低碳科技　塑领未来

LOW-CARBON TECH　SHAPING THE FUTURE

PCR产业·低碳循环
PCR Industry · Low Carbon & Circularity

利在当下·功在千秋
Benefit presence and future

材料创新·全球引领
Materials Innovation · Global Leadership

携手共进·相互成就
Working Together, Mutual Achievement

上海奥塞尔材料科技有限公司
SHANGHAI AUSELL MATERIAL TECHNOLOGY CO., LTD

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Ausell 奥塞尔

PCR低碳材料产品手册
PCR PORTFOLIO MANUAL

PCR材料高值化应用解决方案
High-Value Application Solutions for PCR Materials

PCR	ELV	PCR
工程塑料	材料解决方案	汽车回收料
Post-Consumer Recycled	End-of-Life Vehicle (ELV) Material Solutions	Post-consumer Recycle for Automotive industry

上海奥塞尔材料科技有限公司
SHANGHAI AUSELL MATERIAL TECHNOLOGY CO., LTD

CORPORATE VISION
企业愿景

致力于成为全球 PCR 行业的领导者

To become the global leader in the PCR industry



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公司简介

上海奥塞尔材料科技有限公司（以下简称“ 奥塞尔 ”）成立于 2005 年，总部位于上海市松江国家经济技术开发区、G60 科创走廊。在全国拥有多个 PC 再生资源前端处理加工基地，总环评超 13 万吨 / 年。长期专注于高品质低碳 PC、ABS、PP、PA、PMMA 等 PCR 材料研发、生产及销售。产品主要运用于高端新能源汽车、高端消费类电子、智能家居、高端照明等领域。公司拥有回收、分选、粉碎、清洗、造粒、检验等的完整生态产业链，是中国境内较早期从事车灯加工利用且具有规模效应的 PCR 材料企业，并为客户提供定制化的高性能、低碳环保、可追溯的系统解决方案。

奥塞尔长期致力于推动中国 PCR 行业高品质可持续、高质量发展，作为中国再生 PC：GB/T 40006.7-2021《塑料 再生塑料 第 7 部分：聚碳酸酯 PC 材料》牵头起草单位，中国再生 PP：GB/T 40006.3-2021《塑料 再生塑料 第 3 部分：聚丙烯 PP 材料》起草单位，中国再生 ABS：GB/T 40006.5-2021《塑料 再生塑料 第 5 部分：丙烯晴 - 丁二烯 - 苯乙烯 ABS 材料》起草单位，拥有 ISO 9001 质量管理体系、ISO 14001 环境管理体系、ISO 45001 职业健康管理体系，IATF16949 汽车行业全球质量管理体系认证，对产品各个环节进行全程监控，确保产品高质量出厂品质。公司拥有 50 多项专利，包括发明专利 7 项、实用新型专利 24 项、软件著作权 21 项，曾先后获得了小昆山“ 小老虎企业 ”、小昆山“ 科技创新奖 ”、“ 上海市高新技术企业 ”、“ 上海市专精特新中小企业 ” 等荣誉称号。在绿色低碳可持续认证方面，奥塞尔公司产品已经通过全球知名认证机构比如 TUV 认证，UL2809、GRS 认证等相关国际认证。

2020 年，奥塞尔与农夫山泉、科思创三方跨界合作，打造了全球领先的 19L 聚碳酸酯（PC）水桶闭环循环体系，构建了覆盖“ 生产 - 消费 - 回收 - 再生 - 高值化应用 ” 的产业链闭环模式。通过尖端再生技术，将废旧饮用水桶转化为高性能 PCR PC 材料，应用于电子电器行业，推动中国循环经济模式走向世界。同时把更多品牌的废旧水桶应用于新能源汽车、高端消费类电子产品，为汽车行业解决源头的汽车 PCR PC 材料技术难题，为零部件厂商提供性比价卓越的可喷涂、高光的外饰件、结构件、内饰件汽车回收 PC 材料，助力汽车行业可持续发展。

