

企业动态

OFFICIAL NEWSLETTER



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历史性里程碑 PMPV 成功完成首个出口货柜装柜

开启全新篇章

Press Metal PV (Sarawak) Sdn. Bhd. (PMPV) 自豪地迎来公司发展历程中的重要里程碑——首个生产货柜成功完成装柜并顺利发出。

这项成就的意义远不止于一个货柜的运输。它象征着从项目建设到生产准备过程中，各部门之间的紧密协作、坚定投入与共同努力。



首个货柜成功发出

首个货柜的成功装柜，标志着 PMPV 正式朝着全面运营迈出了又一重要步伐。

从生产规划、质量检验、包装、仓储、物流协调到最终装柜，每一个环节都凝聚了全体员工的共同努力。

这一里程碑体现了我们对卓越运营、产品质量、工作场所安全及客户满意度的共同承诺。

这项成果离不开每一位同事的付出与团队协作。每个人都在实现这一重要里程碑的过程中扮演了不可或缺的角色。

今天的首个货柜，标志着我们迈向更强未来的新起点——这是由每一位 PMPV 员工的辛勤付出、坚持不懈与团队精神共同铸就的成果。

撰写/Author: Jorgina
编辑/Editor: Branda Yap

A Historic Milestone PMPV Successfully Loads Its First Export Container



Celebrating a New Beginning

Press Metal PV (Sarawak) Sdn. Bhd. (PMPV) proudly marks a significant milestone in our company's journey with the successful loading and dispatch of our first production container.

This achievement represents far more than the movement of a container, it symbolizes the successful collaboration, dedication, and commitment of every department that has worked tirelessly from project development to production readiness.



First Container Successfully Dispatched

The successful loading of our first container demonstrates that PMPV has officially taken another major step towards full-scale operations.

Every stage of the process, from production planning, quality inspection, packaging, warehousing, logistics coordination, and loading, was completed through the collective efforts of our employees.

This milestone reflects our shared commitment to operational excellence, product quality, workplace safety, and customer satisfaction.

This accomplishment would not have been possible without the dedication and teamwork, every individual played an important role in making this milestone possible.

Today's first container marks the beginning of a stronger journey ahead built by the hard work, perseverance and teamwork of every PMPV employee.

撰写/Author: Jorgina
编辑/Editor: Branda Yap

通过数据分析成功避免年损失超十万元

——记公司“隐形水损”排查纪实



1212立方米，对于一个大型企业来说，或许只是生产流程中不起眼的数字波动。但就在刚刚过去的5月，正是这“多出来的1212吨水”，牵出了一个隐藏在地下水管的“水老虎”。没有突发的生产事故，没有明显的路面塌陷，依靠数据对比和属地责任的落实，我们成功揪出了一处深埋地下、日漏水量高达70-80吨的“管涌暗流”。

一、数据波动引警觉，从“账单”里找问题

6月初，公司EHS&持续改善部门在核对月度能源消耗报表时，一组异常数据引起了汇总人员的注意：5月份全公司用水总量较4月激增约1212立方米，且目前平均每天大约有150立方米的用水量，而近期生产负荷未增加、各车间产量稳定，且绿化浇灌、生活用水无明显变化的前提下，这凭空消失的1212吨水去了哪里？

“事出反常必有妖。在公司申请ASI体系认证和公司严控生产成本的大背景下，每一滴水、每一度电都必须用在刀刃上。”发现问题后EHS&持续改善部门立即将该情况向公司相关领导进行汇报，并在会议上要求各区域负责人对所属区域进行排查。

二、地毯式排查无果，“看不见”的敌人最可怕

排查指令下达后，各车间、各部门迅速响应，对本部门所属的卫生间、清洗线、现场临时施工区域、绿化带取水点展开了“地毯式”自查。然而，经过排查反馈，地面以上所有肉眼可见的阀门、水龙头、管道接口均未发现“跑冒滴漏”现象。

是水表坏了？还是地下有文章？由于厂区管线多为埋地敷设，隐蔽性强，这给排查工作带来了极大的难度。

三、北四门墙缝渗水，牵出“地下黑洞”

就在排查工作陷入僵局时，仓库物控专员王华在巡检至北四门附近时，发现墙角与地面接缝处有水流渗出。这一线索被迅速上报。

“挖！”，相关部门申报后立即组织施工队对该区域进行开挖。当表层混凝土垫层被破开，眼前的景象让所有人倒吸一口凉气：深埋地下约0.5米处的供水主管道，因长期受土壤潮湿腐蚀影响，管壁接口处已出现直径约0.5厘米的穿孔洞。水正不断从该破损点喷涌而出，同时地下已经形成一个隐形暗流。

四、 抢修与复盘，避免资源“流血”

找到漏点即是胜利。维修人员立即通报并关闭送水阀门，对腐蚀管段进行了切除更换，并重新做了防腐处理。随着阀门重新开启，水压恢复正常，经过近一周的持续观察，这个“地下暗流”终于被彻底截断。

算一笔经济账：该漏点每日流失水量约70-80立方米。若非通过数据对比及时发现，仅此一个漏点，每年将造成公司近2-3万吨水资源的浪费，直接经济损失及污水处理费用合计逾10-15万元。



五、 降本增效，首在“意识”

此次“北四门漏水”事件的圆满解决，并非偶然。它是数据化管理与全员主人翁意识双重作用下的胜利。

此次事件也为我们敲响了警钟：随着厂区投用年限增长，地下隐蔽工程的风险正在上升。下一步，公司将定期对用水情况进行数字对比分析，及早发现问题，坚决守住公司的“钱袋子”和“生命线”。

再此向所有参与此次排查与抢修的同事们致敬！提质增效，我们一直在路上！

撰写：王勇

澳美高新 EHS&持续改善部

HIDDEN WATER LOSS DETECTION: A SITE CASE STUDY DATA ANALYSIS AVOIDS ANNUAL LOSSES OVER RMB 100,000



1,212 cubic meters may seem like a negligible fluctuation in consumption figures for a large manufacturing plant. However, this excess volume recorded in May led our team to uncover a hidden underground water leak that had long gone undetected. There were no sudden operational failures or obvious ground subsidence to signal the issue. Thanks to cross-referenced utility data and clear area accountability protocols, we identified an underground pipe rupture leaking 70 to 80 cubic meters of water every single day.

1. Anomalous Consumption Data Raises Red Flags: Troubleshooting From Utility Billing Records

In early June, the EHS & Continuous Improvement team was reconciling monthly energy consumption reports when staff spotted an irregular data anomaly: total facility water usage in May surged by approximately 1,212 cubic meters compared to April.

