

HG

**CHEMICAL INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

HG/T 5871-2021

**Technical specification for green-design product assessment -
Polyethylene terephthalate (PET) resin**

绿色设计产品评价技术规范 聚对苯二甲酸乙二醇酯(PET)树脂
(English Translation)

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1 Scope

This standard specifies the terms and definitions, assessment principles and methods, assessment requirements, product life cycle assessment report preparation methods for polyethylene terephthalate (PET) resin green design products.

This standard applies to the assessment of polyethylene terephthalate (PET) resin green design products, which are produced by the direct esterification process.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) is applicable to this standard.

GB/T 2589 General principles for calculation of the comprehensive energy consumption

GB 12348 Emission standard for industrial enterprises noise at boundary

GB/T 14189 Fiber grade polyester chip (PET)

GB 17167 General principle for equipping and managing of the measuring instrument of energy in organization of energy using

GB/T 17593.1 Textiles - Determination of heavy metals - Part 1: Atomic absorption spectrophotometry

GB/T 17931 Poly (ethylene terephthalate) (PET) resin for bottles

GB/T 19001 Quality management systems - Requirements

GB/T 23331 Energy management systems - Requirements with guidance for use

GB/T 24001 Environmental management systems - Requirements with guidance for

GB/T 24040 Environmental management - Life cycle assessment - Principles and frameworks

GB/T 24044 Environmental management - Life cycle assessment - Requirements and guidelines

GB 31572 Emission standard of pollutants for synthetic resin industry

GB 31604.49 National food safety standard - Food contact materials and articles - Determination of arsenic, cadmium, chromium and lead; migration of arsenic, cadmium, chromium, nickel, lead, antimony and zinc

GB/T 32161 General principles for eco-design product assessment

GB/T 32685 Purified terephthalic acid (PTA) for industrial use

GB 37822 Standard for fugitive emission of volatile organic compounds

GB/T 45001 Occupational health and safety management systems - Requirements with guidance for use

AQ/T 9006 Basic norms for work safety standardization of enterprises

SH/T 1817 Plastics - Determination of residual acetaldehyde in polyethylene terephthalate (PET) resin for bottles - Headspace gas chromatography Measures for the Disclosure of Environmental Information of Enterprises and Institutions (Order No.31 of the Ministry of Environmental Protection of the People's Republic of China, December 19, 2014)

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 Green-design product

Products that meet product performance and safety requirements, with low energy consumption, low pollution emissions, low environmental impact, harmless to human health, easy recycling and reuse, in the entire life cycle of raw material acquisition, product production, use, waste disposal, under the premise of meeting technical feasibility and economic rationality.

3.2 Life cycle

A series of linked stages in the product system, from the acquisition of raw materials from nature or natural resources to final disposal.

3.3 Life cycle assessment (LCA)

The stage of understanding and evaluating the potential environmental impact and importance of the product system throughout the product life cycle.

3.4 Direct esterification

A method of producing esters by direct reaction of acids and alcohols. High-purity terephthalic acid and ethylene glycol are prepared, according to the molar ratio, to form fluid bis(hydroxyethyl) terephthalate, then poly-condensed to obtain PET.

4.1.1 Principle of combining life cycle assessment with indicator assessment

Based on the principle of combining life cycle assessment with indicator assessment, the entire life cycle of polyethylene terephthalate (PET) resin products is considered; the resource and energy consumption, ecological environment, human health factors of each stage are deeply analyzed from product design, raw material acquisition, product production, product use, post-waste recycling, comprehensive utilization of the industrial "three wastes" produced, to select the indicators that can be evaluated at different stages to form an assessment indicator system.

4.1.2 Principle of optimal selection of environmental impact types

Based on the characteristics of polyethylene terephthalate (PET) resin products and production process characteristics, taking into account the types of environmental impacts that are of high social concern and clearly required by national laws or policies, select the key resource attributes, energy attributes, environmental attributes, product attributes for assessment. This technical specification selects indicators such as raw material unit consumption, fresh water consumption, waste recovery and resource utilization rate, unit product comprehensive energy consumption, unit product wastewater discharge, organic waste liquid harmless treatment rate, heavy metal, aldehyde content for assessment.

4.2.1 Assessment method

Technologies, processes, equipment that are eliminated or prohibited by the state or relevant departments shall not be used. Clean production audits shall be actively promoted.

5 Assessment requirements

5.1.2

Materials that are eliminated or prohibited by the state or industry shall not be used. Restricted materials shall not be selected beyond the scope. Manufacturers shall continue to pay attention to harmful substances, that are banned by the state and industry.

5.1.3

Pollutant emissions from manufacturers shall meet the requirements of national and local pollutant emission standards; strictly implement relevant national standards for energy conservation and environmental protection. The management of hazardous wastes shall comply with the requirements of national and local regulations.

5.1.4

The total amount of pollutants controlled by manufacturers shall meet the national and local pollutant emission total amount control indicators.

5.1.5

The enterprise of the product to be evaluated has no major production safety and sudden environmental pollution incidents, within 3 years as of the assessment date.

5.1.6

The level of enterprise safety production standardization shall meet the requirements of AQ/T 9006.

5.1.7

Production enterprises shall be equipped with energy metering instruments in accordance with GB 17167.

5.1.8

Production enterprises shall establish and operate environmental management systems, quality management systems, occupational health and safety management systems in accordance with GB/T 24001, GB/T 19001, GB/T 45001 (or the occupational health and safety management system of petrochemical enterprises); carry out energy consumption and material consumption assessments and establish assessment systems; or establish and operate energy management systems in accordance with GB/T 23331.

5.1.9

Enterprises are encouraged to dispose of or recycle surplus products and packaging.

5.1.10

Enterprises are encouraged to disclose environmental information in accordance with Articles 9 ~ 12 of the Measures for the Disclosure of Environmental Information of