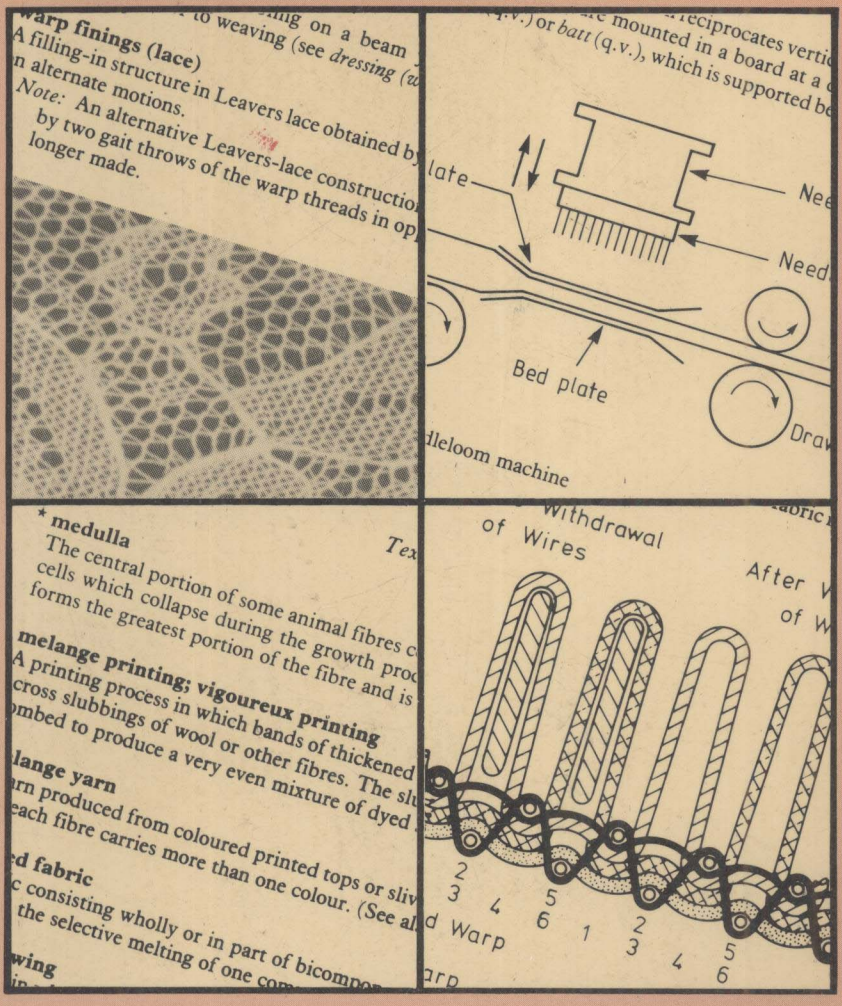
The Textile Institute

Textile Terms and Definitions



Eighth Edition

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Preface to the Eighth Edition

During the Textile Institute's inaugural ceremonies in 1910, the importance was emphasized of the Institute becoming 'the real authority for the determination of standards, usages and terms for international purposes, recognised to the ends of the earth as the standard authority of those things' [1] and in the original Royal Charter of 1925, the constitution of such an authority is set out as one of the objects.

The reference book *Textile Terms and Definitions* now widely used in virtually every country of the world both by manufacturing industry and in litigation and consumer affairs, is published in fulfilment of these ideals. Since its first edition in 1954, it has now been brought up to date on seven occasions, and this eighth edition represents an enormous amount of work, not only on the part of the Textile Institute headquarters staff but also of over 150 expert volunteers who have been working for up to five years as ten panels, each specialising in a different area of the very wide field. All the definitions have been reviewed, nearly 500 have been revised, and new definitions have increased the total by nearly 40%. The number of photographs, drawings and cross-references have also been considerably extended. This opportunity is taken to thank all those concerned for the friendly and enthusiastic way in which they have given their cooperation.

