

INSULATION



smawarm[®]



CREATIVE
TECH
TEXTILE

Hans
Global
Textile



reddot award 2018
winner



Taiwan

One of the prosperous aquaculture in Taiwan is oyster farming, there are around **200,000,000** KG of oyster per year, mostly distributed in the west coast of Taiwan.



Oyster Farming

The Problem

We're Facing Now.



What're we going to deal with these shells?

According to the statistics, there're around **160,000,000 KG** of oyster shells will be discarded. These shells are just piling up and cause the awful smell.

Material Innovation



**RECYCLED
BOTTLE**

REUSE REDUCE RECYCLE



**OYSTER
SHELL**

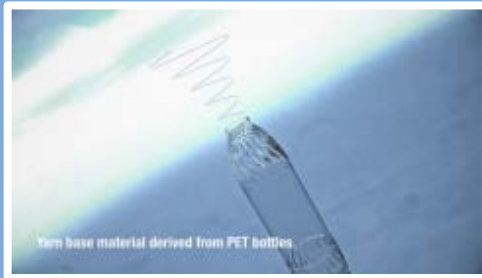
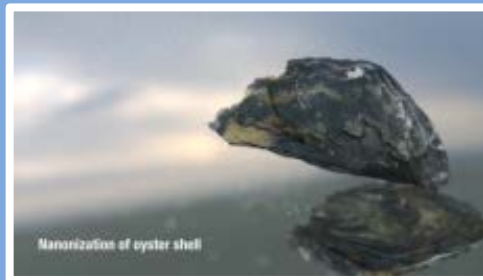
After spending almost **10 years**,
we're proud and excited that we finally
find a way to deal with the mountains of
Oyster Shells.

Take fully advantages of oyster shells, get
the most out of it.

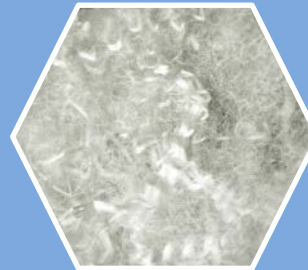
The NEW Material made of
Recycled Bottle
&
Oyster Shell

Fused by nano technology, combining Recycled PET bottles and Oyster Shells and making them into the functional fibers.

Create **Smawarm**[®] Insulation containing permanent functions.



OYSTER SHELL

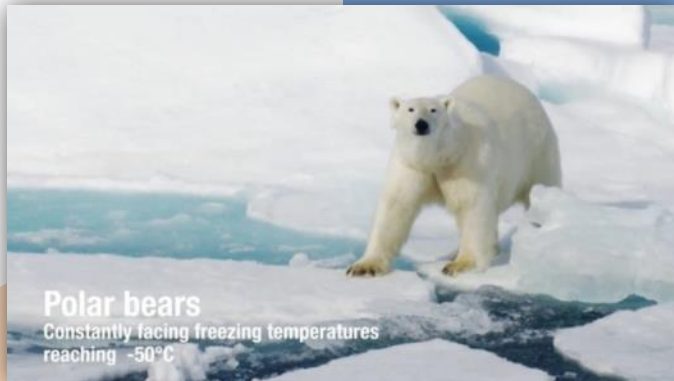


SMAWARM FIBER



RECYCLED PET BOTTLE

The Secret of Polar Bears



Polar bears constantly face freezing temperature reaching -50°C.