2024 年，在欧盟《车辆循环设计及报废管理》（ELV）提案推动全球汽车产业绿色转型的背景下，在德国国际合作组织 GIZ 的牵头下，奥塞尔联合科思创、中汽研、大众、蔚来、格林美等知名企业，以创新为引擎，以可持续为使命，率先突破行业壁垒，共同推进车用塑料闭环回收，将废弃汽车材料转化为用于生产新车零部件的原材料，打造“ 从汽车到汽车 ”（CAR-TO-CAR）的高值化闭环解决方案，树立循环经济领域的国际标杆。汽车闭环项目凭借尖端再生技术与全链路追溯体系，已经获得 TÜV 全球首张废旧汽车车灯来源认证与 UL 2809 全球首张车灯再生料来源认证，重塑汽车全生命周期的可持续未来，填补汽车零部件高值化回收的国际标准空白，推动中国制造与国际 ESG 标准接轨。

在双碳战略目标背景下，奥塞尔作为再生塑料行业的创新引领者，始终秉持 " 资源再生，价值重塑 " 的企业使命，致力于将废弃塑料转化为高价值的再生材料，减少废弃物和碳排放，为实现可持续发展目标做出贡献，坚定不移往成为再生塑料行业的先行者而努力，通过技术创新、产业链整合、市场拓展和品牌建设，推动再生塑料材料在高端领域的应用，为高端制造业提供了真正可持续的材料解决方案。在产业链整合方面，奥塞尔将秉持必作于细，必成于实的坚定信念，全面打造闭环高值化 PCR 汽车回收材料，计划在天津滨海新区建立亚太地区领先的报废汽车回收塑料高值化应用 5G 数字化零碳工厂，致力于成为全球循环经济转型的重要推动者，为构建绿色低碳的可持续发展贡献奥塞尔智慧，为中国环保材料企业走向世界奋斗不息。



Shanghai Ausell Materials Technology Co., Ltd. ("Ausell"), founded in 2005 and headquartered in Shanghai Songjiang National Economic & Technological Development Zone along the G60 Sci-Tech Innovation Corridor, is a pioneer in China's PCR materials industry. With multiple PC recycling preprocessing bases nationwide and an annual environmental processing capacity exceeding 130,000 tons, we specialize in R&D, production and sales of high-quality low-carbon PCR materials including PC, ABS, PP, PA and PMMA.

Our products serve premium applications in:

- Electric Vehicle
- High-end consumer electronics
- Smart Home Appliances
- Advanced lighting systems

Boasting a fully integrated circular ecosystem covering collection, sorting, crushing, washing, pelletizing and quality inspection, Ausell is among China's earliest and most scaled PCR specialists for automotive lighting applications. We deliver customized high-performance, low-carbon and traceable material solutions.

Industry Leadership:

Leading the China national standard draft on：

- GB/T 40006.7-2021 (Recycled PC)

Participate the drafting of：

- GB/T 40006.3-2021 (Recycled PP)
- GB/T 40006.5-2021 (Recycled ABS)

Certifications & Honors:

- ISO 9001/14001/45001, IATF 16949 certified
- 50+ patents
- Recognized as Shanghai High-Tech Enterprise, Specialized SME
- TÜV, UL 2809, GRS certified products

Landmark Innovations:

2020: Established Globally leading 19L PC water bottle closed-loop with Nongfu Spring and Covestro, transforming post-consumer bottles into high-value PCR materials for electronics.

2024: Spearheading automotive circular economy under EU ELV directive through groundbreaking Car-to-Car initiative with GIZ, CATARC, Volkswagen, NIO and Gem. Achieved:

- World's first TÜV certification for automotive lamp recycling
- Pioneer UL 2809 certification for lamp-derived PCR content
- Setting global benchmarks for automotive PCR standards

Sustainability Vision:

Under China's dual-carbon strategy, Ausell champions "Resource Regeneration, Value Reengineering". Our roadmap includes:

- Development of an Asia-Pacific Leading 5G-Enabled Digital Zero-Carbon Facility for High-Value Plastic Recycling from End-of-Life Vehicles in Tianjin Binhai New Area
- Developing closed-loop high-value applications for end-of-life vehicles
- Bridging Chinese recycling innovation with global ESG standards
- Driving adoption of PCR materials in premium manufacturing

As an innovation leader, we remain committed to technological breakthroughs, supply chain integration and sustainable material solutions - relentlessly advancing our mission to become a global circular economy catalyst.

DEVELOPMENT HISTORY
发展历程

2005
2005年7月上海奥塞尔成立
Jul 2005, AUSELL founded in Shanghai

2008
落户于国家级经济技术开发区上海G60科创走廊
2008 – Relocation to the Shanghai G60 Sci-Tech Innovation Corridor, the national economic and technological development zone.

