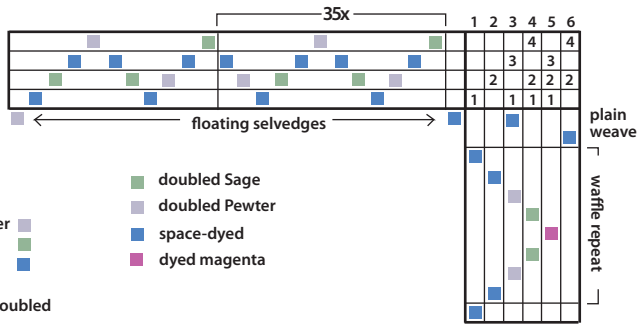
Finishing

Machine stitch the ends of the fabric and repair any errors. Machine wash, warm water, gentle cycle, mild dishwashing detergetnt. Agitate for 4 min. Rinse without agitation and hang to dry. Stem press very lightly.

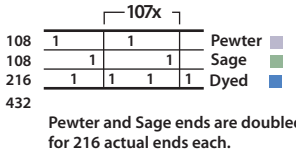
Assembly

Follow pattern directions for sewing and assembly and the directions with fusible interfacing to interface pattern pieces. The layout shown here is the one I used and can help your placement of pattern pieces. To sew the waffle-weave fabric, use light pressure on the presser foot and lower the feed dogs a notch. When you join handwoven fabric to lining, sew with the lining on top and the feed dogs in their regular position. I recommend pad-stitching at the lapel for control of the roll line. Use the plain-weave fabric for covered buttons, if desired.

Draft



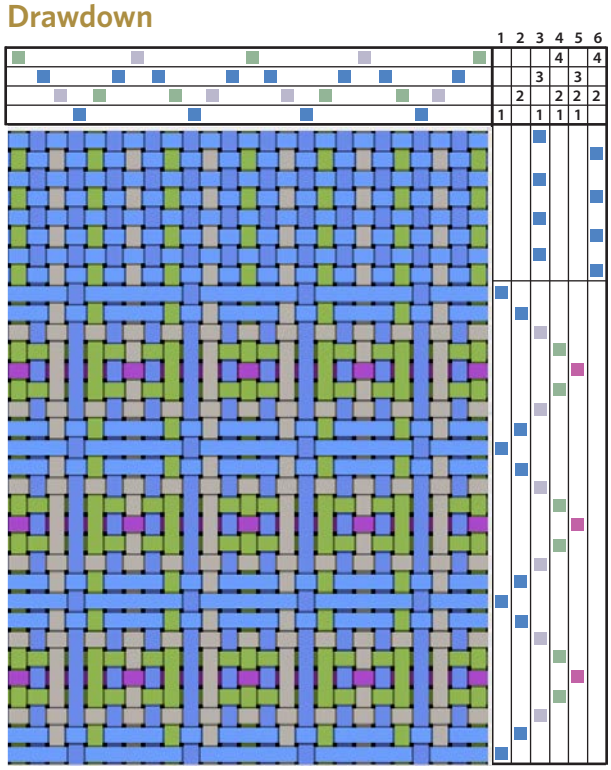
Warp color order



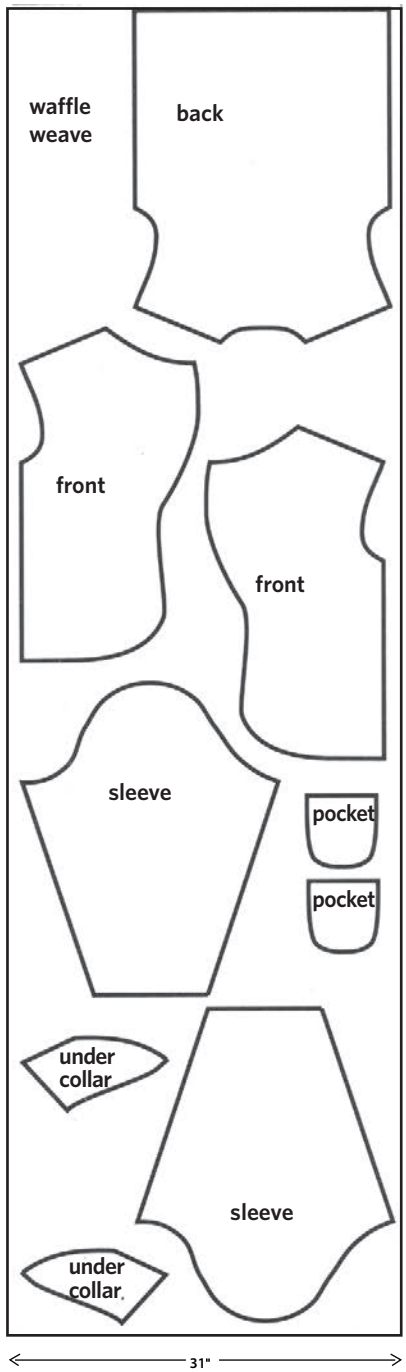
Pewter and Sage ends are doubled for 216 actual ends each.

