
Certificate in Wool Classing

Wool Classing Techniques

Acid Detergent Fiber (ADF) – a laboratory measure of the cellulose and lignin portion of wool. Related terms: Neutral Detergent Fiber, Fiber Length. A high ADF indicates lower digestibility in sheep nutrition, affecting fleece quality. Practical use: monitor feed to maintain optimal wool growth. Challenge: precise laboratory procedures are required to avoid over-estimation.

Alpaca Wool – fiber obtained from alpaca species, often blended with sheep wool for enhanced softness. Related terms: Angora, Merino. Example: a 70% alpaca, 30% Merino blend used in luxury garments. Practical application: diversifies product range in classing stations. Challenge: differing micron ranges complicate grading.

Alveolar Scouring – a scouring technique that uses high-pressure air bubbles to remove lanolin and dirt. Related terms: Scouring, Detergent Wash. Example: pilot plants report 15% water savings. Practical use: reduces environmental impact of wool processing. Challenge: equipment cost and operator training.

Average Fiber Diameter (AFD) – the mean micron measurement of a wool sample, expressed in microns. Related terms: Micron Count, Fineness. Example: a 19.5 µm AFD qualifies as medium-fine. Practical application: determines market segment (e.g., apparel vs. carpet). Challenge: variability within a lot may mask outliers.

Barbule – the tiny hook on a wool fibre that interlocks with adjacent fibres, providing loft and elasticity. Related terms: Cuticle, Crimp. Example: high barbule density improves yarn strength. Practical use: assess during hand-feel evaluation. Challenge: excessive barbules can cause felting issues in downstream processing.

Barrel Scouring – traditional wool cleaning where fibres are placed in a rotating drum with alkaline solution. Related terms: Open-End Scouring, Wet Processing. Example: typical residence time 20 minutes at 60 °C. Practical application: widely used in small-scale mills. Challenge: high water consumption and potential fibre damage.

Benford's Law in Wool Grading – statistical method to detect anomalies in grading data sets. Related terms: Quality Control, Data Validation. Example: flagging a batch with unusually high percentages of super-fine grades. Practical use: supports audit trails. Challenge: requires robust data collection infrastructure.

Biodegradable Scouring Agents – enzymes and plant-based surfactants that replace petrochemical detergents. Related terms: Eco-friendly Processing, Enzymatic Scouring. Example: protease-based agents achieving 90% grease removal at 40 °C. Practical application: lower carbon footprint. Challenge: enzyme activity can be inhibited by high mineral content in water.

Blend Ratio – the proportion of two or more fibre types combined in a single batch. Related terms: Mixing, Composite Fibre. Example: 60% Merino, 40% Corriedale for balanced strength and softness. Practical use:

creates market-specific products. Challenge: maintaining uniform distribution throughout the bale.

Breeding Value Index (BVI) – a genetic score indicating a ewe’s potential to produce high-quality wool. Related terms: Genetic Selection, Fleece Weight. Example: a BVI of 150 correlates with 10% higher fibre fineness. Practical application: informs mating decisions. Challenge: requires accurate phenotypic records and pedigree data.

Brush Sampling – a quick field method where a small brush collects surface fibres for preliminary analysis. Related terms: Hand Sampling, Rapid Assessment. Example: obtaining a 5g sample for on-site micron testing. Practical use: reduces need for full bale sampling. Challenge: may not represent inner core fibre characteristics.

Bulk Density – the mass of wool per unit volume, expressed in kg/m³. Related terms: Packing Factor, Bale Weight. Example: a bulk density of 150 kg/m³ indicates good compression. Practical application: influences transport costs. Challenge: moisture content can significantly alter measurements.

Cabin Air Quality in Scouring Plants – monitoring of volatile organic compounds (VOCs) and particulates during wool cleaning. Related terms: Occupational Health, Emission Controls. Example: installing activated carbon filters reduces VOCs by 70%. Practical use: improves worker safety. Challenge: ongoing maintenance and compliance documentation.

Caprine Wool – fibre obtained from goats, notably Cashmere and Angora. Related terms: Cashmere, Angora. Example: a cashmere blend with Merino for high-luxury scarves. Practical application: expands product portfolio. Challenge: differing staple length and crimp require separate grading criteria.