Daily average water consumption stood at 150 cubic meters, yet production output across all workshops remained unchanged, with no upticks in landscape irrigation or domestic facility water use. The unexplained volume loss immediately triggered concern.

“Any abnormal deviation warrants investigation. As we pursue ASI System certification and implement stringent cost control measures across the site, every drop of water and every kilowatt-hour of electricity must be allocated efficiently,” team leads stated.

Upon identifying the discrepancy, the EHS & Continuous Improvement department escalated the issue to site leadership and issued a formal request for zone supervisors to conduct full-site leak inspections.

2. Comprehensive Visual Inspection Yields No Clues: The Danger of Invisible Waste

All workshops and departments mobilized quickly to carry out full visual audits of their respective zones, including restrooms, washing lines, temporary construction zones and outdoor irrigation taps. After thorough checks, teams confirmed zero visible leaks, dripping faucets or faulty pipe joints above ground.

Two hypotheses emerged: faulty water meters, or hidden underground pipe damage. The majority of the facility’s water pipelines are buried underground, creating major obstacles to inspection and concealing potential failures. The investigation reached an impasse.

3. Seepage at North Gate 4 Wall Joint Reveals Underground Pipe Failure

As the inspection stalled, Wang Hua, Warehouse Material Control Specialist, noticed water seeping from the joint between the wall and pavement near North Gate 4 during his routine patrol. He immediately reported the observation to management.

Upon formal work permit approval, site teams contracted excavation crews to dig out the affected area. Once the top concrete layer was removed, the team discovered a critical failure: the main water supply pipe, buried half a meter below ground, had sustained long-term corrosion from damp soil. A 0.5-centimeter hole had formed at a pipe coupling, continuously discharging water and creating an unseen underground flow beneath the pavement.



4. Emergency Repair & Post-Incident Review: Stopping Uncontrolled Resource Waste

Locating the leak marked a critical breakthrough. Maintenance crews isolated the pipeline by shutting off the supply valve, removed the corroded pipe segment and installed a replacement with full anti-corrosion coating treatment.



Water pressure was restored after repair work, and a one-week continuous monitoring period confirmed the underground leak had been fully eliminated.

Financial Impact Assessment

The damaged pipe leaked 70–80 cubic meters of water daily. Without timely detection via data analytics, the site would have lost 20,000 to 30,000 tons of water annually from this single failure alone. Combined water charges and wastewater treatment costs would have resulted in direct financial losses exceeding RMB 100,000 to 150,000 per year.

5. Cost Reduction & Operational Efficiency Start With Proactive Risk Awareness

The successful resolution of the North Gate 4 water leak was no coincidence—it was a direct outcome of data-centric facility management and a company-wide ownership mindset among all staff.

This incident also serves as a critical risk reminder: as the facility ages, the risk of concealed underground infrastructure failures continues to rise. Moving forward, the company will implement regular comparative analysis of water consumption metrics to identify abnormalities at the earliest stage, protecting operational budgets and sustainable water resources.

We extend our sincere appreciation to all team members who participated in the inspection and emergency repair. Our commitment to quality improvement and cost optimization remains ongoing.

Authors: 王勇

EHS & Continuous Improvement

热烈欢迎

我们的合作伙伴莅临参观我们的熔炼厂。

2026年7月2日（星期四）



这是一次非常好的机会，深入了解铝的电解工艺，帮助我们的合作伙伴更好地理解铝从氧化铝到成品所经历的高能耗生产过程



更重要的是，此次参观让合作伙伴更深入了解完整的铝价值链——从熔炼、挤压到下游深加工。理解上游环节有助于我们在整个供应链中加强协作，做出更好的决策。



我们也分享了我们的可持续发展之路。通过使用可再生能源、优化工艺以及生产低碳铝，我们持续努力降低 CO₂ 排放。可持续发展不再只是责任，更是我们行业的关键竞争优势。



感谢合作伙伴的到访。我们期待通过透明、创新和长期合作，共同创造更大价值。



特别感谢我们的团队在整个参观过程中提供的专业讲解和热情接待。你们的专业知识、热情与付出，帮助合作伙伴深入了解我们的熔炼运营、可持续发展努力以及完整的价值链。你们以卓越的表现展现了齐力澳美的专业与风采。大家辛苦了，表现非常棒！



了解价值链



推动可持续发展



共建更紧密的合作关系
推动可持续发展



创造更大长期价值



撰写/Author: Mr HK Lim
编辑/Editor: Branda Yap

Welcoming our business partners to visit our smelting plant.

2 July 2026 (Thu)



It was a great opportunity to walk through the aluminium electrolysis process, helping our partners better understand how aluminium is produced from alumina through a highly energy-intensive process.



More importantly, the visit provided a deeper appreciation of the entire aluminium value chain—from smelting to extrusion and downstream value-added manufacturing. Understanding the upstream process enables stronger collaboration and better decision-making across the supply chain.



We also shared our sustainability journey, including our continuous efforts to reduce CO₂ emissions through renewable energy, process optimisation, and low-carbon aluminium production. Sustainability is no longer just a responsibility—it is becoming a key competitive advantage for our industry.



Thank you to our partners for the visit. We look forward to creating greater value together through transparency, innovation, and long-term collaboration.



A special thank you to our team for their professionalism, excellent explanation, and warm hospitality throughout the visit. Their knowledge, passion, and commitment helped our business partners gain a deeper understanding of our operations, sustainability efforts, and integrated value chain. You represented Press Metal with pride and excellence. Well done, everyone!



Understanding the value chain



Promoting sustainability



Building stronger partnerships



Creating greater long-term value



撰写/Author: Mr HK Lim
编辑/Editor: Branda Yap

双雄并进！乐平镇“工会杯”羽毛球赛圆满落幕， 我司代表队再创佳绩

6月26日晚，乐平镇“工会杯”第十二届职工羽毛球赛圆满落幕。在历时12天、汇聚24支队伍235名职工的激烈角逐中，我公司派出的齐力澳美工会队与澳美宜新工会队两支代表队脱颖而出，分别斩获殿军（第四名）与第八名的优异成绩。

迎难而上，稳居四强

齐力澳美工会队是“工会杯”的常客，近年来成绩稳步攀升。本届赛事，队伍被分入堪称“死亡之组”的小组，与三支前四强队伍及一支潜力强队同组竞技。面对决赛级别的对抗，齐力澳美队顶住压力突围，并在半决赛中与本届亚军激战至最后一刻，在男双、女双、混双三项比拼中仅以2分之差惜败，最终锁定殿军。