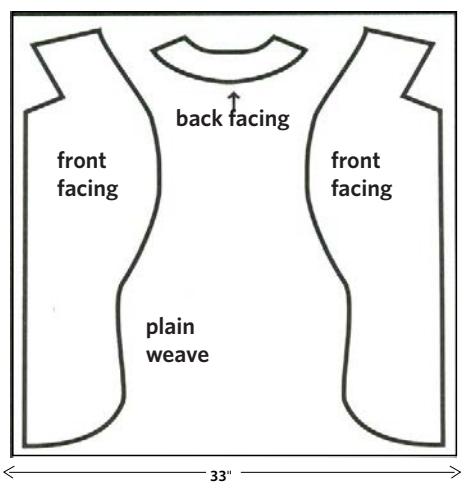
doubled Sage
doubled Pewter
space-dyed
dyed magenta

Drawdown



Pattern layout





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Waffle-weave handbook *by Kathryn Wertenberger*

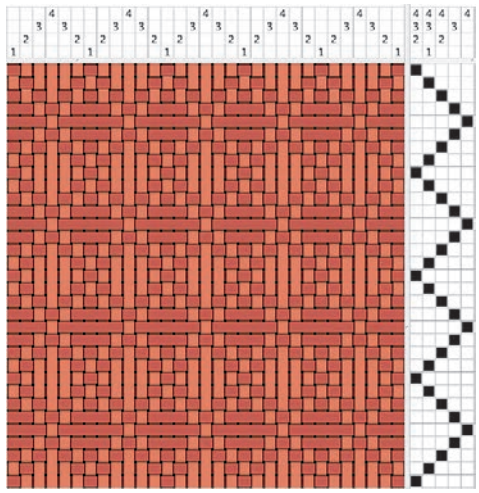
The weave structure we call "waffle weave" in contemporary handweaving literature is called "honeycomb" in most industry publications as well as in British handweaving texts. I have not been able to trace where and how our use of "waffle" as a name for this structure evolved. One theory is that the term "honeycomb" was already in use in our vocabulary to identify a structure woven on a block threading (usually overshot) that produces round cells outlined with a thick weft. Most honeycomb drafts are derived from the threadings for colonial coverlets or similar Scandinavian textiles. Edward Worst included colonial honeycomb drafts of this kind in his 1918 book, *Foot-Power Loom Weaving*. In that same book, he includes a draft for waffle weave, but it is not named.

Whatever it is called, this weave is a simple structure with a great many possible variations. The basic threading is a point on four or more shafts. The tie-up produces long warp and weft floats that frame a plain-weave center. One or more lines of diagonal interlacing ("single" or "double" stitching) join the plain-weave sections that form the depressions in the waffle cells. (Note that two rows of plain weave outline the diamonds in Draft 4b, only one row in 4a.) When there are two rows, the diamonds are "double-stitched." The more of these interlacements, the firmer the fabric. The longer the floats, the deeper the waffle cells.

When you use the same point order in the treadling as in the threading, the weft floats (the top and bottom of the cell's frame) are not always same length as the warp floats (the sides of the frame). Additional treadles/picks are often added (especially with 4-shaft drafts) to make the floats the same length in both directions; see Drafts 1a and 1b. With drafts like these, to "square" the pattern in the actual fabric (i.e., weave waffle cells that are the same height as width), adjustments to warp sett or yarn sizes can be made. (Note that for the 5-shaft waffle in Draft 2b, the number of weft threads in each repeat is greater than the number of warp threads; for the double-stitched 5-shaft waffle in Draft 2c, weft floats span 5 threads, warp floats span)