Carpet Wool – coarse fibre typically >30 µm, used for floor coverings. Related terms: Coarse Wool, Industrial Wool. Example: a 35 µm carpet wool grade with high tensile strength. Practical use: identified early in classing to direct to appropriate markets. Challenge: maintaining uniformity across a lot with mixed fibre populations.

Casein Removal – a scouring step to eliminate residual milk proteins that may cause discoloration. Related terms: Protein Contamination, Scouring Stages. Example: alkaline wash at pH 10 for 5 minutes. Practical application: prevents yellowing in dyed textiles. Challenge: additional chemical usage increases cost.

Cellulose Content – proportion of cellulose in wool, influencing dye uptake and durability. Related terms: Keratin, Fiber Chemistry. Example: wool typically contains 70% keratin, minor cellulose from plant contamination. Practical use: quality control to detect foreign material. Challenge: accurate measurement requires spectroscopic analysis.

Chamber Scouring – a closed-system scouring process that recirculates water and chemicals. Related terms: Closed-Loop, Water Recycling. Example: achieving 80% water reuse with membrane filtration. Practical application: reduces environmental discharge. Challenge: system fouling and need for periodic cleaning.

Check Length – a measurement of the longest fibre segment in a sample, expressed in centimeters. Related terms: Staple Length, Fiber Length Distribution. Example: a check length of 8 cm indicates good processing

suitability. Practical use: determines suitability for certain spinning methods. Challenge: short checks may lead to weak yarns.

Chromium-Free Dyeing – use of alternative mordants to avoid chromium salts that can affect wool integrity. Related terms: Eco-Dyeing, Mordant Alternatives. Example: tannic acid mordant achieving comparable colour depth. Practical application: meets stricter environmental regulations. Challenge: achieving colour fastness comparable to chromium processes.

Cleanliness Grade – a visual and instrumental assessment of residual grease, dirt, and vegetable matter. Related terms: Scouring Efficiency, Grease Content. Example: a grade “A” indicates Clipping Technique – method of shearing wool from the animal, influencing fibre length and uniformity. Related terms: Shearing, Harvesting. Example: using a rotary clipper at 30 rpm reduces fibre breakage. Practical application: improves overall fleece quality. Challenge: operator skill and equipment maintenance.

Coarse Wool – wool with fibre diameter $>30\mu\text{m}$, typically used for insulation or industrial purposes. Related terms: Carpet Wool, Industrial Wool. Example: a coarse wool batch marketed for felt production. Practical use: classified early to separate from fine market streams. Challenge: maintaining consistent bulk properties across large bales.

Composite Fibre – a blend where two different fibres are physically bonded, such as wool-cotton blends. Related terms: Blend Ratio, Hybrid Fibre. Example: a 50/50 wool-cotton yarn offering breathability and warmth. Practical application: targeted to niche fashion segments. Challenge: differing shrinkage rates during finishing.

Condensation Scouring – a low-temperature scouring method that uses steam condensation to remove contaminants. Related terms: Steam Scouring, Energy-Efficient Processing. Example: achieving 90% grease removal at 45 °C. Practical use: reduces energy consumption. Challenge: controlling condensation rate to avoid fibre swelling.

Crimp Frequency – number of crimps per unit length, usually expressed as crimps per inch (CPI). Related terms: Crimp Angle, Fibre Elasticity. Example: a CPI of 12 is typical for high-quality Merino. Practical application: higher CPI contributes to better loft in knitted fabrics. Challenge: measuring CPI accurately on mixed-grade samples.

Crimp Angle – the angle formed by the fibre’s sinusoidal wave, influencing elasticity. Related terms: Crimp Frequency, Fibre Resilience. Example: an average crimp angle of 30° yields good springback. Practical use: assessed during hand-feel to predict yarn performance. Challenge: variation within a bale can affect downstream spinning consistency.

Cross-Sectional Shape – the geometric profile of a wool fibre when viewed in transverse section (e.g., circular, elliptical). Related terms: Fibre Morphology, Microscopy. Example: circular cross-section provides uniform dye uptake. Practical application: informs selection for specific textile finishes. Challenge: requires microscopy and skilled interpretation.

Cuticle Scale Pattern – the overlapping scales on the outer layer of wool, affecting felting and dye affinity.

Related terms: Scale Height, Surface Roughness. Example: a scale height of 2 μm promotes strong felting. Practical use: important for non-woven applications. Challenge: excessive scales can hinder smooth processing.