突破自我，成长可见

澳美宜新队则上演了精彩的“逆袭”剧本。继去年首次参赛未能小组出线后，队伍在短短一年内实现了质的飞跃，今年成功闯入八强，展现了年轻队伍蓬勃向上的成长潜力。



跨部门协作，诠释团队精神

两支代表队均由来自生产、技术、管理等各部门的纯内部员工组成。赛场上，队员们将日常工作中培养出的跨部门协作习惯转化为默契配合，完美诠释了公司“没有个人英雄，只有卓越团队”的核心价值观。

以人为本，打造活力职场

从赛场上的默契配合到工作中的高效协同，成绩的取得折射出公司对员工关怀与文体建设的持续投入。公司通过配备健身房、球场等设施，鼓励员工保持运动习惯，致力于将赛场上的拼搏与协作精神融入日常，打造充满活力与凝聚力的职场环境。

未来，两支队伍将继续在赛场上挥洒汗水，力争再创佳绩！

撰写：向英分 行政部

HEADLINE: PMI AND PMPT SHINE AT LEPING, TOWN' S 12TH TRADE UNION BADMINTON TOURNAMENT

On the evening of June 26, the 12th Trade Union Badminton Tournament of Leping Town successfully concluded. Spanning 12 days, the tournament featured fierce competition among 24 teams and 235 employees from various enterprises and public institutions in the town. Representing our company, the PMI Trade Union Team and the PMPT Trade Union Team delivered outstanding performances, securing 4th and 8th place respectively.

Rising to the Challenge: PMI Secures a Spot in the Top Four

As a veteran participant in the Trade Union Cup, the PMI team has demonstrated consistent growth in recent years. This year, they were drawn into a "Group of Death," facing three top-four contenders from the previous year and a highly competitive emerging team. Despite encountering finals-level intensity, the PMI team withstood the pressure to advance from the group stage. In the semi-finals, they fought valiantly against the eventual runner-up, falling short by a mere 2 points across the men's doubles, women's doubles, and mixed doubles matches, ultimately clinching the 4th place.



Breaking Through: PMPT Showcases Remarkable Growth

The PMPT team delivered an inspiring performance of self-breakthrough. Following a group-stage exit in their debut last year, the team achieved a significant leap in just one year, successfully advancing to the quarter-finals this year and finishing 8th, which highlights the robust growth potential of our younger workforce.



Cross-Functional Collaboration: Embodying Team Spirit

Both teams were composed entirely of internal employees from various departments, including Production, Technology, and Management. On the court, the team members seamlessly translated the cross-functional collaboration habits cultivated in their daily work into seamless teamwork. This perfectly embodied our core corporate value: "No individual heroes, only an outstanding team."

People-Centric Culture: Fostering a Dynamic Workplace

The seamless coordination on the court reflects our continuous investment in employee well-being and cultural initiatives. By providing comprehensive sports facilities such as a gymnasium, basketball court, and

football field, we encourage our employees to maintain an active lifestyle. We are committed to integrating the sportsmanship and collaborative spirit demonstrated on the court back into our daily work, fostering a dynamic and cohesive workplace.

Looking ahead, both teams will continue to strive for excellence and aim for even greater achievements in next year's tournament!

Authors: Cathy Xiang
Administration Department

员工健康优先： 职业健康医生（OHD）后续跟进已完成



管理层的承诺与职责

这项举措直接体现了公司在职场安全方面的未雨绸缪。通过投入支持这些后续复查，管理层彰显了对以下方面的坚定承诺：

- 积极监测：密切关注团队的长期健康状况，从源头上预防职业健康问题的发生。
- 支持性文化：通过迅速且贴心的实际行动，展现公司对全体员工发自内心的关怀。
- 卓越合规：确保我们的工厂完全符合国家职业安全与卫生（OSH）标准，以保护我们的员工与业务运营。

任何一项倡议的成功都离不开团队合作。我们想对所有参与其中的员工致以最诚挚的谢意，感谢大家在整个检查过程中展现出的高效配合、准时守时以及积极态度。

“守护今日听力，筑就健康明天。让我们继续携手共进，共同守护安全的工作环境！”



在 PMBA Aluminium，员工的福祉绝不仅仅是一个流于形式的选项，而是我们的核心价值。

为了持续打造一个安全、健康且符合规范的工作环境，我们于 2026 年 6 月 26 日和 29 日成功开展了一系列职业健康医生（OHD）后续医疗复查。

继近期完成了例行听力测试后，我们邀请了来自 iDinamik 诊所的注册职业健康医生 Dr. Mullaivaanan 主持这些复查与评估工作。整个过程均严格按照《2019年职业安全与卫生（噪声暴露）条例》执行。

管理层深知积极追踪健康状况的重要性，因此第一时间妥善安排了这些专属复查环节。这确保了我们的团队成员能够获得持续的专家医疗指导；并在有需要时，获得相应的职场调整与协助，让每位员工都能健康茁壮地成长。



撰写/Author: Wan Hazwani

Employee Health First: OHD Follow-Up Completed



At PMBA Aluminium, employee wellbeing is never just a checkbox, it is a core value.

In our continuous effort to maintain a safe, healthy, and compliant working environment, we successfully conducted a series of Occupational Health Doctor (OHD) Follow-Up Medical Examinations on June 26 and June 29, 2026.

Following our recent routine audiometric tests, these review sessions were conducted by Dr. Mullaivaanan, a certified OHD from iDinamik Clinic. The entire exercise was carried out in strict accordance with the Occupational Safety and Health (Noise Exposure) Regulations 2019.

Recognizing the value of proactive health tracking, management took immediate care to arrange these dedicated follow-up sessions. This ensures that our team members receive continuous expert medical guidance and, where helpful, appropriate workplace adjustments to keep everyone thriving.

Management's Commitments and Responsibilities

This initiative is a direct reflection of the company's proactive approach to workplace safety. By investing in these follow-up exams, management highlights its commitment to:

- **Active Monitoring:** Keeping a close eye on our team's long-term well-being to prevent workplace health concerns before they start.
- **A Supportive Culture:** Demonstrating that the company genuinely cares for its workforce by taking swift, supportive action.
- **Regulatory Excellence:** Ensuring our plant fully complies with national OSH standards to protect both our people and our operations.

An initiative like this can only succeed with teamwork. We want to extend a massive thank you to all employees involved for their excellent cooperation, punctuality, and positive attitude throughout the checkups.

"Protecting your hearing today ensures a healthier tomorrow. Let's continue working together to keep our workplace safe!"



