

mmG™ 联洋



CrioTitan®

深冷绝热材料

创造绿色材料

SUSTAINABLE COMPOSITES

mmG™

联洋

Marine

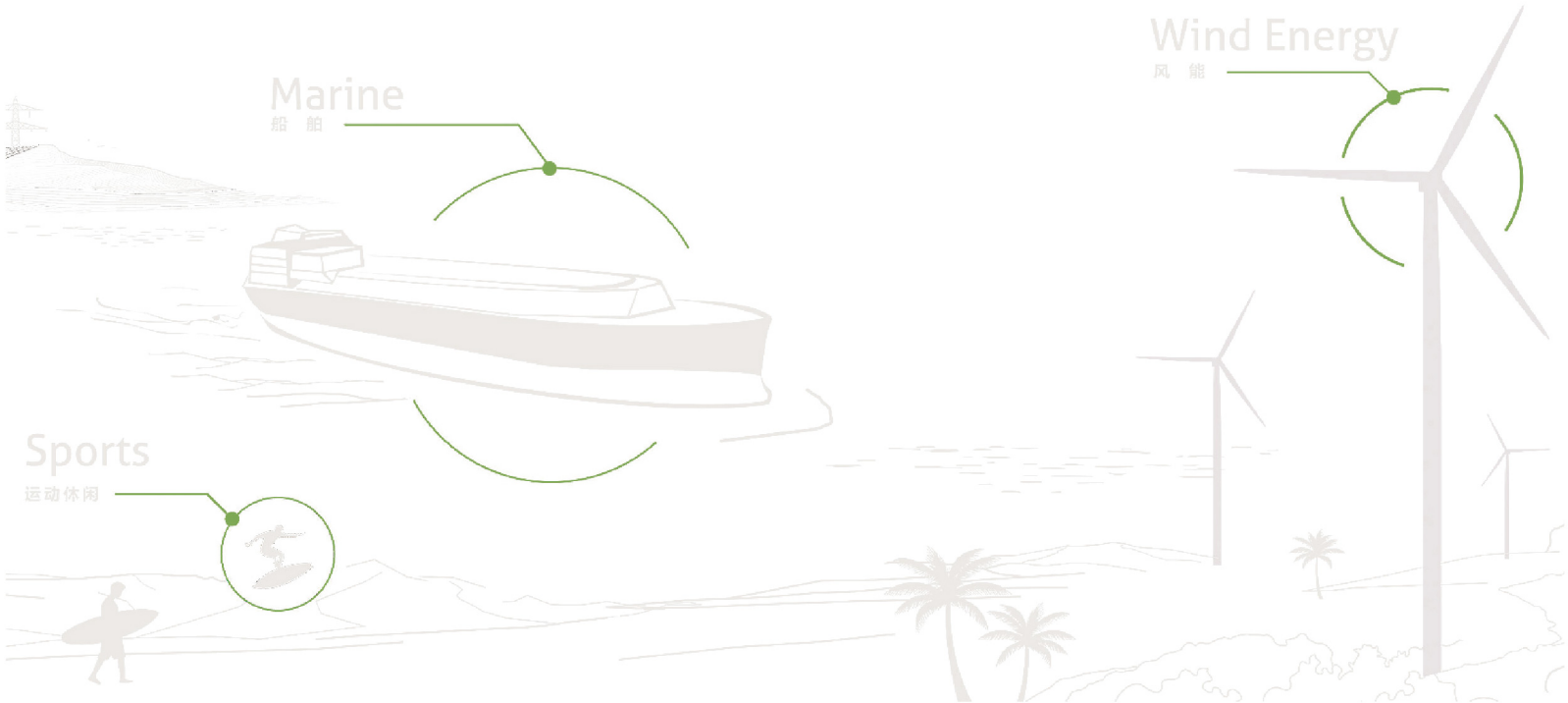
船舶

Wind Energy

风能

Sports

运动休闲



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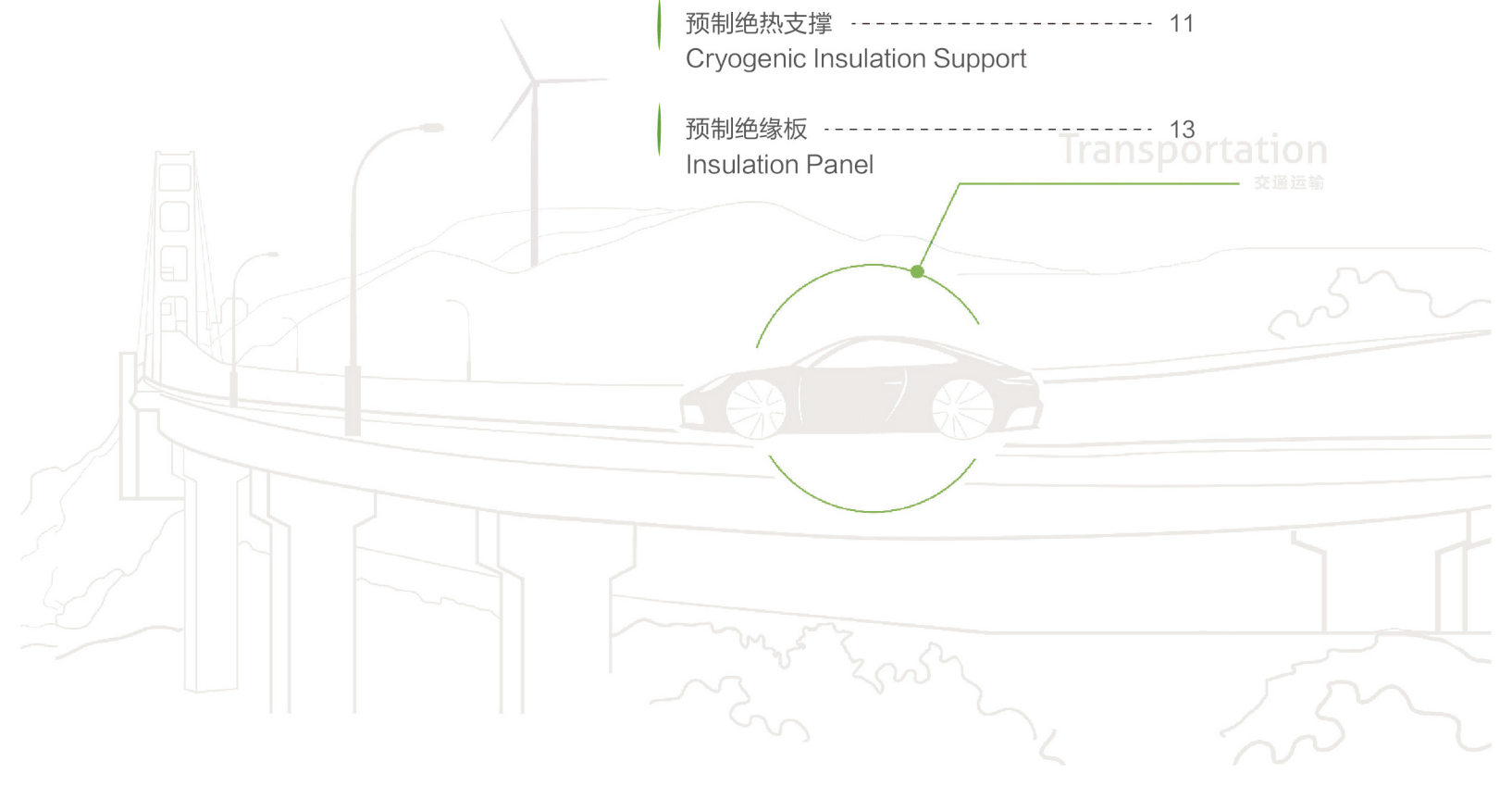
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Company Profile

浙江联洋新材料股份有限公司，是一家专业从事高性能复合材料研发、制造和销售为一体的高新技术企业和国家级专精特新“小巨人”。公司紧紧围绕绿色化发展、国际化经营、数字化转型、创新性驱动的战略发展规划，主要为清洁能源领域提供系列产品和服务。公司在浙江桐乡、意大利戈里齐亚和泰国罗勇分别建立了创新智造基地，服务全球市场。

NMG, is a high-tech enterprise specializing in developing, manufacturing and selling high-performance composite materials and a state-level specialized special new "Little Giant". The company is iclosely around green development, international operation, digital transformation, and innovation-driven StrategicProgramming, mainly for the clean energy