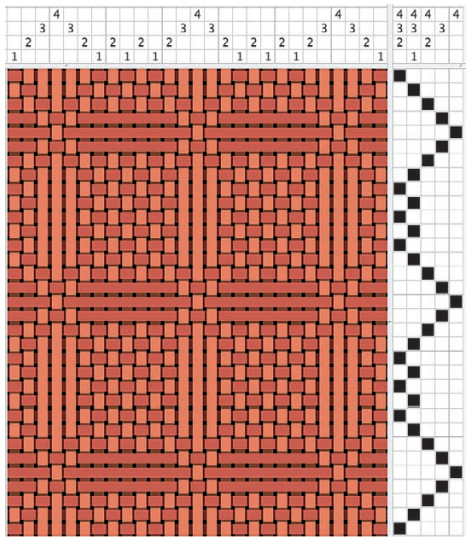
Compare Drafts 2a–2c. They show three possible tie-ups for a 5-shaft point threading. Next, compare the tie-ups in Drafts 4 a–c. If you have an 8-shaft loom, thread a basic point and play with designing tie-ups to produce many different waffle effects on one warp. Weave each sample long enough to be able to assess fabric hand and determine yarn take-up and shrinkage.

Draft 1a



4-shaft waffle, 5-thread floats in both warp and weft.

Draft 1b



4-shaft waffle, 9-thread floats in both warp and weft.

Sett considerations

The warp needs to be sett very closely for deep waffles—the longer the floats, the closer the sett. Expect a lot of warp take-up and weft draw-in. Tie-ups with more frequent interlacements of warp and weft will draw in less than those with fewer interlacements (and create shallower waffles).

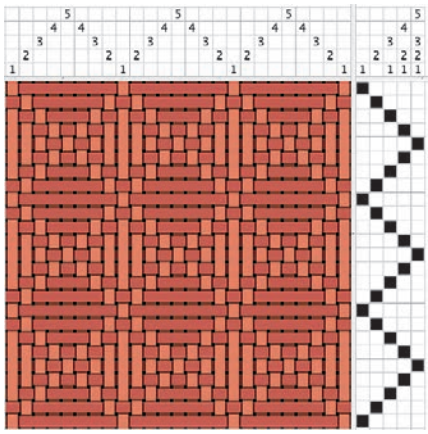
Color considerations

Color plays an important role in waffle designs. If you want the emphasis on the structure itself, plan to use a single, solid color in a light to medium value. (Very dark yarns will not show the shadows in the centers of the cells.) Contrasting yarns can emphasize parts of the waffle cell.

Originally published in ***Handwoven***®, September/October 1987, pp. 83–84.

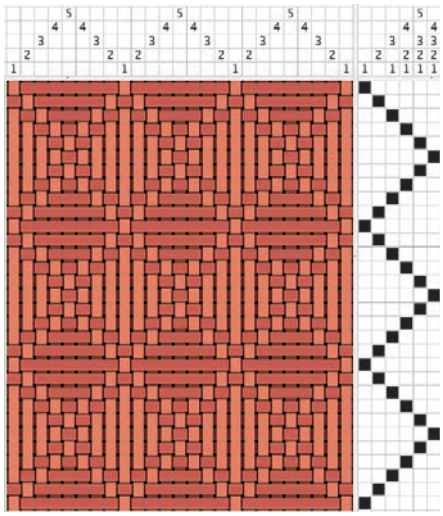
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Draft 2a



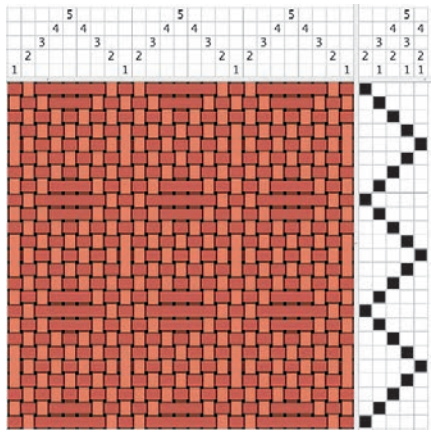
5-shaft waffle, 5-thread floats in the warp, 7-thread floats in the weft.

Draft 2b



5-shaft waffle, 7-thread floats in both warp and weft.