撰写/Author: Wan Hazwani



内部消防设备培训

HSE部门为紧急应变小组（ERT）举办了一场内部紧急应变培训，内容涵盖消防设备、急救箱及化学品泄漏应急处理包（Chemical Spill Kit）的正确使用方法。培训重点包括紧急应变程序、应急设备的正确操作，以及ERT成员在工作场所紧急事故中的职责与责任。培训结束后，ERT团队向全体员工进行了简报，分享消防灭火器、急救箱及化学品泄漏应急处理包的正确使用方法，以提升员工的紧急应变能力，并共同营造更安全的工作环境。



🔥 培训重点

- 了解灭火器、急救箱及化学品泄漏应急处理包（Chemical Spill Kit）的位置。
- 在需要时正确使用应急设备。在处理紧急情况前，佩戴适当的个人防护装备（PPE）。
- 发生火灾、受伤或化学品泄漏时，应立即报告。保持冷静，并遵循紧急应变程序。



HSE 每月现场巡检

HSE部门于2026年6月10日进行了每月一次的现场巡查（Gemba Walk），此活动固定于每月第一周进行。此次巡查旨在识别不安全行为、不安全状况及工作场所的改善机会，同时促进安全的工作环境。

结果：

- 已识别不安全行为及不安全状况
- 已将纠正措施分配至相关部门。
- 已提醒员工持续保持安全工作规范



错误行为



- 辆装有饮用水瓶的手推车与工具/材料混放在一起
- 卫生管理不良



正确行为

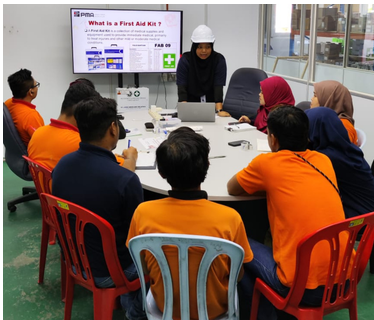


- 饮用水瓶已与工具/材料分开存放。
- 手推车已标识为“仅限饮用水”。

撰写：:Nurul Ain

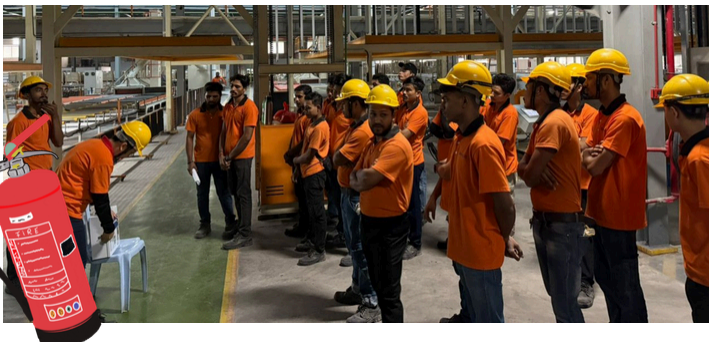
FIRE FIGHTING EQUIPMENT INTERNAL TRAINING

On 12 June 2026, the HSE Department Nilai conducted an Internal Emergency Response Training for the Emergency Response Team (ERT), covering the proper use of Fire Fighting Equipment, First Aid Box, and Chemical Spill Kit. The training focused on emergency response procedures, the correct use of emergency equipment, and the roles and responsibilities of ERT members during workplace emergencies. Following the session, the ERT team briefed all employees on the key learning points, including the correct use of fire extinguishers, first aid supplies, and chemical spill kits to enhance emergency preparedness and promote a safer working environment.



Key Takeaways

- Know the location of the Fire Extinguisher, First Aid Box, and Chemical Spill Kit.
- Use the correct emergency equipment when needed.
- Wear the appropriate PPE before responding to an emergency.
- Report all fires, injuries, and chemical spills immediately.
- Stay calm and follow the Emergency Response Procedure.



HSE Monthly Gemba Walk

On 10 June 2026, the HSE Department conducted the monthly Gemba Walk, which is carried out during the first week of every month. The purpose of the activity is to identify unsafe acts, unsafe conditions, and opportunities for workplace improvement while promoting a safe working environment.

Outcome:

- Unsafe acts and unsafe conditions were identified.
- Corrective actions were assigned to the respective departments. Employees were reminded to maintain safe work practices.



WHAT IS WRONG?



- A trolley containing drinking water bottles is mixed together with tools/materials.
- Poor Housekeeping.

CORRECT ACTION



- Drinking water bottles segregated from tools/materials.
- Trolley labelled "DRINKING WATER ONLY".

Author : Nurul Ain

每一步都算数——曾雪冰访谈录



从管培生到项目跟进

曾雪冰，高新材料项目管理部。作为管培生进入公司，一做就是十几年。刚进公司时做宜家项目的成本核算和报价，偏向沟通类工作，后来部门调整，慢慢转向技术方向。

“前面肯定有人带，但那会儿部门也是新成立的，大家都在摸索。”

直升机平台项目是她早期参与的一个典型项目。工期短、体量大、复杂度高。材料需要第三方船级社认证，加工涉及大量组装，对工人的手工技能要求很高。“直径二十二米左右，拼起来要力气比较大的工人，当时要求一定要男的、长得壮实一点的。”她印象最深的是自己戴着草帽在户外盯进度，“晒得很黑，从外表就看得出来。”

转战汽车：从零起步，感谢那个严苛的客户

2017年前后，公司从工业材进一步转向汽车材。曾雪冰真正完全转到汽车领域，是2018年与某国际零部件企业的合作。客户对产品提出很高要求，双方合作开发一种新的7系合金。“铸棒是新的，模具是新的，挤压工艺也是新的，几乎全是新的。”每周跟客户开会汇报进度，但经常失败，“很难为情，不知道怎么讲。但他们要求很细，为什么失败、数据是什么，然后协助你解决。”

回头看，她很感谢那个客户。“他帮助你去成长，去做沉淀。”

两个节点建立信心，一次出差逼出能力

曾雪冰说，做汽车项目以来，有两个节点让她真正建立起信心。

第一个是2019年左右，那个高难度合金项目成功开发并进入量产，到现在五年多，稳定性和质量都很好。“证明我们是可以的，在高难度要求里能够做到。”

第二个是后来跟欧洲客户的合作。对方SQE的风格跟日系完全不同，“你以为做得挺好的东西，在他看来还有很多问题。细细去想，他隐藏的点确实令人深思。”有一次审核给了NG，问题很小，但让团队重新思考：不要做表面功夫，要真正让员工了解自己在做什么。经过那次训练，团队做得更扎实，客户离开时对团队评价很高。