feld to provide a series of products and services. The company hasestablished innovative and itelligent manufacturing bases in Zhejiang,Gorizia (Italy) and Rayong(Thailand) to serve the global market.



NMG总部 (HQ)

为践行“创造绿色材料”这一崇高使命，联洋将持续发扬“燃烧激情、创新成长”的企业精神，秉承以“正念、正心、正道”为核心的价值观，恪守“以客户为中心”的经营理念，为实现全球绿色可持续发展而奋斗。

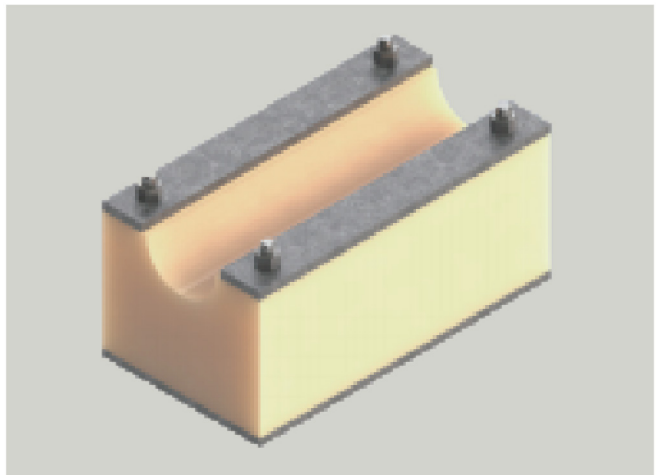
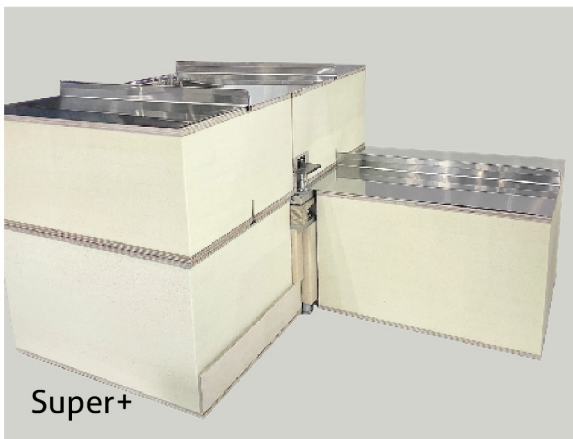
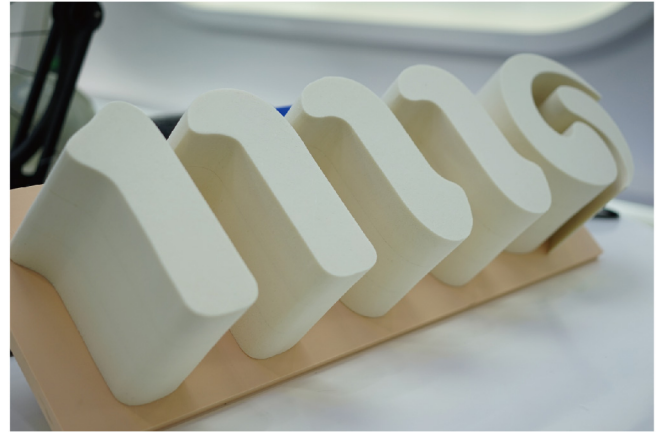
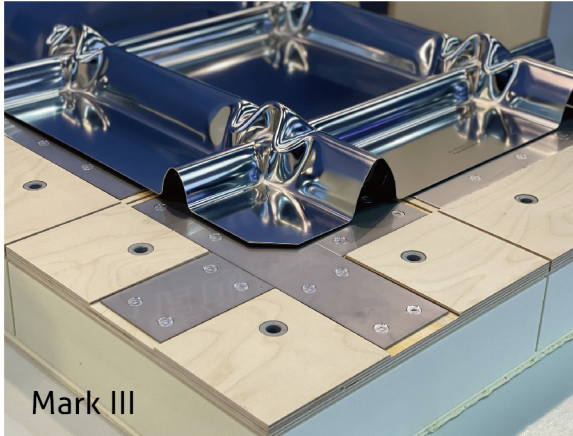
In order to fulfil the lofty mission of "Sustainable Composites", the company will continue to carry forward the enterprise spirit of "Burning passion, Innovative growth upholding the core value of "Mindfulness, Right Mindset, Right Path" abide by the business philosophy of "Customer-centric" to strive for global green and sustainable development.