Draft 2c



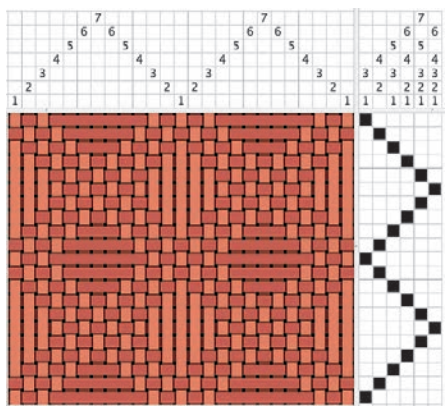
5-shaft waffle, 3-thread floats in the warp, 5-thread floats in the weft.

An interesting color arrangement is to assign a different color or value to each shaft in the draft (working from light to dark or warm to cool). Placing the lightest colors on the shafts that produce the frames (the longest floats) and the darkest colors on the shafts that weave the plain-weave sections in both warp and weft will add the perception of depth to the cells. Variegated yarns can also be very effective in waffle structures.

Yarn considerations

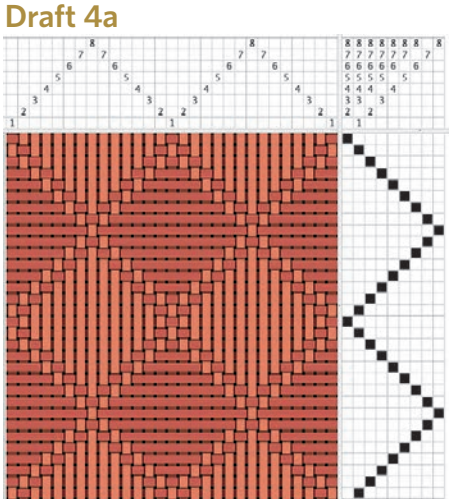
A variety of yarns can be used for waffle weave, including novelties. Plied yarns are a better choice than singles, since they make the long floats more durable. Because of excessive draw-in, plain-weave hems are not usually practical with waffleweave, which means that fringe is the usual option as an end finish. In this case, warp yarns must be suitable for fringe. Basketweave and/or using finer weft yarns than in the waffle-weave body can produce hems that don't ruffle, especially with shallow waffle cells, such as are woven on four shafts.

Draft 3



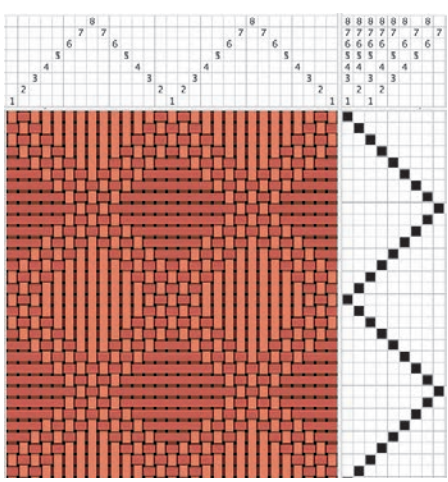
7-shaft waffle, double stitched, 7-thread floats in both warp and weft.

Draft 4a



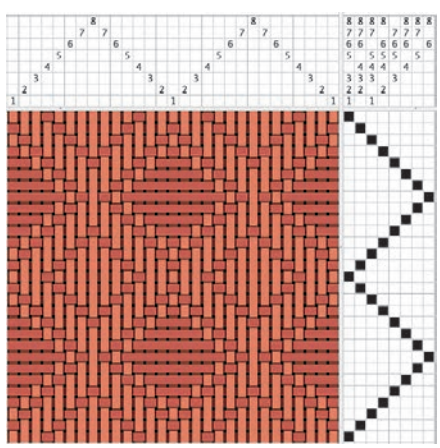
8-shaft waffle, 13-thread floats in both warp and weft.

Draft 4b



8-shaft waffle, double stitched, 11-thread floats in both warp and weft.

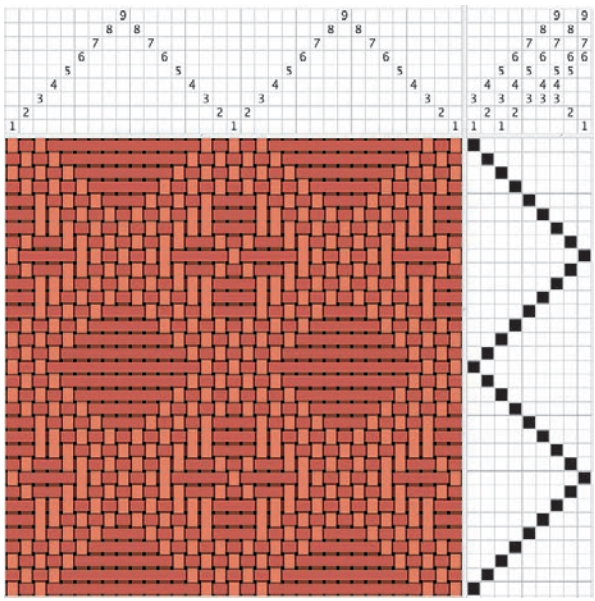
Draft 4c



8-shaft waffle, 7-thread floats in the warp, 9-thread floats in the weft.

