

ALUCOBOND® 阿鲁克邦®

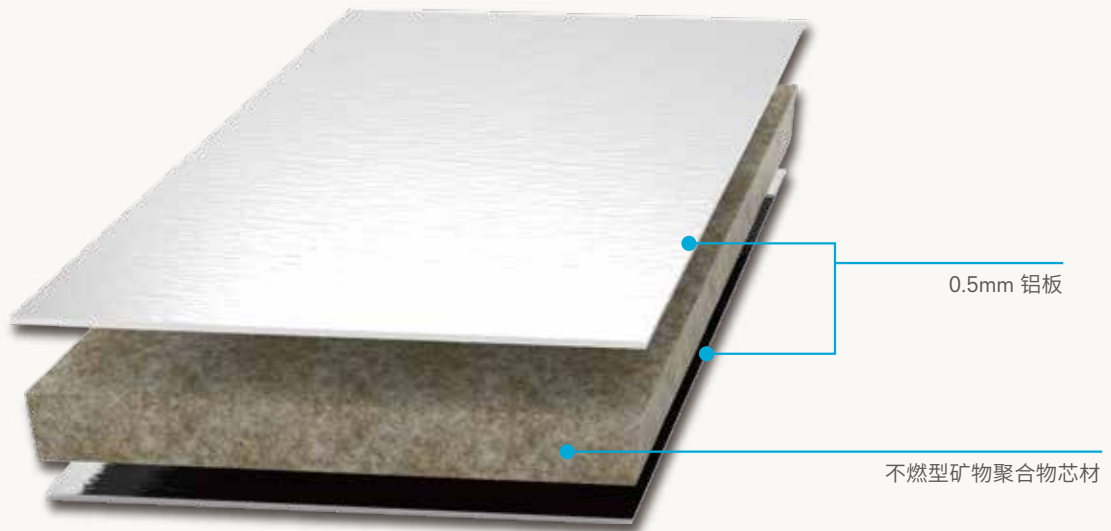
NEXT, ENDLESS AND BEYOND

A2

阿鲁克邦®A2级(不燃级)铝复合板
ALUCOBOND®A2 (Non-combustible) Aluminum Composite Panel

燃烧性能

阿鲁克邦®A2 是全球建筑领域领先的不燃型铝复合板，它采用不燃的特种高矿物料填充芯层，芯材中无机组份含量大于90%。



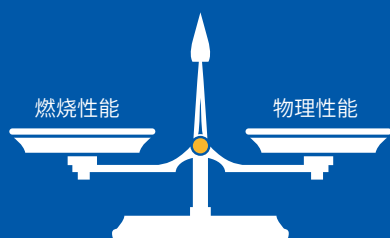
阿鲁克邦®A2 具有卓越的防火性能，燃烧性能符合《建筑材料及制品燃烧性能分级》（GB8624-2012）中A(A2-s1,d0,t0)级不燃材料（制品）的技术要求。

阿鲁克邦®至今仍是世界公认的防火铝复合板行业领导者，产品质量和应用技术通过了众多国家的各类体系认证。

阿鲁克邦®A2 在各个国家通过的防火测试

国家	测试标准	级别
中国	GB8624-2012	Class A2-s1,d0,t0
欧洲	EN 13501-1	Class A2-s1,d0
德国	DIN EN 13501-1	Class A2, non-combustible
法国	NF P 92-501	Class M0, non-combustible
英国/英格兰/威尔士/苏格兰	BS 476, Part 6 BS 476, Part 7 BS 6853 BS EN 13501-1	Index 0 } Class 0 Class 1 } Building Regulations Meets the requirements of the London Underground Ltd. Code of Practice for Fire Safety Limited combustible Non-combustible (Scotland)
日本	JIS A 1231 JIS A 1231	QNC Class 2
马来西亚	BS 476, Part 6 BS 476, Part 7	Class 0 Class 1
新加坡	Approved for outdoor wall cladding of any type of building without height limit	
斯堪的纳维亚	DS 1085-1	Class A
瑞士	VFK	Class 6q.3
俄罗斯	GOST 30244-94 GOST 30244-95 GOST 12.1.044-89 GOST 12.1.044-89 GOST 31251-03	G1(combustibility) W1(flammability) D1(smoke emission) T1(smoke flammability) k0
澳洲	AS ISO 9705 AS 1530.3 Indices EN 13501-1	Group 1 material SMOGRA 0.630 m2/s2 0(ignitibility) 0(flame spread) 0(heat evolved) 0-1(smoke developed) A2,s1,d0
美国	UBC 17-5 ASTM-E84 ASTM D2015	Passed UBC Class 1 509 BTU/lb

物理力学性能



燃烧性能

物理性能

你知道A2级(不燃级)铝复合板的黄金平衡点吗?