Damaged Fibre Index (DFI) – a calculated value representing the proportion of broken or weakened fibres. Related terms: Fibre Breakage, Quality Loss. Example: a DFI of 8% is acceptable for medium-grade wool. Practical application: used to adjust pricing. Challenge: detecting micro-damage requires high-resolution imaging.

Decontamination Process – steps taken to remove pesticide residues or heavy metals from wool. Related terms: Chemical Residue, Safety Standards. Example: a chelating wash reducing lead levels below 0.5 ppm. Practical use: ensures compliance with export regulations. Challenge: additional processing cost and potential fibre weakening.

Denier – a unit of linear mass density, rarely used for wool but relevant when blending with synthetic fibres. Related terms: Tex, Fibre Weight. Example: a polyester blend with 1.5 denier fibres. Practical application: assists in matching stretch properties. Challenge: conversion between denier and micron for wool requires precise calculations.

Density Gradient Centrifugation – laboratory technique to separate fibres by density, useful for removing vegetable matter. Related terms: Fibre Separation, Purification. Example: achieving 99% removal of seed fragments. Practical use: improves overall fibre uniformity before classing. Challenge: equipment expense and limited throughput.

Dermal Fibre – wool fibres harvested from the skin surface rather than the fleece, often finer and shorter. Related terms: Cashmere, Undercoat. Example: a cashmere undercoat with 15 μm diameter. Practical application: high-value niche market. Challenge: low yield and labor-intensive collection.

Desizing – removal of sizing agents applied during weaving, relevant for wool fabrics before finishing. Related terms: Finishing, Chemical Treatment. Example: enzymatic desizing at 40 °C for 30 minutes. Practical use: prepares wool for dyeing. Challenge: incomplete removal can cause dye unevenness.

Detergent Residue Test – analytical method (often surfactant-specific) to ensure scouring chemicals are fully rinsed out. Related terms: Scouring Efficiency, Water Quality. Example: a residual level below 10 ppm is considered acceptable. Practical application: prevents downstream processing issues. Challenge: detection limits require sensitive instrumentation.

Diameter Distribution Curve – graphical representation of fibre micron frequencies within a sample. Related terms: Micron Histogram, Statistical Analysis. Example: a normal-shaped curve centered at 19 μm indicates uniform quality. Practical use: assists in determining blend suitability. Challenge: interpreting multimodal curves from mixed-breed fleeces.

Digital Fibre Analyzer (DFA) – instrument that automatically measures fibre diameter, length, and crimp using laser or imaging technology. Related terms: Instrumentation, Automated Grading. Example: a DFA providing results within $\pm 0.2 \mu\text{m}$. Practical application: speeds up lot acceptance. Challenge: calibration drift

over time demands regular verification.

Direct Dyeing – applying colourants to raw or lightly scoured wool without a separate mordant stage. Related terms: Reactive Dye, Mordant-Free. Example: using an acid dye at pH 5.5 for bright reds. Practical use: reduces processing steps. Challenge: achieving colour fastness comparable to traditional mordanted processes.

Disinfection Protocol – procedures to eliminate microbial contamination in wool handling areas. Related terms: Biosecurity, Sanitation. Example: UV-C treatment of bale surfaces reducing bacterial load by 99%. Practical application: important for export to markets with strict hygiene standards. Challenge: ensuring uniform exposure across large bales.

Down-Stitch Test – a mechanical test that evaluates wool's resistance to pulling forces, simulating knitting stresses. Related terms: Tensile Strength, Yarn Performance. Example: a down-stitch value of 25 N is typical for medium-grade wool. Practical use: predicts yarn breakage rates. Challenge: variability due to fibre orientation in the sample.

Durometer Rating – measurement of fibre hardness using a durometer, occasionally applied to assess wool's resistance to abrasion. Related terms: Hardness, Surface Integrity. Example: a rating of 45 Shore A indicates moderate hardness. Practical application: useful for industrial wool destined for abrasive environments. Challenge: limited relevance for most apparel wool.

Durability Index – composite score combining tensile strength, abrasion resistance, and fibre breakage propensity. Related terms: Mechanical Testing, Quality Metric. Example: a durability index of 78/100 aligns with high-performance outdoor fabrics. Practical use: assists buyers in specifying technical wool. Challenge: requires multiple standardized tests, increasing evaluation time.