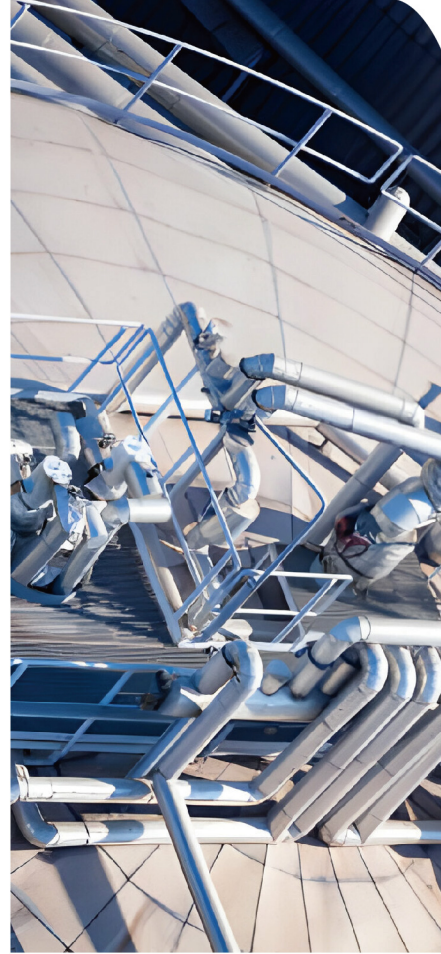


CrioTitan[®]

CRIOTITAN系公司深冷保温材料的产品品牌，包括保温泡沫和绝缘板，产品具有优异的力学性能和超低的导热系数等特点，主要应用于保温隔热如建筑、冷链运输、石油化工等，特别是深冷储运保温领域如以LNG为主的大型液化气体运输船、燃料舱、陆地罐、管道和设备保温、海上/陆上的液化天然气平台等。

CRIOTITAN is a product brand of cryogenic insulation materials, including insulation foam and insulation panel. The products have excellent mechanical properties and ultra-low thermal conductivity, and are widely used in the fields of thermal insulation in building、cold-chain transportation、Petro-chemical etc, especially in the field of cryogenic storage and transportation insulation, such as LNG carrier/LEG/LPG carrier、LNG fuel tank、pipe&equipment insulation、Onshore- storage(GST)、Onshore/Offshore plant、FSRU/FLNG etc.