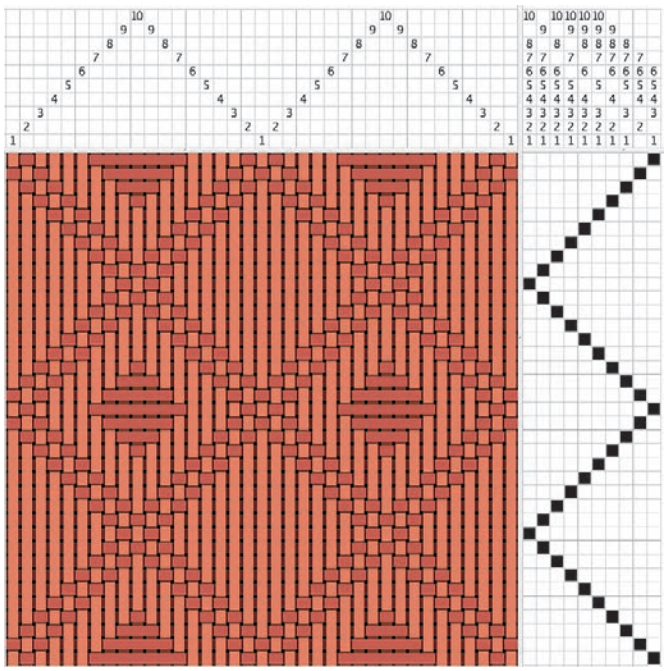
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Draft 5



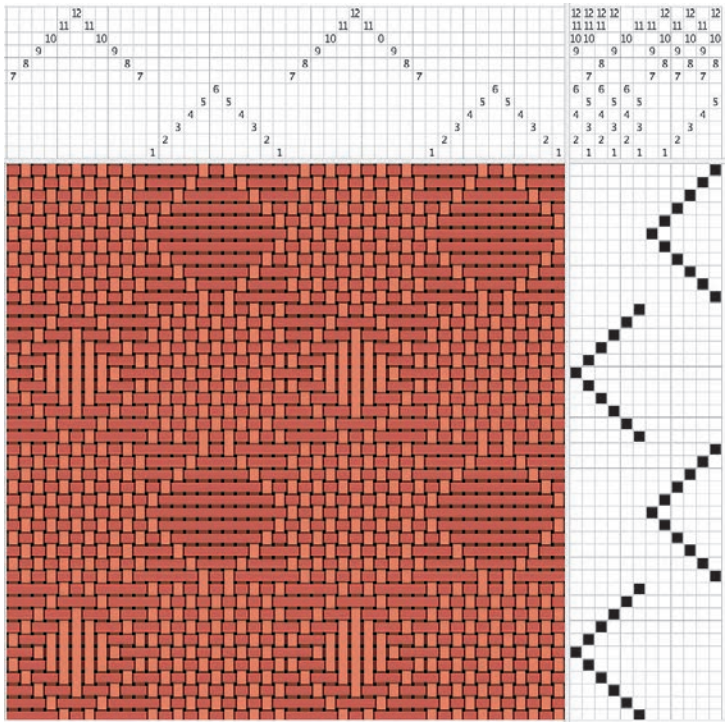
9-shaft waffle, double-stitched, 11-thead weft-float areas alternate with flower motifs.