Suggestions from the panels have been studied by a committee of about 24 active members and the proposed definitions have then been published in draft form in *Textile Horizons* so that some 26 000 readers in 100 countries have had an opportunity to comment. Many readers have responded in this way, and their contributions are hereby gratefully acknowledged. Just as important are those whose careful scrutiny of the definitions has not revealed any reason to comment, for their tacit approval is essential to the whole project.

The guiding principle has been to reflect the meaning of terms as now used in the textile industry, not to dictate how terms 'should' be used. ISO and BSI definitions have been adopted wherever appropriate and thanks are extended to these organisations for their permission. The Committee has, however, felt free to provide different definitions in those cases where this allowed current usage to be more accurately expressed.

Revision of *Textile Terms and Definitions* is a continuing process and suggestions for additions, deletions or amendments are welcomed.

The Textile Institute receives no subsidy or grant for exercising this vital role in world textile terminology (or for any other purpose). The way to ensure its continuation and development is for every textile professional to encourage suppliers, customers and others with whom they deal to purchase and use the book. Adherence to the quoted definitions is often of major commercial benefit.

S ROBERT BEECH

Technical Editor
Chairman of Textile Terms and Definitions Committee

[1] The President of the UK Board of Trade in a speech of support for the new Institute.

Acknowledgements

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Introduction and Notes

The following conventions and diagrams are used throughout this book to describe or represent fabric structures.

Woven Fabrics

Details of woven fabrics are given in the following order, and, where relevent, references to the warp precede those to the weft:

(*a*) yarn linear density (see *linear density*),

(*b*) *twist level* (q.v.) and *twist direction* (q.v.),

(*c*) numbers of ends (see *end* (2)) and picks (see *pick* (2)) per unit length,

(*d*) yarn crimp (see *crimp* (2)),

(*e*) fabric thickness,

(*f*) area density,

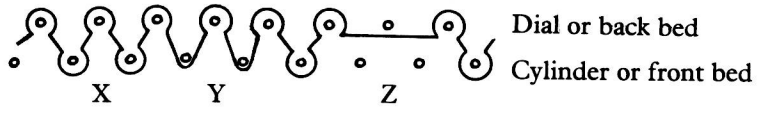
(*g*) *cover factor (woven fabrics)* (q.v.), and

(*h*) fabric width.

In all weave diagrams marked squares indicate where the warp is raised over the weft.

Knitted Fabrics

In diagrams repesenting knitted fabrics, the dots represent needles. A line partially encircling a dot (as at X) represents a knitted loop, a line passing around a dot (as at Y) represents a tucked stitch, and a non-knitting position is represented by a horizontal line (as at Z).



Abbreviations and Symbols

adj.	adjective
BS	British Standard
BSI	British Standards Institution
cf.	compare (Latin: *confer*)
E	the number of knitting needles per inch on a circular machine. See also *gauge Note (a)*
E.E.C.	European Economic Commission
e.g.	for example (Latin: *exempli gratia*)
ER	the number of knitting needles per two inches on a Rashcel knitting machine. See also *gauge Note (b)*
FTC	Federal Trade Commission (U.S.)
i.e.	that is (Latin: *id est*)
ISO	International Organization for Standardization
n.	noun
N	(followed by suffix). Symbol for specific length or count unit (see page 292.)
(q.v.)	which see (Latin: *quod vide*)
R	(sometimes with a subscript number). Denotes an organic mono- or bi-radical in chemical formulae.
R	(before linear density or count values) resultant. Indicates overall value of combined components (see page 293)
SI	Système International d'Unités
sic	so written.
T	(followed by suffix). Symbol for linear density unit (see page 292)
U.K.	United Kingdom
U.S.	United States of America
v.	verb
viz	namely (Latin: *videlicet*)
⋆	indicates new definitions and those that have been revised since the publication of the seventh edition.
†	indicates those definitions which have been agreed with the Society of Dyers and Colourists.