Applications

应用领域

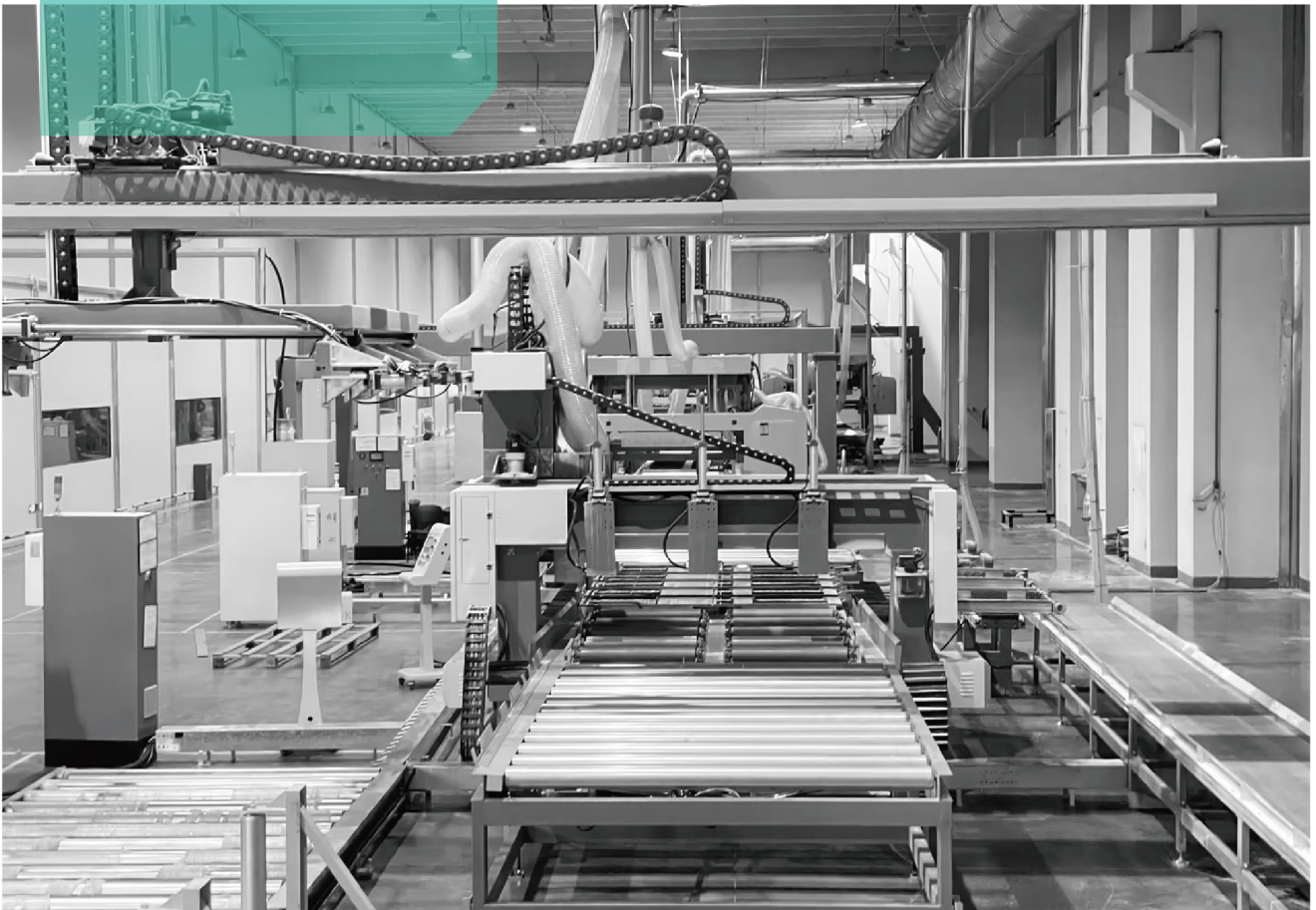
制造能力

MANUFACTURING



公司按照智能工厂的要求来建造R-PUF连续发泡生产线和绝缘板组装生产线，配备国内外先进的设备，可生产GTT薄膜型维护系统所需的各种绝缘板材。

The NMG is fully in accordance with the requirements of the smart factory to build R-PUF continuous foaming production line and insulation board assembly line, equipped with advanced equipment at home and abroad, can produce various insulation boards required for GTT film maintenance system.





连续发泡生产线
Foaming Line



切割线
Trimming Line



CNC加工线
CNC Machining Line



涂胶线
Gluing & Pressing Line



创新能力 INNOVATION



公司从2013年起被评为高新技术企业，现有产品及在研产品均具有自主知识产权，2017年荣获浙江省专利示范企业。建立浙江省博士后工作站，荣获国家级专精特新“小巨人”企业、省级高新技术企业研究开发中心、浙江联洋高性能复合材料研究院、省级企业技术中心和浙江省科技奖等荣誉。

NMG was rated as Provincial High-tech Enterprise in 2013. Itsself-owned intellectual property rights cover all the products in existence and research.NMG has awarded a Patent demonstration enterprise in Zhejiang Province in 2017.

NMG has established provincial postdoctoral workstations and won the honors of national-evel specialized new“little giant”,Provincial R&D Center of High-tech Enterprise Zhejiang,NMG Research Institute of High-Performance Composites,Provincial Enterprise Technology Center and Zhejiang Science and Technology Award.



实验室

Laboratory

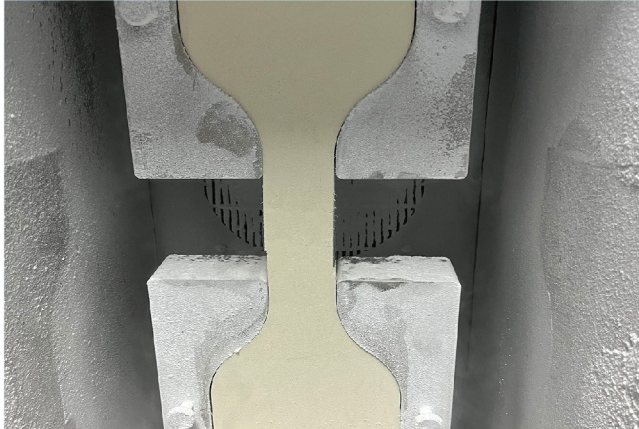
公司在国内外皆配备装备齐全的材料检测实验室，设备较为先进，如Instron万能材料试验机/疲劳试验机、卡尔费休水分测试仪、电位滴定仪、DSC热分析仪等设备，占地超500平方米，配备专业匹配检测人员20余人，具备从原料到制品等较为全面的检测能力。

国内实验室于2023年通过中国合格评定国家认可委员会（CNAS）认可，欧洲实验室于2018年获得挪威船级社(DNV)认可实验室资质。

NMG is equipped with various material testing machine locally and overseas site, including Instron universal material testing machine/fatigue testing machine, Karl Fischer moisture tester, potentiometric titrator, DSC thermal analyzer and so on. More than 20 person were involved the testing from the raw materials incoming inspection, products final inspection and some R&D projects.

