声明书编号 CN24/00005371

生命周期评价核查声明书

生命周期清单和潜在环境影响

1 吨碳酸丙烯酯

以上产品计算由以下公司生产

山东利兴新材料科技股份有限公司

山东省临沂市郯城县皇亭路北侧兴郯路东侧

已验证满足 ISO 14044:2006

被核查产品的生命周期阶段为：（摇篮到大门）

产品生命周期评价结果如下：

Impact category	Unit	Value	Impact category	Unit	Value
酸雨	mol H+ eq	18.31835	人体毒性致癌	CTUh	6.57E-07
气候变化	kg CO2 eq	3329.3	人体毒性非致癌	CTUh	2.02E-05
淡水生态毒性	CTUe	234786.3	电离辐射	kBq U-235 eq	298.3969
颗粒物	disease inc.	0.000171	土地利用	Pt	10203.74
海水富营养化	kg N eq	3.582797	臭氧层消耗	kg CFC11 eq	0.001181
淡水富营养化	kg P eq	1.180693	光化学臭氧产生	kg NMVOC eq	12.65951
陆地富营养化	mol N eq	36.0887	资源枯竭，化石资源使用	MJ	69035.8
水资源利用	m3 depriv.	2525.785	资源枯竭，矿产和金属资源使用	kg Sb eq	0.035581

签署

David Xin

Sr. Director - Business Assurance

日期：2024 年 8 月 26 日

通标标准技术服务有限公司
北京市阜成路 73 号世纪裕惠大厦 16 层 100142
t +86 (0)10 58251188 www.sgsgroup.com.cn

通标标准技术服务有限公司（以下简称 SGS），经与山东利兴新材料科技股份有限公司（以下简称利兴新材，山东省临沂市郯城县皇亭路北侧兴郯路东侧）达成双边协议，依据 ISO 14044:2006 要求执行产品生命周期评价的核查，确认符合以下标准要求

ISO 14044:2006

角色和职责

利兴新材负责产品生命周期信息系统的管理，确保开发和维护的记录、报告流程符合该系统，包括产品生命周期信息评价和报告确认。

SGS 负责展现本次核查产品 1 吨碳酸丙烯酯的生命周期评价的核查意见。

SGS 于 2024 年 8 月 8~9 日依据 ISO 14040:2006 和 ISO 14044:2006 相关准则对责任方提供的产品生命周期声明进行了第三方核查。核查是基于客户与 SGS 商定的核查范围、目标和准则。

保证等级

商定的保证等级为合理保证。

适用范围

利兴新材委托 SGS 进行一次独立核查，以确保责任方所报告的 1 吨碳酸丙烯酯的生命周期评价活动与 ISO14044:2006 相关标准要求的符合性，提出保证声明的涵盖内容如下。

这一协议覆盖组织边界内产品生命周期环境影响的核查，且协议基于 ISO 14040:2006 和 ISO 14044:2006。

- 标题或活动描述：对 1 吨碳酸丙烯酯进行生命周期环境影响评价
- 产品类别规则：无
- 功能单位：1 吨碳酸丙烯酯
- 系统边界：涵盖了从摇篮到大门的生命周期评价，系统边界按照 ISO 14040:2006 和 ISO 14044:2006 规范明确界定。所有环境影响以 Environment Footprint 3.1 研究方法为基础。
- 数据资源：收集制造和自己的运作阶段的初级活动数据。次级活动数据收集主要来自 Ecoinvent3.8 数据库。
- 生命周期评价工具和指数：
- - 使用 Simapro9.6 版本软件进行生命周期排放量的计算.
- - 应用 Environment Footprint 3.1 评价模式
- 取舍准则：对于任何类别影响，如果相同影响在一个特定的过程/活动的总和小于 1%。
- 分配原则：
  - 多重输出：基于资源消耗及污染排放的变化，依照研究系统的产品输出、功能、或经济关系等来分配。

- 多重输入：基于实际关系的分配。例如，制造过程中的排放，可能会受到废物流输入变化影响。

- 生产地点：山东省临沂市郯城县皇亭路北侧兴郯路东侧
- 产品生命周期所产生的环境影响包括：展示在利兴新材提供的电子报告清单。
- 环境影响的种类是包括：Environment Footprint 3.1 评价模型指标
- 以下生产期间的环境影响信息被核查：2023 年 1 月 1 日-2023 年 12 月 31 日，排放涵盖的特定时期。
- 核查声明的预期使用者：客户

