ISO 14064 核查意见书

编　　号：XRD260406

核查年度：2025 年 1 月 1 日—2025 年 12 月 31 日

委托单位：戴卡优艾希杰渤铝汽车零部件有限公司

核查机构：天津鑫瑞达咨询服务有限公司

报告日期：2026 年 4 月 16 日

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一、核查基本信息

1.1 核查目的

对委托单位温室气体排放数据进行独立、客观核查，验证排放报告的真实性、准确性、完整性，确认其符合 ISO 14064-1、ISO 14064-3 及相关国家/行业标准要求，为碳排放披露、碳交易、供应链审核、绿色认证等提供第三方核查结论。

1.2 核查依据

- ISO 14064-1:2018《温室气体 第 1 部分：组织层面温室气体排放和清除的量化和报告指南及规范》
- ISO 14064-3:2019《温室气体 第 3 部分：温室气体声明核查与验证指南》
- GB/T 32150-2015《工业企业温室气体排放核算和报告通则》
- 国家/地方/行业温室气体核算方法与排放因子
- 委托单位温室气体排放报告、管理制度、监测计划、原始数据及支撑文件

1.3 核查范围

1). 组织边界：

法人实体/运营控制边界/财务控制边界，包含：位于河北省秦皇岛市海港区北环路 89 号的戴卡优艾希杰渤铝汽车零部件有限公司所有活动和设施

2). 运营边界：

厂区/车间/办公区/分支机构： 铝制汽车零部件的生产及相关管理活动

3). 排放范围：

范围 1（Scope1）直接温室气体排放

范围 2（Scope2）外购电力间接排放

范围 3（Scope3）其他间接排放

4). 涵盖气体：

CO_2 、CH_4 、N_2 O、HFCs、PFCs、SF_6 等，统一折算为二氧化碳当量（tCO_2 e）

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1.4 核查准则

- 保证等级：合理保证

- 重要性水平：≤5%

- 核查方法：文件评审、现场核查、数据抽样复核、计量器具验证、计算过程复核、人员访谈、交叉验证

二、委托单位概况

单位名称：戴卡优艾希杰渤铝汽车零部件有限公司

注册地址：河北省秦皇岛市海港区北环路 89 号

生产/运营地址：河北省秦皇岛市海港区北环路 89 号

主营业务：铝制汽车配件的生产及加工

主要产品：铝制汽车配件

温室气体管理负责人及部门： 韩立军、马健，EHS 部

温室气体核算与报告体系建设情况：体系建设完善

三、核查过程与方法

3.1 边界与排放源识别

1). 组织边界确定依据及说明

2). 运营边界及设施清单

3). 排放源识别与分类（按范围 1/2/3）

4). 不纳入核算范围的设施/排放源及理由

3.2 数据来源与验证

1). 活动数据来源：能源消耗台账、采购票据、电力结算单、生产报表、燃料消耗记录、工艺运行记录等

2). 数据抽样原则：关键排放源全覆盖，一般排放源抽样核查

3). 数据质量验证：完整性、时效性、一致性、可追溯性核查

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3.3 核算方法

采用排放因子法核算：

温室气体排放量 = 活动数据 × 排放因子 × 全球变暖潜势（GWP）

排放因子来源：IPCC、Ecoinvent 3.11、国家/行业/区域排放因子、企业实测数据、CDCP(中国产品生命周期因子库）

3.4 不确定性分析

主要不确定性来源：活动数据精度、排放因子选取、计量偏差、计算方法等

总体不确定性水平：5%

四、温室气体排放核查结果

单位：tCO_2e

4.1 范围 1 直接排放

1). 固定燃烧排放：88.58

2). 移动源排放：2.10

3). 工业工艺过程排放：0

4). 逸散排放：528.96

范围 1 合计：619.64

4.2 范围 2 间接排放

1). 外购电力排放：438.13

2). 外购蒸汽/热水/热力排放：0

范围 2 合计：438.13

4.3 范围 3 其他间接排放（如适用）

1).源自交通产生的排放：340.42

2).源自组织使用的产品的间接排放：53983.02

3). 电力/燃料生产设施及基建（上游）：46.93

4).废弃物处理及运输产生的排放：215.29

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范围 3 合计：54585.66