作为A2级(不燃级)铝复合板最早研发和生产应用的推动者,阿鲁克邦®找到了那个黄金平衡点!

正如天平的两端,平衡兼顾好燃烧性能和物理力学性能才是验证高品质 A2 级(不燃级)铝复合板的关键所在!

阿鲁克邦®一贯保持产品极佳的剥离强度和耐久性能,阿鲁克邦®A2通过了CTC检测的:

- 耐热水性 (90°C 6h) 剥离值下降率≤25%测试
- 耐盐雾性 (4000h) 测试
- 耐温变性测试
- 耐人工气候老化 (4000h) 测试

同时阿鲁克邦®A2也拥有:

- 高强度,重量轻
- 优越的涂层性能
- 极佳的耐腐蚀性能和耐候性能
- 吸收震动噪声的能力

应用科学的产品从科学的应用系统开始!

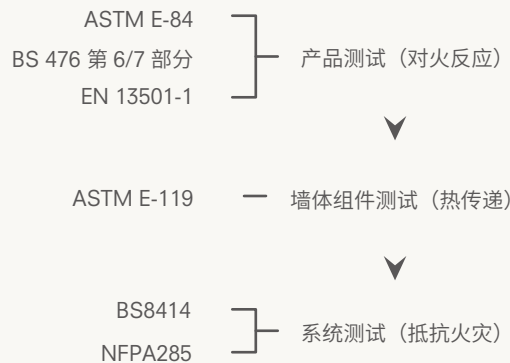
安全具有防火作用的铝复合板系统构造应包含:

- 墙体
- 幕墙龙骨及防火系统构造 (内部防火封堵系统)
- 外立面材料

因此在未来建筑防火设计中,除了注重外立面材料的防火性能,防火系统构造在幕墙防火方面也起着同等重要的地位。

在建筑幕墙防火系统中,科学合理设计的防火封堵系统构造和不燃的外立面材料,在有效阻止火势迅速蔓延上起到同等关键的作用。

阿鲁克邦®A2通过了世界最先进的系统防火性能测试:



BS8414-1
(建筑物外部镶面系统防火性能检测方法)



NFPA285
(评价包含易燃成分的非承重外墙火灾蔓延特性的标准试验方法)

阿鲁克邦®A2 的独特设计优势

阿鲁克邦®A2不仅满足设计师在防火设计中的基本要求,而且尽管采用新型不燃芯层,却依然延续了阿鲁克邦®家族产品以下独特优势:

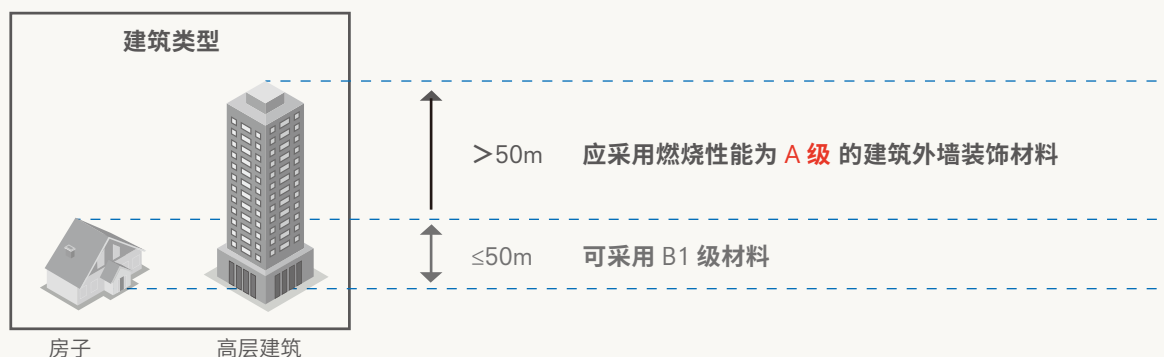
- ① 自重轻
- ② 方便成型
- ③ 易于加工
- ④ 预制板块
- ⑤ 平整度高
- ⑥ 提供多种尺寸、涂层饰面和色彩可供选择
- ⑦ 环保节能
- ⑧ 各种安装方式和系统可供选择
- ⑨ 各种技术支持