2019
陕西工厂成立
2019, AUSELL Shannxi Plant Start-up

2020
2020年1月：签订农夫山泉&奥塞尔&科思创三方闭环合作协议
Jan. 2020-Signed a three-party closed-loop recycle agreement with Nongfu Spring and Covestro.

2020年2月：获得上海市“专精特新”荣誉称号
Feb. 2020-Recognized as "Specialized and New Enterprise (SNE)" by Shanghai Municipal Government.

2021
2021年5月：国家标准：GB/T 40006.3-2021《塑料 再生塑料 第3部分:聚丙烯PP材料》参与起草
May 2021-Contributed drafting China National Standard GB/T 40006.3-2021 Plastics—Recycled Plastics—Part 3: Polypropylene (PP) Materials

2021年10月：国家标准 GB/T 40006.7-2021《塑料 再生塑料 第7部分:聚碳酸酯PC材料》牵头起草
Oct. 2021-Lead the drafting of GB/T 40006.7-2021 Plastics—Recycled Plastics—Part 7:Polycarbonate (PC) Materials.

2021年10月：国家标准GB/T 40006.5-2021《塑料 再生塑料 第5部分:丙烯晴-丁二烯-苯乙烯ABS材料》参与起草
Oct. 2021-Participated in drafting GB/T 40006.5-2021 Plastics—Recycled Plastics—Part 5:Acrylonitrile-Butadi- ene-Styrene (ABS) Materials.

2022
上海工厂2.5万吨环评
陕西工厂10万吨环评
Obtained the approval of environmental impact assessment (EIA) for:
·Shanghai facility (25,000-ton capacity).
·Shaanxi facility (100,000-ton capacity).

2024
2024年2月：团体标准：《海洋捕捞废弃塑料回收可追溯性和再生碳减排核算指南》参与起草
Feb. 2024-Contributed to the Group Standard:Guidelines for Traceability and Carbon Emission Reduction Accounting of Recycled Marine Fishing Waste Plastics.

2024年5月：国家标准：《塑料废弃物的回收和再利用指南》参与起草
May 2024 – Participated in drafting the China National Standard: Guidelines for the Recovery and Recycling of Plastic Waste.

2024年8月：荣获TFS认证91分
Aug. 2024-Achieved Together for Sustainability (TFS) certification with a score of 91, reflecting industry-leading ESG performance.

2024年12月：荣获TUV全球首张废旧汽车车灯来源认证
Dec. 2024-Awarded by TÜV, the world-first certification for recycled materials derived from Waste automobile headlamps

2025
2025年4月：荣获UL2809首张100%废旧汽车车灯来源认证
Apr. 2025-Pioneering UL2809 Certification with 100% post-consumer recycled material from automobile headlamp.

2025年4月：计划成立天津工厂（报废汽车回收塑料高值化应用5G 数字化零碳工厂）
Apr. 2025-Announced to establish a Tianjin plant with Zero-Carbon emission and digitalization by 5G for high value-added automotive plastic recycle.

ENTERPRISE QUALIFICATION

企业资质

经过多年发展，公司现已经取得50多项专利，发明专利7个，实用新型专利24个，软件著作权21个；

并获得TUV、TUV汽车、UL2809、GRS、ISO 9001、ISO 14001、ISO 45001相关认证

> 50 patents including 7 invention patents, 24 utility model patents, and 21 software copyrights

Obtained certificates from TUV,TUV Automotive, UL2809, GRS, ISO 9001, and ISO 14001,ISO 45001,etc

7 项
发明专利
7 invention patents

24 项
实用新型专利
24 utility model patents

21 项
软件著作权
21 software copyrights





NATIONAL STANDARD DRAFTING

国标起草

2021年5月：国家标准：GB/T 40006.3-2021《塑料 再生塑料 第3部分:聚丙烯PP材料》参与起草
2021年10月：国家标准 GB/T 40006.7-2021《塑料 再生塑料 第7部分:聚碳酸酯PC材料》牵头起草
2021年10月：国家标准GB/T 40006.5-2021《塑料 再生塑料 第5部分:丙烯晴-丁二烯-苯乙烯ABS材料》参与起草

- China Recycled PC: Primary drafting unit of GB/T 40006.7-2021 "Plastics—Recycled Plastics—Part 7: Polycarbonate (PC) Materials"
- China Recycled PP: Drafting unit of GB/T 40006.3-2021 "Plastics—Recycled Plastics—Part 3: Polypropylene (PP) Materials"
- China Recycled ABS: Drafting unit of GB/T 40006.5-2021 "Plastics—Recycled Plastics—Part 5: Acrylonitrile-Butadiene-Styrene (ABS) Materials"