Contents

Textile Terms and Definitions

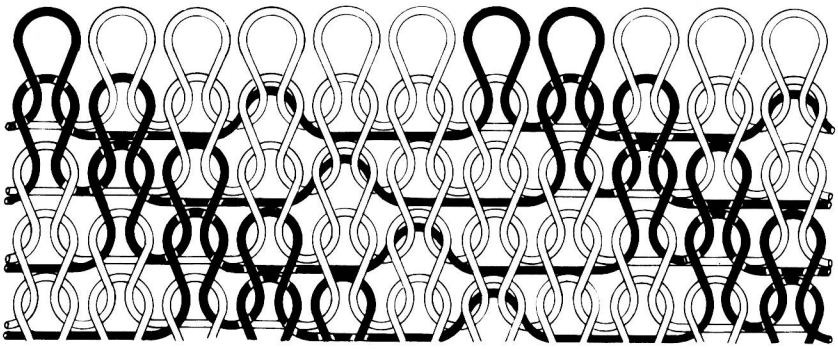
abaca *n.*
See *manila*.

abraded yarn *n.*
A continuous-filament yarn that has been subjected to abrading action, generally to provide it with the hairiness characteristic of a staple-fibre yarn.
Note: Unintentional abrading of yarn is a defect.

abrasion mark *n.*
See *chafe mark*.

*† **accelerant** *n.*
A substance, often a swelling agent, which, added to a dyebath or printing paste, accelerates the diffusion of a dye into a substrate.

* **accordion fabric** *n.*
A weft-knitted fabric, showing a figure design in two or more colours, that is produced on one set of needles by knitting, tucking, and missing, and in which tuck loops are introduced to eliminate long lenghts of floating thread at the back.



Accordion fabric

* **acetate (fibre)** (generic name) *adj.*
The term used to describe fibres of cellulose ethanoate (acetate) wherein between 74% and 92% of the hydroxyl groups of the original cellulose are ethanoylated (acetylated). (See also Classification Table p. 297.)

* **acetic acid value** *n.*
The percentage by weight of combined ethanoyl (acetyl) radical expressed as ethanoic (acetic) acid.

acetone-soluble cellulose acetate *n.*
See *cellulose acetate*.

* **acetylation** *n.*
The process of introducing an ethanoyl (acetyl) radical into an organic molecule.
Note 1: The term acetylation is used to describe the process of combining cellulose with ethanoic (acetic) acid.
Note 2: A partial acetylation is sometimes applied to cotton in the form of yarn or fibre to give it special properties.

† **acid ageing** *n.*
ageing (q.v.) in which a volatile acid is present in the vapour.

* **acid dye** *n.*
An anionic dye characterized by *substantivity* (q.v.) for protein and polyamide fibres and usually applied from an acidic or neutral dyebath.

*** acrylic (fibre)** (generic name) *adj.*
A term used to describe fibres composed of synthetic linear macromolecules having in the chain at least 85% (by mass) of recurring cyanoethene (acrylonitrile) groups. (See also Classification Table p. 297.)

*** addition polymerization** *n.*
The formation of a polymer by reaction of a compound or compounds without the formation of other reaction products, e.g.,

$$n\mathrm{CH_2 = CHCl} \longrightarrow [- \mathrm{CH_2 - CHCl} -]_n .$$

*** add-on** *n.*
The weight of solids left on a given weight of fabric after impregnation and drying. The percentage add-on is given by

$$(w_2 - w_1) \times 100 \div w_1,$$

where w_1 is the weight of material before impregnation, and w_2 is the weight of material after impregnation and drying. The use of the terms *pick up* (q.v.) and *wet pick up* (q.v.) to denote the weight of solids taken up by a fabric is to be deprecated.

Note: Besides impregnation, fabric can also be sprayed, lick-roller coated, or foamed and coated, resulting in the deposition of a solute. The add-on is then calculated as above.