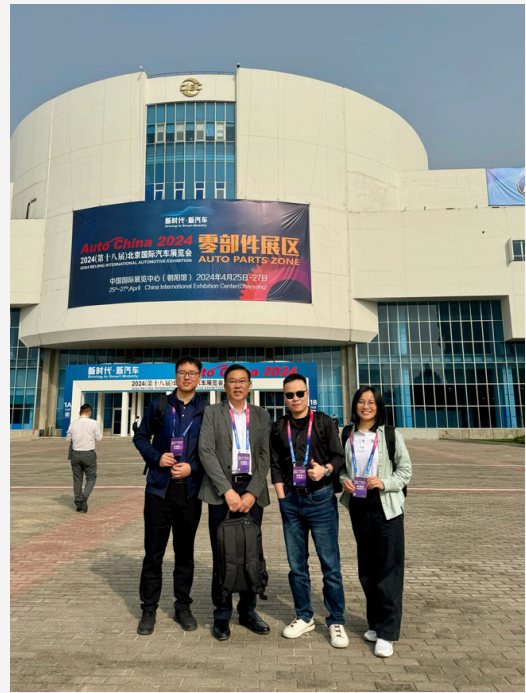
去越南处理客户投诉的那次经历，她也记得很清楚。白天去客户现场做验证，晚上回到酒店，大家围在大厅里写报告，还要跟国内团队沟通改进方案。“待了一周半左右，挺煎熬的。”但那次逼着团队通读了客户的标准，也对标了国际其他车企的标准。“在铝这块，客户可能还没有我们专业，他们更依赖我们去解决问题。”

带团队与沉淀：态度第一，每一步都算数

在选人上，曾雪冰最看重态度，其次是行业背景——做过汽车的人，天然知道这个行业是什么节奏。

她强调标准化和体系化。“项目不是一个人做的，团队需要沉淀。我们把问题和解决方法整理成经验库，后面的人可以查，遇到类似问题知道以前怎么解决的。”在项目管理中，她讲究QCD（质量、成本、交付）的平衡，“前期规划特别重要，没想清楚，后面代价就很高。”

从最初到汽车项目，从产品到体系，她跟着公司战略走过了好几个阶段。“有的时候当时走的时候不觉得，回头去看，前面一直都在铺路。”对于未来，她的期待很实在：拿到更多项目，在汽车领域积累更多实绩，规模和产品丰富度都能上一个台阶。



撰写：罗炜杰

EVERY STEP COUNTS: AN INTERVIEW WITH SPRING ZENG



From Management Trainee to Project Lead

Spring Zeng is currently with the PMIT Material Project Management Department. Joining the company as a management trainee over a decade ago, she has built a long and dynamic career. In her early days, her role focused on cost estimation and quotation for IKEA projects, which involved significant communication. Following a departmental restructuring, she gradually transitioned into a more technical track. "There was certainly mentorship in the beginning, but since the department was newly established at the time, we were all navigating uncharted territory together," she recalls.

The Helicopter Platform project stands out as a quintessential early assignment. It was characterized by a tight schedule, massive scale, and high complexity. The materials required third-party classification society certification, and the manufacturing process involved extensive assembly, demanding exceptional manual dexterity from the workforce. "With a diameter of roughly 22 meters, assembling the components required physically strong workers; at the time, we specifically had to recruit taller, more robust men." Her most vivid memory is wearing a straw hat on-site to monitor progress outdoors. "I got heavily tanned," she notes with a smile. "It was quite visible."

Pivoting to Automotive: Starting from Scratch and Embracing a Demanding Client

Around 2017, the company began a strategic shift from industrial to automotive aluminum. Spring's full transition into the automotive sector materialized in 2018 through a partnership with a major international Tier-1 supplier. The client set exceptionally high standards, and the two parties collaborated to develop a new 7-series alloy. "The cast billets were new, the dies were new, and the extrusion process was new—it was virtually a blank slate." She held weekly progress meetings with the client, which frequently ended in failure. "It was incredibly embarrassing; I often didn't know how to explain the setbacks. But their requirements were extremely granular. They wanted to know exactly why we failed and what the data showed, and then they actively helped us troubleshoot."

Looking back, she is deeply grateful to that client. "They pushed me to grow and helped me build a solid foundation."

Two Milestones of Confidence and One Business Trip That Forged Resilience

Spring notes that two key milestones truly solidified her confidence in automotive projects.

The first occurred around 2019, when the highly complex alloy project was successfully developed and entered mass production. Over five years later, its stability and quality remain excellent. "It proved that we are capable of meeting the most stringent requirements."

The second milestone came during a subsequent collaboration with a European client. Their SQE (Supplier Quality Engineer) had a completely different approach from Japanese counterparts. "What you thought was a flawless execution often still had room for improvement in their eyes. When you dig deeper, their underlying points are truly thought-provoking." During one audit, the team received an NG (No Good) rating for a minor issue, which prompted a profound team reflection: stop focusing on superficial fixes and ensure employees genuinely understand their processes. After this rigorous training, the team's execution became much more robust, earning high praise from the client upon departure.

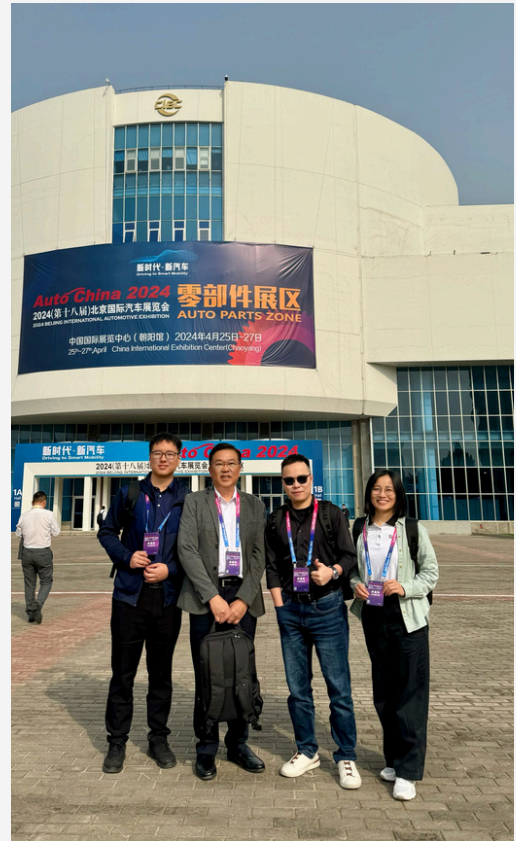
She also vividly recalls a business trip to Vietnam to address a customer complaint. The team spent days conducting on-site verification and returned to the hotel every evening to gather in the lobby, drafting reports and coordinating with the domestic team on improvement plans. "We were there for about a week and a half. It was quite grueling." However, the experience forced the team to thoroughly study the client's standards and benchmark them against other global automotive OEMs. "In the aluminum sector, the client might not be as specialized as we are; they rely heavily on us to solve their problems."