ISO9001 ISO14001 ISO45001 IATF16949 GRS认证 TUV认证 UL2809

















PCR ENGINEERING PLASTICS

PCR 工程塑料

PCR PC 系列来源于消费后回收材料，包含：板材、车灯、水桶、日用品、CD、晶圆盒等回收材料，经过回收、分选、粉碎、清洗、造粒等标准化生产工艺流程制成高性能、标准化 PCR PC 产品，已成熟应用于高端新能源汽车、高端消费类电子、智能家居、高端照明等领域。同时可根据客户需求提供定制化的高性能、低碳环保、可追溯的系统解决方案。

The PCR PC portfolio is derived by post consume materials from sheets, automotive lamps, 5 gallon water bottle, consumer goods, CDs, and silicon wafer cassettes. The PCR materials are produced by a standard production process including collection, sorting, crushing. cleaning, and palletization.

These advanced PCR materials are now widely used in:

- Electric Vhecile,
- High-end consumer electronics.
- Smart home systems
- Adv. lighting solutions.

We offer tailor-made solutions based on client requirements to fulfill

- Consistent mechanical performance
- Low-carbon footprint
- Traceability

LOW CARBON EMISSION

低碳 PCR PC 材料



PC 3011　PC 2010 ANC　PC 2010 BNC　PC 2010 CBC　PC 2010 DBC　PC 6008　PC 2010A-WF18

规格型号 GRADE NAME	熔融指数 / MFR g/10min	缺口冲击强度 /NII J/M	颜色 COLOR	应用领域 APPLICATION
PC 3011	4—10	> 700	蓝透 Blue and Transparent	汽车、消费类电子、智能家居等 Automotive, Consumer Electronics, Smart Home Appliances, etc.
PC 2010 ANC	10—20	> 600	本透 Natural Color	汽车、消费类电子、智能家居等 Automotive, Consumer Electronics, Smart Home Appliances, etc.
PC 2010 BNC	15—20	> 600	黄透 Transparent with yellow color	汽车、消费类电子、智能家居等 Automotive, Consumer Electronics, Smart Home Appliances, etc.
PC 2010 CBC	18—24	> 500	绿透 Transparent with green color	汽车、电子电器等 Automotive, Consumer Electronics, etc.
PC 2010 DBC	17—22	> 500	黑色 Black	汽车、电子电器等 Automotive, Consumer Electronics, etc.
PC 6008	60—80	> 100	透明 Transparent	消费类电子等 Consumer Electronics, etc.
PC 2010A-WF18	16-21	> 600	本透 Natural Translucent	晶圆盒来源，汽车、消费类电子、智能家居等 Source: Wafer Cassettes | Applications: Automotive, Consumer Electronics, Smart Home, etc.



HIGH VALUE-ADDED APPLICATION FROM WASTED AUTOLIGHTING

废旧车灯高值化应用材料

PC 2010B-CAR18　PC 2010B-CAR25　PC 2010B-CAR35

规格型号 GRADE NAME	熔融指数 / MFR g/10min	缺口冲击强度 / NII KJ/m²	颜色 COLOR	应用领域 APPLICATION
PC 2010B-CAR18	14-20	≥50	透明 Transparent	100% 汽车回收专用料 100% Automotive-Grade Recycled
PC 2010B-CAR25	22-28	≥50	透明 Transparent	70% 汽车回收专用料 +30 其他 PCR 材料 70% Automotive-Grade PCR +30% Other PCR Materials
PC 2010B-CAR35	30-36	≥45	透明 Transparent	50% 汽车回收专用料 +50 其他 PCR 材料 50% Automotive-Grade PCR + 50% Other PCR Materials

AUSELL HEADLIGHT PC PROCESSING DIAGRAM

AUSELL 车灯 PC 处理示意图



车灯回收 Automotive Lamp Assembly Recycling　拆解 Dismantling　粉碎 Crush　清洗 Multi-stage Purification　造粒 Compounding & Pelletization

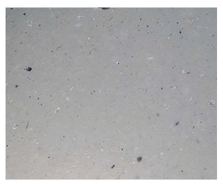
PC 2010B-CAR18 适用于汽车结构件、内饰件、外饰件、喷涂件、高光件

PC 2010B-Car18 Applications:

