

## Bristle Brush Material Descriptions

*Our thanks to Gordon Brush for allowing us to reprint the following article.*

### ANIMAL HAIR



**Goat Hair:** A very fine hair with limited elasticity. It has a natural kink that cannot be straightened. Used for short, soft bristle brushes like cosmetic brushes. Available in natural black and white, and dyed in blue, brown, gold, green, gray, and purple.

**Hog Bristle:** Relatively scarce and expensive. This material has characteristics that set it apart as the best natural filling material for a wide variety of bristle brushes. Each strand of bristle has a natural taper from the butt or flesh end to the tip, giving it resilience not found in other hairs. In addition, the tip end of each bristle is naturally split into two or more branches called the flag. Hog bristle has a slightly stiff to very stiff texture and is brown or black in color excellent for ESD applications. It has excellent durability and water resistance.

**Horsehair:** Horsehair is a medium to high cost material. Tail hair is stiffer than mane hair. Its soft to slightly stiff texture gives a scratch-free dry cleaning and has very good durability. Not resistant to acids or alkalis. Used for buffing, cleaning, dusting, and finishing in a variety of bristle brush styles: floor sweeps, shoe shine brushes, tin handle acid brushes, counter dusters, and window brushes, excellent for ESD applications. Heat distortion temperature is 370o F.

**Camel Hair:** Camel Hair brushes are not usually made from camel hair. Rather, "camel hair" is a more generic term used for lower priced, soft hair that is commonly used for artist brushes.

**Ox Hair:** In proportion to its diameter, ox hair is perhaps the stiffest of all soft hairs. Ox hair is particularly sought after in artist or dental brushes for fine lettering, striping and marking brushes.

**Red Sable:** The hair of the red sable is the most valuable of all soft hairs. It is very fine, has strong, sharp points and great elasticity and carries color well. Red sable hair makes the finest artists' brushes, being particularly suited for use with Japan colors, oil colors and heavy-bodied sign-writing materials, and is best for fine lettering. Pure red sable hair has a perpetual taper, creating the finest point possible on a bristle brush.

**Skunk or Fitch:** This hair is rarely used alone. Combined with Chinese hog bristle, it makes excellent sign writer's brushes. Grey skunk hair from eastern and western Europe has been found to be ideal for bristle brushes used in the manufacture of shade cloth.

**Squirrel:** This hair is divided into blue squirrel and Canadian squirrel. A very fine hair used for applying thin lacquers, Japan colors, light-bodied varnishes, and for general artwork, lettering and striping, as well as, cosmetic brushes.

### VEGETABLE FIBER



**Bass or Piassava:** Obtained from the leaves of palm trees grown in West Africa. Two varieties of this fiber are available: Calabar Fiber, which is very coarse and brittle and Sherebro Fiber which is very stiff and pliable. This fiber is light brownish red and very coarse. It is used primarily in street brooms.

**Bassine:** A select grade of Palmyra fiber, stiffer, more durable and more resistant to water. A very dark brown in color. Its coarseness and good water resistance make it ideal for stiff scrub brushes and is widely used in conveyor cleaning brushes.

**Kittool:** Extremely tough, dyed glossy black for the brush industry. Used in roofing brushes and saturated felt brushes.

**Palmetto:** Produced from the Florida Palmetto Palm. It is coarse, reddish in color and oil treated for wet applications. Palmetto is a quality bristle brush fiber, widely used in deck and can scrubs, garage sweeps, whisk brooms, etc.

**Palmyra:** A cinnamon colored fiber produced from the base of the leaf stalks of the India Palmyra palm. It has a medium stiff to stiff texture and is light to dark brown in color. It is finer, less stiff, more brittle, and of lower quality than bassine. Used in garage floor brushes, fender washing brushes, deck brushes, and scrub brushes.

**Rice Root:** Made from the roots of Eipcomes Macecura found in central Mexico and Guatemala. This is a crinkly, yellow, fibrous root called Zacatan or rice root. This fiber finds limited use in dairy scrubs and horse grooming brushes.

**Tampico:** Produced in Mexico from the stalk of the Agave plant. Has a soft to medium texture and is off white in color. It is often dyed and blended to give the desired effects to a bristle brush. It is heat, alkali, and acid resistant. The porous fibers absorb water and work wet or dry. More aggressive than nylon or horsehair. Used for removing surface particles and tool marks, dusting, wet scrubbing, cleaning, and spreading liquids. Excellent for removing light feather burrs and for light edge blending when used with a compound. Heat distortion temperature is 283o F.

**Union Fiber:** A mixture of two or more materials – usually tampico and palmyra. It has a medium stiff texture.

## SYNTHETIC



**Carbon Fiber:** A very fine [ .00030 ] fiber of 94% pure carbon. Fiber has a tensile strength of 525 Ksi, a tensile modulus of 33 Msi, and an electrical resistivity of .00055 Ohms- in.

**Nylon Abrasive:** A long wearing abrasive nylon filament impregnated with silicone carbide particles. We stock several filament diameters and silicone carbide particle sizes.

**Nylon - Type 6:** Provides a good durable nylon with good recovery, temperature stability and abrasion resistance at a low cost.

