

Your Brush Deserves the Best Filaments – DuPont Filaments Continues to Lead the Way in Innovative Solutions



For more than 70 years, DuPont Filaments has been recognized as a leader in innovative synthetic filaments that enable brush manufacturers to address emerging trends and meet evolving consumer expectations. Building on a legacy of innovation, our global team of scientists and development engineers continues to expand the broad range of filaments offerings for premium quality brushes and industrial applications, giving leading global brands and brush manufacturers ever more flexibilities in brush designs.

Health deserves the best filaments – Toothbrush Filaments.

The most important component of a toothbrush lies in the bristle. With outstanding industry expertise accumulated over the years, coupled with our proven technologies, DuPont Filaments is dedicated to the oral care brush industry with our nylon solutions under the brand names of DuPont™ Tynex® (nylon 612) and DuPont™ Herox® (nylon 610). Leading toothbrush brands and manufacturers are able to produce very high-quality brushes with a balance of consistent quality, wear performance and unmatched productivities in tufting and end-rounding by using DuPont filaments.

As consumer trends in toothbrushes are increasingly focused on the six major areas of 1) Visual Attractiveness, 2) Interdental Cleaning, 3) Plaque Removal, 4) Gum Comfort, 5) Gingival Cleaning and 6) Anti-microbial within the filaments, DuPont Filaments has been working closely with the leading global brands in oral care as well as toothbrush manufacturers by fulfilling these needs with our broad range of innovative products in the portfolio. DuPont™ Tynex® Brilliance Pro filaments, launched in late 2015, are a prime example of DuPont's newest innovation that combines both visual attractiveness and functional benefits. With its unique diamond shape profile and distinguished color effects, it is the ultimate filament for premium toothbrushes. The soft bristle of Tynex® Brilliance Pro, with its outstanding translucency and glistening look brought by a proprietary color recipe, will make any toothbrush an "eye-catcher" on the shelf while retaining the superior cleaning ability for interdental and plaque removal performance.

As Herox® was successfully reintroduced to the toothbrush filament market by DuPont, it



is known as a "green" material, with 67% of its ingredients coming from renewable sourced raw material. Another innovation - DuPont™ Herox® Binchotan filaments was added to the product portfolio in 2015 as DuPont adapted its product strategy to provide tailor-made solutions targeting customer needs and growth in Asia Pacific. Capturing the emerging trend of using charcoal in various dispensary applications especially in Asia, DuPont Filaments brought yet another innovation to the market by combining nylon and binchotan charcoal powder. The binchotan charcoal powder used by DuPont is manufactured from 100% natural wood through a specialized carbonization process

in Japan, where binchotan is originated. The combination of nylon and binchotan, with perceived functional benefits commonly known in Asia and increasingly in other regions, allows toothbrush designers to bring new concepts of toothbrushes to consumers. DuPont™ Herox® Link filaments, another member of the Herox® family and a "new" nylon material using co-extrusion technology, was recently introduced to toothbrush customers who are seeking alternative nylon filament solutions with better cost effectiveness that also retain the good performance needed to better satisfy their markets in need of comparatively softness for toothbrush filaments.

Beauty deserves the best filaments – Fine Filaments

When it comes to the cosmetics industry, consumer needs are dynamic and ever-changing. There is also an increasing expectation for high performance tools as consumer cosmetics applications are more and more specialized towards professional grades. From powder to eyeliner, mascara to nail polish, as well as facial cleaning brushes, consumers are looking for brushes with high performance in durability, ease of cleaning, soft touch-and-feel, powder pickup / release...etc. Even if different animal hair are still available as options for cosmetic brushes in the market, responsible cosmetic brands are already leading the trend to be “cruelty free” and use only synthetic filaments in their brushes.

DuPont™ Natrafil® filaments, a pioneering filament from DuPont's unique polyester-based material, contain proprietary texturizing additives that create a structured surface that mimics animal hair. Natrafil® filaments offer a synthetic alternative to animal hair in premium cosmetic powder brushes with more consistency in the bristle while maintaining the touch-and-feel of premium animal hair. Studies have shown that brushes made with Natrafil® filaments have equal to superior pickup and release performance versus brushes made with animal hair.

Hygiene in cosmetic products is a serious but often forgotten concern. If you think your makeup brush is bacteria free, you should think again. Infection-causing bacteria can thrive in cosmetic brushes and products that are not adequately cleaned or are used beyond its indicated product lifespan. DuPont is helping to tackle this problem with DuPont™ Tynex® StaClean® fine filaments, launched in 2015. Independent verification by authoritative third-party testing agency has confirmed that Tynex® StaClean® fine filaments are 99% effective in bacteria inhibition. This is due to the silver-oxygen combination in the filaments that inhibits the growth of micro-organisms. The launch of Tynex® StaClean® fine filaments addresses the hygienic concern for cosmetic brushes.