The domestic laboratory was authenticated by the China National Accreditation Service for Conformity Assessment (CNAS) in 2023, and the European laboratory was accredited by the DNV in 2018.

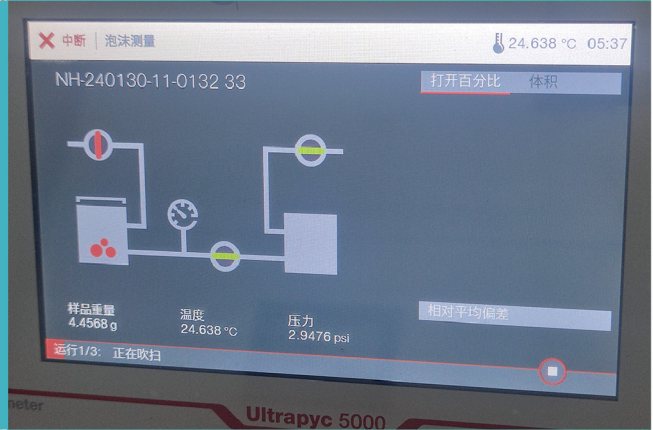




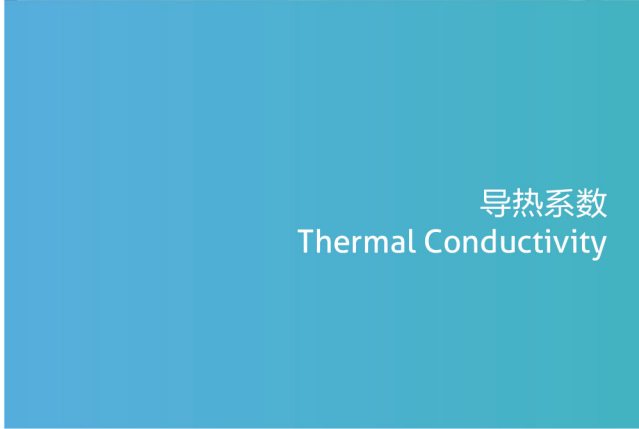
拉伸性能
Tensile Property



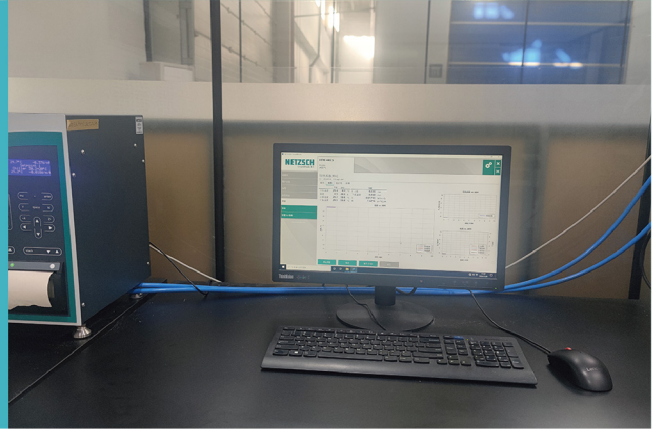
闭孔率
Closed Cells Content



剪切性能
Shear Property

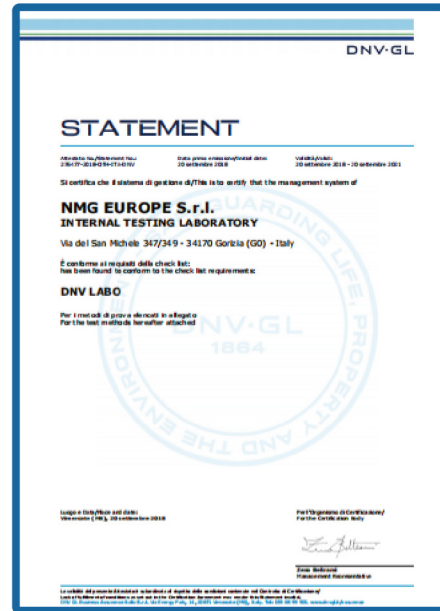


导热系数
Thermal Conductivity



Lab Qualifications

实验室资质



Type Approval

产品认证

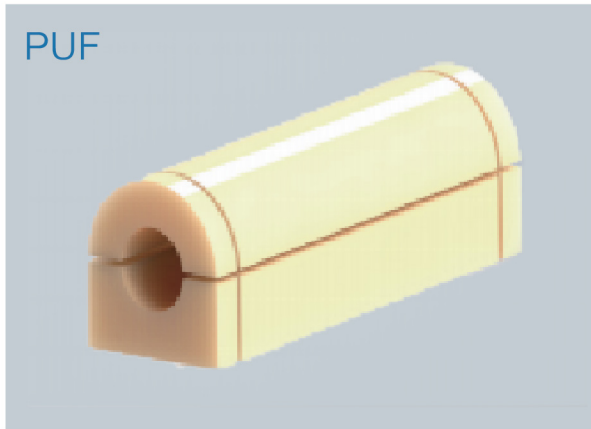


CrioFoam®

保温绝热泡沫 INSULATION FOAM

CRIOFOAM分为常规硬质聚氨酯泡沫（PUF）和纤维增强硬质聚氨酯泡沫（R-PUF）。PUF采用连续大块泡或者模塑泡形式制备。R-PUF通过在发泡过程在线植入连续纤维毡（CFM），泡沫生长过程纤维毡逐渐蓬松并均匀分散于泡沫内，实现超低温下良好的尺寸稳定性和优异的力学增强，对于泡沫板材的握钉力具有明显提升。

CRIOFOAM include conventional rigid polyurethane foam (PUF) and fiber reinforced foam (R-PUF). PUF can be prepared in the form of continuous bulk bubbles or molded bubbles, which is more conventional. R-PUF implants continuous fiber felt (CFM) in the foaming process, and the fiber felt is gradually fluffy and evenly dispersed in the foam during the foam growth process, which achieves good dimensional stability and excellent mechanical enhancement at ultra-low temperature, and significantly improves the gripping force of the foam board.