Team Building and Institutional Knowledge: Attitude First, Every Step Counts

When it comes to hiring, Spring prioritizes attitude above all else, followed by industry background. "Professionals with prior automotive experience naturally understand the pace and rhythm of this industry."

She strongly emphasizes standardization and systematic processes. "A project is never a one-person show; the team needs to build institutional memory. We consolidate issues and solutions into an experience database so that future team members can refer to it and know how similar problems were previously resolved." In project management, she focuses on balancing QCD (Quality, Cost, Delivery). "Front-end planning is absolutely critical. If you don't think things through early on, the downstream costs will be exorbitant."

From her early days to her current automotive projects, and from product development to system building, she has navigated multiple strategic phases alongside the company. "Sometimes you don't realize it while you're in the thick of it, but looking back, every step was paving the way for the future." As for the future, her expectations are grounded and pragmatic: securing more projects, accumulating a stronger track record in the automotive sector, and elevating both scale and product portfolio diversity to the next level.



Authors: Kevin Luo

市场资讯分享

热管理

热管理只是单纯散热吗？

热管理不是单纯的降温，它是一套完整的温度调控系统，核心功能远不止散热降温。

1. 覆盖三类温度调控需求

热管理根据对象要求，分为加热、冷却、恒温三种类型，并非只做降温：

低温环境下，它需要给动力电池、芯片等部件加热，让设备快速进入最佳工作温度区间；运行过程中，要精准控温，严格控制不同部件间的温差，避免局部过热或过冷。

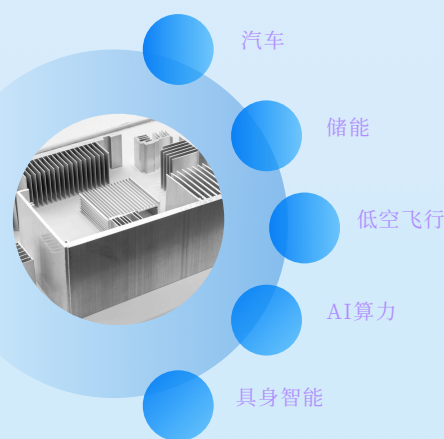
2. 核心目标不止于“不热”

热管理的核心是让设备长期稳定工作在安全高效的温度区间，除了防止过热失效，还能：

- 提升设备性能，比如保障半导体芯片运算效率、提升电池充放电速度；
- 优化能效，通过余热回收等技术降低系统整体能耗；
- 保障使用舒适性，比如乘用车座舱的温湿度调节。

3. 是系统级的热量调度

传统热管理：应用边界狭窄，核心围绕燃油车发动机散热、普通消费电子基础散热，仅需实现“不发生热损害”的基础目标，功能单一。现代热管理已经从单一的散热部件升级为整车/算力中心的能量调度中枢，通过智能算法统筹不同热源的热量分配，实现能量的最大化利用，而非简单的“把热量排出去”。



当新能源汽车驶入规模化普及深水区，当AI算力基础设施、低空经济、具身智能等万亿级新兴产业加速崛起，热管理——这一曾长期隐于产业链背后的关键技术，正以前所未有的速度走向产业舞台中央。

数据显示，2025年中国新能源汽车热管理系统市场规模已达864亿元，市场渗透率逼近50%；预计2026年市场规模将进一步跃升至1274亿元。2023—2027年间，行业复合年增长率（CAGR）预计达到20%。

在产业规模持续扩张的同时，技术体系也正经历深层重构：集成式热管理系统加速普及，多热源协同与能量管理能力持续进化，环保冷媒、高效换热材料、智能控制算法等创新技术不断突破，推动产业从“功能支撑”迈向“效率驱动”。

为什么铝合金适合用于热管理？

前沿导热系数高

铝的导热系数约为 $200\text{W}/(\text{m}\cdot\text{K})$ ，仅次于铜

密度低

密度只有铜的 $1/3$ ，这对汽车、飞行器、机器人等行业应用至关重要

成型性好

可以挤出复杂流道、散热齿片，一次成型

耐腐蚀

搭配乙二醇冷却液长期使用不锈蚀

可回收

符合双碳法规，欧盟碳关税下优势明显

铝合金在热管理中的三大角色



角色一：结构承载

作为电池托盘、电机壳体、机器人骨架，承担力学支撑功能；作为外壳体、箱体，兼具承载内部部件功能。

角色二：散热通道

内部挤出微流道、腔体，冷却液从中流过带走热量——“型材本身即水管”。

角色三：散热表面

表面挤出密集齿片（散热鳍片），增大与空气的接触面积，自然或强制对流散热。

新能源汽车

热管理市场产品：

- 电池托盘（水冷板一体化）、电驱/电机壳体（带冷却流道）、Chiller（冷却器）结构件等。

机遇要点：

- 智己、长安、东风多家车企等提到的“集成化热管理系统”，高度集成化必定带来热管理系统设备更新换代，这意味着电池、电驱、座舱热管理正在合并，追求更好的能量传导、高度集成减轻车载负重。对于供应商的需求逐渐变成提供大型、多腔体、高精度的集成式底盘/车身结构件，而不仅仅是单个电池盒。
- 热管理中使用的冷媒技术变化将会导致冷媒在使用过程中压力极高，对冷媒回路密封性要求苛刻。这要求型材流道的光洁度、抗压防渗漏性能大幅提升（从“不漏水”升级到“不漏气”）。
- 商用车热管理升级：北汽福田提到商用车能效提升，卡车、工程机械的大尺寸电池架、水冷板。

储能

热管理市场产品：

- 液冷板（大平板式或口琴管式）、液冷管路、端板/侧板结构件。

机遇要点：

- 从“能用”到“好用”的快速增长期。目前储能热管理以风冷为主，但液冷渗透率正在急剧攀升。
- 储能客户对成本敏感的同时对质量要求较高，让供应商发展方向往“降本”和“0漏水风险”之间找到平衡，做到多边形战士。
- 大尺寸、超长液冷板：随着电芯越来越大，液冷板需要做得更长、更宽，对挤压机的吨位和型材的平面度、扭曲度控制是巨大挑战。
- 浸没式液冷结构：液冷方式的浸没式冷却需要高强度、耐腐蚀的铝制箱体来承载绝缘冷却液，这是比液冷板更高的附加值产品。

