How to identify recycled polyester?

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Polyester is a synthetic polymer that is very easy to recycle, if it is available in large quantities, sorted by type and with only minor contamination (this excludes any materials from the household waste stream). Used bottles made of PET from the food industry are ideal for recycling.

Many manufacturers and retailers promote this recycled polyester (rPET) as environmentally friendly and sustainable, since using recycled polyester from melted down and spun PET bottles uses fewer resources than producing new fibers.

However, it should be noted that the use of this material is "downcycling," as the PET material is removed from the stream and is no longer primarily used to make new drinking bottles or food packaging.

The use of textiles made of polyester fibers for the recovery of recycled polyester is also possible and is increasingly being realized on the market.

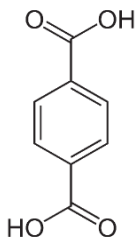
Here, however, the necessary effort for sorting and cleaning is significantly greater and the existing market is much smaller.

Due to the increasing global demand for recycled polyester from the food packaging industry (the mandatory use of recycled polyester in beverage bottles is growing due to implementation of Single Use Plastic Directives) and from apparels manufacturers, significantly higher and further increasing prices are demanded for the recycled material than for so called “virgin” PET.

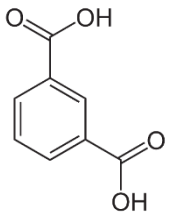
Against this background, it is logical to check whether the material offered or used is actually a containing the declared amount of recycled polyester.

INVESTIGATION ON rPET

The material used for PET bottles is characterized by the fact that, for reasons of better processability, in order to adjust the crystallinity of the polymer, about 2 % of the isophthalic acid (metha-phthalic acid) is added, in addition to the main component of linear terephthalic acid (para-phthalic acid):



Terephthalic acid (CAS no 100-21-0)



Isophthalic acid (CAS no 121-91-5)

The determination of the isophthalic acid content in a textile, film, or other polyester materials thus allows conclusions to be drawn about the content of the recycled polyester.

TUV Rheinland offers analysis to determine the isophthalic acid content and recommend this examination if products containing corresponding advertising claims and also to verify the origin of the material.

The determined content of isophthalic acid can be interpreted as follows:

Content of isophthalic acid	Interpretation of the results
< 0.1 %	No indication of relevant proportions of recycled PET bottles
0.1 % - 0.5 %	Low content of recycled PET bottles
0.5 % - 1.5 %	Significant content of recycled PET bottles
> 1.5 %	Made mostly or entirely from recycled PET bottles

However, the detection of isophthalic acid to prove the use of recycled polyester is not tamper-proof. In the production of polyester virgin fibers, a certain amount of isophthalic acid can be added to give the fiber the appearance of recycled polyester.

RECYCLED POLYESTER MADE OF POLYESTER TEXTIELS

Determining the content of isophthalic acid in recycled polyester obtained from polyester fibers of textiles is not useful. Polyester typically does not contain isophthalic acid and this additive is also not usually required in the initial production of polyester fibres.

Further information on current legal changes can also be found on our homepage at www.tuv.com or https://www.tuv.com/regulations-and-standards/en/.

Further technical information can be obtained from:

TÜV Rheinland LGA Products GmbH
Technical Competence Center Softlines

Dr. Ansgar Wennemer
Wennemer@de.tuv.com

Kathrin Endress
Kathrin.Endress@de.tuv.com

Am Grauen Stein 29
51105 Cologne
Germany

Info box: For additional information about REACH Services please see https://www.tuv.com/world/en/reach.html

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