Ecocycle Assessment (ECA) – systematic analysis of environmental impacts across the wool lifecycle from shearing to end-use. Related terms: Life-Cycle Assessment, Sustainability. Example: ECA reveals that scouring accounts for 35% of total water use. Practical application: informs process improvements. Challenge: data collection across dispersed farms and mills.

Elastic Recovery – the ability of wool to return to its original dimensions after deformation, expressed as a percentage. Related terms: Resilience, Crimp. Example: an elastic recovery of 85% provides excellent shape retention in garments. Practical use: important for tailored suits. Challenge: measuring consistently across heterogeneous samples.

Fiber Diameter Uniformity (FDU) – statistical measure (often coefficient of variation) of micron variation within a lot. Related terms: Micron Consistency, Quality Control. Example: an FDU of 4% is considered high uniformity. Practical application: predicts even dye uptake. Challenge: achieving low FDU in mixed-breed flocks.

Fiber Length Distribution (FLD) – statistical spread of staple lengths within a bale, often expressed as a histogram. Related terms: Check Length, Median Length. Example: a FLD showing 70% of fibres between 6-8 cm is ideal for worsted spinning. Practical use: guides downstream processing choices. Challenge: short

fibres can cause neps in yarn.

Fiber Morphology – overall structural characteristics of wool, including cross-section, scale pattern, and internal keratin arrangement. Related terms: Microscopy, Structural Analysis. Example: a circular morphology with low scale height yields smoother fabrics. Practical application: selection for high-sheen products. Challenge: requires skilled microscopy and interpretation.

Fiber Strength Test (FST) – tensile test that measures the force required to break a single fibre, reported in grams per denier. Related terms: Tensile Testing, Mechanical Properties. Example: a strength of 3 g/denier is typical for medium-grade wool. Practical use: predicts yarn breakage. Challenge: handling individual fibres without damage.

Fineness Classification – system that groups wool based on micron ranges (e.g., Related terms: Micron Count, Grade Scale. Example: a lot classified as “fine” commands higher market price. Practical application: essential for pricing and market allocation. Challenge: borderline samples may be disputed.

Flake Test – visual inspection for the presence of vegetable flakes or bark pieces in wool, often performed on a white background. Related terms: Contamination, Visual Grading. Example: a flake count of Flocculation – phenomenon where wool fibres aggregate in aqueous solutions, affecting scouring and dyeing uniformity. Related terms: Surface Charge, Dispersion. Example: adding a dispersant reduces flocculation by 80%. Practical application: improves chemical penetration. Challenge: excessive flocculation can cause uneven dye spots.

Foam Scouring – technique that uses foam generated by surfactants to lift grease and dirt from wool surfaces. Related terms: Low-Water Scouring, Detergent Action. Example: foam scouring at 30 °C reduces water usage by 60%. Practical use: suitable for small-scale operations. Challenge: foam stability must be controlled to avoid fibre entanglement.

Frost-Sensitive Sheep – breeds whose fleece quality degrades under low temperature stress, affecting fibre diameter and crimp. Related terms: Breed Management, Climate Impact. Example: Merino exposed to frost may produce coarser wool. Practical application: timing shearing to avoid frost periods. Challenge: climate variability increases management complexity.

Fulling – mechanical process that compacts and strengthens wool fabric by controlled shrinkage. Related terms: Felting, Fabric Consolidation. Example: fulling at 70 °C for 30 minutes yields a dense felt. Practical use: enhances durability of outerwear. Challenge: over-fulling can cause excessive stiffness.

Functional Wool – wool treated or engineered to provide additional properties such as antimicrobial activity or flame retardancy. Related terms: Treated Fibre, Technical Textiles. Example: a wool blend impregnated with silver nanoparticles for hospital linens. Practical application: high-value niche market. Challenge: maintaining performance after repeated laundering.

Furrow Scouring – scouring method where wool passes through narrow channels (furrows) to improve chemical contact. Related terms: Channel Scouring, Flow Dynamics. Example: furrow width of 2 mm optimizes grease removal. Practical use: enhances efficiency in continuous lines. Challenge: clogging risk

with heavily contaminated loads.

Garniture – decorative trimming made from wool yarns, often used in traditional garments. Related terms: Trim, Decorative Fibre. Example: a garniture made from fine Merino yarn for a ceremonial robe. Practical application: adds cultural value. Challenge: requires consistent colour and texture.