*** adhesive-bonded nonwoven fabric** *n.*
Textile material composed of a *web* (q.v.) or *batt* (q.v.) of fibres, bonded by the application of adhesive material. Methods of application include *saturation bonding* (q.v.), *spray bonding* (q.v.), *print bonding* (q.v.), and *foam bonding* (q.v.).

advertising tape *n.*
See *bolduc.*

*** aeroplane fabric** *n.*
Any fabric used as the outer covering of a heavier-than-air aircraft. It usually is a simple, single, high-quality fabric of tightly woven construction, and may include rip-stop threads to enhance tear resistance. It was originally made of cotton or linen, and doped in situ to shrink the fabric onto an air frame to reduce air permeability, and may be doped, in order to provide environmental protection. Modern fabrics are typically polyester- or polyamide-based and may be laminated with a thin polymer film or films, these fabrics being used on light and micro-light aircraft, gliders and hang-gliders.

***† affinity** *n.*
The quantitative expression of *substantivity* (q.v.). It is the difference between the chemical potential of the dye in its standard state in the fibre and the corresponding chemical potential in the dyebath.

Note: Affinity is usually expressed in units of calories (joules) per mole. Use of this term in a qualitative sense, synonymous with substantivity, is deprecated.

afgalaine *n.*
Plain-weave, all-wool dress fabric, containing *(a)* woollen warp with woollen weft, or *(b)* worsted warp with woollen weft. In both types, the warp has usually S and Z twist alternately, with S-twist woollen weft.

*** A-frame** *n.*
A movable batching unit, in which a horizontal roller is supported by two A-shaped frames. The unit is used to wind fabric in beam form for either storage or wet processing.

after-welt (knitting) *n.*
A band on a stocking, following the welt, in which there is a variation of quality, stitch, and/or yarn. (Synonyms: *shadow welt, garter band, anti-ladder band, anti-run-back courses,* etc.)

*** ageing** *n.*
(1) Originally, a process in which printed fabric was exposed to a hot, moist atmosphere. At the

* **ageing** *(continued)*
present time, the term is almost exclusively applied to the treatment of printed fabric in moist steam in the absence of air. Ageing is also used for the development of certain colours in dyeing, for example, aniline black.
(2) In the manufacture of viscose, the oxidative depolymerization of alkali cellulose in order to produce a controlled reduction in the chain length of the cellulose.
(3) The oxidation by exposure to air of drying-oil sizes and finishes, e.g., in the production of oiled silk and oilskins and in linseed-oil sizing.
(4) The deterioration of rubber and plastics coatings and proofings and of some lubricants on textiles, caused by gradual oxidation on storage and/or exposure to light.
(5) The term is sometimes, although incorrectly, used to describe the ripening of viscose (see *ripening (2)*).

*† **ageing (testing)** *n.*
Storage of a material under defined conditions, to determine by subsequent tests the effect of these conditions on the properties of the material. The conditions may be chosen to accelerate any natural changes that may occur.

* **ageing (textile coloration)** *n.*
Originally a process in which printed fabric was exposed to a hot moist atmosphere. At present the term is almost exclusively applied to prints in steam. Ageing is also used in the development of certain colorants in dyeing, e.g., aniline black.

*† **ager** *n.*
A chamber used for *ageing (textile coloration)* (q.v.).

* **agra gauze; agré gauze** *n.*
A plain-weave open-sett silk fabric having a gauze-like appearance that receives a stiff finish and is used for trimmings.

agré gauze *n.*
See *agra gauze.*

air jet spinning *n.*
See *jet spinning.*

* **air laying** *n.*
A method of forming a fibre *web* (q.v.) or *batt* (q.v.) in which the fibres are dispersed into an air stream and condensed from the air stream on to a permeable cage or lattice to form the *web* or *batt.*

* **airloop fabric, warp-knitted** *n.*
A construction with reverse locknit lapping movements, the bar being overfed to give a short pile on the surface of the fabric.