Draft 6



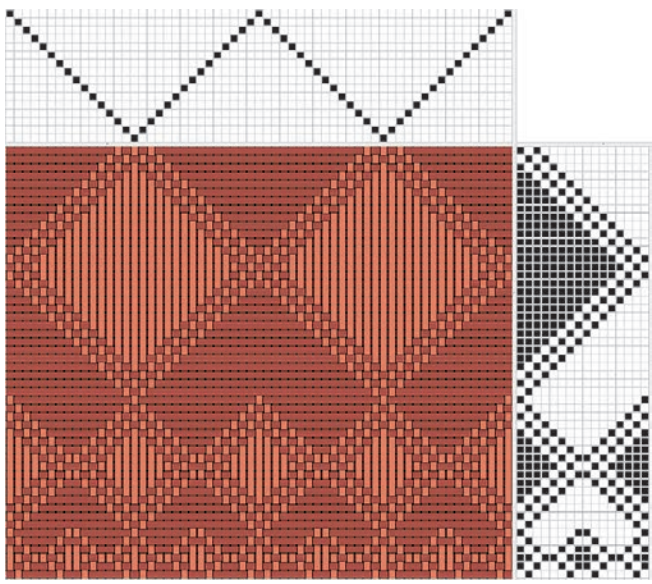
10-shaft waffle, double stitched, 15-thread warp floats, 7-thread weft floats.

Draft 7



12-shaft waffle in "blocks," sections of plain weave alternate with 7-thread warp and 11-thread weft floats.

Draft 8

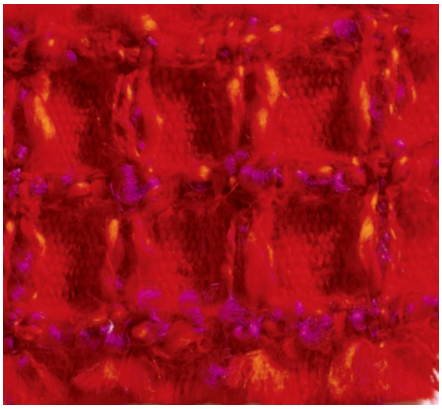


16-shaft waffle, double stitched; in the top section, 25-thread floats in both warp and weft; in the middle section, 9-thread warp floats) alternate with 14-thread weft floats.

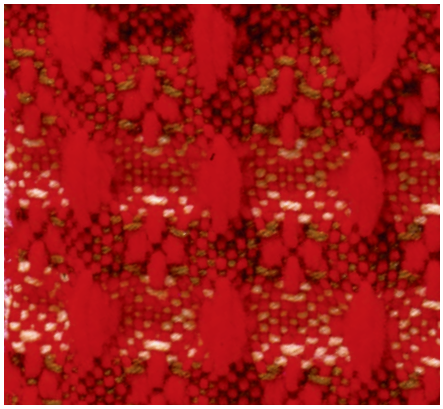
Fabric use

Waffle fabrics are elastic, spongy, and absorbent, making them ideal for washcloths and towels. They are very insulating, so they make warm throws and blankets in wools. Wool will also allow long floats and therefore deeper cells and therefore a warmer fabric. Occasionally, waffle weaves are used for clothing, but be aware that seaming will flatten the texture, which can distort garment tailoring. Deep cells also mean long floats, which can be impractical in clothing..

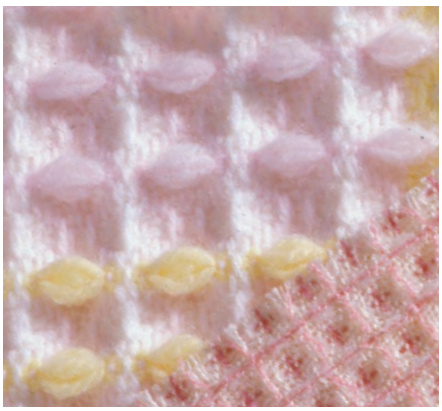
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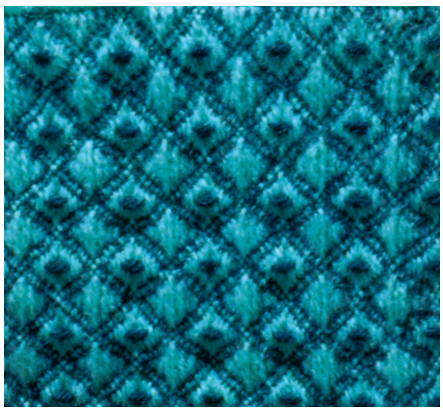
Sample 1



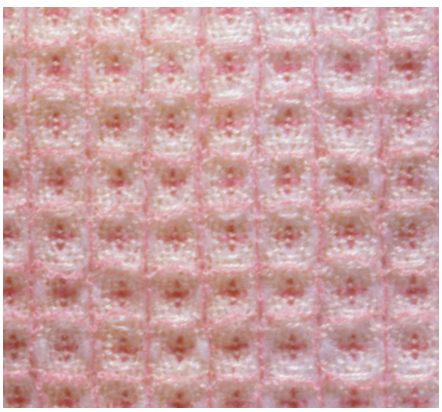
Sample 4



Sample 2



Sample 5



Sample 3



Sample 6



Sample 7

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TIPS FOR PLANNING, HEMSTITCHING, AND FRINGING

TAKE-UP AND SHRINKAGE

Weft take-up and shrinkage.

