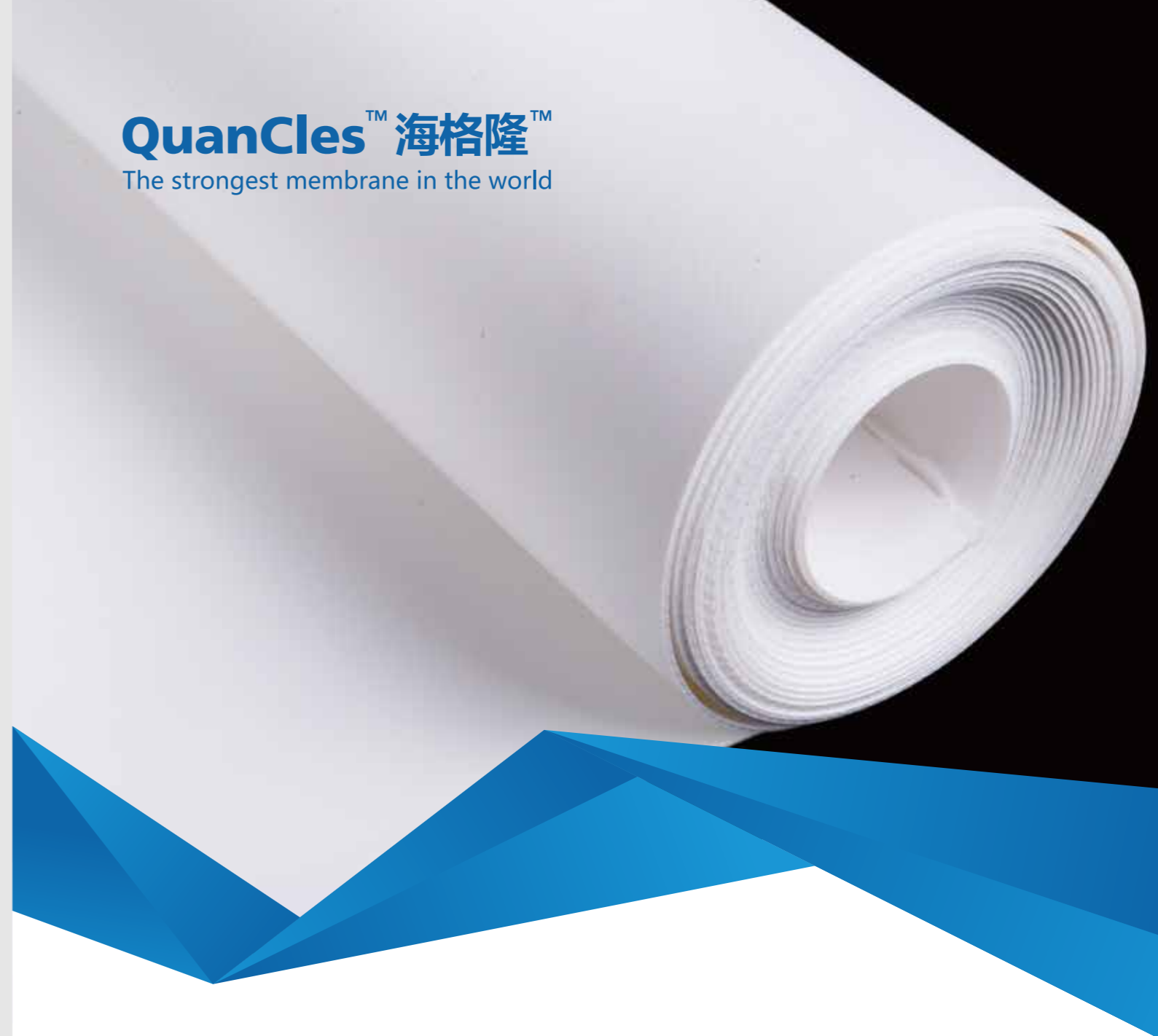


**QuanCles™ 海格隆™**  
The strongest membrane in the world



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**THE STRONGEST MEMBRANE IN THE WORLD**  
**高性能复合膜材**

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## ABOUT QUANTUMETA 公司简介

QUANTUMETA is an innovative solution provider of high performance composites. Our goal is to meet customer's ever-increasing demand on lighter-and-stronger composite materials in every industry, product and application by our unique knowhow of advanced materials and application solutions.