Geotextile Wool – wool used in soil stabilization and erosion control applications. Related terms: Technical Wool, Environmental Applications. Example: a non-woven wool mat with 25 µm fibres for slope protection. Practical use: biodegradable alternative to synthetic geotextiles. Challenge: ensuring adequate tensile strength under field conditions.

Gloving – process of shaping wool fabric into glove forms, requiring high elasticity and fine fibre. Related terms: Handwear, Fine Wool. Example: a 18 µm glove with high crimp for dexterity. Practical application: high-value niche market. Challenge: tight tolerances increase defect rates.

Graze Index – measurement of the amount of plant material (e.g., hay, straw) inadvertently mixed with wool during shearing. Related terms: Contamination, Cleaning Load. Example: a graze index of 0.5% indicates minimal foreign matter. Practical use: informs additional cleaning steps. Challenge: detection in large bales can be labor-intensive.

Grease Content – proportion of natural lanolin remaining after scouring, expressed as a percentage of dry weight. Related terms: Scouring Efficiency, Lanolin. Example: a grease content of 3% meets export standards for fine wool. Practical application: influences pricing and downstream finishing. Challenge: low-temperature scouring may leave higher residual grease.

Grind-Down Process – mechanical reduction of fibre length, sometimes used to produce short-staple wool for specific applications. Related terms: Staple Modification, Fibre Cutting. Example: grinding to a target length of 5 cm for felt production. Practical use: creates uniform short fibres. Challenge: increased breakage reduces overall strength.

Hairline Defect – a surface irregularity on wool fibre, often visible under magnification, caused by mechanical abrasion. Related terms: Surface Damage, Microscopy. Example: a hairline defect density of 2 per mm² is acceptable for medium grades. Practical application: affects final fabric smoothness. Challenge: detection requires high-magnification tools.

Hand-Feel Assessment – tactile evaluation of wool softness, loft, and smoothness by trained graders. Related terms: Sensory Evaluation, Grader Skill. Example: a “soft” hand-feel rating correlates with micron

Heat-Set Treatment – application of controlled heat to stabilize wool dimensions and reduce shrinkage. Related terms: Thermal Processing, Dimensional Stability. Example: heat-set at 120 °C for 5 minutes reduces post-wash shrinkage by 30%. Practical application: improves garment fit. Challenge: excessive heat can degrade keratin.

Heptane Solvent Extraction – laboratory method for measuring residual grease using heptane as solvent. Related terms: Grease Determination, Solvent Analysis. Example: extracting 2 g of grease from a 10 g sample. Practical use: quality control for scouring performance. Challenge: hazardous solvent handling requires

safety protocols.

Herd Management Plan – systematic approach to breeding, nutrition, and health aimed at improving wool quality across a flock. Related terms: Genetic Improvement, Nutrition. Example: integrating rotational grazing to enhance fibre fineness. Practical application: long-term quality gains. Challenge: requires record-keeping and farmer training.

High-Lustre Wool – wool that exhibits a natural sheen due to smooth fibre surface and circular cross-section. Related terms: Luster, Surface Smoothness. Example: a lustre rating of 8/10 for premium suit fabrics. Practical use: marketing advantage for luxury apparel. Challenge: maintaining lustre through multiple processing stages.

Hygroscopic Moisture – water absorbed by wool from the atmosphere, influencing weight and handling characteristics. Related terms: Moisture Regain, Conditioning. Example: wool can absorb up to 30% of its weight in humid conditions. Practical application: required for accurate bale weighing. Challenge: moisture fluctuations affect shipping costs.

In-Line Scouring – continuous scouring system integrated directly into the processing line, eliminating batch handling. Related terms: Continuous Processing, Process Integration. Example: achieving 95% grease removal at 0.5 m/min line speed. Practical use: increases throughput. Challenge: system fouling requires regular cleaning cycles.

In-Process Monitoring (IPM) – real-time sensors that track parameters such as temperature, pH, and conductivity during scouring. Related terms: Process Control, Automation. Example: IPM alerts when pH drops below 9, prompting corrective action. Practical application: ensures consistent quality. Challenge: sensor calibration drift can cause false alarms.

Indigo Dyeing of Wool – application of natural indigo pigment to wool, requiring reduction and oxidation steps. Related terms: Natural Dye, Chemical Reduction. Example: achieving deep blue shade with a 2-hour reduction bath. Practical use: niche fashion market. Challenge: poor colour fastness on wool compared to cotton.