► 产品特点 / Features



优越的耐候性能
Excellent weather resistance



优越的疲劳性能
Excellent fatigue performance



优越的深冷保温性能
Excellent cryogenic insulation performance



导热系数低
Low thermal conductivity



优越的力学性能
Excellent mechanical properties



定制化解决方案
Customized solutions



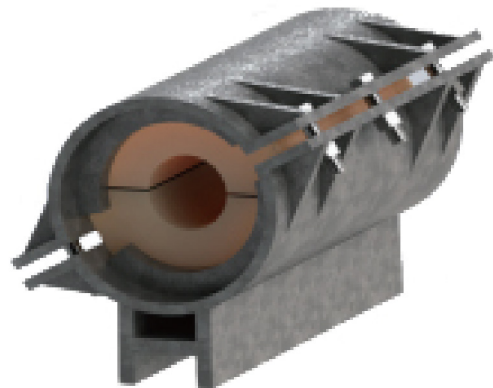
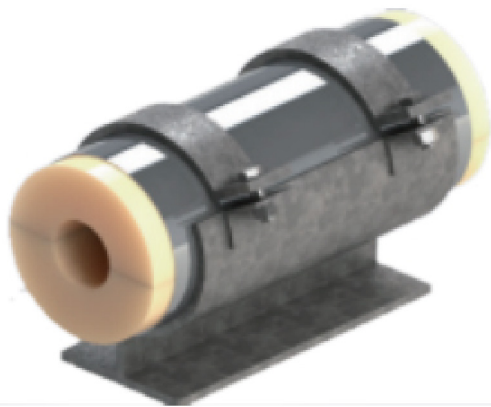
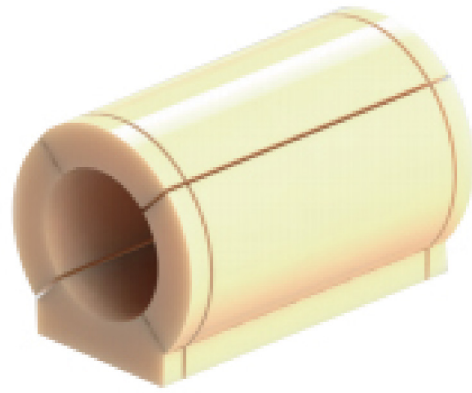
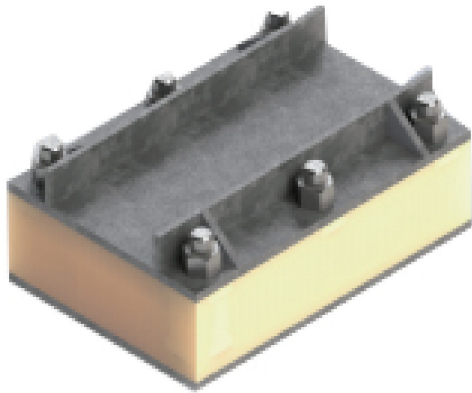
低环境影响
Low environmental impact

CrioFoam®

预制绝热支撑 CRYOGENIC INSULATION SUPPORT

聚氨酯泡沫(PUF)特殊的化学组成赋予其优异的阻燃性能，产品密度范围35-500kg/m³，其中低密度如35kg-60kg/m³级别主要应用于低温保冷，如管道、船舶、建筑等保温隔热。其中高密度产品广泛应用于管托支架等结构部位，其应用范围包括各种液化气体如丙烷、丁烷、甲烷、乙烷、氮气的深冷管路运输领域。

The insulation foam(PUF) particular chemical composition give its excellent fire resistance, density area 35-500kg/m³, Low density PUF 35kg-60kg/m³ mainly used in low temperature insulation, such as pipelines, marine, buildings and other thermal insulation.