北京量子天地新材料科技有限公司（公司简称“量子天地”）成立于2015年，通过创新的高性能复合材料解决方案立足于先进复合材料领域。公司将生产基地和研发中心建设于浙江省桐乡市，成立了浙江全米特新材料科技有限公司，设计引进最先进的生产实验设备，工艺水平领先，研发实力雄厚。公司的研发人员和技术服务团队广泛贴近市场，倾听客户需求，用定制化的解决方案满足客户的产品性能需求，帮助客户挖掘和提升产品的商业价值。

## TECHNOLOGY 技术专长

QUANTUMETA has technical expertise of high performance fabric design and application solutions. Its product portfolio covers UHMWPE fiber, high performance fabrics, prepregs, and composite parts. With unique value proposition of "lighter-and-stronger composites", QUANTUMETA serves a wide range of markets and applications like marine engineering, lightweight vehicles, inflatable structures, sports equipment, new energy and etc.

QUANTUMETA's product applications compose of two major categories, i.e. rigid composite and flexible composite. Its high performance fabrics used as reinforcement can effectively reduce weight of composites, improving strength and impact resistance. Its high performance membrane, QuanCles™, is the world's strongest membrane with extremely high strength to weight ratio and excellent properties, bringing flexible composite fields many more possibilities.

量子天地拥有高性能织物设计专长和应用技术专长，通过创新的材料技术为市场提供具有轻质、高强、高性能等优异性能的复合材料产品和应用解决方案。公司产品涵盖高性能纤维、高性能增强织物、预浸料、高性能膜材和复合材料制件，广泛服务于海洋工程、特种建筑、轻量化交通、体育休闲和新能源等应用市场。

量子天地的产品主要分为两大应用方向，硬质复合材料和柔性复合材料。在硬质复合材领域，量子天地的高性能增强解决方案可以显著降低复合材料的重量，提升复合材料的强度和耐冲击韧性；在柔性复合材料领域，海格隆™柔性复合膜材性能突破了传统膜材的最高水平，其超高的比强度和优异的性能为柔性复合材料领域带来了更多的可能。

# QuanCles™ 海格隆™

UHMWPE Fiber Reinforced Composite Membrane  
超高分子量聚乙烯纤维增强复合膜材

## PRODUCT DESCRIPTION / 产品介绍

QuanCles™ is the brand name of the high performance membrane with characteristics of high strength and advantageous properties. It composes of UHMWPE fabric and modified TPU resin. UHMWPE fiber has the highest strength among all reinforcement fibers and a density lighter than water. With UHMWPE fabric as reinforcement, QuanCles™ has far higher tensile strength, tear strength and burst strength than traditional membrane with lighter weight. TPU resin is also the best of its kind with high strength, high modulus, high elongation rate, excellent properties of anti-aging and low temperature resistant, and the best anti-abrasion property. QUANTUMETA combines the world's strongest fiber and world's strongest resin, making QuanCles™ the strongest membrane in the world.

In specific applications, QuanCles™ can be tailor-made to be fire-proof, self-cleaning, anti-yellowing and colorful, meeting different needs from customers.

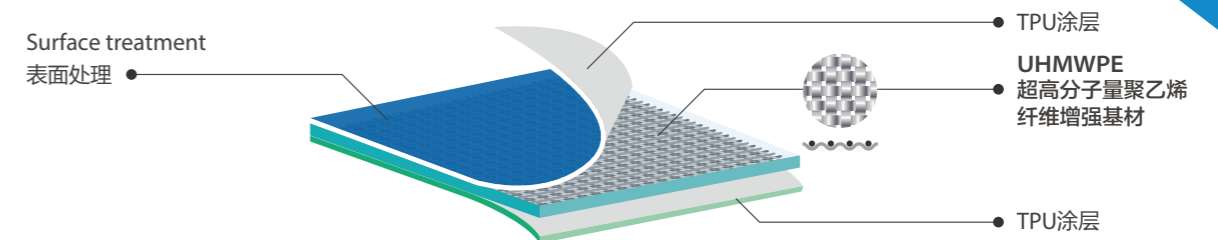
海格隆™是量子天地研发的一款具有超高强度和优异性能的柔性复合膜材。海格隆™以超高分子量聚乙烯纤维织物为增强材料，拥有超高的比强度和优异的性能，其拉伸强度、撕裂强度和顶破强度都远超出传统纤维增强膜材和橡胶材质。海格隆™使用的改性TPU树脂强度高、模量高、伸长率高、具有优秀的耐老化和耐低温性能，其耐磨性在同类树脂材料中更是首屈一指。

在不同的应用中，海格隆™可以进行阻燃、自洁性、抗黄变和多种颜色的处理，满足客户对产品的多样需求。

## PERFORMANCE FEATURES / 性能特点

- |                      |                             |        |       |
|----------------------|-----------------------------|--------|-------|
| • High strength      | • Corrosion-resistant       | • 超高强度 | • 耐腐蚀 |
| • Light weight       | • Low temperature resistant | • 重量轻  | • 耐低温 |
| • Abrasion-resistant | • Anti-aging                | • 耐磨损  | • 耐老化 |