Automotive structural components,Interior trim parts,Exterior trim parts,Paintable components,High-gloss finish parts

COMPARISON OF SURFACE CLEANLINESS

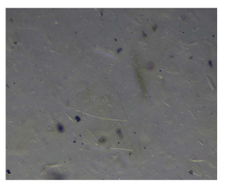
表面洁净度对比



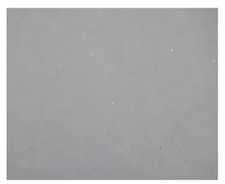
清洗前 放大 30 倍 Before Cleaning Magnify 30 times



清洗后 放大 30 倍 After Cleaning Magnify 30 Times



清洗前 放大 140 倍 Before Cleaning Magnify 140 times



清洗后 放大 140 倍 After Cleaning Magnify 140 Times

ELV SOLUTION
ELV 解决方案

TUV 全球首张废旧汽车车灯来源认证材料，
UL2809 全球首张 100% 废旧车灯来源 PCR 含量认证

Global first TUV-Certified Material Sourced from Waste automobile headlamps
Global first UL2809 Certificate on PCR materials from 100% automotive headlamps



PC 2010B-CAR18是基于单一废旧汽车车灯来源的消费后回收PC材料，通过拆解、分选、粉碎、清洗、造粒，将报废汽车车灯变为高性能的“车到车“PCR材料。

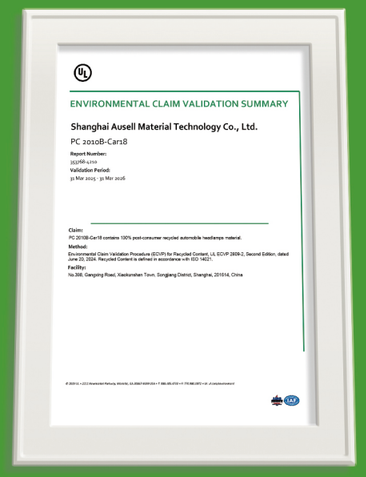
PC 3011是基于中国品牌水桶来源的消费后回收PC材料，有着优异机械性能，可用于共混改性或直接注塑成型，已成熟应用于ELV项目。

奥塞尔作为中国再生PC：GB/T 40006.7-2021第一起草单位，长期为高端新能源汽车、高端消费类电子、智能家居、高端照明等行业提供定制化的可追溯的系统解决方案和降碳数据库。

PC 2010B-Car18 is a post-consumer recycled PC material based on a single source of scrap car lights. Through disassembly, sorting, crushing, cleaning and granulation, scrap car lights are transformed into high-performance "car-to-car" PCR materials.

PC 3011 is a post-consumer recycled PC material based on the source of Chinese brand buckets. It has excellent mechanical properties and can be used for blending modification or direct injection molding. It has been applied to ELV projects.

As the Principal Drafting Unit of China's Recycled PC Standard GB/T 40006.7-2021 "Plastics—Recycled Plastics—Part 7: Polycarbonate (PC) Materials", AUSELL has long provided customized traceable system solutions and carbon reduction databases for high-end new energy vehicles, high-end consumer electronics, smart homes, high-end lighting and other industries.

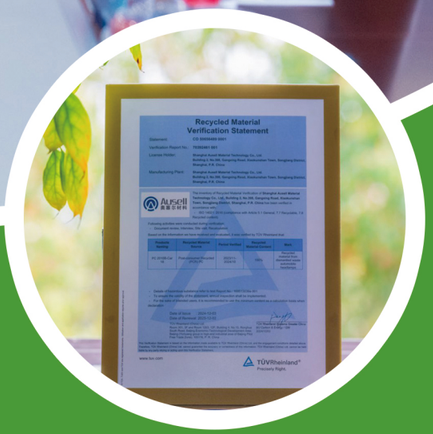

ENVIRONMENTAL CLAIM VALIDATION SUMMARY

Shanghai Ausell Material Technology Co., Ltd.