airplane fabric *n.*
See *aeroplane fabric.*

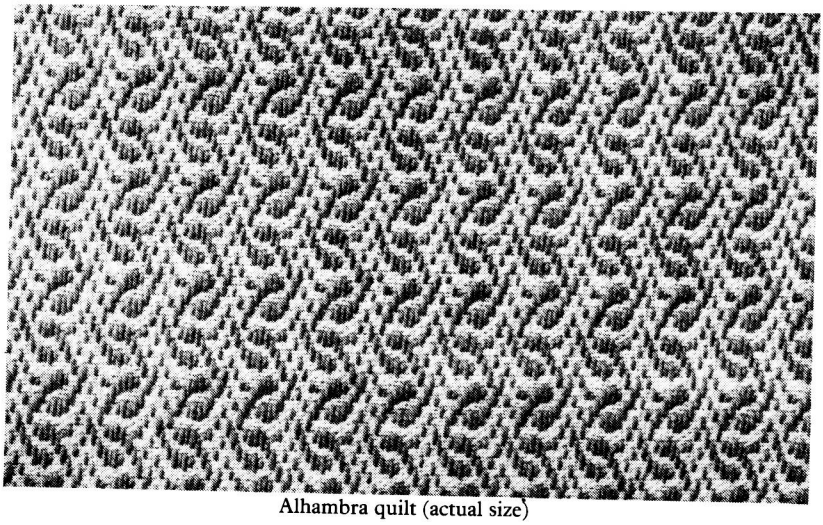
air-textured yarn; air-jet textured yarn *n.*
See *textured yarn, Note 1 (g).*

* **Albert cloth** *n.*
A reversible centre or self-stitched double-cloth overcoating, woven with a different design on each side, in stripes or checks.

* **alginate (fibre)** (generic name) *adj.*
A term used to describe fibres composed of metallic salts of alginic acid. (See also Classification Table p. 297.)

alhambra quilt *n.*
A jacquard figured fabric with a plain ground weave that requires two warps. The figuring warp is usually two-ply and coloured, the ground warp singles and undyed. The weft is often made on the condenser system, soft spun, and of coarse count.

alhambra quilt *(continued)*



Alhambra quilt (actual size)

* **alkali-cellulose** *n.*
The product of the interaction of strong sodium hydroxide (caustic soda) with purified cellulose.
Note: In the manufacture of viscose rayon, the cellulose may be cotton linters or wood-pulp. After pressing, alkali-cellulose usually contains approximately 30% of cellulose and 15% of sodium hydroxide, the remainder being water. During the steeping of the cellulose in sodium hydroxide (18-20% w/w) to form the alkali-cellulose, soluble impurities, including soluble cellulose are removed.

allovers (lace) *n.*
Lace in which the repeats merge into a whole without marked divisions in the pattern.
Note: Allovers may be made the full width of the machine and cut to selling width after finishing.

alpaca fabric *n.*
A fabric made from *alpaca fibre* (q.v.)
Note: The term has been used to describe fabrics made from black cotton warp and alpaca weft, subsequently piece-dyed. This usage is deprecated.

* **alpaca fibre (hair)** *n.*
Fibre from the fleece of the alpaca *(Lama pacos)* which inhabits the high mountain region of South America.

* **amazon fabric** *n.*
A light-weight and full soft-handling dress fabric made from worsted (usually merino) yarns as warp and soft-spun worsted or woollen yarns as weft. The weaves employed are 5-end warp satin or 2 x 1 warp twill with comparatively high setts in the warp.

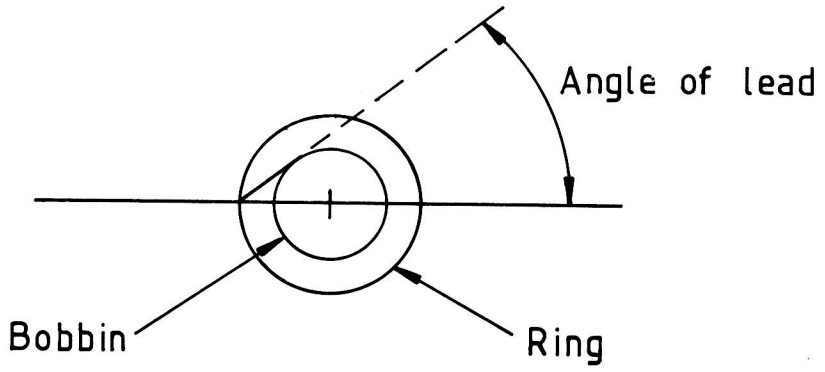
American cloth *n.*
A light-weight, plain-weave fabric, usually of cotton, coated on one side with a mixture of linseed oil and other materials so as to render it glossy and impermeable to air or water.

