



GOING GREEN BY FRIEDRICH



### Level 3

Biodegradable polyester yarn to reduce microplastic pollution from textiles powered by CiCLO® technology

## Innovative CiCLO® Technology -

reduces microplastic pollution, retaining the positive characteristics of polyester yarn

Polyester is weatherproof, UV resistant and shows hardly any signs of usage. Its longevity becomes a problem when polyester enters the environment in the form of microplastics.

### Natural solution through CiCLO® Technology

During production, CiCLO® technology is embedded in the yarn, enabling microbial degradation. This drop-in solution requires no changes to existing processes and preserves the yarn's performance, usability and durability.

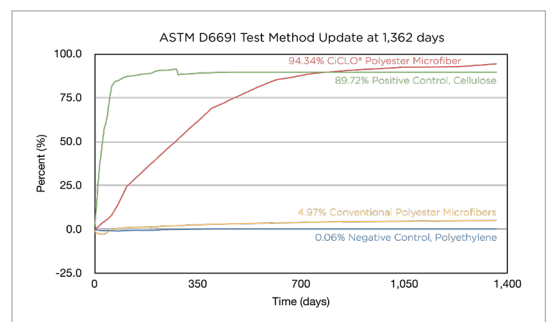
Microplastic particles released into the environment in the course of a textile's life can be biodegraded by microorganisms - just like naturally occurring fibers.

Independent certification confirms that CiCLO® ingredients meet ecologically responsible manufacturing standards, being OEKO-TEX® ECO PASSPORT certified and REACH compliant, and are safe and non-toxic to marine and plant life.

### Natural Seawater Environment - ASTM D6691-17 certified

ASTM D6691-17 Standard Test Method determines the rate and degree of aerobic biodegradation of plastic materials exposed to the indigenous population existing in natural seawater.

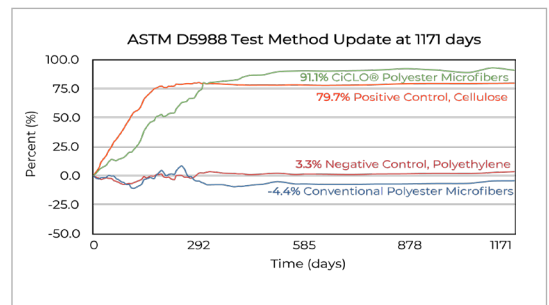
After 1,362 days in natural sea water, CiCLO® fibers (red line) biodegraded 94 %, whereas comparable untreated fibers (yellow line) biodegraded 5 %.



### Soil - ASTM D5988 certified

ASTM D5988 Standard Test Method determines the degree and rate of aerobic biodegradation of synthetic plastic materials on exposure to fertile soil to assure active microbiota that is mixed with compost to simulate agricultural applications.

After 1,171 days in soil conditions, CiCLO® microfibers (green line) are biodegraded 91 %, whereas comparable untreated microfibers (blue line) have not biodegraded at all.



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Georg+Otto Friedrich  
TEXTILES. MADE IN GERMANY.

### Our cooperation partner

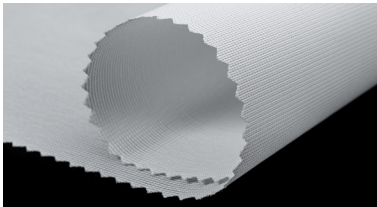
The innovative CiCLO® technology is distributed by Intrinsic Advanced Materials (IAM). In 2018, IAM was founded as a joint venture between Intrinsic Textiles Group (USA) und Parkdale Advanced Materials, a subsidiary of Parkdale Inc. The IAM team consists of scientists, engineers and experts from the textile industry. Together, they develop technologies that will lead to a more sustainable textile economy.

► We are a preferred CiCLO® partner and use certified CiCLO® yarn to produce our CiCLO® flag fabrics.

### Available products

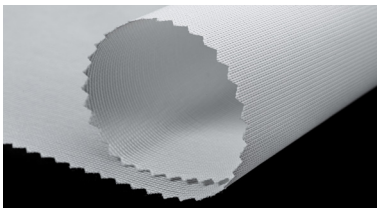
#### Jetflag Life GS | 6144CGS

- with GS finishing for the best printing results on most printers
- offers all advantages of Jetflag, doesn't cause microplastics



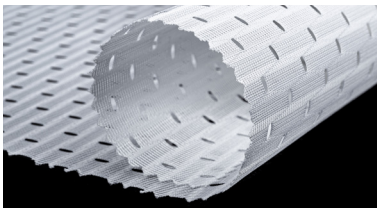
#### Jetflag Life K | 6144CK

- with K finishing for even better print-through and optimised especially for inline fixations
- offers all advantages of Jetflag, doesn't cause microplastics



#### Beach Life K | 6953CK

- with K finishing for even better print-through and optimised especially for inline fixations
- offers all the advantages of our mesh flag fabric (Beach), does not cause microplastics



### More information

 Georg+Otto Friedrich X CiCLO® Technology (YouTube)

