
Certificate in Wool Classing

Wool Handling And Preparation

Alkaline Scouring

Related terms: scouring, detergent, pH

A cleaning process that uses an alkaline solution, typically sodium carbonate or sodium hydroxide, to remove grease, lanolin, and natural oils from raw wool. The high pH breaks down waxy substances, allowing them to be rinsed away. Example: a fleece is immersed in a 5 % NaOH bath at 60 °C for 30 minutes. Practical application includes preparing wool for dyeing, where residual oils can cause uneven colour. A challenge is controlling the alkalinity to avoid fibre damage; excessive alkalinity can weaken keratin bonds, leading to reduced tensile strength.

Alkali Resistance

Related terms: fiber strength, chemical treatment, durability

The ability of wool fibres to retain their structural integrity after exposure to alkaline environments. Wool with higher alkali resistance tolerates harsher scouring without loss of length or elasticity. Example: Merino wool often exhibits better resistance than coarse breeds. In practice, selecting breeds with inherent alkali resistance reduces chemical consumption. The challenge lies in testing resistance accurately; laboratory methods must simulate industrial conditions without over-estimating performance.

Bleaching

Related terms: whitening, oxidative agents, colour removal

A chemical treatment using oxidising agents such as hydrogen peroxide or sodium hypochlorite to lighten the natural colour of wool and remove residual pigments. The process improves uniformity for subsequent dyeing. Example: a 2 % hydrogen peroxide solution applied at 40 °C for 20 minutes yields a pale, even shade. Practical use includes preparing wool for high-visibility garments. Challenges include controlling over-bleaching, which can degrade fibre strength and cause brittleness.

Blending

Related terms: mixing, fibre ratios, composite yarn

The act of combining wool with other fibres—such as alpaca, cashmere, or synthetic polymers—to achieve desired performance characteristics. Blending can enhance warmth, softness, or durability. Example: a 70 % Merino / 30 % nylon blend yields a fabric that feels natural yet resists abrasion. Practical application involves creating specialty textiles for sportswear. Challenges include achieving uniform distribution and preventing fibre segregation during carding.

Carding

Related terms: garnetting, fibre alignment, loft

A mechanical process that disentangles, cleans, and aligns wool fibres into a continuous web or sliver.

Carding machines use rotating drums fitted with fine teeth to open the fleece and remove short fibres. Example: a 12-inch carding drum processes 2 kg of wool per hour, producing a uniform sliver of 2 mm thickness. In practice, carding prepares the fibre for spinning. Challenges involve managing fibre breakage and ensuring consistent fibre orientation, especially with mixed-breed fleeces.

Cleaning

Related terms: pre-scouring, contamination removal, hygiene

The preliminary step of removing visible debris—such as grass, dirt, and vegetable matter—from raw wool before chemical treatment. Mechanical cleaning may involve shaking, brushing, or air-blowing. Example: hand-picked cleaning of a 5 kg fleece reduces foreign material by 85 %. Practical relevance includes reducing chemical loads in scouring, saving water and detergent. The challenge is achieving thorough cleaning without causing fibre loss, particularly with fine merino fleeces.

Clipping

Related terms: shearing, fleece harvest, animal welfare

The process of removing the wool coat from a live sheep using specialized shears. Proper clipping maximises fleece length while minimizing animal stress. Example: a skilled shearer can clip a mature Merino in under 30 seconds, yielding 4-5 kg of clean fleece. In practice, timing of clipping (seasonal considerations) influences fibre quality; wool clipped during wet periods may contain higher moisture, affecting downstream handling. Challenges include maintaining consistent fleece length and avoiding cuts to the animal.

Compacting

Related terms: crimp reduction, fibre density, finishing

A finishing technique that reduces the natural crimp of wool, increasing fabric density and reducing shrinkage. The process applies heat and pressure, often with a steam-rich environment. Example: a 2-minute compacting cycle at 130 °C yields a 15 % reduction in fabric thickness. Practical use includes producing smoother, more stable garments for high-fashion applications. Challenges involve preventing fibre damage from excessive heat, which can lower tensile strength.

Crimp

Related terms: elasticity, fibre curvature, loft

The natural waviness of wool fibres, measured as the number of bends per unit length. Crimp contributes to wool's insulating properties and elasticity. Example: fine Merino wool may display 120 crimps per centimetre, whereas coarse breeds show fewer. In practice, high crimp is desirable for knitting and weaving because it traps air. Challenges arise when scouring or mechanical handling flattens crimp, reducing loft and warmth.