## STRUCTURE / 膜材结构



Code 产品代码	Areal Density 面密度	Tensile Strength 拉伸强度	Surface 表面处理
3004	400 ± 50 g/m <sup>2</sup>	3000/3000 N/5cm	PVDF/Acrylic
7010F	1000 ± 50 g/m <sup>2</sup>	7000/6500 N/5cm	PVDF
9014	1400 ± 50 g/m <sup>2</sup>	9000/8500 N/5cm	PVDF/Acrylic/Polyurea
14016	1600 ± 50 g/m <sup>2</sup>	14000/14000 N/5cm	PVDF/Acrylic/Polyurea

## APPLICATIONS / 应用领域

Air dome / Salvage buoyancy airbag / Airship / Inflatable tent / Inflatable landing boat / Ship fender / Others  
气膜建筑、打捞浮力气囊、飞艇、充气帐篷、充气登陆艇、充气护舷、其他



# AIR DOME

## 气膜建筑

### APPLICATION DESCRIPTION / 应用介绍

An air dome structure is a special air-supported membrane building where the membrane is supported by a slightly higher air pressure inside the dome. Therefore, weight and strength of the membrane itself largely decide the structure designing. When air dome reaches a certain weight or span, designers have to add steel beams and pillars to keep its form and security. But with QuanCles™ membrane, the span limit of beamless structure can be greatly maximized. QuanCles™ membrane has high weight-to-strength ratio that it can easily reach the strength requirement with a lighter weight and it can be supported by only air pressure in a large-span dome structure, which means a great saving of space and time of construction.

Besides, QuanCles™ membrane demonstrates excellent properties of low temperature resistant, corrosion resistant, UV-resistant and wear resistant that it can keep performance in extremely conditions such as cold, corrosive, high UV-radiation, or windy and sandy environment.

Unlike PVC, TPU resin is healthier. It has rare VOC and no chloride release. QuanCles™ membrane, made of UHMWPE fiber and TPU resin, is designated to provide safer and healthier active space for people inside.

建设气膜场馆时，膜材料的自重和强度对场馆的结构设计非常关键，当膜体过重时往往需要增加钢梁和支柱支撑。海格隆™的出现解决了大跨度场馆建设难题。海格隆™具有超高的比拉伸强度和撕裂强度，这意味着海格隆™能够以更轻的重量达到更高的强度要求。在超大跨度的气承式气膜建筑中，海格隆™膜材可以通过气压差直接撑起，无需再增加支撑梁，这不仅可以有效的减少场馆空间的浪费，更能大幅度提升建筑效率，节省人工成本。此外，海格隆™有着优异的耐寒性、耐腐蚀性、耐紫外老化性和耐磨损性能，使其能够适应高寒、高腐蚀、高温差和高风沙的恶劣环境。海格隆™所采用的TPU树脂挥发性极小，无刺激性气味产生，保障了气膜空间的清洁性和安全性。



### [7010F]

#### TECHNICAL DATA SHEET / 技术参数表

	Unit 单位	Data 参数	Test standard 检测标准
Reinforcement 基布		UHMWPE Fabric 超高分子量聚乙烯纤维织物	
Resin 树脂		TPU	
Surface Treatment 表面处理		PVDF	
Color 颜色		Customized	
Areal Density 面密度	g/m <sup>2</sup>	1000 ± 50	ISO 2286-3
Thickness 厚度	mm	1 ± 0.1	ISO 2286-2
Width 幅宽	m	1.2 ~ 1.6	ISO 2286-2
Tensile Strength 拉伸强度	N/5cm	7000 / 6500	ISO 1421
Elongation 断裂伸长率	%	10 / 10	ISO 1421
Tear Strength 撕裂强度	N	1200 / 1200	ISO 4674-1
Bursting Strength 顶破强度	kN	>19.15	GB / T 14800-2010
Peel Strength 剥离强度	N/2.5cm	50	GB / T 2791-1995
Flame Resistance 阻燃等级	/	B1	GB 8624-2012

# SALVAGE BUOYANCY AIRBAG

## 打捞浮力气囊

### APPLICATION DESCRIPTION / 应用介绍

- Salvage buoyancy airbag made with QuanCles™ membrane is lighter and stronger, and it weighs only 1/10 of rubber buoyancy airbag and 1/30 of steel pontoon at the same buoyancy, which makes it easier to transport and operate, especially by air container and in water.
- Benefits from the high tensile strength, tear strength and bursting strength of QuanCles™ membrane, which turned into high inner pressure capacity and excellent tear-resistance of airbag, the salvage buoyancy airbag can be used in deeper-sea salvage and complex working environment.
- Covered with polyurea as protective layer, QuanCles™'s properties of wear resistance, corrosion resistance and aging resistance were further strengthened, endows salvage airbags longer working life in repeated usage.
- QuanCles™ salvage buoyancy airbags perform well in extreme climate conditions especially in low temperature places, such as polar region for the membrane keeps flexible and no strength losses in.