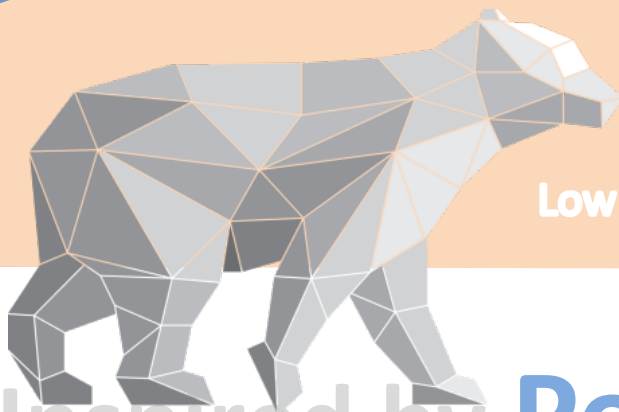
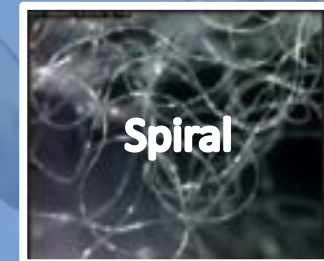
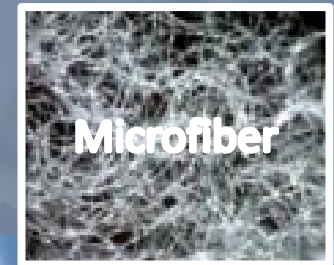
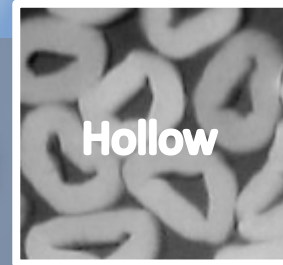
Besides the thick layer of blubber, the fur on their body plays a major role insulating body temperature from harsh environment with the combination of guard hair and undercoat to maximize heat-loss prevention.

Smawarm® Structural Features

Low Thermal Conductivity – The multilayer composite material of low thermal conductivity.

Microfiber – Only 1/3 of the feather.

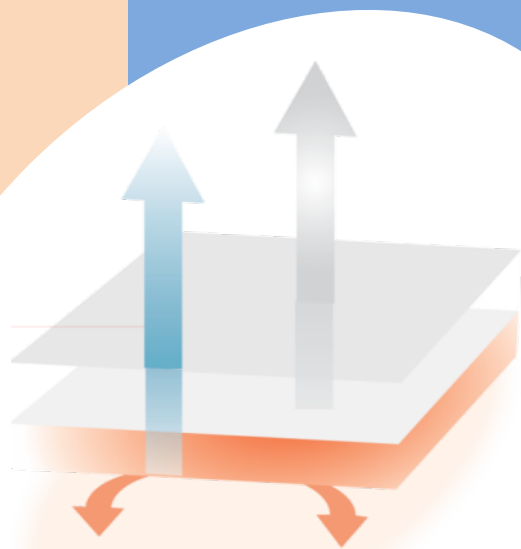
Spiral fibers – Setting up a layer of still air, heat retention.