目标

本次核查目的是通过客观证据审查：

- 产品生命周期评价是否如组织的生命周期声明所述
- 所报的数据是准确的、完整的、一致的、透明的和没有实质错误或遗漏。

准则

核查依据的准则是 ISO 14044:2006。

实质性

基于产品生命周期评价声明的预期使用者的需要，本次核查的实质性定为 5%。

结论

山东利兴新材料科技股份有限公司依据 ISO 14044:2006 要求提出产品生命周期评价声明。SGS 以客观公正的立场，评价在 2023 年 1 月 1 日-2023 年 12 月 31 日期间产品生命周期信息，经 SGS 核查达到合理保证等级，与商定的核查范围、目标和准则一致。

SGS 采用风险评估方法为基础，理解所报告的生命周期评价信息相关的风险并加以控制，从而减轻风险。我们的检查包括评估与组织产品的生命周期评价报告相关数量证据和生命周期评价报告披露。

SGS 计划并执行相关工作来获取必要的信息、解释和证据，以提供合理保证等级，确保能公正地陈述责任方的 1 吨碳酸丙烯酯产品的生命周期评估。

SGS 所提供的关于利兴新材产品生命周期评价声明的核查，包括对生命周期信息系统进行评价、监控和报告计划或协议。这次评价包括收集用以支持所报告数据的证据，以及检查所参考的协议条款是否被一致和适当地应用。

SGS 认为责任方递交的产品生命周期评价声明

- 是实质性准确的，且为生命周期数据和信息的真实展现，及
- 是依据 ISO 14044:2006 的要求对生命周期评价进行量化、监控和报告。

本核查声明书有效期为两年，此声明必须与“LCA 报告-利兴新材-碳酸丙烯酯”生命周期评价报告作为一个整体进行解释说明。

本生命周期评价核查声明是以英语订立。若有任何译文差异，以英文版为准。

Statement CN24/00005371

Life Cycle Assessment Verification Statement

The life cycle inventory and potential environmental impacts of

1t Propylene carbonate

which is made by

Shandong Lixing Advanced Material Co.,Ltd.

Huang Ting Road,Tancheng County,Linyi City,Shandong Province,China.

has been verified meeting the requirements of

ISO 14044:2006

For the life cycle assessment of product: **Cradle to Gate**

The results of product life cycle assessment are as follows:

Impact category	Unit	Value	Impact category	Unit	Value
Acidification	mol H+ eq	18.31835	Human toxicity, cancer	CTUh	6.57E-07
Climate change	kg CO2 eq	3329.3	Human toxicity, non-cancer	CTUh	2.02E-05
Ecotoxicity, freshwater	CTUe	234786.3	Ionising radiation	kBq U-235 eq	298.3969
Particulate matter	disease inc.	0.000171	Land use	Pt	10203.74
Eutrophication, marine	kg N eq	3.582797	Ozone depletion	kg CFC11 eq	0.001181
Eutrophication, freshwater	kg P eq	1.180693	Photochemical ozone formation	kg NMVOC eq	12.65951
Eutrophication, terrestrial	mol N eq	36.0887	Resource use, fossils	MJ	69035.8
Water use	m3 depriv.	2525.785	Resource use, minerals and metals	kg Sb eq	0.035581

Authorized by

David Xin
Sr. Director - Business Assurance
Date: 26 August 2024

SGS-CSTC Standards Technical Services Co., Ltd.
16F Century YuHui Mansion, No. 73 Fucheng Road, Beijing, P.R. CHINA 100142
t +86 (0)10 58251188 www.sgsgroup.com.cn

SGS has been commissioned by Shandong Lixing Advanced Material Co.,Ltd. (hereinafter referred to as "LIXING NEW MATERIALS"), Huang Ting Road,Tancheng County,Linyi City,Shandong Province,China. for the verification of the Life Cycle Assessment (LCA) of product as provided by LIXING NEW MATERIALS in accordance with

ISO 14044:2006

Roles and responsibilities

The management of LIXING NEW MATERIALS is responsible for the organization's LCA information system, the development and maintenance of records and reporting procedures in accordance with that system, including the calculation and determination of the LCA of product information and the reported LCA of product.