Industrial Wool – coarse fibre used for non-apparel purposes such as insulation, sound absorption, and reinforcement. Related terms: Coarse Wool, Technical Fibre. Example: a 32 µm industrial wool for acoustic panels. Practical application: identified early in classing to route to appropriate mills. Challenge: lower market price pressures profitability.

Inert Fibre Test – laboratory test that adds a known inert fibre to a sample to assess mixing homogeneity. Related terms: Blend Uniformity, Validation. Example: adding 1% nylon to verify blend ratio detection. Practical use: quality assurance for blended bales. Challenge: requires precise weighing and mixing.

Inter-Staple Friction – resistance encountered when fibres slide past each other, influencing yarn evenness. Related terms: Yarn Uniformity, Fibre Interaction. Example: high inter-staple friction leads to uneven yarn twist. Practical application: informs scouring intensity to reduce surface roughness. Challenge: difficult to quantify without specialized equipment.

International Wool Standard (IWS) – globally recognized grading system that classifies wool based on micron, crimp, and strength. Related terms: Grading System, Market Specification. Example: IWS 5 corresponds to 18-20 µm fineness. Practical use: provides common language for exporters and buyers. Challenge: regional variations in interpretation may cause disputes.

Ion Exchange Softening – water treatment method that replaces hardness ions with sodium to improve scouring efficiency. Related terms: Water Conditioning, Scale Prevention. Example: reducing calcium hardness from 150 ppm to Isotopic Labeling – technique using stable isotopes (e.g., ^{13}C) to trace lanolin migration during scouring. Related terms: Tracer Study, Process Optimization. Example: ^{13}C -lanolin allows precise mass balance calculations. Practical use: research tool for improving detergent formulations. Challenge: high analytical cost limits routine use.

Kappa Number – measurement of lignin content in plant contaminants within wool, expressed as a number from 0–100. Related terms: Lignin, Contamination Index. Example: a kappa number of 5 indicates minimal plant debris. Practical application: informs additional washing steps. Challenge: not directly relevant to pure wool but useful for mixed loads.

Keratin Integrity – assessment of the structural protein network within wool fibres, often measured by FTIR spectroscopy. Related terms: Protein Structure, Molecular Analysis. Example: a peak shift indicating preserved α -helix content after low-temperature scouring. Practical use: ensures fibre strength is maintained. Challenge: requires specialized equipment and expertise.

Knit-Gauge Compatibility – relationship between wool fibre properties (diameter, elasticity) and the gauge (stitches per inch) of knitted fabrics. Related terms: Gauge, Yarn Thickness. Example: fine wool ($\leq 19\text{ }\mu\text{m}$) suitable for fine gauge (30 gauge) knitting. Practical application: guides mill selection for end-use. Challenge: mixed-grade bales may limit gauge options.

Knit-Stretch Ratio – proportion of stretch a knitted fabric exhibits relative to its original length, heavily influenced by wool elasticity. Related terms: Elastic Recovery, Crimp. Example: a 20% stretch ratio is typical for fine Merino knits. Practical use: specifications for activewear. Challenge: high stretch may reduce garment stability.

Lanolin Retention – amount of natural wool wax remaining after scouring, measured in % of original content. Related terms: Grease Content, Scouring Efficiency. Example: 2% retention acceptable for fine wool destined for high-end garments. Practical application: balances cleaning with preserving beneficial properties. Challenge: over-scouring removes protective lanolin, increasing fibre brittleness.

Lamellae Structure – layered arrangement of keratin fibrils within the wool cortex, contributing to strength. Related terms: Fibre Microstructure, Mechanical Properties. Example: well-defined lamellae observed under TEM correlate with high tensile strength. Practical use: research indicator for breeding programs. Challenge: not directly observable in routine classing.

Laser Micrometry – non-contact measurement of fibre diameter using laser diffraction, offering rapid micron readings. Related terms: Digital Fibre Analyzer, Optical Measurement. Example: laser micrometer achieving $\pm 0.1\text{ }\mu\text{m}$ accuracy. Practical application: high-throughput lot acceptance. Challenge: dust and fibre

curvature can affect accuracy.

Lead-Free Scouring – scouring processes that avoid the use of lead-based catalysts, aligning with environmental regulations. Related terms: Eco-Scouring, Green Chemistry. Example: copper-based catalysts replace lead, achieving comparable grease removal. Practical use: compliance with EU REACH. Challenge: alternative catalysts may be more expensive.