Degreasing

Related terms: lanolin removal, scouring, oil extraction

The removal of lanolin—a waxy, water-repellent secretion—from wool during scouring. Effective degreasing

ensures that subsequent dye uptake is uniform. Example: a 2% sodium carbonate solution at 55 °C removes 95% of lanolin from a standard fleece. Practical application includes recovering lanolin for commercial sale. The challenge is balancing temperature and detergent concentration to avoid fibre swelling, which can lead to fibre weakening.

Detergent

Related terms: surfactant, cleaning agent, foaming

A chemical compound that reduces surface tension, allowing water to penetrate and lift contaminants from wool fibres. Detergents used in wool processing are typically mild, non-ionic surfactants to protect fibre integrity. Example: a 0.5% non-ionic surfactant added to a scouring bath improves oil removal efficiency by 20% without affecting fibre tensile strength. In practice, detergent choice influences effluent treatment requirements. Challenges include selecting biodegradable formulations that meet environmental regulations while maintaining cleaning performance.

Diameter

Related terms: micron, fibre thickness, fineness

The cross-sectional measurement of a wool fibre, expressed in microns (μm). Diameter determines the perceived softness and suitability for various textile applications. Example: a fibre with a diameter of 18 μm is classified as fine, suitable for high-quality knitwear. Practical implication includes grading fleeces for market pricing. Challenges involve accurate measurement, as fibres can be irregular and compression during sampling may affect readings.

Dyeing

Related terms: colouration, mordant, pigment

The process of imparting colour to wool fibres using dyes that chemically bond with the keratin structure. Wool's affinity for acidic dyes makes it ideal for a wide colour palette. Example: a batch dyeing at 70 °C with a 2% acid dye achieves colour depth of 4 on the K/S scale. Practical use includes producing fashion fabrics and technical textiles. Challenges include achieving uniform colour on heavily scoured wool, as residual chemicals can cause uneven uptake.

Elastic Modulus

Related terms: stiffness, tensile testing, mechanical property

A measure of the wool fibre's resistance to deformation under load, expressed in gigapascals (GPa). Higher modulus indicates stiffer fibres, affecting drape and feel. Example: Merino wool typically exhibits an elastic modulus of 1.2 GPa, whereas coarse breeds may reach 1.6 GPa. In practice, modulus informs selection for applications requiring specific hand feel. Challenges involve maintaining modulus after repeated washing, as fibre fatigue can reduce stiffness.

Fiber Length

Related terms: staple length, staple, measurement

The distance from one fibre tip to the other, measured in centimeters or inches, influencing yarn strength

and spinning efficiency. Example: a staple length of 7 cm is considered medium, suitable for both knitting and weaving. Practical relevance includes determining the appropriate processing equipment; longer fibres require larger carding drums. Challenges include fibre breakage during handling, which reduces effective length and can lead to weak yarn.

Fiber Fineness

Related terms: micron count, softness, quality grading

The average diameter of wool fibres within a fleece, expressed in microns. Fineness directly affects the tactile qualities of the final product. Example: a fleece with an average fineness of 15 μm is classified as ultra-fine, commanding premium prices. In practice, fineness guides market segmentation—fine wools for luxury apparel, coarser wools for carpets. Challenges include variability within a single fleece, requiring blend strategies to achieve uniformity.

Fiber Strength

Related terms: tensile strength, breakage, durability

The maximum force a wool fibre can withstand before breaking, measured in newtons per tex. Example: a typical Merino fibre exhibits a tensile strength of 30 N/tex. Practical application includes determining suitability for high-stress fabrics such as activewear. Challenges arise from chemical treatments that may reduce strength; careful control of scouring temperature and detergent concentration is essential.

Fleece

Related terms: shearing, raw wool, harvest

The entire coat of wool removed from a sheep during clipping, containing fibres of varying lengths, diameters, and contaminants. Example: a mature Merino yields a fleece weighing 4.5 kg with an average staple length of 6 cm. In practice, fleece assessment determines grading and pricing. Challenges include heterogeneity; uneven distribution of fine and coarse fibres within a single fleece can complicate processing.