4.4 总排放量

核查后年度总温室气体排放量：**55643.43** tCO_2e

4.5 与企业自报数据差异说明

企业申报排放量：**50683.02** tCO_2e

核查调整量：**4960.41** tCO_2e

差异率：**8.91%**

差异原因：数据修正、边界调整、排放因子更新、计量误差、计算错误等

五、核查发现与不符合项

5.1 观察项（改进建议）

1). 公务车的冷媒采用的计算方法是添加计算，后面建议考虑用逸散方法进行计算；

2).七氟丙烷排放采用的计算方法是添加计算，后面建议考虑用逸散方法进行计算；

5.2 不符合项

1. 一般不符合项：

描述：

1).废水处理产生的排放核算方法有误，未考虑 COD 浓度差的计算；

整改要求：修正计算方法

2). 电的因子引用不适合，未采用最新国家公布的数据；

整改要求：修正因子

2. 重大不符合项（如有）：无

描述：

整改要求：

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六、核查结论

经独立核查，确认委托单位 戴卡优艾希杰渤铝汽车零部件有限公司 2025 年度温室气体排放报告在所有重大方面符合 ISO 14064-1、ISO 14064-3 及相关法规标准要求，核查数据真实、准确、完整，不存在重大错报，能够公允反映该年度温室气体排放状况。

七、减排建议

7.1、源头材料低碳：大力普及再生铝闭环替代

1). 大幅提升再生铝配比

售后备件优先采用汽车报废拆解纯废铝，底盘 / 轮毂 / 结构件备件再生铝占比≥60%，高端结构件远期提升至 85%~95%。

2). 严控杂质，配套高精度分选除杂，保障备件力学性能匹配原车标准，适配维修替换场景。

3). 闭环回收体系建设，联动主机厂、4S 店、报废车企、拆解企业，搭建报废汽车铝备件→回收分选→再生熔炼→新备件本地闭环供应链。

4). 建立备件全生命周期溯源，区分原厂旧件、边角料、报废件分级回收，杜绝低质杂铝混入。

5). 轻量化结构优化减材，备件轻量化拓扑优化，减少铝材用量；采用高比强低碳铝合金，同等强度用料更少，从源头降碳。

7.2、能源结构清零：全面替换化石能源，多用绿电绿氢

1). 冶炼能源深度脱碳

淘汰高碳燃气熔炼炉，全面改用中频电感应炉、电炉熔炼；推广绿电 + 氢能熔炼，彻底替代煤、天然气。

2). 长期通过绿电 PPA 长协、光伏自发自用、水电 / 风电直购，实现熔炼、热处理 100% 清洁能源供电。

3). 全工序电气化改造

压铸、热处理、机加工、喷涂全线电气化，关停燃油供热、燃油动力设备，降低间接碳排放。

4). 余热高效回收利用

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熔炼烟气余热回收供暖、预热铝料，炉体余热循环利用，单炉能耗降低 15%~25%。

7.3、生产工艺革新：铸造 + 加工全流程降耗减碳

1). 一体化压铸精简工序

多零散铝备件合并一体压铸，减少焊接、拼接、装配工序，大幅降低加工能耗与物料损耗。

2). 推广免热处理铝合金备件，省去高温热处理高耗能环节，制造端碳排放最高降 97.5%。

熔炼铸造节能提质

3). 低温低压压铸、精密近净成型，提高材料利用率，减少边角废料；精细化控温，避免过度熔炼损耗。

4). 密闭熔炼 + 烟气捕集，降低无组织排放与热损失，提升热效率。

5). 后处理低碳改造

水性涂装、粉末涂装替代高 VOC 溶剂喷涂；低温固化工艺，降低烘干能耗。

6). 精密数控加工，减少切削余量，降低机加工耗电与废铝产生。

7.4、全生命周期循环：售后 + 报废闭环长效降碳

1). 备件再制造循环复用

老旧铝轮毂、底盘结构件、壳体备件无损修复、翻新再制造，直接二次售后使用，零熔炼碳排放。

建立二手合格备件认证体系，扩大维修市场循环供给。

2). 边角料 100% 内部回用

压铸飞边、机加工铝屑、浇冒口全部就近回收重熔，不外卖、不外流，厂区内部零废弃循环。

3). 逆向物流低碳化

集中集约化配送备件，整车满载运输；就近布局再生与备件基地，缩短长途汽运距离，降低物流碳排。

7.5、碳管理数字化：核算、溯源、管控一体化

1). 全流程碳足迹核算

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按 ISO 14064 核算备件原料 - 生产 - 物流 - 使用 - 回收全生命周期碳足迹，建立单品碳台账。