It is SGS's responsibility to express an independent LCA verification opinion on the LCA of 1t Propylene carbonate.

SGS conducted a third-party verification of the provided LCA assertion against the principles of ISO 14040: 2006 and ISO 14044: 2006 on 8~9 August 2024. The verification was based on the verification scope, objectives and criteria as agreed between LIXING NEW MATERIALS and SGS.

Level of Assurance

The level of assurance agreed is that of reasonable assurance.

Scope

LIXING NEW MATERIALS has commissioned an independent verification by SGS-CSTC of reported LCA of product of LIXING NEW MATERIALS arising from the manufacture of 1t Propylene carbonate product activities, to establish conformance with ISO 14040 principles within the scope of the verification as outlined below.

This engagement covers verification of emission from life cycle of the product of environmental impact included within the organization's boundary and is based on ISO 14040 and ISO 14044.

- Title or description activities: LCA of 1t Propylene carbonate.
- Product Catalog Rule: there was not relevant PCR can be considered.
- Functional unit: 1t Propylene carbonate.
- System boundary: Covers a cradle to gate assessment of the life cycle impacts, the system boundary be clearly defined in accordance with ISO 14040:2006 and ISO 14044:2006. All environmental impact's enlisted on Environment Footprint 3.1.

- Data resources: The primary data collection from manufacture and own operation phase. The secondary data collection mainly from Ecoinvent database (Version 3.8)
- Life cycle assessment tool and index using:
  - Software applied Simapro 9.6 version.
  - Environment Footprint 3.1.
- Cut-off rules: For any impact category, if the sum of various impacts from a specific process/activity is less than 1% of the impact equivalent in that category
- Allocation rules:
  - Multi-output: The allocations are based on the changes in the resource consumption and pollutant emissions following the changes in the studied system's output product, or function or economical relationship.
  - Multi-input: The allocation is based on actual relationship. For example, the manufacturing process's emissions may be affected by the change in waste flow input.
- Manufacturing locations: Huang Ting Road,Tancheng County,Linyi City,Shandong Province,China.
- Environmental impacts arising from the life cycle of product included: Sources as presented in the inventory spreadsheet provided by LIXING NEW MATERIALS.
- Types of environmental impact is included: Environment Footprint 3.1.
- Environmental impacts information for the following production period was verified: 1 January 2023 to 31 December 2023, emissions covered the period.
- Intended user of the verification statement: Customer

Objective

The purposes of this verification exercise are, by review of objective evidence, to independently review:

- Whether the LCA of product is as declared by the organization's LCA assertion
- The data reported are accurate, complete, consistent, transparent, and free of material error or omission.

Criteria

Criteria against which the verification assessment is undertaken are the principles of ISO 14044:2006.

Materiality

The materiality required of the verification was considered by SGS to 5%, based on the needs of the intended user of the LCA Assertion.

Conclusion

Shandong Lixing Advanced Material Co.,Ltd. provided the LCA assertion based on the requirements of ISO 14044:2006. The LCA information of product for the production period form 1 January 2023 to 31 December 2023 are verified by SGS to a reasonable level of assurance, consistent with the agreed verification scope, objectives, and criteria.

SGS's approach is risk-based, drawing on an understanding of the risks associated with reporting the LCA of product information and the controls in place to mitigate these. Our examination includes assessment, on a test basis, of evidence relevant to the amounts and disclosures in relation to the organization's reported LCA of product.

We planned and performed our work to obtain the information, explanations, and evidence that we considered necessary to provide a reasonable level of assurance that LCA of 1t Propylene carbonate are fairly stated.

We conducted our verification with regard to the LCA assertion of LIXING NEW MATERIALS which included assessment of LCA information system, monitoring and reporting plan/protocol. This assessment included the collection of evidence supporting the reported data, and checking whether the provisions of the protocol reference, were consistently and appropriately applied

In SGS's opinion the presented LCA assertion

- is materially correct and is a fair representation of the LCA data and information, and
- is prepared in accordance with ISO14044:2006 on LCA quantification, monitoring and reporting.

This statement shall be interpreted with the LCA assertion of "LCA report-LIXING NEW MATERIALS- Propylene carbonate " as a whole, this result shall be valid for a maximum period of two years.