PC 2010B-Car18

Report Number:
352766-4210
Validation Period:
31 Mar 2025 - 31 Mar 2026

Claim:
PC 2010B-Car18 contains 100% post-consumer recycled automobile headlamps material.
Method:
Environmental Claim Validation Procedure (ECVP) for Recycled Content, UL ECVP 2809-2, Second Edition, dated June 20, 2024. Recycled Content is defined in accordance with ISO 14021.
Facility:
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PCR ABS SERIES

PCR ABS 系列

PCR 聚丙烯腈 - 丁二烯 - 苯乙烯（PCR ABS）来源于消费后回收材料，来源包含板材、管材、家电、线圈、通讯设备等），经过回收、分选、粉碎、清洗、造粒等标准化生产工艺流程制成高性能、标准化 PCR 产品。可满足行业客户的不同应用需求，同时可根据客户要求提供定制化的高性能、低碳环保、可追溯的系统解决方案。

PCR ABS portfolio is derived from the sources in below but not Limited to:

- Sheets & panels
- Pipes & fittings
- Household appliances
- Electrical coils
- Telecommunication equipment

Through standardized industrial processes:

Collection → Sorting → Crushing → Washing → Pelletizing

we transform these materials into high-performance, standardized PCR ABS products.



ABS 2012 NCA



ABS 2012 NCB

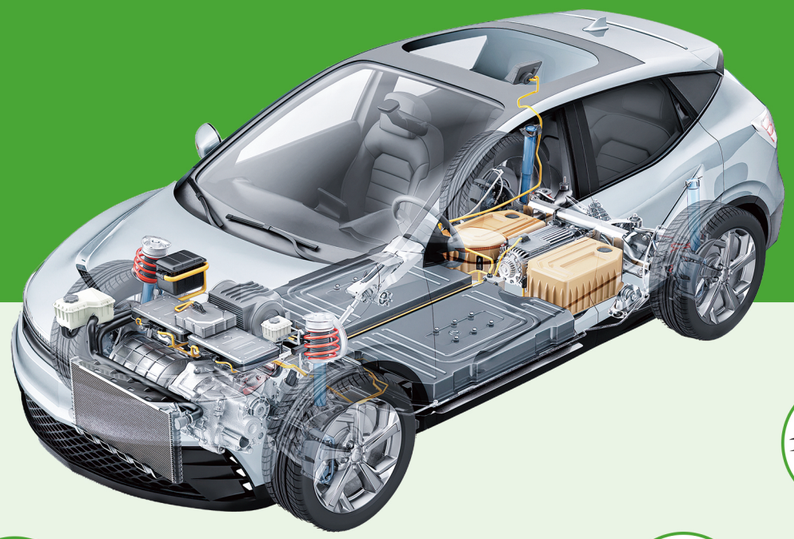


ABS 2210 BK

规格型号 SPECIFICATIONS	熔融指数 / MFR g/10min	缺口冲击强度 / NII KJ/m²	颜色 COLOR	应用领域 APPLICATION FIELDS
ABS 2012 NCA	16-30	≥12	本色 Natural	改性、注塑 Compounding& Material Modification
ABS 2012 NCB	16-30	≥10	米黄 Beige	改性、注塑 Compounding& Material Modification
ABS 2210 BK	20-35	≥10	黑色 Black	改性、注塑 Compounding& Material Modification

HIGH VALUE-ADDED APPLICATION OF AUTOMOTIVE RECYCLED MATERIALS

汽车回收料高值化应用



PP
中央置物盒
Central glove box

PC
车顶行李架
Roof rack

PP
前挡板
The front baffle

PC
车灯
Auto lamp

PP
门板框
Door frame

PP
前后轮眉
Front and rear wheel brow

PC、PC/ABS
仪表盘
Cockpit

ABS、PC/ABS
风口格栅
Air outlet qrille

PP、ABS
前后护杠
Before and afte the retaining bar

ASA/PC、ABS
后视镜壳
Rearview mirror shell

PP、PC
前后踏板
Front and rear pedal

PP
轮壳罩板
Round shel cover plate



PCR AUTOMOTIVE RECYCLING – PP & PMMA

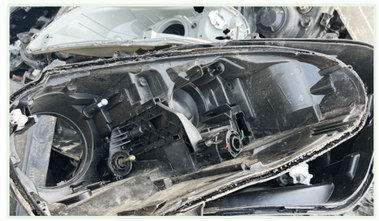
PCR 汽车回收 PP、PMMA



废旧车灯
WASTE AUTOMOTIVE LAMPS



车灯底座 PP
PP HEADLIGHT BASE



车灯底座 PP
PP HEADLIGHT BASE



汽车内饰 PP
PP AUTOMOTIVE INTERIOR COMPONENTS



汽车保险杠 PP
PP AUTOMOTIVE BUMPER



汽车尾灯 PMMA
PMMA AUTOMOTIVE TAILLIGHT LENSES