区分原生铝、再生铝、绿电、灰电单独核算，精准定位高碳环节。

2). 数字化低碳管控

上线能耗在线监测、炉效智能管控、配料智能优化，实时管控熔炼、热处理高耗能工序。

3). 区块链溯源再生铝来源、绿电凭证，满足出口 CBAM、国内碳核查合规要求。

4). 碳交易与碳抵消

纳入全国碳市场，配额管控减排；林业碳汇、绿证合理抵消剩余碳排放，降低履约成本。

7.6、政策合规与产业链协同

1). 紧跟国家铝产业低碳政策

对标《铝产业高质量发展实施方案》，落实再生铝强制比例、绿色铝采购、碳足迹认证要求中国政府网。

2). 提前适配欧盟碳关税、海外车企低碳准入，优先供应低碳绿色铝备件。

3). 上下游协同降碳

倒逼上游铝锭 / 再生铝企业低碳供电；联动主机厂约定备件再生铝配额、低碳采购标准。

4). 行业共建统一再生铝品质、碳核算、备件循环标准，避免无序高碳竞争。

7.7、短期快速见效 + 长期战略路径

1). 短期（1-2 年）

电炉替换燃气炉、厂区光伏、废铝内部回用、免热处理工艺落地，快速降碳 30%+。

2).中长期（3-5 年）

全闭环再生铝供应链、100% 绿电生产、一体化压铸普及、备件再制造规模化，行业整体碳强度下降 70%~90%。

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八、签字盖章

核查员签字：孙经伟

核查负责人签字：[illegible]

核查机构（盖章）：

日期：2026 年 4 月 18 日

九、附件清单

盘查清册

盘查报告

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ISO 14064-1:2018 Greenhouse Gas Emissions Verification Opinion

Report No.: XRD260406

Verification Period: January 1, 2025 – December 31, 2025

Entrusting Party: Dicastal UACJ Bolv Automotive Components Co., LTD

Verification organization:Tianjin Xinruida Consulting Service Co., Ltd.

Report Date: April 16, 2026

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1.1 Verification Purpose

To conduct an independent and objective verification of the client's greenhouse gas (GHG) emission data, verify the authenticity, accuracy and completeness of the emission report, confirm its compliance with ISO 14064-1, ISO 14064-3 and relevant national/industrial standards, and provide third-party verification findings for carbon emission disclosure, carbon trading, supply chain verification, green certification, etc.

1.2 Verification Standard

1). ISO 14064-1:2018 *Greenhouse gases — Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals*

2).ISO 14064-3:2019 *Greenhouse gases — Part 3: Specification with guidance for the validation and verification of greenhouse gas statements*

3). GB/T 32150-2015 *General principles for accounting and reporting of greenhouse gas emissions of industrial enterprises*

4). National/local/industrial GHG accounting methodologies and emission factors

5). GHG emission report, management system, monitoring plan, raw data and supporting documents of entrusting party

1.3 Scope of Verification

1). **Organizational Boundary**:Legal entity / operational control boundary / financial control boundary, covering all activities and facilities of Dicastal UACJ Bolv Automotive Components Co., LTD located at No.89 Beihuan Road, Haigang District ,Qinhuangdao City , Hebei Province China

2). **Operational Boundary**:Factory/workshop/office area/branches: Production and related management activities of aluminum automotive components.

3). **Emission Scopes**:
Scope 1: Direct GHG emissions
Scope 2: Indirect emissions from purchased electricity
Scope 3: Other indirect emissions.

4). **Gases Covered**:CO_2 , CH_4 , N_2 O, HFCs, PFCs, SF_6 , etc., uniformly converted to carbon dioxide equivalent (tCO_2 e).

