



## Material Suggestion

# “PLA(Polyactic Acid)”Fibers Proposal

MIYAMACO.,LTD

1-10, Ikutamatera-machi,

Tennoji-ku,

Osaka, Japan

# What is PLA (Polylactic Acid) Fiber?

It is plant based polylactic acid fiber , and its main features are below:

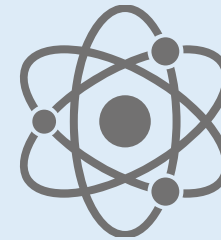


1



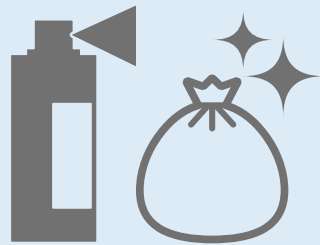
**Biodegradable**

2



**Heat-resistant, Dyeable**

3



**Deodorization, Antibacterial**

4



**Slightly Acidic**

# Development Chronology

---

1. The conventional PLA is used to be mixed with the petroleum-derived one, but special additives, modifiers and our know-how made it possible to develop high quality 100% plant based products.
2. It is expected to be used as a substitute for polyester that is one of the cause of the environmental issues today.



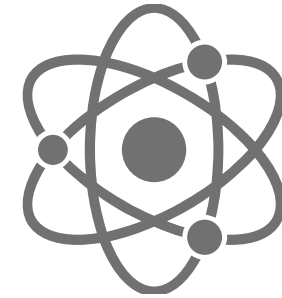
Discharged clothes that floats with plastic wastes, causing the serious environmental problems.

# Biodegradability

## Principle

①Hydrolysis (ph8, humidity : 80%, temperature : 80°C)

②Be digested by bacteria  
; Be decomposed into water and carbon dioxide



## Environment

①Compost (Garbage disposal machine)

②Natural environment (Soil : ○ Water : × Sea : △)

③It is NOT decomposed in living environment.



# Difference from other companies' PLA

## ADVANTAGE

### Increased crystallinity while remaining softness

- ① **Heat resistance** → Glass-transition temperature and melting point have been improved (Filament:130°C Staple:125°C)
- ② **dyeability** → High dyeing stability due to the well-organized molecules

※Disadvantage : Biodegradability is worse than unmodified PLA

## Excellent heat resistance and dyeability

# ① Color Fastness

## PLA 100% Color Fastness

Washing Fastness	Discoloration : grade 4-5	Staining : grade 4-5
Rubbing Fastness	Dry friction : grade 4-5	Wet friction : grade 4-5
Sweat Fastness (Acid)	Discoloration : grade 5	Staining : grade 4
Sweat Fastness (Alkali)	Discoloration : grade 5	Staining : grade 4
Color Fastness to Water	Discoloration : grade 5	Staining : grade 4
Light Fastness	Irradiation : grade 3	Above the : grade 3

**No difference from polyester except for light fastness**

## ②PLA Short Fiber Antibacterial Test

### Results:

No.	SAMPLE	生菌数の常用対数値(最大最小値)		抗菌活性値
		接種直後	18時間培養後	
①30/1 PLA70/C30 BLACK	Original	3.97(0.3)	1.30(0.0)	5.7
	Washed 10 times	3.81(0.1)	2.38(1.3)	4.6
②30/1 C70/PLA30 BLACK	Original	3.93(0.3)	2.77(0.4)	4.2
	Washed 10 times	4.26(0.1)	2.49(0.2)	4.5
---	---	---	---	---
	---	---	---	---
---	---	---	---	---
	---	---	---	---
---	---	---	---	---
	---	---	---	---
Control test ・ [standard cloth ( C100%、 white cloth)]		4.54(0.1)	6.99(0.0)	Propagation late F : 2.4

※Using the test bacterial suspension that is added surfactant interfacial active agent (Tween80)

Test Procedure : JIS L1902:2015・ Bacterium liquid-absorbing method

### ③ Deodorant Test

Results: Instrumental analysis {  
 Detector tube method : Ammonia, Acetic acid  
 Gas chromatography : Isovaleric acid

		Decrement(%)		
		Ammonia	Acetic acid	Isovaleric acid
①C70 PLA30 (BLACK)	Original	88	91	98
	Washed 10 times	89	96	99
②C70 PLA30 (Raw white)	Original	90	86	98
	Washed 10 times	80	91	99

Test Procedure: Japan Textile Evaluation Technology Council Corporation  
 Instrumental analysis manual (Detector tube method, Gas chromatography)

- Initial gas concentration... Ammonia 100ppm, Acetic Acid 30ppm, Isovaleric Acid about 88ppm
- Measurement time... 2 hours later
- Sample size... Detector tube method 100cm<sup>2</sup>, Gas chromatography 50cm<sup>2</sup>



# Ph Test(PLA Polylactic Acid Fiber)

The results described in this report are for the test sample and do not prove the quality of the entire lot.

## 生地品質検査報告書

Test Items	Test Method /Material No.		1	2	3	4	5	6	7	8
	Light-resistant	JIS L 0842	Change in color							
Laundry fastness (Grade)	JIS L 0844 (A-2)	Change in color								
		Staining								
Sweat fastness (Grade)	JIS L 0848 A	Acid	Change in color							
			Staining							
		Alkali	Change in color							
			Staining							
Rubbing fastness (Grade)	JIS L 0849 (II)	Dry								
		Wet								
Dry cleaning (Grade)	JIS L 0850	Change in color								
		Staining								
Bleeding(Grade)	Daimaru Method	Staining								
<b>Ph of ext.</b>	JIS L 1096 A		<b>5.6</b>							

染色堅牢度

Ph5.6=Slightly Acidic

Gentle on the skin,  
Low stimulation

# Main Application Examples of PLA Materials

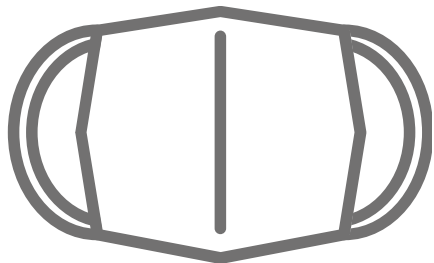
---



Knit products e.g. sweater, socks



Fabric e.g. suits, shirts



Face mask (slightly acidic)



General merchandise e.g. tableware, trash bag, raincoat

**Can Be Used in Various Products as an Eco-friendly Material Instead of polyester**

# Main Target

## 1. For all apparel products



- Can be used for all apparel products such as cut-and-sew, fabric, and knitted articles.
- Exporting companies



## 2. For baby products



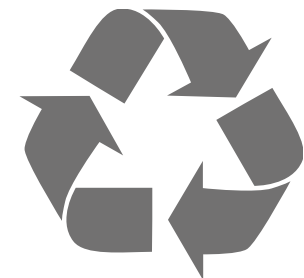
- Natural materials + antimicrobial and deodorant
- Cut-and-sew, mittens, socks and bibs etc.



## 3. Enterprise interested in SDG's



- Uniforms, material related



PLA (polylactic acid) Fiber

# Finally

---

CHECK !!

PLA products are on sale at the website below

<https://www.miyama-tex.shop/shopbrand/ct10/>



Thank you !