

NEWS RELEASE

Teijin Frontier Develops Seamless Knitwear Using Special Bulky Fancy Yarn Providing Both Thermal Comfort and High Functionality



Tokyo, Japan, November 21, 2023 --- [Teijin Frontier Co., Ltd.](#), the [Teijin Group](#)'s fibers and products converting company, today announced the development of *Microft*[®] AR, a seamless knitwear for outdoor sports, featuring warmth that gently envelops and innovative stress-free comfort combined with a high functionality. The innovative clothing is made of a bulky fancy yarn using Teijin Frontier's newly-developed high-performance polyester filament.

Microft[®] AR uses highly crimped (*1) *DELTAPEAK*[®] processed yarn as the core to create a high density loop structure to provide favorable raising and bulky heat-insulating performance while preventing fibers from falling off. Also, Teijin Frontier's proprietary polyester filament is used for pile to provide various functionalities. Low gauge seamless knitwear (*2) made of the fancy yarn enables *Microft*[®] AR to offer unique sense of fit such as stress-free and soft, lightweight, and warmth that gently envelops with wear comfortability such as sweat-absorbency and quick-drying, high breathability. Also, it can be compactly foldable in small-size. Furthermore, *Microft*[®] AR is an environmentally compatible product as it is made of 100% recycled polyester and features limited appearance changes after repeated washing and wearing, long-term use, and a reduced amount of falling-off fibers that are degraded to microplastics.

(*1) Highly crimped fiber: Crimped fiber that offer high bulkiness, elasticity, and stretchability.

(*2) Low gauge: Knitting coarsely with thick yarn.

Technical features of *Microft*[®] AR

Product	Process	Technical details				
Special fancy yarn	Yarn dyeing	<ul style="list-style-type: none"> • Dyeing technology that produces high crimp textured yarn of <i>DELTAPEAK</i>[®] • Functional finishing technology for highly functioning 				
	Yarn processing	<table border="1"> <tr> <td>Core yarn</td> <td> <ul style="list-style-type: none"> • High density design for highly crimped <i>DELTAPEAK</i>[®] finished yarn that provides bulky raising property of pile and prevention of fibers from falling off </td> </tr> <tr> <td>Pile</td> <td> <ul style="list-style-type: none"> • Bulkiness control by pile length design • Original special yarns offering various applications can be used (e.g., water-absorbent and quick-drying properties by <i>CALCULO</i>[®], soft texture by <i>WAVERON</i>[®], antibacterial and deodorant properties by <i>Ecopure</i>[®]) </td> </tr> </table>	Core yarn	<ul style="list-style-type: none"> • High density design for highly crimped <i>DELTAPEAK</i>[®] finished yarn that provides bulky raising property of pile and prevention of fibers from falling off 	Pile	<ul style="list-style-type: none"> • Bulkiness control by pile length design • Original special yarns offering various applications can be used (e.g., water-absorbent and quick-drying properties by <i>CALCULO</i>[®], soft texture by <i>WAVERON</i>[®], antibacterial and deodorant properties by <i>Ecopure</i>[®])
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<i>Microft</i> [®] AR	Knitting	<ul style="list-style-type: none"> • Appropriate knitting technology of special bulky fancy yarn • Fabric design for special sophisticated breathability that can support both heat-retaining and sweaty feeling preventing properties • Seamless knitwear design that can provide thermal comfort and stress-free feeling 				
		<p><i>Microft</i>[®] AR</p>   <p><i>Microft</i>[®] AR, enlarged image of the surface</p>				

Article characteristics of *Microft*[®] AR

Function		Feature
Comfortability	Excellent heat-insulating performance	- Light, soft, and thermal comfort thanks to super bulky raised structure of special bulky fancy yarn
	Comfortable to wear	- Stress-free wearing comfort due to no seams - Comfortable fit thanks to low gauge bulky knit structure and stretch
	Functional comfortability	- Excellent sweat-absorbent/quick-drying performance thanks to non-brushed structure - Prevention of sweaty feeling through high breathability - Functional combination (e.g., antibacterial deodorant) by using various special original yarns for pile
	Other	- Compactly foldable small-size
Environmental response	Microplastic countermeasure	- Reduction of falling off of fibers during washing thanks to special high-density fancy yarn structure
	Recycling	- Made of 100% recycled materials
	Wearability	- Capable of long-term use with little morphological change such as pilling ^(*4) even after wearing and washing ^(*4) Hairballs generated on the surface of clothes due to friction during wearing

Recently, outdoor clothing and sportswear are required to have a premium look and feel, further wear comfortability (high water-absorbent/quick-drying and stress-free properties), and eco-friendliness are desired in addition to excellent heat retaining property. Light and thermal fleece materials are popular, nevertheless, it has some issues such as poor sweat-absorbent and quick-drying functions, bulkiness and appearance change after washing and wearing due to brushed fabrics. Teijin Frontier focused on the structure of chenille yarn ^(*3) to assure heat retention and functionality without brushing. However, conventional chenille yarns have been mainly used for fashionable clothing with the focus on textures such as soft feeling and airy appearance, lacking the functionality required for outdoor uses.

^(*3) Chenille yarn: Fancy yarn consists of core threads, pile, etc. Knitwear created with chenille yarn is generally considered high-pile and good in touch.

Teijin Frontier will begin promoting *Microft*[®] AR for the 2025 autumn and winter outdoor clothing and sportswear collections, thereafter, expanding globally for functional clothes such as casual wear and uniforms. It expects *Microft*[®] AR sales to reach 100,000 pieces during fiscal 2026.

About the Teijin Group

Teijin (TSE: 3401) is a technology-driven global group with two core businesses: high-performance materials and healthcare solutions. Established in 1918 as Japan's first rayon manufacturer, Teijin today comprises some 170 companies employing 20,000 people in

20 countries. Through “Human Chemistry, Human Solutions,” Teijin relentlessly strives to aims to be a company that supports the society of the future by protecting the global environment and addressing the needs of people and communities. Teijin posted consolidated sales of JPY 1,018.8 billion (USD 7.6 billion) and total assets of JPY 1,242.4 billion (USD 9.2 billion) in the fiscal year ending March 31, 2023.

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