能够完美诠释设计师更丰富的造型设计需求,实现设计师在高端建筑及室内设计概念上更多的突破和创新。

行业背景

当前，世界各国对建筑安全性的要求越来越严格，而防火性能是安全性的一项重要指标。近年来多起高层建筑物特大火灾的发生引起相关部门高度重视，公安部、建设部联合颁布了多项法规，对建筑装饰材料的防火要求制定了强制性的标准。

最新的《建筑设计防火规范》(GB50016-2014)发布，其中明确规定了应用中材料防火等级的要求，其中 6.7.12 写到，“**建筑外墙的装饰层应采用燃烧性能为 A 级的材料，但建筑高度不大于 50m 时，可采用 B1 级材料**”，因此当建筑高度大于 50 米时，建筑外墙必须使用 A 级不燃材料。很多国内重点工程的防火要求越发严格，防火性能差的铝复合板必然逐步被市场淘汰，A2 级（不燃级）铝复合板更能成为业内共识。



高层建筑设计要有前瞻性，首先考虑防火安全设计，在选材上 A2 级（不燃级）铝复合板会是最理想的选择。为顺应规范迅速升级而多次修订完善的《建筑幕墙用铝塑复合板》国家标准和《建筑材料及制品燃烧性能分级》产品标准，这是最新的发展趋势，预示 A2 级（不燃级）铝复合板必将成为设计师们笔下的宠儿。