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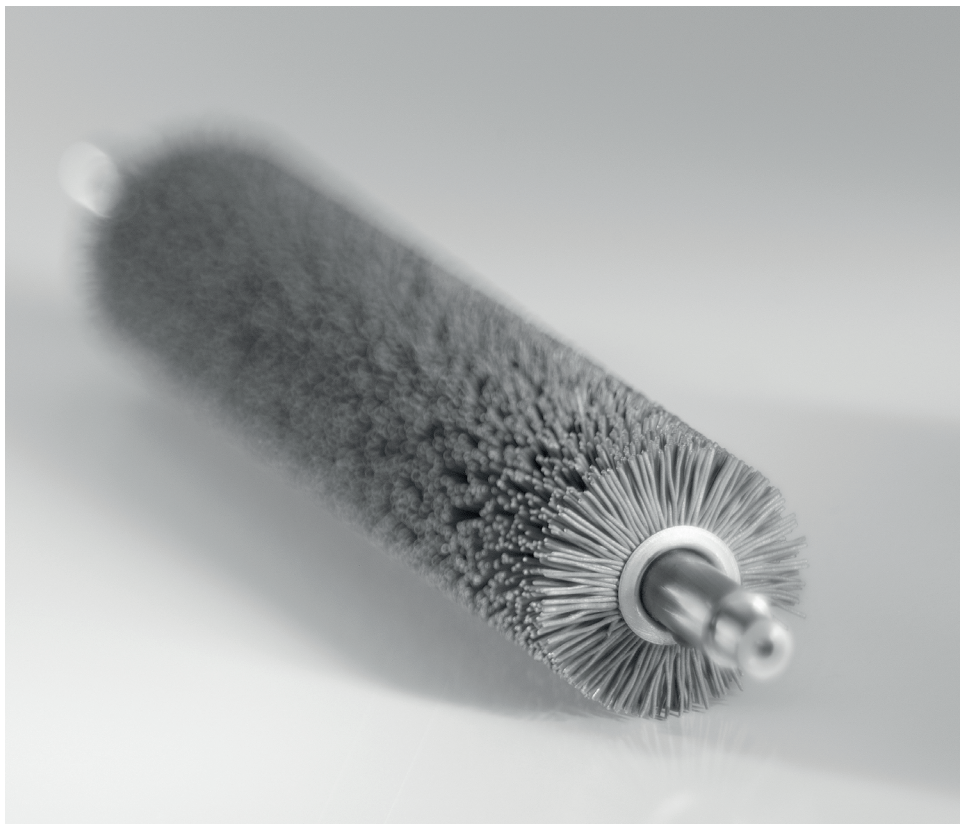
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Efficiency deserves the best filaments – Abrasive Filaments

Like most industries, steel manufacturers are always looking for ways to increase productivity. The emphasis is on getting more square feet of metal through the mill, cleaned and coated faster than ever before. To accomplish this, steel mills are using more aggressive cleaning solutions. The problem is that the cleaning brushes typically used were quickly degrading because many plastics used in the brush filaments cannot handle the solutions of the extremes of the PH scale. The technical resources at DuPont Filaments were able to help solve the problem by adding stabilizers to one of the nylon polymer formulations, effectively extending the pH range that these filaments can be used in. Brushes made with these filaments deliver cleaning performance over an improved service life, helping steel manufacturers to achieve higher productivity.

Another need voiced by customers is higher aggressiveness in metal finishing applications. DuPont™ Tynex® A filaments, a family of ceramic grit-containing filaments, was developed to meet this need.



Creativity deserves the best filaments – Paintbrush Filaments



When manufacturers began changing their paints to water-based formulations, more people began using paintbrushes made with synthetic bristles because the hog bristles traditionally used in paintbrushes lost stiffness in water-based paints. Synthetics such as DuPont™ Tynex®, DuPont™ Chinex® and DuPont™ Orel® brand filaments quickly became popular choices. As paint manufacturers continue to improve their water-based formulations by reducing volatile organic compound (VOC) content,

increasing solid loadings and decreasing drying times, there is an ongoing need for increasingly higher performing brushes. To meet this need, DuPont Filaments continues to innovate and help customize solutions. For example, we developed filaments with stiffer cross-section that can push higher viscosity paints more efficiently. We also changed the shapes of the filaments so that they not only pick up more paint from the can for faster application, but are easier to clean.



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