Fleece Grading

Related terms: quality assessment, market classification, standards

The systematic evaluation of a fleece based on criteria such as fineness, length, cleanliness, and crimp. Grading assigns a numeric or letter rating that influences market value. Example: a Grade A fleece meets stringent standards for fineness (Fibre Alignment)

Related terms: carding, parallelism, yarn uniformity

The degree to which wool fibres are oriented in the same direction, crucial for producing smooth, even yarn. Alignment is achieved during carding and drafting. Example: a well-aligned sliver shows a parallelism index of 0.85, indicating 85 % of fibres within a narrow angular range. In practice, high alignment reduces yarn irregularities and improves tensile properties. Challenges include maintaining alignment during blending with coarser fibres, which tend to disrupt uniform orientation.

Fibre Moisture Content

Related terms: humidity, drying, handling

The proportion of water retained in wool fibres after processing, expressed as a percentage of dry weight. Wool naturally absorbs up to 30 % moisture without feeling wet. Example: after scouring, fibres may retain 12 % moisture, requiring drying to below 5 % before storage. Practical significance includes preventing microbial growth during storage. Challenges involve balancing drying speed with fibre damage; excessive heat can cause shrinkage and loss of elasticity.

Fibre Processing

Related terms: handling, preparation, workflow

The series of operations—cleaning, scouring, carding, drafting, and finishing—applied to raw wool to produce usable yarn or fabric. Example: a typical processing line includes a 30-minute scouring stage, a 15-minute carding stage, and a 10-minute drafting stage. In practice, efficient processing reduces waste and improves product consistency. Challenges encompass equipment maintenance, energy consumption, and environmental compliance with effluent discharge.

Fibre Quality

Related terms: grade, fineness, strength

An overall assessment combining fineness, length, strength, crimp, and cleanliness to determine suitability for specific end-uses. Example: premium quality wool for fine knitwear must meet thresholds of 10 cm staple length, and >25 N/tex strength. Practical application includes premium pricing and targeted marketing. Challenges involve variability between flocks; breeding programs aim to improve genetic traits that enhance fibre quality.

Fibre Uniformity

Related terms: consistency, distribution, grading

The degree to which fibre characteristics (diameter, length, crimp) are consistent within a batch. Uniformity facilitates predictable yarn performance. Example: a uniformity index of 0.92 indicates that 92 % of fibres fall within a narrow range of fineness. In practice, high uniformity reduces the need for blending and re-sorting. Challenges arise from natural variation; processing steps such as combing can improve uniformity but increase cost.

Fibre Yield

Related terms: recovery, efficiency, waste

The proportion of usable wool obtained from raw fleece after cleaning, scouring, and removal of contaminants. Yield is expressed as a percentage of the original dry weight. Example: a well-managed scouring process may achieve an 85 % fibre yield. Practical relevance includes cost calculations and environmental impact assessments. Challenges involve minimizing loss during handling—short fibres may be discarded unintentionally, reducing overall yield.

Fibre Washing

Related terms: rinse, water treatment, effluent

The final rinsing step after scouring and any chemical treatments, intended to remove residual detergents, salts, and chemicals. Example: a multi-stage wash with progressively cooler water reduces detergent residues to below 0.1 % of fibre weight. In practice, thorough washing ensures that downstream processes such as dyeing are not compromised. Challenges include managing water consumption and treating effluent to meet regulatory standards.

Fibre Wool

Related terms: keratin, animal fibre, natural polymer

A protein-based natural fibre harvested from sheep, goats, or other mammals, characterised by a complex structure of keratin, disulfide bonds, and natural oils. Example: the keratin composition of Merino wool gives it superior softness and thermal regulation. Practical importance lies in its biodegradability and renewable nature, making it a sustainable textile option. Challenges include susceptibility to moth damage and the need for careful handling to preserve its intrinsic properties.

Fleece Harvest

Related terms: clipping, shearing, collection

The coordinated collection of fleeces from a flock during a defined period, typically once per year. Example: a commercial operation may harvest 10,000 kg of fleece over a two-week window, requiring logistics for transport and storage. In practice, timing of harvest influences fibre moisture and contamination levels. Challenges involve weather conditions; unexpected rain can increase fibre moisture, complicating scouring and storage.

Fleece Storage

Related terms: warehouse, humidity control, preservation

The method of keeping harvested wool in a condition that prevents degradation, mould growth, and pest infestation. Example: storing fleece in a ventilated, low-humidity ($\leq 65\%$) environment with regular turning reduces moisture buildup. Practical applications include maintaining fibre quality before processing. Challenges involve controlling temperature fluctuations and protecting against rodent damage, which can compromise large batches of wool.