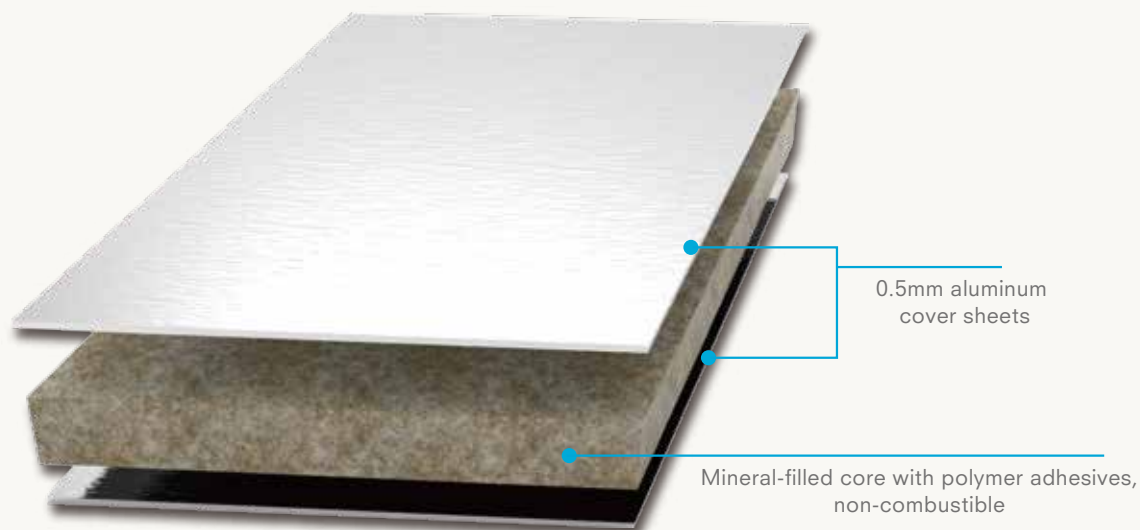


技术参数

技术性能 Technical Properties	标准 Standard	单位 Units	板材厚度 Panel Thickness
板材厚度 Panel Thickness		[mm]	4mm
铝皮厚AL AL Skin Thickness		[mm]	0.5mm
重量 Areal Density		[kg/m ²]	7.8
板材宽度 Panel Width	1000mm, 1250mm, 1500mm		
板材长度 Panel Length	2000mm-8000mm		
技术性能 Technical Properties			
截面模量 Section Modulus W	DIN 53293	[cm ³ /m]	1.75
刚性 Rigidity(Poisson's ration $\nu=0.3$) E-I	DIN 53293	[kNcm ² /m]	2400
合金 Alloy	GB T 3880 EN 573-3		EN AW-5005 (AlMg1)
状态 Temper of AL.	GB T 3880 EN 515		H24 / H44
弹性模量 Modulus of Elasticity	GB T 3880 EN 1999 1-1	[N/mm ²]	70'000
铝材拉伸强度 Tensile Strength of AL.	GB T 3880 EN 485-2	[N/mm ²]	Rm \geq 130
铝材屈服强度 0.2% Proof Stress	GB T 3880 EN 485-2	[N/mm ²]	Rp0,2 \geq 90
伸长率 Elongation	GB T 3880 EN 485-2	[%]	A50 \geq 4
热膨胀 Linear Thermal Expansion	EN 1999 1-1		2,4 mm / m at 100°C temperature difference
芯材 Core 矿物填充聚合物 mineral filled polymer			
表面 Surface			铝卷涂覆Coil Coating
涂层 Lacquering			氟碳漆Fluorocarbon based
光泽度 Gloss(initial value)	EN 13523-2	[%]	30 – 80
铅笔硬度 Pencil Hardness	EN 13523-4		HB - F
声学性能 Acoustical Properties			
吸音因数 Sound Absorption Factor α_s	ISO 354		0.05
隔音等级 Sound Transmission Rw	ASTM E90	[dB]	STC: 30 OITC: 24
热传递性能 Thermal Properties			
热阻 Thermal Resistance R	ASTM C518	[m ² K/W]	0.009
耐热性能 Temperature Resistance		[°C]	-50 to +80
防火等级 Fire Classification	GB 8624		A级 Class A2,s1, d0, t0
	EN 13501-1		A级 Class A2,s1, d0
	NFPA 285		通过 Pass

Combustibility

ALUCOBOND®A2 is the only **non-combustible** aluminum composite panel used in architecture worldwide. It uses **non-combustible** mineral-filled core, of which the inorganic group is over 90%.



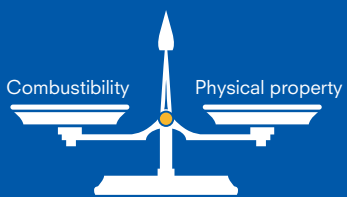
ALUCOBOND®A2 has excellent fire retardant ability. Combustibility conforms to the technical requirements of Class A (A2-s1,d0,t0) non-combustible material (products) in Classification for Burning Behavior of Building Materials and Products.

ALUCOBOND® is still the leader in the worldwide non-combustible ACM field. The quality and applied technologies of ALUCOBOND® have passed a large quantity of international approvals.

Fire behaviour of ALUCOBOND®A2 Aluminium Composite Material

Country	Test accord. to...	Classification
China	GB8624-2012	Class A2-s1,d0,t0
EU	EN 13501-1	Class A2-s1,d0
Germany	DIN EN 13501-1	Class A2, non-combustible
France	NF P 92-501	Class M0, non-combustible
Great Britain/England/ ales/Scotland	BS 476, Part 6 BS 476, Part 7 BS 6853 BS EN 13501-1	Index 0 } Class 0 Class 1 } Building Regulations Meets the requirements of the London Underground Ltd. Code of Practice for Fire Safety Limited combustible Non-combustible (Scotland)
Japan	JIS A 1231 JIS A 1231	QNC Class 2
Malaysia	BS 476, Part 6 BS 476, Part 7	Class 0 Class 1
Singapore	Approved for outdoor wall cladding of any type of building without height limit	
Scandinavia	DS 1085-1	Class A
Switzerland	VFK	Class 6q,3
Russia	GOST 30244-94 GOST 30244-95 GOST 12.1.044-89 GOST 12.1.044-89 GOST 31251-03	G1(combustibility) W1(flammability) D1(smoke emission) T1(smoke flammability) k0
Australia	AS ISO 9705 AS 1530.3 Indices EN 13501-1	Group 1 material SMOGRA 0.630 m2/s2 0(ignitibility) 0(flame spread) 0(heat evolved) 0-1(smoke developed) A2,s1,d0
USA	UBC 17-5 ASTM-E84 ASTM D2015	Passed UBC Class 1 509 BTU/lb

Physical-mechanical property



Do you know the golden equilibrium point of the Non-combustible Aluminum Composite Panels?

As the primary promoter of researching and producing the true non-combustible (Class A2) aluminium composite panels, ALUCOBOND® figured out the golden equilibrium point!

Just like the two ends of the balance, balancing fire retardant and physical-mechanical properties is the key to verify the high-quality of Non-Combustible Aluminum Composite Panels!

ALUCOBOND® has been consistently sustaining the excellent peel strength and lasting quality.