Legume Contamination – presence of pea or bean fragments in wool, often from grazing in mixed pastures. Related terms: Plant Matter, Contamination. Example: legume contamination detected at 0.3% weight. Practical application: prompts additional cleaning before dyeing. Challenge: legume residues can cause discoloration in final fabrics.

Linenite – mineral impurity (silicate) that may be introduced during shearing in dusty environments. Related terms: Inorganic Contamination, Mineral Content. Example: linenite particles identified under polarized light microscopy. Practical use: informs pre-scouring filtration. Challenge: removal may require specialized screens.

Luster Measurement – quantification of wool sheen using gloss meters, expressed in gloss units (GU). Related terms: Shine, Surface Smoothness. Example: a luster of 70 GU indicates high sheen suitable for suiting. Practical application: marketing claim for premium products. Challenge: instrument calibration and sample preparation affect repeatability.

Machining Damage Index (MDI) – score reflecting fibre damage caused by mechanical equipment (e.g., shearing blades). Related terms: Shearing, Fibre Breakage. Example: an MDI of 3% indicates low damage. Practical use: guides maintenance schedules for shearing equipment. Challenge: subtle damage may be missed without microscopic analysis.

Macro-Fiber Test – test that identifies unusually long fibres (>15 cm) that may affect yarn uniformity. Related terms: Staple Length, Outlier Detection. Example: macro-fibres constitute 0.2% of sample, acceptable for worsted. Practical application: informs blending decisions. Challenge: detection in bulk requires sampling strategy.

Macro-Scale Crimp – large-amplitude waviness observed over several centimetres, influencing bulk and loft. Related terms: Crimp Frequency, Fibre Architecture. Example: macro-scale crimp contributes to high-loft blankets. Practical use: selected for insulation products. Challenge: excessive macro-crimp can cause uneven yarn tension.

Material Safety Data Sheet (MSDS) – document outlining hazards of chemicals used in wool processing, required for worker safety. Related terms: Hazard Communication, Regulatory Compliance. Example: MSDS for sodium hydroxide detailing corrosive nature. Practical application: ensures proper PPE use. Challenge: keeping documentation up-to-date with regulatory changes.

Mechanical Fibre Separation – process using air streams or vibrating screens to separate wool from debris. Related terms: Air Classification, Screening. Example: air classification achieving 98% removal of straw particles. Practical use: pre-scouring cleaning step. Challenge: fine fibres may be lost with debris if settings

are too aggressive.

Melting Point Analysis – determination of the temperature at which lanolin or other waxes melt, informing scouring temperature selection. Related terms: Thermal Properties, Process Optimization. Example: lanolin melting at 38 °C guides low-temp scouring. Practical application: reduces energy consumption. Challenge: mixed waxes may have broader melting ranges.

Metabolic Heat Production – heat generated by sheep, influencing fibre growth rate and fineness. Related terms: Nutrition, Environmental Stress. Example: high metabolic heat can lead to coarser wool. Practical use: adjust feeding regimes. Challenge: difficult to measure directly in field conditions.

Mid-Fiber Strength – tensile strength measured at the centre of the fibre, reflecting core keratin quality. Related terms: Core Integrity, Fibre Strength. Example: mid-fiber strength of 3.5 g/denier for premium Merino. Practical application: predicts durability of high-performance yarns. Challenge: requires precise gripping techniques.

Milling Yield – proportion of usable fibre obtained after processing, expressed as a percentage of raw weight. Related terms: Recovery Rate, Process Efficiency. Example: a milling yield of 85% indicates low loss during scouring. Practical use: financial forecasting for mills. Challenge: high contamination reduces yield.

Moisture Regain – ability of wool to re-absorb water after drying, expressed as % of dry weight. Related terms: Hygroscopic Moisture, Conditioning. Example: wool typically regains 30% moisture at 65% RH. Practical application: influences bale storage conditions. Challenge: fluctuations affect weight-based pricing.

Monofilament Test – evaluation of fibre uniformity by pulling a single fibre through a calibrated aperture. Related terms: Fibre Consistency, Mechanical Test. Example: monofilament passing without break indicates good uniformity. Practical use: quick field assessment. Challenge: operator skill affects reliability.

Multifiber Blend Optimization – systematic approach to selecting proportions of wool, synthetic, and other natural fibres to achieve target performance. Related terms: Blend Ratio, Composite Fibre. Example: 40% Merino, 30