Fleece Sorting

Related terms: grading, segregation, batch processing

The division of harvested fleece into categories based on quality parameters such as fineness, length, and cleanliness. Example: a sorting line may separate a mixed batch into three streams: fine ($\leq 18\mu\text{m}$), medium ($18\text{--}24\mu\text{m}$), and coarse ($>24\mu\text{m}$). In practice, sorting enables targeted processing routes, optimizing value recovery. Challenges include the speed of sorting equipment and ensuring minimal fibre loss during segregation.

Fleece Weighing

Related terms: scale, measurement, yield calculation

The determination of the mass of a fleece, typically performed immediately after clipping to assess

productivity. Example: a digital platform scale with 0.01 kg precision provides accurate records for each animal. Practical relevance includes performance monitoring of breeding programs. Challenges involve ensuring tare weight removal (e.g., animal weight) and accounting for moisture content variations.

Fleece Yield

Related terms: recovery, processing efficiency, waste reduction

The ratio of usable wool obtained after processing to the original dry fleece weight, expressed as a percentage. Example: a well-optimized scouring line can achieve a 90% yield, meaning 0.9 kg of clean wool per kilogram of raw fleece. Practical importance includes cost estimation and environmental impact, as higher yields reduce waste. Challenges stem from variations in contaminant levels and fibre breakage during handling.

Fiber Crimp Index

Related terms: crimp, elasticity, loft

A numerical representation of the density of fibre waviness, calculated as the number of crimps per centimetre. Example: a crimp index of 120 crimps/cm indicates a highly elastic fibre suitable for knitting. In practice, the crimp index guides yarn designers in selecting fibres for specific fabric structures. Challenges include maintaining crimp during mechanical processing; over-carding can flatten the natural waviness, diminishing insulating properties.

Fiber Diameter Distribution

Related terms: fineness, uniformity, grading

The statistical spread of fibre diameters within a fleece, commonly expressed as a histogram or standard deviation. Example: a narrow distribution with a standard deviation of 1.2 µm indicates high uniformity, desirable for premium markets. Practical significance includes predicting yarn evenness and reducing the need for extensive blending. Challenges involve measuring distribution accurately, as sampling bias can misrepresent the true variability.

Fiber Moisture Management

Related terms: drying, humidity control, storage

The set of practices aimed at controlling the water content of wool throughout processing, from scouring to final storage. Example: employing a low-temperature drying tunnel at 60 °C reduces moisture to 4% without damaging fibre integrity. In practice, proper moisture management prevents microbial growth and preserves mechanical properties. Challenges include balancing drying speed with energy consumption and avoiding overheating that may cause fibre shrinkage.

Fiber Strength Testing

Related terms: tensile test, ASTM standards, quality control

The laboratory procedure used to determine the maximum load a single wool fibre can sustain before failure. Example: using an Instron tensile tester with a gauge length of 30 mm, a Merino fibre may break at 25 N. Practical application includes quality assurance and selection of fibres for high-stress applications.

Challenges involve handling extremely fine fibres without introducing pre-test damage, requiring specialized grips and environmental controls.

Fiber Treatment

Related terms: scouring, bleaching, finishing

Any chemical or mechanical operation applied to wool to modify its surface or internal properties, enhancing performance for specific end-uses. Example: a mild enzymatic treatment can reduce fibre felting propensity while preserving softness. In practice, tailored treatments enable the production of technical textiles such as flame-retardant fabrics. Challenges include ensuring compatibility of multiple treatments; sequential processes may interact, leading to unexpected results.

Fiber Uniformity Index

Related terms: consistency, statistical measure, grading

A calculated value representing the degree of homogeneity in fibre characteristics within a batch, often derived from variance in diameter and length. Example: an index of 0.95 (on a 0–1 scale) denotes excellent uniformity, suitable for fine yarn production. Practical relevance includes informing blending decisions and predicting yarn quality. Challenges involve achieving high uniformity without excessive processing, which can increase cost.

Finishing

Related terms: compacting, heat setting, surface treatment

The final set of operations applied to wool fabric or yarn to impart desired hand, appearance, and performance attributes. Example: a steam-compact finish reduces shrinkage by 30% and enhances smoothness. In practice, finishing adds value and meets market expectations for texture and durability. Challenges include selecting finishes that do not compromise wool's natural breathability and ensuring environmental compliance of finish chemicals.