ALUCOBOND®A2 has passed the following performance tests:

- Decrease rate of roll peel strength of boiling water resistance (90°C 6h) \leq 25%
- Salt spray resistance (4000h) test
- Temperature-change resistance test
- Artificial weathering (4000h) test

ALUCOBOND®A2 also possesses:

- Low weight and high rigidity
- Superior coating performance
- Excellent corrosion resistance and long-term behavior
- Ability to absorb vibration and noise

The application of scientific products begins with the scientific application system!

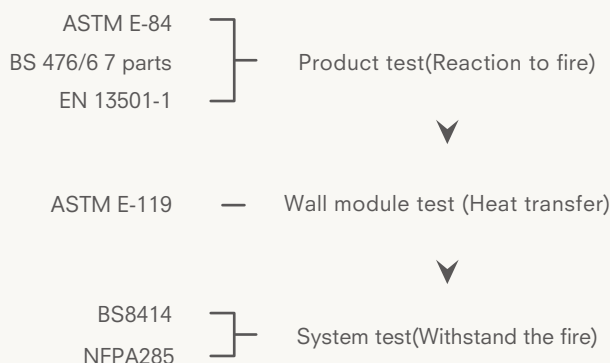
The fire retardant facade system of aluminum composite panel should consider:

- Base Wall
- Sub-structure of curtain wall and fire barrier system (internal fire prevention barrier system)
- Exterior facade material

Therefore, the fire retardant design for modern buildings, in addition to focusing on the fire performance of facade materials, the construction of fire protection system plays an equally important role in an FR cladding solution.

In the fire retardant facade system, the scientific and reasonable design of fire barrier system structure and non-flammable facade materials play the equally important role in effectively preventing the rapid spread of fire.

ALUCOBOND®A2 passed the most advanced system fireproofing tests:



BS8414-1
(Fire-proof performance testing method for building exterior veneer system)



NFPA285
(Standard testing method for evaluating fire spread characteristics of non-bearing exterior walls containing flammable components)

Unique designing advantages of ALUCOBOND®A2

ALUCOBOND®A2 can not only meet the designer's basic requirements of fire protection, but also can realize the following unique advantages though the new non-combustible core has been applied:

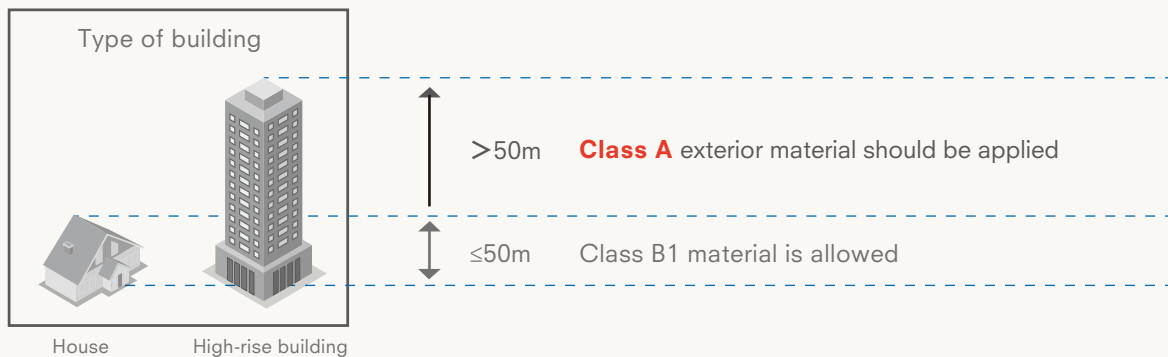
- ① Low weight
- ② Good formability
- ③ Easily processed
- ④ Prefabricated panels
- ⑤ Perfect flatness
- ⑥ Finishes, colours and panel sizes available
- ⑦ Environmental protection
- ⑧ Various fabrication and installation techniques and multiple fixing systems available
- ⑨ Excellent technical services

It can perfectly interpret the designer's more abundant needs of modeling design, and realize more breakthroughs and innovations in the concept of buildings' design.

Industry background

At present, the requirements of building safety are more and more stringent all over the world, and fire protection performance is an important index of safety. In recent years, the occurrence of several super-large fires in high-rise buildings has attracted great attention of relevant departments. The Ministry of Public Security and the Ministry of Construction jointly promulgated a number of laws and regulations, and formulated mandatory standards for fire protection requirements of building decorative materials.