Low Conductivity

Inspired by **Polar Bear**

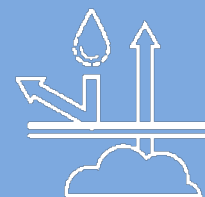
About Functions



Thermal
regulation



Moisture
management



Breathable



Quick dry



Anti-bacterial



Anti-static

High CLO value

試験成績証明書

依頼者名 暖博士新材料(无锡)有限公司 殿

品名 ①80g 普通綿

②SMW-W80

試験項目 保温性

平成 29 年 11 月 23 日提出の試料に対する試験結果は下記の通りです。

平成 29 年 11 月 29 日

上海可泰檢驗有限公司

一般財団法人 日本纖維製品品質技術センター

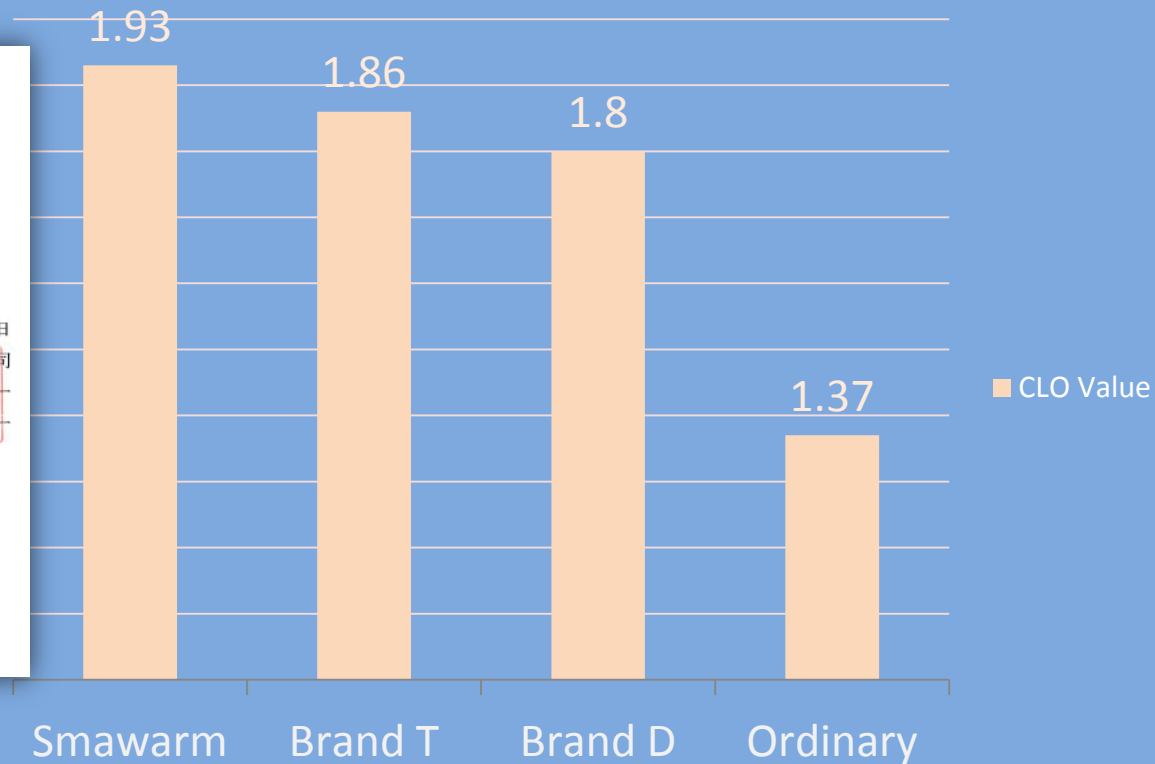
上海総合試験センター

記

○ 試験結果

保温性

①	保温性	71.2%
	(Clo 値)	1.37
②	保温性	77.8%
	(Clo 値)	1.93



* All samples are similar items(80g/sqm).

** This comparison chart is for reference only.

Low Thermal Conductivity

Cold environment →

T_1

Heat flow q

$\lambda (W/mk)$



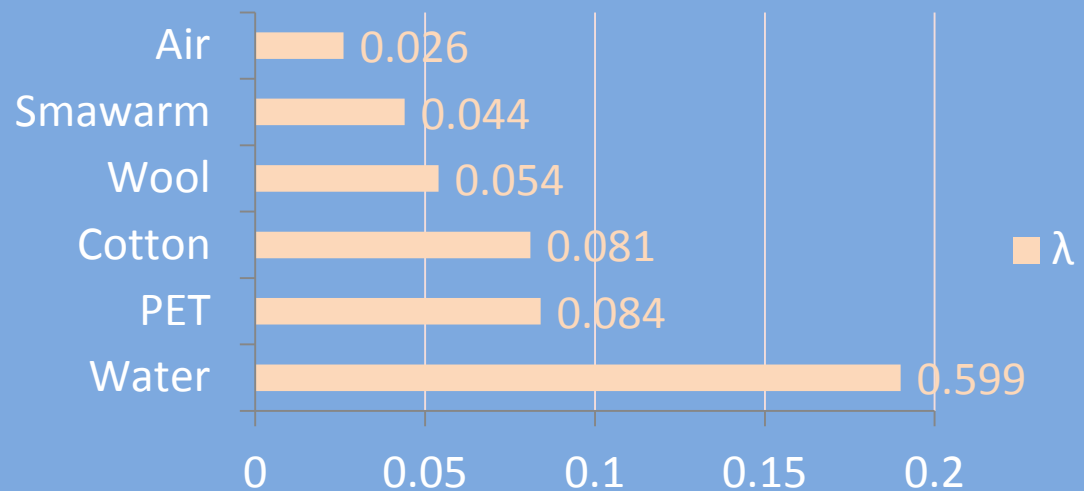
smawarm®
Premium Insulation

T_2

← Hot environment

Heat can be lost through the process of conduction.

