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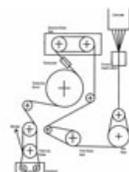
PA, PET, PP and PTT Carpet Fibers

Friction control is the most important characteristic of a BCF spin finish. Understanding the impact of fiber surface interactions in the BCF process is crucial to developing properly balanced finishes.

Two of the primary characteristics influencing consumer carpet selection are appearance (color, style and construction) and tactile feel. The appearance of the carpet is limited only by the creativity of the carpet designer while the tactile feel or hand can be modified by a variety of technical approaches during carpet yarn manufacturing.

There has been greater interest recently in engineering of the tactile feel of yarn and ultimately, the carpet, through surface treatments. Common approaches used to manipulate tactile feel of the final carpet are:

- Fiber Cross-Section
- Fiber Denier
- Smoothness of Fiber Surface
- Level of Crimp, Texture
- Yarn Twist Level
- Heat Setting Conditions



The topical treatment approach to improving softness offers advantages over mechanically modifying fiber properties, such as maintaining productivity levels with no capital expense incurred. In some cases, topical treatment can be used to obtain softness beyond what can be accomplished by changes in fiber properties. Softeners applied in conjunction with the fiber lubricant system at spinning yield better uniformity, and therefore can be effective at lower lubricant levels. Modifying the surface of a fiber to produce a soft-hand carpet can be done topically or by incorporation of polymer additives.

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Goulston News

"It Just Doesn't Hold Water. It Repels Alcohol As Well."
Press Release. Dr. Michael Kutsenko and Steve Fox

"It just doesn't hold water."
Press Release.



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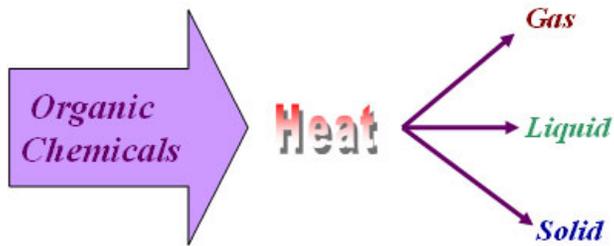
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PET & PA Industrial Filament

Industrial finishes are designed for specific end-use applications: coated fabrics, air bags, rope & cordage, marine application, tire cord, seat belt yarns, etc. These finishes are formulated with both the end-user and fiber producer in mind. Today's processing temperatures present a challenge to the formulator in balancing end-use performance and fiber production efficiencies.



Goulston News

By Nikki Brooks & Srinivasan Ranganatha Goulston Technologies, Inc.

"New Fiber Lubricants Take on New Roles"

By Srinivasan Ranganathan Goulston Technologies, Inc.

"Advancements in Topical Treatments for Nonwovens"

Goulston Technologies is offering new technology which allows for longer running times between cleaning cycles by reducing the amount of deposit formed and enabling the deposit to be easily removed.

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Spandex

Spin finish oils have always played an important role in the processing of synthetic fibers. This point is especially true for spandex considering that typical OPU levels are much higher for spandex than other fibers such as polyester or nylon. Spandex finishes not only must provide lubrication to the fiber but must also be designed to help prevent inter-fiber sticking, controlled release from the bobbin, smooth unwinding tension, and antistatic protection. The growing end-uses of spandex fiber make the type of spin finish used even more critical in today's rapidly changing spandex market. Goulston Technologies, Inc. has been supplying fiber lubricants for spandex nearly as long as the fiber has been in existence and knows very well how to design products to match the different needs of our customers and their market. Rarely are two spandex processes or polymers exactly the same, so too spin finish formulations must change appropriately. In general there are three classes of products which can typically be used based on the end use. It is easy to see why selecting the right finish is crucial to ensuring that spandex fiber performs up to the expectations of the downstream end-user.

The following results compare some of the technical properties Goulston Technologies feels are important in choosing a spin finish for spandex. The three types of spin finishes compared.

Product Name	General Composition	Typical End-Use
Lurol® SF-563	Clear type, no-MgSt	Covering, CSY, circular knitting
Lurol® SF-565	Base lubricant, including a stabilized dispersion of MgSt	Covering, CSY, circular knitting or some warp knitting
Lurol® SF-567	Complete finish system including stabilized MgSt and a powerful antistat.	Covering, CSY, circular knitting or warp knitting

Friction control is the main reason for using a spin finish oil. The first set of data compares the fiber to ceramic friction and unwinding tensions of the test samples. Due to the wide ranging deniers and fiber tenacities, and deficiencies in commercial testing machines available, Goulston has specially designed its own test equipment.

Dynamic F/C Friction and Unwinding Tension

Product	μd		Unwinding Tensions, g	
	As Is	Aged	As Is	Aged
Lurol SF-563	0.322	0.461	0.55	0.71
Lurol SF-565	0.286	0.365	0.43	0.55
Lurol SF-567	0.301	0.366	0.44	0.57

Notes

- Samples were prepared by application of 3% finish onto the 40d finish free yarn.
- μd was measured at 150 m/min against ceramic pins
- Draw ratio was set at 1:3.
- Unwinding tension measured in grams at 50 m/min unwinding speed.
- Aging was conducted for 3 days at 60°C in the air forced oven

The above chart shows that the type of base lubricant used as well as the additives included is crucial in determining how the fiber responds to accelerated aging. Low, controlled unwinding tension and friction are obviously important, but these can be affected by the amount of finish penetration into the fiber. For this reason, Goulston designs products so that the amount of finish penetration into the polymer is controlled.

Fiber-to-fiber friction is important for many reasons not the least of which is package formation during winding and unwinding of the fiber during downstream processes

Goulston News

From Biosustainable Raw Materials"
By Nikki Brooks & Srinivasan Ranganathan
Goulston Technologies, Inc.

"New Fiber Lubricants Take on New Roles"
By Srinivasan Ranganathan Goulston
Technologies, Inc.

"Advancements in Topical

of the fiber during downstream processes.

F/F Friction Coefficient

Product	μs	
	As Is	Aged
Lurol SF-563	0.160	0.171
Lurol SF-565	0.145	0.156
Lurol SF-567	0.148	0.160

Notes

- Samples were prepared by application of 3% finish onto the 40d yarn.
- μs was measured at 2 m/sec speed at one full twist. Pretension weight – 5 grams.
- Aging was conducted for 3 days at 60°C in the air forced oven.

Goulston believes it is possible to control the stickiness or slipperiness of the fiber by product design and chemistry. The effect of the antistat on F/F friction can be seen in the previous chart as well. Antistats should only be incorporated if required by the end-use.

The next chart shows the effect of adding antistat to the finish system. Results are presented in the form of the Log of the resistance; therefore any change of 1.0 signifies a 10-fold increase or decrease in the antistatic effect.

Antistatic Resistance Comparison

Product	Log (R)[Ohms]	
	As Is	Aged
Lurol SF-563	13.61	13.65
Lurol SF-565	13.65	13.62
Lurol SF-567	13.01	13.09

Notes

- Samples were prepared by application of 3% finish onto the 40d yarn
- Log(R) – surface resistivity was measured at 100V charge
- Samples were conditioned at 40% RH for 24 hours prior to testing
- Aging was conducted for 3 days at 60°C in the air forced oven

These results also show that the static protection does not dissipate significantly after accelerated aging.

In addition to product design advantages, Goulston Technologies is committed to consistent supply of quality products at competitive, reasonable prices. Our growing share in the global spandex finish oil supply shows that partnering with Goulston Technologies can gain companies an advantage in this ever increasingly competitive marketplace.

We are ready and happy to help.

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