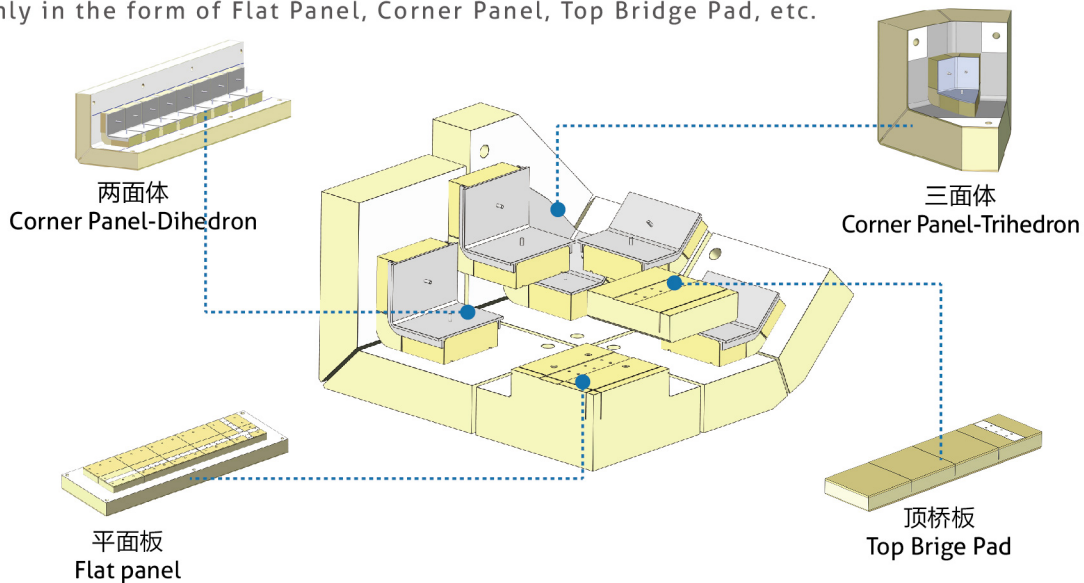
CrioTitan®

预制绝缘板 INSULATION PANELS

► Mark III系列绝缘系统 Mark III Insulation System

Mark III薄膜系统是一种由船体结构直接支撑的绝缘结构设计，它由一个位于预制绝缘板顶部的主级波纹不锈钢膜，和一个由复合材料制成的完整次级屏蔽膜组成。其主要的绝缘材料采用模块化的预制组件，可以适应任何形状和容量的储罐。组件主要有平面板、角落板、顶桥板等。

The Mark III membrane system is a containment and insulation system, directly supported by the ships hull structure. It is composed of a primary corrugated stainless steel membrane, positioned on top of prefabricated insulation panels, including a complete secondary membrane made of composite material. The main insulation materials are modular prefabricated components that can accommodate any shapes and capacities of tanks. The components are mainly in the form of Flat Panel, Corner Panel, Top Bridge Pad, etc.



典型性能 Typical Performance		Mark III Systems		
		Mark III	Mark III Flex	Mark III Flex+
蒸发率BOR* (170K m ³ vessel)		From 0.15 to 0.125%	From 0.10 to 0.085%	0.07%
薄膜Membranes		主屏蔽Primary: 不锈钢Stainless steel 304L – 1.2 mm 次屏蔽Secondary: 复合材料Composite material		
厚度 Thickness	主层 Primary panel	100	100	100
	次层 Secondary panel	170	300	380
	总厚度 Total Thickness	270mm=100+170	400mm=100+300	480mm=100+380

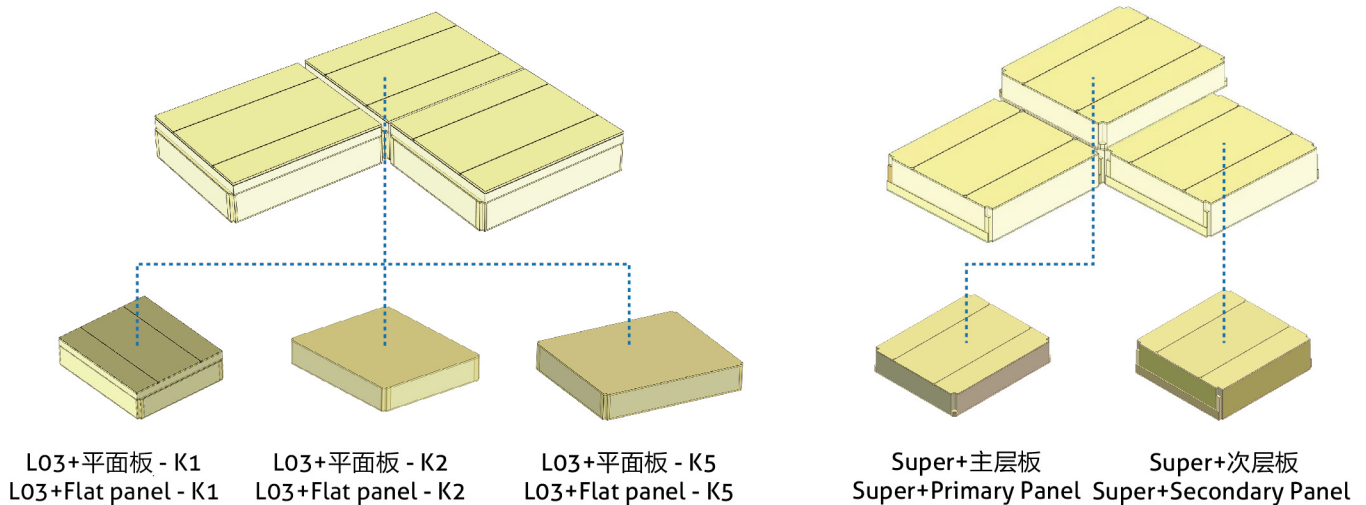
CrioTitan®

预制绝缘板 INSULATION PANELS

► NO 96系列绝缘系统 NO 96 Insulation System

NO96系统的主级和次级薄膜由殷瓦钢®制成，这是一种厚度为0.7毫米，36%的镍钢合金。主级膜直接与液化天然气接触，而与主级膜相同的次级膜确保在发生泄漏时100%冗余。每条500毫米宽的殷瓦钢®条纹都沿着罐壁连续分布，并由主级和次级绝缘层均匀支撑。

The primary and secondary membranes of NO96 system are made of Invar®, a 36% nickel-steel alloy, 0.7mm thick. The primary membrane contains the LNG cargo, while the secondary membrane, identical to the primary, ensures a 100% redundancy in case of leakage. Each of the 500mm wide Invar® strakes is continuously spread along the tank walls and is evenly supported by the primary and the secondary insulation layers.