Fleece Cleaning

Related terms: pre-scouring, debris removal, preparation

The removal of extraneous material—such as grass, mud, and vegetable matter—from raw wool prior to scouring. Example: a pneumatic cleaning system can extract 90% of visible contaminants in a single pass. Practical benefit includes reducing chemical consumption during scouring. Challenges involve preventing loss of short fibres during aggressive cleaning, which can affect overall yield.

Fleece Condition

Related terms: health, cleanliness, moisture

The overall state of a harvested fleece, encompassing factors such as contamination level, fibre moisture, and presence of parasites. Example: a fleece with low vegetable matter (Fleece Moisture Content

Related terms: humidity, drying, storage

The proportion of water retained in the fleece after harvest, expressed as a percentage of dry weight.

Example: a fleece harvested after a dry spell may exhibit a moisture content of 8%, whereas one harvested

after rain may reach 15 %. Practical relevance includes determining drying requirements and estimating scouring water usage. Challenges involve accurately measuring moisture without altering the fleece, as sampling can cause moisture loss.

Fleece Quality Assessment

Related terms: grading, inspection, standards

A systematic evaluation of the fleece based on criteria such as fineness, length, cleanliness, crimp, and strength, often performed by certified graders. Example: a certified assessor uses a micrometer and visual inspection to assign a grade of 2.5, indicating premium quality. In practice, the assessment determines market price and processing route. Challenges include maintaining consistency across assessors and adapting standards to regional breed variations.

Fleece Sampling

Related terms: representative sample, testing, analysis

The selection of a small portion of a fleece for laboratory analysis to infer properties of the whole batch. Example: a 5-gram sample taken from multiple points of a fleece provides a reliable average fineness within $\pm 0.5 \mu\text{m}$. Practical use includes quality control and breeding program feedback. Challenges involve ensuring the sample is truly representative, as fleece heterogeneity can lead to misleading results.

Fleece Splitting

Related terms: segregation, grade separation, processing

The mechanical division of a harvested fleece into distinct sections based on quality parameters, often using automated sorting equipment. Example: a splitting line separates a mixed fleece into fine ($\leq 18 \mu\text{m}$) and coarse ($> 24 \mu\text{m}$) streams, each directed to different processing lines. In practice, splitting maximises value by routing each segment to the most appropriate market. Challenges include maintaining high throughput while achieving accurate segregation, especially with fleeces containing a wide range of fibre diameters.

Fleece Stacking

Related terms: storage, ventilation, organization

The arrangement of multiple fleeces in a storage area to promote airflow and prevent compression that could damage fibres. Example: stacking fleeces on pallets with 30 cm spacing enables adequate ventilation and reduces moisture accumulation. Practical importance includes preserving fibre quality during long-term storage. Challenges involve limited warehouse space and ensuring uniform conditions throughout the stack.

Fleece Tagging

Related terms: identification, traceability, record-keeping

The process of attaching a unique identifier—such as a barcode or RFID tag—to each fleece for tracking throughout the supply chain. Example: a QR code printed on a tag records the animal ID, harvest date, and initial grade. In practice, tagging enhances traceability, aids in quality audits, and supports certification schemes. Challenges include ensuring tags remain attached during processing and that they withstand moisture and mechanical stress.

Fleece Transfer

Related terms: logistics, handling, transport

The movement of harvested wool from the shearing site to the processing facility, involving vehicles, containers, and handling equipment. Example: a refrigerated truck maintains fleece temperature at 10 °C to limit moisture gain during a 200-km transport. Practical significance includes minimizing fibre degradation and contamination. Challenges involve coordinating schedules, protecting fleeces from weather exposure, and complying with biosecurity regulations.

Fleece Washing

Related terms: pre-scouring, rinse, impurity removal

A preliminary rinsing step applied to raw fleece to loosen surface dirt before full scouring. Example: a gentle spray of lukewarm water removes 60 % of visible soil, reducing detergent demand in the subsequent scouring stage. In practice, effective washing improves overall cleaning efficiency and reduces chemical load. Challenges include managing water usage and ensuring that washing does not introduce additional contaminants.