由海格隆™膜材制成的打捞浮力气囊强度高而重量轻，在同等浮力下重量仅为橡胶气囊的1/10，钢制浮筒的1/30，便于快速运输和潜水员水下安装，可极大提高救援速度和施工效率。海格隆™超高的拉伸强度、撕裂强度、顶破强度使打捞气囊拥有超强的承压能力和抗撕裂能力，使其适用于更深海域的打捞作业和更恶劣的施工环境。在表面喷涂聚脲保护层可使气囊的耐磨性、耐腐蚀性和耐老化性进一步增强，能够适应长期海底作业，并可重复使用。海格隆™有着优异的耐低温性能，在超低温环境下膜材保持柔软且无强度损失，适用于极端环境下如极地打捞作业。



[9014]

### TECHNICAL DATA SHEET / 技术参数表

	Unit 单位	Data 参数	Test standard 检测标准
Reinforcement 基布		UHMWPE Fabric 超高分子量聚乙烯纤维织物	
Resin 树脂		TPU	
Surface Treatment 表面处理		Polyurea	
Color 颜色		Customized	
Areal Density 面密度	g/m <sup>2</sup>	1400 ± 50	ISO 2286-3
Thickness 厚度	mm	1.4 ± 0.1	ISO 2286-2
Width 幅宽	m	1.2 ~ 1.6	ISO 2286-2
Tensile Strength 拉伸强度	N/5cm	9000 / 8500	ISO 1421
Elongation 断裂伸长率	%	10 / 10	ISO 1421
Tear Strength 撕裂强度	N	1200 / 1200	ISO 4674-1
Bursting Strength 顶破强度	kN	>19.15	GB / T 14800-2010
Peel Strength 剥离强度	N/2.5cm	60	GB / T 2791-1995
Flame Resistance 阻燃等级	/	B1	GB 8624-2012



## AIRSHIP / 飞艇

QuanCles™ has high tear strength, burst strength and a light weight. Its high strength-to-weight ratio enables the airship body a lighter weight and a higher strength, which can be transferred into more capacity load and longer duration of flight. QuanCles™ is abrasion-resistant and tear-resistant, increasing safety for the airship body. And its excellent properties of low temperature resistant and UV aging resistant provide the airship body a wider environment adaptability and longer working cycle.

海格隆™有着超强的撕裂强度、顶破强度，而且质量超轻。用海格隆™制成飞艇结构，可以有效减轻飞艇的艇身重量，增加有效载荷，增长续航时间。海格隆™优秀的耐磨损和耐撕裂性能使飞艇的安全性更高；优秀的耐低温、耐紫外光老化性能使飞艇的使用环境更广，使用周期更长。

## MILITARY TENT / 军旅帐篷

QuanCles™ is a light weight membrane with relatively high strength. It is the best material for military tent, which need good portability and good performance in wild environment. Military tent made with light-weight QuanCles™ is dismountable, portable and stronger compared with common materials, so that it can effectively resist impact from sand and stone, and from windy or snowy weather. Compared to PVC membrane, QuanCles™ doesn't release toxic VOC, providing the army a safer space for sleeping.

海格隆™是一款轻型高强膜材，以较轻的重量即可达到较高的强度，可以应用于对便携性和野外环境适应性有较高要求的军事帐篷。用海格隆™制成的军旅帐篷可拆卸，易移动，易携带；篷面更加结实牢固，可以有效抵挡野外的砂石磨损和风雪天气。与传统PVC膜材料相比，海格隆™无任何有害气体释放，使睡眠空间更加清洁安全。

## [3004] TECHNICAL DATA SHEET / 技术参数表

	Unit 单位	Data 参数	Test standard 检测标准
Reinforcement 基布		UHMWPE Fabric 超高分子量聚乙烯纤维织物	
Resin 树脂		TPU	
Surface Treatment 表面处理		PVDF / Acrylic	
Color 颜色		Customized	
Areal Density 面密度	g/m <sup>2</sup>	400 ± 50	ISO 2286-3
Thickness 厚度	mm	0.4 ± 0.05	ISO 2286-2
Width 幅宽	m	1.2 ~ 1.6	ISO 2286-2
Tensile Strength 拉伸强度	N/5cm	3000 / 3000	ISO 1421
Elongation 断裂伸长率	%	10 / 10	ISO 1421
Tear Strength 撕裂强度	N	600 / 600	ISO 4674-1
Peel Strength 剥离强度	N/2.5cm	40	GB / T 2791-1995
Flame Resistance 阻燃等级	/	B1	GB 8624-2012