Smawarm® has a thermal conductivity – **0.044** that is almost less than half as high as PET – 0.084. It means that Smawarm® is better insulators than polyester.

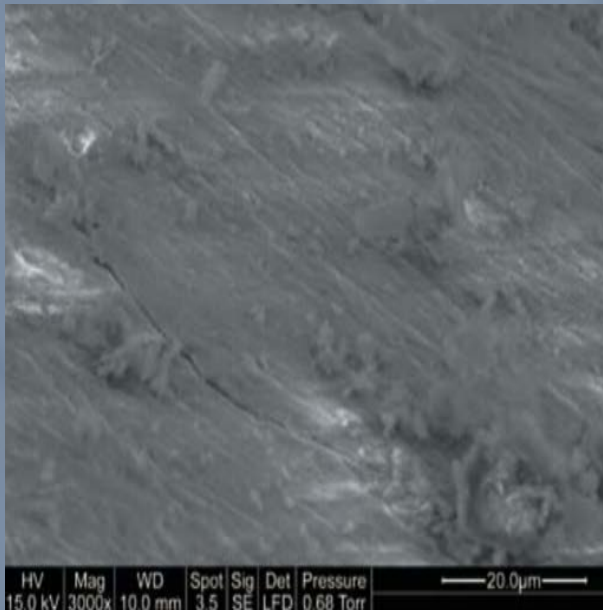


Far Infrared

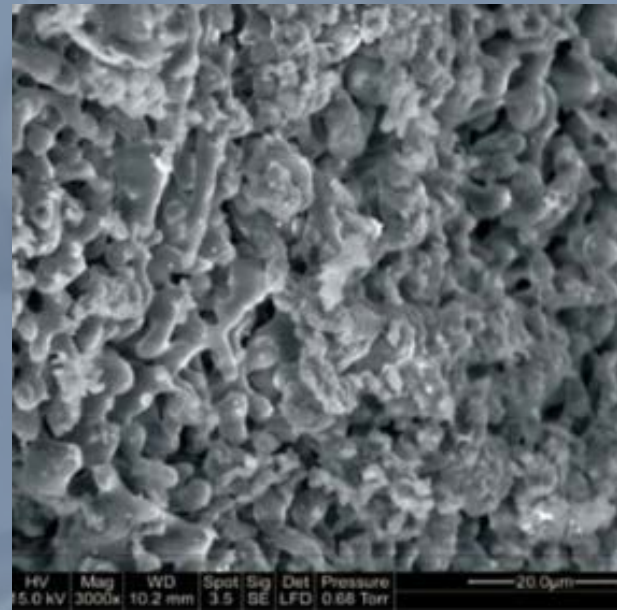
Benefits of Far-Infrared Rays

- Among the infrared waves, the far infrared rays, which have a wavelength of 6-12 microns, are especially good for the human body. These waves have the potential to penetrate 1.5 to 2 inches or more into the body allowing for deep heat and raise your core body temperature from deep inside.
- GTT TEST REPORT – Far Infrared Emissivity : 0.86

Shells – Under Microscope



Unprocessed Oyster Shells



Processed Oyster Shells
Columnar NANO Inorganic Powder



Anti-Static

The fiber of Smawarm® is with larger portion Positive Electricity and the human body is with Negative Electricity, so those two electricity will neutralize after wearing this new fabric's apparel. Therefore, we can avoid static shocks during the winter season.

Intertek Test Report:

Staphylococcus Aureus	: 80%
Escherichia coli	: 85%
Aspergillus niger	: No growth



Anti-Bacterial



Odor-Control

The surface of the oyster shell is mound-like porous structure after the calcination treatment, facilitating the absorption of the odor caused by sweat.

Patents & Awards





red dot
design award



if
DESIGN
AWARD
2018



ISPO
TEXTTRENDS
BEST PRODUCT
2016



ISPO
TEXTTRENDS
TOP 5
2018



WORLD GENIUS
CONVENTION
Genius Gold Medal



羽藤秀雄



DIPLOMA
SILVER MEDAL



DIPLOMA
GOLD MEDAL



Gold Medal



中華民國專利證書



實用新發明專利證書



CREATIVE TECH



Thank you!