Fleece Yield Optimization

Related terms: process efficiency, waste reduction, profitability

Strategies aimed at maximizing the proportion of usable wool recovered from raw fleece, encompassing equipment tuning, chemical dosing, and handling practices. Example: adjusting scouring temperature from 55 °C to 60 °C improves oil removal while maintaining an 88 % fibre yield. Practical impact includes higher revenue per animal and lower environmental impact. Challenges involve balancing yield with fibre quality, as aggressive cleaning can degrade fine fibres.

Fleece Zoning

Related terms: segmentation, quality mapping, targeted processing

Dividing a fleece into zones based on observed quality variations, allowing selective processing of each area. Example: the shoulder region may contain coarser fibres, while the belly region yields finer fibres; each zone is routed to different carding settings. In practice, zoning enhances overall product uniformity and value extraction. Challenges include accurately mapping zones and implementing flexible equipment capable of handling variable inputs.

Fleece-to-Fiber Ratio

Related terms: conversion efficiency, waste, output

The proportion of raw fleece weight that is converted into usable fibre after cleaning and processing. Example: a ratio of 0.85 indicates that 85 % of the original fleece becomes clean wool, with the remainder lost as waste or by-products. Practical relevance includes budgeting for raw material costs and estimating by-product streams such as lanolin. Challenges involve reducing waste while preserving fibre integrity, especially for fine wools prone to breakage.

Fibre Carding Speed

Related terms: throughput, drum rotation, productivity

The rotational speed of the carding drums, measured in revolutions per minute (rpm), influencing the rate at which wool is processed. Example: a carding machine operating at 1200 rpm processes 3 kg of wool per minute, achieving high throughput. In practice, speed adjustments allow matching of processing capacity to supply. Challenges include maintaining fibre alignment and minimizing breakage at higher speeds; excessive speed can cause fibre turbulence and lead to uneven slivers.

Fibre Drafting Ratio

Related terms: attenuation, yarn thickness, spinning

The proportion by which a fibre sliver is stretched during drafting, determining the final yarn's linear density. Example: a drafting ratio of 5:1 reduces a 2 mm sliver to a 0.4 mm yarn, suitable for lightweight knitwear. Practical application includes controlling yarn weight for specific garment specifications. Challenges involve achieving uniform draft without introducing irregularities or fibre breakage, especially when processing mixed-breed fibres.

Fibre Length Distribution

Related terms: staple variation, grading, processing

The statistical representation of fibre lengths within a fleece, often displayed as a histogram indicating the proportion of fibres in defined length intervals. Example: a distribution showing 60 % of fibres between 5–7 cm, 30 % between 3–5 cm, and 10 % above 7 cm informs blending decisions. In practice, understanding length distribution assists in selecting appropriate carding and drafting settings. Challenges arise from narrow length ranges leading to increased short-fibre loss during processing, reducing overall yield.

Fibre Moisture Equilibrium

Related terms: hygroscopicity, ambient humidity, conditioning

The state at which wool fibres have absorbed moisture from the surrounding air to a level consistent with ambient relative humidity, typically 30–40 % RH. Example: at 30 % RH, wool reaches an equilibrium moisture content of approximately 8 %. Practical significance includes predicting dimensional stability and hand feel. Challenges involve controlling storage conditions to maintain equilibrium and prevent fibre swelling or shrinkage that can affect downstream processing.

Fibre Scouring Efficiency

Related terms: detergent use, removal rate, process optimization

A metric indicating the proportion of contaminants removed relative to the amount of chemicals and energy consumed. Example: an efficiency rating of 0.92 means 92 % of oils and greases are eliminated while using 10 % less detergent than the baseline process. In practice, high efficiency reduces operating costs and environmental impact. Challenges include balancing temperature, agitation, and chemical concentration to achieve optimal removal without damaging fibres.

Fibre Softness Index

Related terms: hand feel, tactile assessment, consumer perception

A quantitative measure derived from mechanical testing—such as compression or bending resistance—that correlates with perceived softness. Example: a softness index of 1.8 N·mm indicates a very soft fibre, suitable for luxury apparel. Practical application includes product development and marketing claims. Challenges involve correlating laboratory values with subjective consumer experiences, as perception can vary among individuals.

Fibre Strength Retention

Related terms: post-treatment durability, tensile properties, processing impact

The percentage of original tensile strength maintained after a series of processing steps such as scouring, bleaching, and finishing. Example: a fibre retains 95 % of its initial strength after a mild bleaching protocol, indicating minimal degradation. In practice, high strength retention is essential for applications requiring durability, like outdoor garments. Challenges include selecting chemicals and processing conditions that minimize fibre damage while achieving desired functional outcomes.