低空飞行（eVTOL）

热管理市场产品变化：

- 电机壳体（对轻量化要求极致）、电池包结构箱体（必须满足航空级抗坠撞标准）。

机遇要点：

- 电机定子支架（最直接的散热结构件）：这是eVTOL动力系统的核心，既是结构件，又是导热件。目前行业前沿采用“结构+功能一体化”设计，通过在支架本体集成热管、翅片等散热结构，并一体成形，以在极端紧凑空间内最大化换热面积。这对挤压模具的精度和型材内部微结构设计提出了极高要求。
- 电池热管理结构（铝基一体化电池仓/液冷板）：eVTOL起降阶段功率需求大，产热量极高。目前趋势是将电池结构与散热功能融合，例如将铝合金电池箱体与液冷流道集成，或开发带相变散热腔体的铝制散热组件，直接与电芯大面积接触，提升散热效率。
- 极致轻量化与高强度：论坛提到飞行器“轻量化”是核心痛点。对铝型材而言，从常规的6061等6系合金，向7055/7085等航空级高强铝合金，以及铝锂合金升级，高强铝合金（7系）的挤压应用，以及拓扑优化后的异形中空结构件，大幅替代CNC锻件，这些材料抗疲劳强度提升50%以上。

AI算力

热管理市场产品：

- 冷板式液冷散热器的铝合金冷板本体（用于CPU/GPU）、服务器机柜内的快插接头结构件。

机遇要点：

- 全球AI服务器出货量2025年预计突破350万台，同比暴涨120%；单台AI训练服务器需配备6-8块液冷板，2025年全球需求预计达350万套，液冷渗透率2025年预计超50%，2027-2028年有望突破65%。
- 微通道与复杂流道设计：AI芯片热流密度高达150-300W/cm²（论坛数据）。这要求型材挤压出内部具有更密集、更小尺寸（毫米级）的散热齿片或微流道。
- 英伟达即将量产的Vera Rubin平台已宣布采用100%全面液冷技术，不再需要风冷。这意味着液冷从“可选”变为“标配”，市场确定性极高。

具身智能

热管理市场产品：

- 机器人关节/伺服电机散热壳体、灵巧手内部的微型结构件、骨架结构件。

机遇要点：

- 具身智能机器人的关节内部间隙不足2毫米，伺服关节占总发热量60%-80%这对铝型材意味着精密微型挤压（截面尺寸极小、公差带收窄到μ级）和复杂的“三维弯曲”成型技术，用于在狭小空间内布置冷却流道。
- 人形机器人的“大脑”AI芯片同样是发热大户，热流密度极高，主要需求支撑和冷却机器人“大脑”计算模块的铝合金散热板、散热片，与AI服务器液冷板技术路线相似，要求高精度微流道、优异的导热性能、轻量化。

从“提供型材”到“提供热管理结构解决方案”

热管理行业正从“单一车载温控”向“全域智能热管理”跨越，而铝合金挤压型材，凭借其轻量化、集成化、高性价比的天然优势，正成为这场变革中不可或缺的结构载体，不断推动着行业从“材料供应商”向“热管理结构解决方案提供商”转型升级。

如今AI时代，AI+仿真是驱动的研发效率革命，加速热管理领域的产品开发与更新，通过数字化手段降低试错成本。

热管理的边界正在无限扩展，新能源汽车、储能、AI算力、低空飞行、具身智能等现在是火热的赛道，随着科技的发展，未来会有更多的领域，更多的赛道，铝的应用边界也会随之无限扩展。

热管理，管的是温度，护的是安全，决定的是体验。而我们手中的铝型材，正是守护这道温度防线的第一道“骨骼”。

撰写：黄嘉琪

MARKET INFORMATION SHARING

THERMAL MANAGEMENT

Is Thermal Management Just About Heat Dissipation?

Thermal management is not simply about cooling down—it is a complete temperature regulation system, with core functions that go far beyond just dissipating heat.

1. Thermal Management Addresses Three Distinct Temperature Regulation Requirements

Based on the specific demands of various targets, thermal management encompasses heating, cooling, and temperature stabilization—extending beyond mere cooling:

- In cold environments, it heats power batteries, chips, and other components, helping the equipment quickly reach its optimal operating temperature range

During operation, it precisely regulates temperatures and rigorously manages thermal differentials across components to preclude localized overheating or overcooling.

2. Core Objectives Extend Beyond Thermal Protection

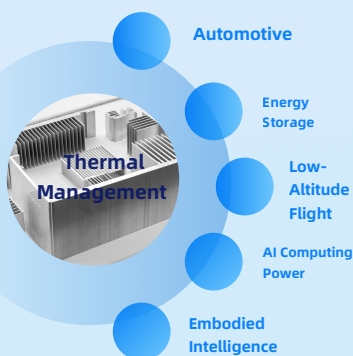
The primary objective of thermal management is to ensure stable, safe, and efficient operation within the optimal temperature envelope. Beyond merely preventing thermal failure or thermal runaway, it also:

- Maximizes System Performance: For instance, maintaining semiconductor chips at peak computational efficiency and optimizing battery charge/discharge rates.
- Enhances Energy Efficiency: Reducing overall system energy consumption through advanced techniques like waste heat recovery.
- Ensures Cabin Comfort: Precisely regulating temperature and humidity within vehicle passenger compartments.

3. Evolution into a System-Level Thermal Dispatch Mechanism

Traditional thermal management had a limited scope, primarily focusing on basic heat rejection for internal combustion engine (ICE) vehicles and consumer electronics. Its sole function was simply to prevent thermal damage.

Modern thermal management has evolved from isolated component cooling into a centralized **energy dispatch hub** for entire vehicles or computing centers. Driven by intelligent algorithms, it dynamically coordinates **thermal allocation** across multiple heat sources to maximize energy utilization—going far beyond conventional **thermal rejection**.



Driven by the mass adoption of NEVs and the rapid growth of AI, low-altitude, and embodied intelligence sectors, thermal management is transitioning from a behind-the-scenes enabler to a core industry focus.

Market data indicates that China's NEV thermal management sector reached RMB 86.4 billion in 2025, with penetration nearing 50%. Driven by this momentum, the market is projected to surge to RMB 127.4 billion in 2026, sustaining a robust 20% CAGR from 2023 to 2027.