1.4 Verification Criteria

1). Assurance Level: Reasonable Assurance
2). Materiality Level: ≤5%

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3). Verification Methods: Document review, on-site verification, data sampling and review, verification of measuring equipment, calculation process review, personnel interviews, cross-verification

2. Profile of entrusting party

2.1 Name: Dicastal UACJ Bolv Automotive Components Co., LTD
2.2 Registered Address: No. 89 North Ring Road, Haigang District, Qinhuangdao City, Hebei Province
2.3 Operation/Production Address: No.89 Beihuan Road, Haigang District ,Qinhuangdao City , Hebei Province China
2.4 Main Business: Production and processing of aluminum automotive parts
2.5 Main Products: Aluminum automotive parts
2.6 GHG Management Person-in-Charge and Department: Han Lijun, Ma Jian; EHS DepartmentStatus of GHG
2.7 Accounting and Reporting System: Well-established

3 Verification Process and Methodology

3.1 Boundary and Emission Source Identification

1). Basis and explanation for determining organizational boundary
2). Operational boundary and facility list
3). Identification and classification of emission sources (by Scope 1/2/3)
4). Facilities/emission sources excluded from accounting and reasons

3.2 Data Source and Validation

1). Activity Data Sources: Energy consumption ledgers, purchase invoices, electricity settlement sheets, production reports, fuel consumption records, process operation records, etc.
2). Data Sampling Principle: Full coverage of key emission sources; sampling verification for general emission sources
3). Data Quality Verification: Verification of completeness, timeliness, consistency and traceability

3.3 Accounting Methodology

Emission Factor Method adopted:GHG Emissions = Activity Data × Emission Factor × Global Warming Potential (GWP)Sources of Emission Factors: IPCC, Ecoinvent 3.11, national/industrial/regional emission factors, enterprise-measured data, CDCP (China Product Life Cycle Factor Database)

3.4 Uncertainty Analysis

Main Sources of Uncertainty: Accuracy of activity data, emission factor selection, measurement deviation, calculation method, etc.Overall Uncertainty Level: 5%

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4 GHG Emission Verification Results (Unit: tCO_2e

4.1 Scope 1 Direct Emissions

1). Stationary Combustion Emissions: 88.58
2). Mobile Source Emissions: 2.10
3). Industrial Process Emissions: 0
4). Fugitive Emissions: 528.96
5). **Total Scope 1: 619.64**

4.2 Scope 2 Indirect Emissions

1). Emissions from Purchased Electricity: 438.13
2). Emissions from Purchased Steam/Hot Water/Heat: 0
3). **Total Scope 2: 438.13**

4.3 Scope 3 Other Indirect Emissions (where applicable)

1). Emissions from Transportation: 340.42
2). Indirect Emissions from Use of Products: 53,983.02
3). Upstream Electricity/Fuel Production Facilities and Infrastructure: 46.93
4). Emissions from Waste Treatment and Transportation: 215.29
5). **Total Scope 3: 54,585.66**

4.4 Total Emissions

Verified Annual Total GHG Emissions: **55,643.43 tCO_2 e**

4.5 Explanation of Differences from Client's Self-reported Data

1). Client's Reported Emissions: 50,683.02 tCO_2 e
2). Verification Adjustment: 4,960.41 tCO_2 e
3). Difference Ratio: 8.91%
4). Reasons for Differences: Data correction, boundary adjustment, updated emission factors, measurement errors, calculation errors, etc.

5 Verification Findings and Non-conformities

5.1 Observations (Improvement Recommendations)

1). The refrigerant calculation method for official vehicles uses the top-up method; it is recommended to adopt the fugitive emission method in the future.

2). The calculation method for heptafluoropropane emissions uses the top-up method; it is recommended to adopt the fugitive emission method in the future.

5.2 Non-conformities

1). Minor Non-conformities

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. Description: Incorrect accounting method for emissions from wastewater treatment, failure to consider calculation based on COD concentration difference.Corrective Requirement: Revise the calculation method.

. Description: Inappropriate electricity emission factor cited; latest nationally published data not used.

. Corrective Requirement: Revise the emission factor.

2). Major Non-conformities: None

6 Verification Conclusion

Upon independent verification, it is confirmed that the 2025 GHG emission report of the client, Dicastal UACJ Bolv Automotive Components Co., LTD complies in all material respects with ISO 14064-1, ISO 14064-3 and relevant regulatory standards. The verified data are true, accurate and complete, free from material misstatements, and fairly present the GHG emissions performance of the year.