 That's how CiCLO® Technology works (YouTube)



<https://ciclotextiles.com>



<https://worldsustainabilityleaders.com>



visit our website

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The use of CiCLO® as a word or figurative mark as well as the logo must be authorised by the trademark owner, Intrinsic Advanced Materials LLC. For textiles made from 100 % polyester yarn powered by CiCLO® technology purchased from Georg+Otto Friedrich, the following documents agreed on between GOF and IAM may also be used by third parties:

- GOF Circular Level 3 CiCLO® (PDF)
- templates for print labels with CiCLO® logo

If changes or additions are to be made to these documents, we will be happy to support you in obtaining the necessary authorisations from IAM. Further information on the use and utilisation of the CiCLO® brand can also be found at [www.ciclotextiles.com](http://www.ciclotextiles.com).

By using CiCLO® textiles you help to reduce textile microplastic pollution.



### Flag fabrics made of 100 % polyester powered by CiCLO® technology



- the biodegradation of the microplastic particles is carried out by naturally occurring microorganisms
- usual processing and usage
- identical durability compared to our standard flag fabrics
- suitable for direct printing with sublimation inks, transfer printing, screen printing
- directly available from stock
- woven labels with CiCLO® logo available





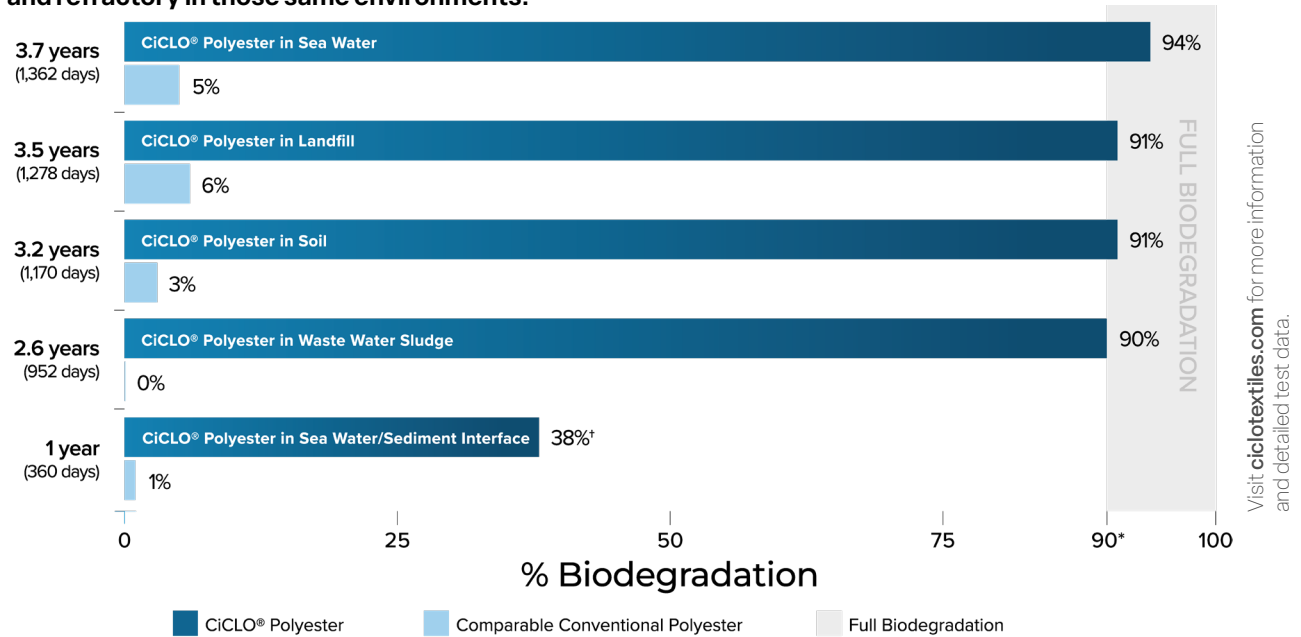
**Scientific testing results:**

**Biodegradation Rate Comparison CiCLO® Polyester vs. Comparable Conventional Polyester**

CiCLO® fibers, yarns and textiles have been proven effective over the course of several years through reliable scientific data from long term studies:

- gathered from independent third party laboratory studies with the American Society for Testing and Materials (ASTM)
- results gained from internationally recognized scientific and technological tests in simulated environments, e. g. seawater and soil
- results show rate and extent of biodegradation in these environments

**CiCLO® textiles and fugitive microfibers are metabolized by microbes while untreated textiles remain persistent and refractory in those same environments.**



\* Achieving ≥ 90 % in respirometry tests is considered full biodegradation. The remaining percentage can be attributed to biomass. Further analysis has been conducted to confirm no microplastics left behind.

† Study still in progress, data represents one point in time.

Data is summarized from studies conducted by 3rd party labs using ASTM/ISO Test Methods.

Synthetic fibers treated with **CiCLO® technology biodegrade like natural materials, at rates similar to wool.**

Comparative results of parallel tests run on wool samples along with 100% recycled CiCLO polyester.

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