As you weave, extra weft length (beyond the width of the warp in the reed) must be placed in the shed to allow for weft take-up (in *Handwoven* projects, this amount is included in required weft yardage). The fabric then draws in as the weft bends over and under the warp thread so that the width of the woven cloth is narrower than the width of the warp in the reed. The cloth narrows further after it is removed from the loom, and shrinkage will narrow it even more if it is washed. To calculate the percentage of weft take-up and shrinkage, divide the finished width by the width of the warp in the reed.

Warp take-up and shrinkage.

As you weave, the warp bends over and under the weft threads so that fabric length is less than the length of the warp threads that produce it (*Handwoven* projects give the number of inches allowed for this take-up under Warp Length). When you release tension and remove the fabric from the loom, the fabric takes up in the warp direction. If you wash the fabric, shrinkage further decreases its length. To calculate the percentage of warp take-up and shrinkage, divide the finished fabric length by the woven length (measured under tension on the loom) plus the inches given for warp take-up.

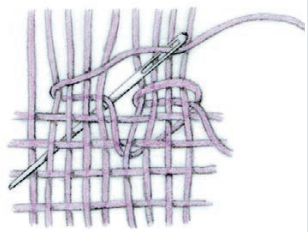
To calculate how long to weave a fabric for a specific finished length, use the percentage derived by dividing the finished length listed in the project by the woven length measured under tension on the loom (for this percentage, do not include the inches allowed for take-up in the warp yarn).

TWISTING (OR PLYING) THE FRINGE



Divide the number of threads for each fringe into two groups. Twist each group clockwise until it kinks. Bring both groups together and allow them to twist around each other counterclockwise (or twist them together in that direction). Secure the ends with an overhand knot. (Use the same method to make a plied cord by attaching one end to a stationary object.)

SIMPLE HEMSTITCHING



Weave several picks of plain weave, ending with the shuttle on the right side if you are right-handed, left side if you are left-handed. Measure a length of weft three times the warp width and cut, leaving the measured length as a tail. Thread the tail into a blunt tapestry needle.

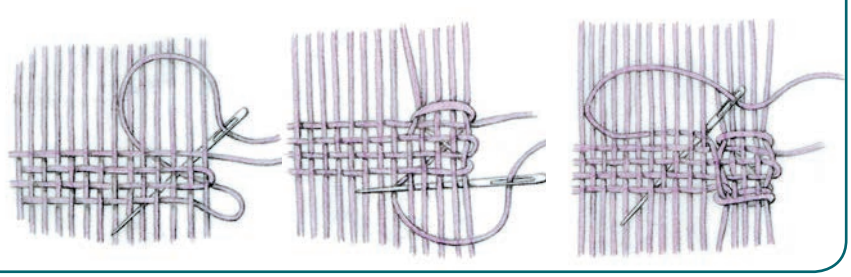
Take the needle under a selected group of ends above the fell and bring it up and back to the starting point, encircling the group. Pass the needle under the same group of ends, bringing it out through the weaving two (or more) weft threads below the fell. Repeat for each group of ends across the fell. Needleweave the tail into the selvedge and trim. (See * below.)

DOUBLE (ITALIAN) HEMSTITCHING

Weave several picks plain weave, ending with the shuttle on the right side if right-handed, left side if left-handed. Measure a length of weft four times the warp width and cut, leaving the measured length as a tail. Thread the tail into a blunt tapestry needle.

Take the needle under a selected group of warp ends above the fell and bring the needle back to encircle the ends. Next, pass the needle under the same ends but come up two or more weft rows down from the fell. Then bring the needle back around the same group of ends below the fell. Then begin again, encircling the next group of ends. (See * below.)

**For both methods: To hemstitch the first end of a piece, weave a header, weave four or five picks of plain weave (or of the basic weave structure used in the piece), and hemstitch over the top two or three weft rows. Weave the piece and then hemstitch the other end over the last two or three weft rows. Remove the fabric from the loom and discard the header and weft threads below the first hemstitching.*



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