Fibre Tensile Modulus

Related terms: elasticity, stiffness, mechanical testing

The ratio of stress to strain in the elastic region of a wool fibre's stress-strain curve, expressed in gigapascals (GPa). Example: a tensile modulus of 1.3 GPa reflects a relatively stiff fibre, influencing drape and resilience. Practical relevance includes predicting how a yarn will behave under load, important for engineering textiles. Challenges involve measuring modulus accurately, as testing conditions (humidity, temperature) can significantly affect results.

Fibre Weave Compatibility

Related terms: yarn count, fabric construction, textile engineering

The suitability of a particular wool fibre's properties—such as fineness, strength, and crimp—for specific weaving patterns. Example: fine, high-crimp fibres are ideal for plain weave fabrics that require flexibility, while coarser, stronger fibres suit twill weaves used in heavy upholstery. In practice, matching fibre characteristics to weave structure optimizes fabric performance. Challenges include ensuring consistent fibre quality across a batch to avoid uneven fabric behavior.

Fibre Yield Loss

Related terms: waste, breakage, by-products

The portion of wool fibre that is discarded or degraded during processing, expressed as a percentage of the original weight. Example: a 5 % yield loss may result from short-fibre removal, breakage during carding, or residual lanolin that cannot be recovered. Practical implications involve cost calculations and environmental considerations, as lost fibre represents both economic and material waste. Challenges include identifying process steps that contribute most to loss and implementing corrective measures.

Fibre Wool Classification

Related terms: breed standards, quality grades, market segmentation

The categorisation of wool based on a combination of attributes such as fineness, length, crimp, and

cleanliness, aligning with industry standards (e.g., Merino, Corriedale). Example: a “Super 100s” classification indicates a fineness of $\leq 16.5 \mu\text{m}$, meeting premium market criteria. In practice, classification guides pricing, buyer expectations, and downstream processing routes. Challenges involve maintaining consistency within a classification, as natural variation can cause fibres to fall outside strict limits.

Fleece Cleaning Efficiency

Related terms: debris removal, water usage, labor

A performance metric that evaluates how effectively visible contaminants are eliminated relative to resources consumed. Example: an efficiency of 0.88 indicates that 88 % of dirt is removed while using 12 % less water than the baseline method. Practical benefits include reduced operating costs and lower environmental impact. Challenges include scaling cleaning methods for large flocks without compromising effectiveness.

Fleece Moisture Management System

Related terms: dehumidification, drying tunnels, climate control

An integrated setup comprising equipment and protocols designed to regulate the water content of wool from harvest through storage. Example: a combination of forced-air dryers and humidity sensors maintains fleece moisture below 8 % throughout processing. In practice, such systems safeguard fibre quality and reduce microbial risk. Challenges involve capital investment, energy consumption, and ensuring uniform moisture distribution across large batches.

Fleece Quality Assurance

Related terms: inspection, standard operating procedures, traceability

A systematic approach that incorporates regular sampling, testing, and documentation to verify that wool meets predetermined specifications. Example: implementing ISO 9001 procedures includes weekly audits of scouring chemical concentrations and fibre strength checks. Practical outcome is consistent product quality and customer confidence. Challenges include training personnel, maintaining calibration of equipment, and adapting to evolving industry standards.

Fleece Processing Workflow

Related terms: operations sequencing, bottleneck analysis, throughput

The ordered series of tasks—cleaning, scouring, drying, carding, drafting, and finishing—through which raw wool passes to become finished yarn or fabric. Example: a typical workflow may allocate 20 minutes for scouring, 10 minutes for drying, and 15 minutes for carding per batch. In practice, workflow optimisation reduces idle time and improves overall productivity. Challenges include synchronising equipment capacities, managing variable fleece qualities, and preventing cross-contamination between batches.

Fleece Inspection Protocol

Related terms: visual assessment, grading checklist, defect detection

A defined set of steps for evaluating a fleece’s condition, including checks for contaminants, fibre uniformity, and animal health indicators. Example: the protocol mandates a visual scan for vegetable matter,

a moisture meter reading, and a crimp count before assigning a grade. Practical application ensures consistent grading across different facilities. Challenges involve maintaining objectivity and reducing human error, often addressed through training and periodic proficiency testing.