American cord *n.*
See *rat-tail cord.*

anaphe *n.*
See *silk, wild.*

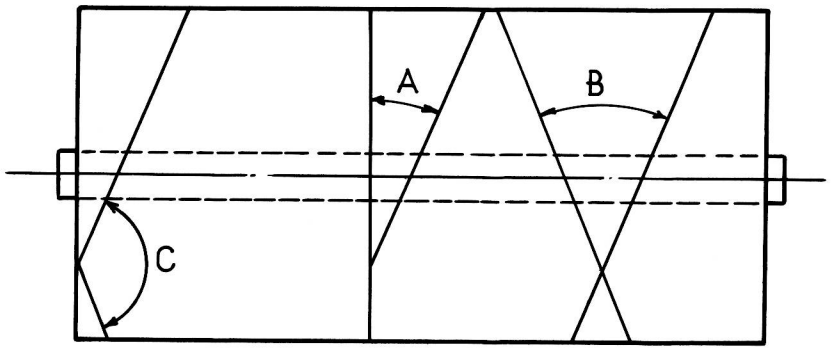
* **angel lace, warp-knitted** *n.*
A patterned warp-knitted fabric made with separating threads that are usually of secondary cellulose acetate subsequently dissolved out to leave narrow strips for trimming. It is generally produced on a tricot machine using atlas lapping movements to produce a scalloped edge.

*** angle of lead; winding-on angle** *n.*
In ring spinning or ring twisting, the angle formed at the traveller between a package radius and the tangent to the package surface.



Angle of lead

angle of wind *n.*
The angle contained between a wrap of yarn on the surface of a package and the diametrical plane of the package.
Note: Other angles are: yarn-crossing angle, yarn-reversal angle (see diagram).



Angles made by yarn wraps on the surface of a package (cheese)
A-Angle of wind B-Angle of crossing C-Angle of reversal

angola *n.* or *adj.*
(1) (Yarn) A yarn spun on the woollen system from a mixture of wool and cotton or other fibre.
(2) (Fabric) A plain or twill fabric made from a cotton warp and an angola-yarn weft.

*** angora** *n.* or *adj.*
The hair of the angora rabbit. (See also *rabbit hair.*)
Note: The hair of the angora goat is referred to as mohair.

*** angora fabric** *n.*
A fabric woven from *angora yarn* (q.v.).
Note: The use of this term to refer to fabric made of cotton warp and mohair weft is deprecated.

*** angora yarn** *n.*
An extremely soft yarn made from the hair of an angora rabbit. The yarn is nominally of 100% angora fibre, although a small proportion of other fibres, e.g., up to 5%, is allowed in certain countries dependent on their fibre content labelling laws.

*** anidex (fibre)** *adj.*
A term used to describe fibres made from a synthetic linear polymer that consists of at least 50% by mass of one or more esters of a monohydric alcohol and propenoic acid (acrylic acid). (See also Classification Table p. 297.

***† anionic dye** *n.*
A dye that dissociates in aqueous solution to give a negatively charged coloured ion.

***† antichlor** *n.*
A chemical used to inactivate residual chlorine in materials.

*** anticockle treatment** *n.*
A mild *setting* (q.v.) treatment imparted to wool knitwear usually by heating the textile material in the presence of an aqueous solution of a reducing agent. The object of this treatment is to prevent distortion and cockling of the knitted structure during subsequent wet processing, e.g., colouration at a higher temperature.