**Nylon - Type 6.6:** Top quality, medium- priced with higher stiffness, recovery, and abrasion resistance than type 6. It has the highest heat distortion temperature of the three nylons at 300o F.

**Nylon - Type 6.12:** Superior type nylon used in applications calling for low water absorption. It has excellent bend recovery, and abrasion resistance. This is the highest-grade nylon and they resist rot and mildew and discourage bacterial growth. Type 6.12 Nylon bristles are FDA approved and widely used in medical brushes, pharmaceutical brushes and food service brushes.

**Nylon - Conductive:** A type 6.6 nylon with an electrically conductive coating suffused onto the surface for antistatic bristle brush applications.

**Polyester:** A polymer that replaces horsehair. Its features of toughness and high temperature resistance resembles those of Nylon, but Polyester is noted for its ability to recover without whip or slapping action – it will not mat. Polyester has excellent resistance to all acids, alkalis, alcohols, gasoline, benzene and most cleaning solvents. It is a medium- priced filament that resists mildew, bacteria and fungus growth.

**Peek:** A durable thermoplastic that offers good chemical resistance and is ideal for high heat and corrosive environments. Peek provides excellent flexural and tensile strength up to 480o F and is a great alternative to .

**Polyethylene:** a soft durable material suitable for applications where abrasion is to be avoided. These flexible bristles are very efficient for thorough washing and polishing of delicate fruits and vegetables. Polyethylene is ideal for soft wiping instead of a brushing action.

**Polypropylene:** A versatile low cost filament used for a wide variety of applications. Polypropylene will not absorb moisture or odors and sheds dirt easily. It has excellent wet stiffness, abrasive tip cleaning action, non- brittle, and is inert to most solvents, oil, acids, and chemicals. It is, in fact, one of the most chemically resistant synthetic filament materials.

**Polystyrene:** This material has replaced natural bristles for use where chemical resistance is needed. Its stiff aggressive properties make it ideal for utility brushes, coffee urn brushes, deck scrub brushes, floor and garage brushes. Polystyrene bristles wear longer, perform better, and yet carry a comparable price tag to natural bristles.

**PTFE:** A Polymer that is inert to most chemicals, resistant to strong mineral and oxidizing acids, along with alcohols, ketones, ethers, amines, esters, chlorinated compounds and common cleaning solvents. PTFE has excellent property resilience up to 500o F.

**PVC:** An economical material with a reasonable flex life, low friction resistance and no loss of stiffness in water.

**Static Dissipative Nylon:** A type 6.12 Nylon with a surface resistivity of 10<sup>9</sup> that does not shed or slough and is cleanroom compatible.

**Statigo 9:** A static dissipative Nylon that is thick enough to do mechanical work, does not shed or slough and is cleanroom compatible.

**Thunderon®:** An acrylic fiber that has been chemically bonded with a layer of copper sulfide. This outer layer becomes a part of the host fiber itself, which precludes the 'flaking' problem experienced by other conductive fibers. The fiber diameter is as fine as .004 cm (.0015") and its conductive layer is a super thin 300-1,000A (angstroms). It has electrical specific resistance of 10<sup>1</sup> - 10<sup>2</sup> Ω / cm. Thunderon®.

**Tynex A:** A long wearing abrasive nylon filament impregnated with silicone carbide particles. We stock several filament diameters and silicone carbide particle sizes.

## WIRE



**Aluminum:** Soft and non- corrosive. Bends easily and takes a set. Recommended for special applications only.

**Brass:** 360 alloy. The softest metal fiber available. Straight or crimped. Used for light to medium cleaning and luster finishing.

**Carbon Steel:** Available both tempered and untempered, in a variety of sizes, straight or crimped. This is a widely used metal fill material. It has excellent cutting ability and fatigue resistance for long brush life at a low cost. It is used for general- purpose cleaning, rust removal, deburring, edge blending, and roughing for adhesion.

**Nickel Silver:** This alloy nominally contains 65% copper and 18% nickel. The alloy's electrical conductivity is about 6% that of copper. Very resistant to most chemicals, this alloy is used in staple wires as well as fill material.

**Phosphor Bronze:** C51000, phosphor bronze B, is non-sparking and about 1/5 as conductive as copper. Stronger than brass [F73 Rockwell] and lasts longer. Resists corrosion and fatigue due to flexing.

**Stainless Steel:** Type 302 stainless for wet and no rust applications in a variety of sizes, straight or crimped. Highly corrosion and heat resistant and unlike carbon steel, stainless steel does not leave after- rust deposits when used on stainless steel, aluminum, and other high-strength alloys. However, once used on carbon steel it cannot be used on stainless steel or rusting can occur. Used in corrosive environments for general purpose cleaning, rust removal, deburring, edge blending, and roughing for adhesion. Stainless Steel is FDA approved and widely used in medical brushes, pharmaceutical brushes and food service brushes.

*Note: The austenitic 302 steel used in our brushes is cold worked [drawn] to achieve the desired tensile strength. This results in the steel becoming somewhat magnetic. This magnetism is normal and is not an indication that the wire is not stainless.*



**Gordon Brush** Mfg. Co., Inc.

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