The latest "Code for Fire Protection in Architectural Design" (GB50016-2014) promulgated, which clearly stipulates the requirements of fire protection grade of materials in application. From the requirement, 6.7.12 said, "**Decorative layer of building exterior wall should adopt materials with burning performance of Class A, but Class B1 material can be used when building height is not more than 50m**". Therefore, when building height is higher than 50 meters, the exterior wall of buildings must use Class A incombustible material. Many domestic key projects have stricter fire protection requirements. Aluminum composite panels with poor fire resistance will inevitably be phased out by the market. A2 (non-combustible) aluminum composite panels will become the consensus of the industry.



High height building design needs to be forward. Fireproof security design should be taken into account at first. As for materials, Class A2 (non-combustible) aluminum composite material is the optimal choice. To conform to the stipulations' rapid promotion, the national standards of Aluminum-Plastic Composite Board for Building Curtain Wall and the product standards of Burning Performance Classification of Building Materials and Products have been revised and perfected many times. It is the latest trend which forecasts Class A2 (non-combustible grade) aluminum composite panels will be widely used.



Technical data sheet

Technical Properties	Standard	Units	Panel Thickness
Panel Thickness		[mm]	4mm
AL Skin Thickness		[mm]	0.5mm
Areal Density		[kg/m ²]	7.8
Panel Width	1000mm, 1250mm, 1500mm		
Panel Length	2000mm-8000mm		
Technical Properties			
Section Modulus W	DIN 53293	[cm ³ /m]	1.75
Rigidity(Poisson's ration $\nu=0.3$) E-I	DIN 53293	[kNcm ² /m]	2400
Alloy	GB T 3880 EN 573-3		EN AW-5005 (AlMg1)
Temper of AL.	GB T 3880 EN 515		H24 / H44
Modulus of Elasticity	GB T 3880 EN 1999 1-1	[N/mm ²]	70'000
Tensile Strength of AL.	GB T 3880 EN 485-2	[N/mm ²]	Rm \geq 130
0.2% Proof Stress	GB T 3880 EN 485-2	[N/mm ²]	Rp0,2 \geq 90
Elongation	GB T 3880 EN 485-2	[%]	A50 \geq 4
Linear Thermal Expansion	EN 1999 1-1		2,4 mm /m at 100°C temperature difference
Core mineral filled polymer			
Surface			Coil Coating
Lacquering			Fluorocarbon based
Gloss(initial value)	EN 13523-2	[%]	30 – 80
Pencil Hardness	EN 13523-4		HB - F
Acoustical Properties			
Sound Absorption Factor α_s	ISO 354		0.05
Sound Transmission Rw	ASTM E90	[dB]	STC: 30 OITC: 24
Thermal Properties			
Thermal Resistance R	ASTM C518	[m ² K/W]	0.009
Temperature Resistance		[°C]	-50 to +80
Fire Classification	GB 8624		Class A2,s1, d0, t0
	EN 13501-1		Class A2,s1, d0
	NFPA 285		Pass



上海华山公寓, 公寓楼, 2017年
Shanghai Royal Pavilion, Residential Project, 2017



北京国家疫苗中心, 办公楼, 2010年
Beijing National Vaccine Center, Office Building, 2010



德国斯图加特飞利浦哈夫纳总部, 公司总部, 2015年
Philips Hafner Headquarters, Stuttgart, Germany, Headquarter, 2015



德国德累斯顿学生公寓, 住宅项目, 2009年
Student Residence, Dresden, Residential Project, 2009



法国Tour Bleue Cergy公寓, 住宅项目, 2017年
Tour Bleue Cergy, France, Residential Project, 2017



德国柏林弗里德里希斯海因的高层公寓楼翻新改造项目, 住宅楼, 2010年
Renovation of high-rise apartment buildings in Friedrichshagen, Berlin, Germany, Residential Project, 2010



莫斯科贝卢斯凯特保时捷, 4S店, 2014年
Porsche, Berluskat, Moscow, 4S shop, 2014



德国吕贝克海洋生物研究中心, 科研教学楼, 2014年
Lubeck Research Institute for Marine Biotechnology, Germany, R&D Building, 2014



俄罗斯圣彼得堡地铁过道，公共建筑，2015年
St. Petersburg Subway Station, Russia, Public Works, 2015



德国马格德堡FAM总部，公司总部，2016年
FAM Headquarters in Magdeburg, Germany, Headquarter, 2016



瑞士Coop公司，办公楼，2015年
COOP Group in Switzerland, Office Building, 2015

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