*** antifoam** *n.*
A substance that prevents foam generation, e.g., in jet dyeing machines, or causes its collapse, e.g., in print pastes.

anti-ladder band (knitting) *n.*
See *after-welt*.

*** anti-redeposition agent** *n.*
A product that prevents soil redeposition (i.e., wet soiling) during washing off or laundering processes. The reagent prevents pick-up of soil suspended in wash liquors.

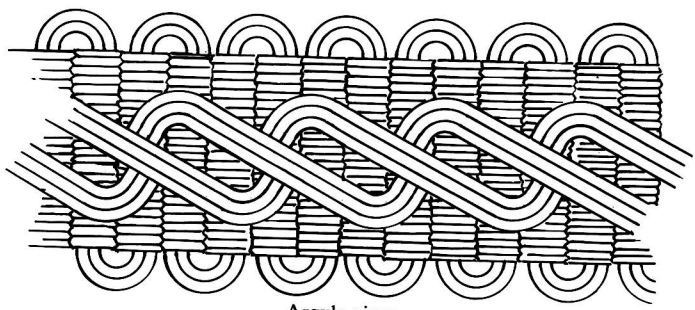
anti-run-back courses (knitting) *n.*
See *after-welt*.

***† antistatic agent** *n.*
A substance applied to a substrate to prevent the accumulation of an electric charge.

apparent wall thickness *n.*
See *wall thickness*.

*** aramid (fibre)** (generic name) *adj.*
A term used to describe fibres composed of synthetic linear macromolecules having in the chain recurring amide groups, at least 85% of which are joined directly to two aromatic rings and in which imide groups may be substituted for up to 50% of the amide groups. (See also Classification Table, p. 297.)

Argyle gimp *n.*
A woven figured narrow fabric having three series of wefts and a warp. Two series consist of three gimp cords laid flat; the ground or third series consists of two gimp cords and forms a plain weave. The two series of three gimp cords form a double-wave raised pattern by passing through the warp every sixth pick alternately and returning over the top of the warp. The over-all width is about 16mm ($\frac{5}{8}$ inch). The warp is usually of rayon.



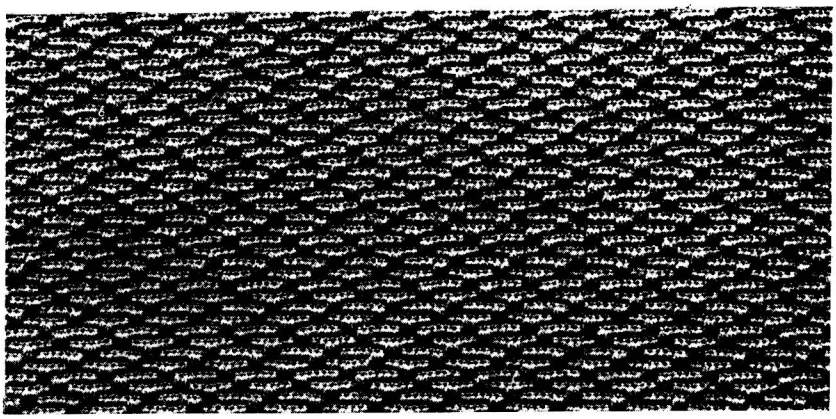
Argyle gimp

armuré *n.*

French term for a small pattern in pebbled or embossed effect, hence:

(a) armuré weave - A weave designed to produce this effect, for example, a weave of a broken or wavy rib character. In some cases, a definite figure rather than a textural surface is produced. If the ribs are broad, they may have the long floats on the back stitched, and

(b) armuré fabric - A fabric in an armuré weave.



Armuré (actual size)

artist's canvas *n.*

A fabric made of cotton, linen, jute, or hemp, prepared with size and primed with lead specifically for artists' painting grounds.