典型性能 Typical Performance	NO96 Systems		
	NO96 L03	NO96 L03+	NO96 Super+
蒸发率BOR* (170K m ³ vessel)	0.11%	0.10%	0.085%
主绝缘材料 Main Insulating Material	玻璃棉和泡沫 Glass-wool and foam 130 kg/m ³		增强泡沫 RPUF
薄膜 Membranes	殷瓦钢 Invar® 0.7 mm		
厚度 Thickness	530 mm = 230 (主层 Primary) + 300 (次层 Secondary)		

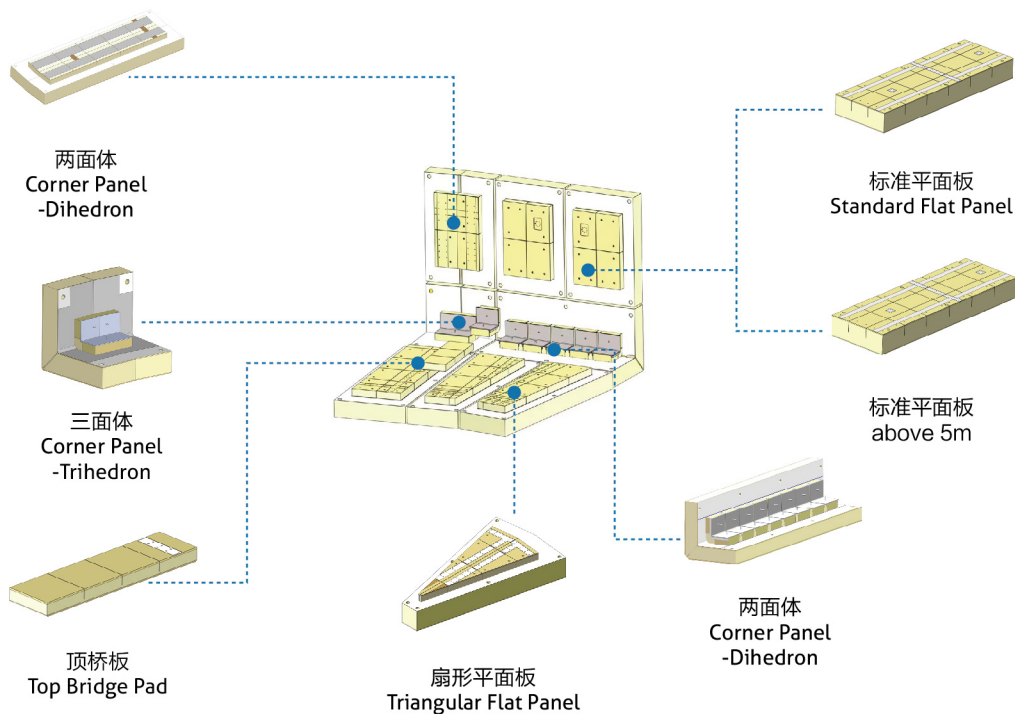
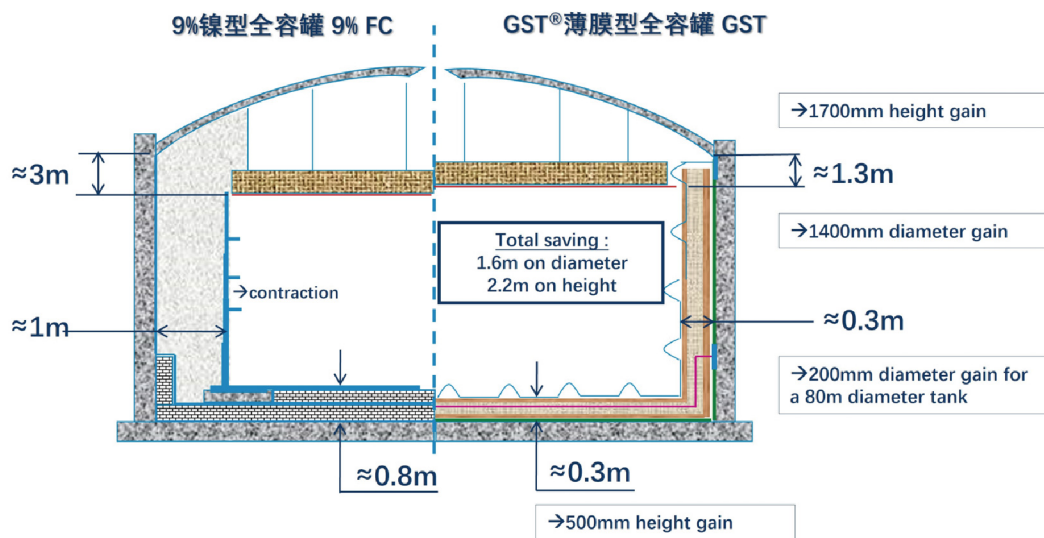
CrioTitan®

预制绝缘板 INSULATION PANELS

► GST系列绝缘系统 GST Insulation System

GST是GTT自主开发的陆上存储设计薄膜系统，得益于30多年的海上经验，它完全符合国际标准，并提供较高的安全级别。GST®系统来源于Mark III技术，因此可以很容易地基于现有的Mark III系统生产线进行预制。

GST® Membrane Full integrity system is an onshore storage system independently developed by GTT, which benefits from more than 30 years of experience at sea, it is fully compliant with international standards, and offers one of the highest safety levels. GST® system is derived from Mark III technology, so it can be easily prefabricated with the existing production lines for Mark III system.





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