7 Emission Reduction Recommendations

7.1 Low-carbon Raw Materials: Promote Closed-loop Replacement with Recycled Aluminum

1). Significantly increase the proportion of recycled aluminum; use pure aluminum scrap from end-of-life vehicles for after-sales parts, with recycled aluminum ratio ≥60% for chassis/wheel/structural parts, and 85%–95% for high-end structural parts in the long term.

2). Strictly control impurities with high-precision sorting and purification to ensure mechanical properties match original vehicle standards.

3). Build a closed-loop recycling system connecting OEMs, 4S shops, end-of-life vehicle enterprises and dismantling enterprises.

4). Establish full life cycle traceability for parts and stratified recycling to avoid low-quality mixed aluminum.

5). Optimize lightweight structures to reduce material usage and adopt high-specific-strength low-carbon aluminum alloys.

7.2 Clean Energy Transition: Replace Fossil Fuels with Green Electricity and Hydrogen

1). Deep decarbonization of smelting energy: phase out high-carbon gas-fired furnaces, adopt medium-frequency induction furnaces and electric furnaces; promote green electricity + hydrogen smelting.

2). Achieve 100% clean energy supply for smelting and heat treatment via green electricity PPA, on-site photovoltaic (PV) power, direct hydropower/wind power purchase.

3). Full-process electrification: electrify die-casting, heat treatment, machining and painting; shut down fossil fuel–fired equipment.

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4). Efficient waste heat recovery: reuse flue gas and furnace waste heat to reduce unit energy consumption by 15%–25%.

7.3 Process Innovation: Whole-process Consumption and Carbon Reduction in Casting and Machining

1). Integrated die-casting to simplify processes, reduce welding, assembly and material waste.

2). Promote heat-treatment-free aluminum alloys to eliminate high-energy heat treatment, reducing manufacturing emissions by up to 97.5%.

3）.Low-temperature low-pressure die-casting and near-net-shape forming to improve material utilization.

4). Closed smelting and flue gas capture to reduce fugitive emissions and heat loss.

5). Low-carbon post-treatment: water-based and powder coating instead of high-VOC solvent painting; low-temperature curing.

6). Precision CNC machining to reduce cutting allowance and power consumption.

7.4 Full Life Cycle Circularity: Closed-loop Carbon Reduction for After-sales and End-of-life

1). Parts remanufacturing: nondestructive repair and refurbishment of used aluminum parts for secondary use.

2). 100% internal reuse of scrap: on-site recycling and remelting of die-casting flashes, machining chips and gates.

3). Low-carbon reverse logistics: centralized full-load distribution and short-haul transportation to lower logistics emissions.

7.5 Digital Carbon Management: Integrated Accounting, Traceability and Control

1). Full-process carbon footprint accounting in accordance with ISO 14064; establish single-product carbon ledgers.

2). Digital low-carbon control: online energy monitoring, intelligent furnace efficiency and recipe optimization.

3). Blockchain traceability for recycled aluminum and green power certificates to meet CBAM and domestic carbon verification requirements.

4). Carbon trading and offsetting: quota management, forest carbon sinks and green certificates for cost reduction.

7.6 Policy Compliance and Industrial Chain Collaboration

1). Follow national low-carbon policies for aluminum industry; implement mandatory recycled aluminum content, low-carbon aluminum procurement and carbon footprint certification.

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2). Prepare for EU CBAM and low-carbon access requirements of overseas automakers.

3). Collaborate upstream and downstream to require low-carbon power supply and low-carbon procurement standards.

4). Jointly establish industry standards for recycled aluminum quality, carbon accounting and parts recycling.

7.7 Short-term Quick Wins + Long-term Strategic Path

1). Short-term (1–2 years): Replace gas furnaces with electric furnaces, install on-site PV systems, internal scrap reuse, implement heat-treatment-free processes; reduce carbon emissions by more than 30%.

2). Medium-to-long-term (3–5 years): Full closed-loop recycled aluminum supply chain, 100% green electricity, wide application of integrated die-casting, large-scale parts remanufacturing; reduce industrial carbon intensity by 70%–90%.

8 Signature and Seal

8.1 Verifier Signature: Jingwei. SUN

8.2 Verification Manager Signature: Xiaoming. Xue

8.3 Verification Body (Seal):Date: April 18, 2026

9 Attachment List

9.1 Verification Inventory

9.2 Verification Report

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