*** asbestos** *n.*

A generic name used to describe a family of naturally occuring fibrous hydrated silicates divided on the basis of mineralogical features into serpentines and amphiboles. Six varieties are of commercial importance:

serpentine: chrysotile $Mg_3(Si_2O_5)(OH)_4$

amphiboles: actinolite $Ca_2(MgFe)_5(Si_8O_{22})(OH)_2$

asbestos grunerite (amosite) $(FeMg)_7(Si_8O_{22})(OH)_2$

anthophyllite $(MgFe)_7(Si_8O_{22})(OH)_2$

crocidolite $Na_2Fe_3^{II}Fe_2^{III}(Si_8O_{22})(OH)_2$

tremolite $Ca_2Mg_5(Si_8O_{22})(OH)_2$

The six varieties are deemed to be asbestos only when they have a fibrous form.

*** assembly beaming** *n.*

The unwinding of a warp from several back beams (each containing part of the total number of ends) onto a weaver's beam.

*** assembly winding** *n.*

The winding of two or more yarns as one onto a single package usually in preparation for a subsequent twisting process.

*** astrakhan fabric, warp-knitted** *n.*

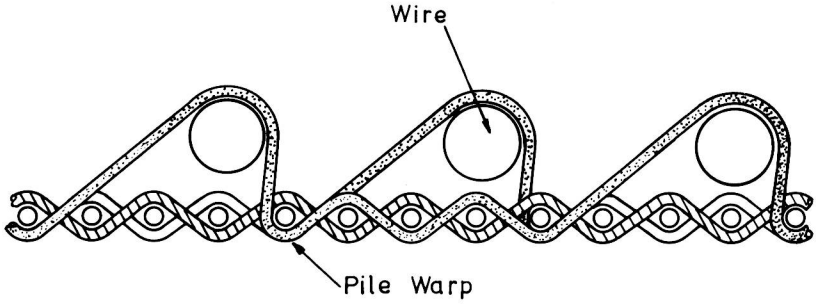
A warp-knitted fabric in which a thick curled yarn is attached to the ground fabric by the threads of two guide bars while three other guide bars knit the ground fabric.

*** astrakhan fabric, weft-knitted** *n.*

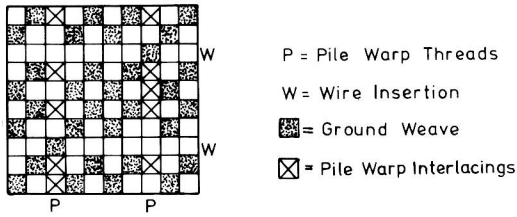
A weft-knitted fabric, made on one set of needles, with curled yarn inlaid on a tuck-miss basis. (See also *laid-in fabric, weft-knitted.*)

*** astrakhan fabric, woven** *n.*

A curled-pile fabric made to imitate the fleece of a still-born or very young astrakhan lamb. The effect is obtained by pre-treatment of the pile yarn, which is heat-set while held in the form of a helix.



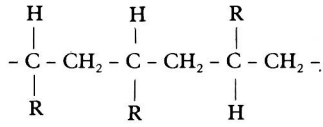
Astrakhan fabric: section through weft



Astrakhan weave

*** atactic polymer** *n.*

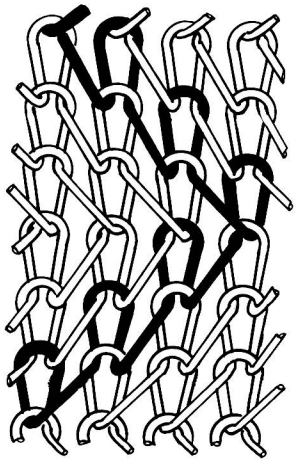
A linear polymer containing asymmetrically-substituted carbon atoms in the repeating unit in the main chain, a planar projection of whose structure has the same substituents situated randomly to one side or the other of the main chain, e.g.,



See also *isotactic polymer* and *syndiotactic polymer.*

*** atlas fabric, single bar; vandyke fabric; shadow stripe fabric** *n.*

A warp-knitted fabric characterized by having one set of threads traversing in a diagonal manner, one wale per course for a number of courses, returning in the same manner to the original wale. Open or closed laps may be used. A typical example is shown.



Single bar atlas fabric