As industrial scale expands, the technology landscape is undergoing a profound restructuring. Integrated thermal management systems are seeing rapid adoption, with steady advancements in multi-heat-source coordination and energy management. Concurrently, breakthroughs in eco-friendly refrigerants, high-efficiency heat exchange materials, and intelligent control algorithms are propelling the industry from functional support to efficiency-driven development.

Why is aluminum alloy suitable for thermal management?

High thermal conductivity	Low density	Excellent formability	Corrosion resistance	Recyclability
The thermal conductivity of aluminum is approximately 200 W/(m·K), second only to copper.	Its density is only one-third that of copper, which is critical for industry applications such as automobiles, aircraft, and robotics.	It can extrude complex flow channels and heat dissipation fins in a single forming process.	When used long-term with ethylene glycol coolant, aluminum alloy remains corrosion-resistant and does not rust.	It complies with dual carbon regulations and offers clear advantages under the EU Carbon Border Adjustment Mechanism (CBAM).

The Three Major Roles of Aluminum Alloy in Thermal Management



Role One: Structural Support

Serving as battery trays, motor housings, and robotic skeletons, it undertakes mechanical load-bearing functions; as outer casings and enclosures, it also accommodates and supports internal components.

Role Two: Cooling Flow Channel

Micro-channels and cavities are extruded into the interior, through which coolant flows to carry away heat — "the profile itself serves as the water pipe."

Role Three: Heat Dissipation Surface

Dense teeth (heat dissipation fins) are extruded on the surface to increase the contact area with air, enabling natural or forced convection heat dissipation.

New Energy Vehicles

Thermal Management Market Products

Key product offerings include integrated battery trays (with embedded cooling plates), electric drive/motor housings (featuring internal cooling channels), and chiller structural components.

Key Market Opportunities

- 1. System Integration Drives Structural Upgrades
 - Trend: OEMs are converging battery, e-drive, and cabin thermal loops to reduce weight and optimize energy.
 - Demand: Shift from individual enclosures to large-scale, high-precision integrated chassis/body structures.
- 2. Next-Gen Refrigerants Demand "Gas-Tight" Sealing
 - Challenge: Higher operating pressures require stringent sealing.
 - Upgrade: Aluminum extrusions must evolve from "water-tight" to "gas-tight" (enhanced smoothness, strength, and zero-leakage).
- 3. Commercial Vehicle Expansion
 - Driver: Push for commercial fleet energy efficiency.
 - Demand: Growing need for large-format battery frames and cooling plates for heavy-duty applications.

Energy Storage

Thermal Management Market Products:

Liquid cooling plates (large flat-plate type or dimple tube type), liquid cooling pipelines, end plates/side plate structural components.

Key Market Opportunities

1. Liquid Cooling Surge in Energy Storage
 - Trend: Rapid shift from air to liquid cooling as energy storage demands high performance.
 - Demand: Suppliers must balance cost reduction with zero-leakage reliability.
2. Large-Format Cooling Plates
 - Driver: Larger battery cells (314Ah+) require longer/wider plates.
 - Challenge: Strict manufacturing demands for extruder tonnage, flatness, and twist control.
3. Immersion Cooling Structures
 - Requirement: High-strength, corrosion-resistant enclosures for dielectric fluids.
 - Value: Higher-value-added alternative to conventional liquid cooling plates

Low-Altitude Flight (eVTOL)

Product Evolution

Motor Housings: Extreme lightweighting required.

Battery Enclosures: Must meet aviation-grade crashworthiness standards.

Key Market Opportunities

1. Integrated Motor Stator Brackets
 - Design: "Structure + Function" integration (embedding heat pipes/fins directly into the bracket).
 - Challenge: High demands on extrusion die precision and internal micro-structural design.
2. Integrated Battery Thermal Structures
 - Driver: Extreme heat loads during eVTOL takeoff and landing.
 - Trend: Combining aluminum enclosures with liquid cooling channels or phase-change material (PCM) cavities for direct cell contact.
3. Advanced Materials & Extreme Lightweighting
 - Shift: Transition from conventional 6xxx alloys to aviation-grade 7xxx series (7055/7085) and aluminum-lithium alloys.
 - Advantage: Topologically optimized extrusions replacing CNC-forged parts, delivering >50% fatigue strength improvement.

AI Computing Power

Thermal Management Market Products:

Aluminum alloy cold plates for liquid cooling heat sinks (used for CPU/GPU), quick-connect coupling structural components within server racks.

Key Market Opportunities

1. Explosive Market Growth

- Surge: Global AI server shipments projected to exceed 3.5M units in 2025 (+120% YoY), driving demand for 3.5M liquid cooling plate sets.
- Penetration: Liquid cooling adoption expected to exceed 50% in 2025 and surpass 65% by 2027–2028.

2. Micro-Channel Design Demands

- Driver: AI chips generate extreme heat flux densities (150–300 W/cm²).
- Challenge: Extruded profiles require denser, millimeter-level micro-channels and heat dissipation fins.

3. Liquid Cooling Becomes Standard

- Catalyst: NVIDIA's Vera Rubin platform mandates 100% full liquid cooling, eliminating air cooling.
- Impact: Liquid cooling shifts from "optional" to "standard," ensuring high market certainty.

Embodied Intelligence

Thermal Management Market Products:

Robot joint/servo motor heat dissipation housings, micro-structural components inside dexterous hands, and skeletal structural components.

Key Market Opportunities

1. Precision Micro-Extrusion for Joints

- Driver: Servo joints generate 60%–80% of total heat within <2 mm internal clearance.
- Challenge: Requires precision micro-extrusion (micron-level tolerances) and complex 3D bending to accommodate cooling channels in confined spaces.

2. AI Chip Thermal Management

- Driver: High heat flux density from humanoid robot "brain" AI chips.
- Demand: Lightweight aluminum heat dissipation plates/fins with high-precision micro-channels, mirroring AI server liquid cooling technologies.

From "supplying profiles" to "providing thermal management structural solutions"

The thermal management industry is transitioning from single-vehicle temperature control to full-scenario intelligent thermal management. Aluminum extrusions, with their lightweight, integrated, and cost-effective advantages, are evolving from basic material suppliers into comprehensive structural solution providers.

In the AI era, AI-driven simulation is revolutionizing R&D efficiency, accelerating product iteration, and significantly reducing trial-and-error costs through digitalization.

As boundaries expand across NEVs, energy storage, AI computing, low-altitude flight, and embodied intelligence, new application frontiers for aluminum will continuously emerge.

Thermal management governs temperature, safeguards safety, and defines user experience. The aluminum extrusions in our hands are the foundational skeleton guarding this critical thermal defense line.

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