中国标准化协会标准

STANDARDS OF CHINBASSOCIATION FOR STANDARDIZATION

CAS 126-2005

胶粉聚苯颗粒复合型外墙外保温系统

External Thermal Insulation Composite Systems Based on Mineral Binder and Expanded Polystyrene Granule Insulating Material with Other Insulating Material

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胶粉聚苯颗粒复合型外墙外保温系统

1 范围

本标准规定了胶粉聚苯颗粒复合型外墙外保温系统的术语和定义、分类、技术要求、试验方法、检验规则以及产品的标志、标签、包装、运输和贮存。

本标准适用于工业和民用建筑采用的胶粉聚苯颗粒复合型外墙外保温系统产品，组成系统的各种材料应由系统产品制造商配套供应。

2 规范性引用文件

下列文件中的条款通过本标准的引用而成为本标准的条款。凡是注日期的引用文件，其随后所有的修改单(不包括勘误的内容)或修订版均不适用于本标准，然而，鼓励根据本标准达成协议的各方研究是否可使用这些文件的最新版本。凡是不注日期的引用文件，其最新版本适用于本标准。

GB/T 1721—1979 清漆、清油及稀释剂外观和透明度测定法

GB/T 1728—1979（1989） 漆膜、腻子膜干燥时间测定法

GB 3186 涂料产品的取样(neq ISO 1512:1974)

GB/T 6343—1995 泡沫塑料和橡胶 表观(体积)密度的测定（neq ISO 845:1988）

GB/T 8625 建筑材料难燃性试验方法

GB/T 9265—1998 建筑涂料 涂层耐碱性的测定

GB/T 9271—1988 色漆和清漆 标准试板（eqv ISO 1514:1984）

GB 9278 涂料试样状态调节和试验的温湿度(eqv ISO 3270:1984)

GB/T 9286—1998 色漆和清漆 漆膜的划格试验（eqv ISO 2409:1992）

GB/T 9779—1988 复层建筑涂料

GB/T 10294 绝热材料稳态热阻及有关特性的测定防护热板法

GB/T 10801.2—2002 绝热用挤塑聚苯乙烯泡沫塑料(XPS)

GB/T 11835—1998 绝热用岩棉、矿渣棉及其制品

GB/T 13480 矿物棉制品压缩性能试验方法

GB/T 16777—1997 建筑防水涂料试验方法

GB/T 17671—1999 水泥胶砂强度检验方法（ISO 法）

JC/T 412—1991 建筑用石棉水泥平板

JC/T 907—2002 混凝土界面处理剂

JG/T 24—2000 合成树脂乳液砂壁状建筑涂料

JGJ 110—1997 建筑工程饰面砖粘结强度检验标准

JGJ 144—2004 外墙外保温工程技术规程

JG 149—2003 膨胀聚苯板薄抹灰外墙外保温系统

JG 158—2004 胶粉聚苯颗粒外墙外保温系统

QB/T 1925.2—1993 一般用途镀锌低碳钢丝编织网（六角网）

QB/T 3806—1999 建筑物隔热用硬质聚氨酯泡沫塑料

QB/T 3897—1999 镀锌电焊网

YB/T 126—1997 钢丝网架夹芯板用钢丝

3 术语和定义

下列术语和定义及 JGJ 144—2004、JG 149—2003、JG 158—2004 中的相关术语和定义适用于本标准。

3.1

胶粉聚苯颗粒复合型外墙外保温系统 external thermal insulation composite systems based on mineral binder and expanded polystyrene granule insulating material with other insulating material

设置在外墙外侧，由胶粉聚苯颗粒保温浆料复合基层墙体或胶粉聚苯颗粒粘结找平浆料复合其他保温材料构成的具有保温隔热、防护和装饰作用的构造系统，主要包括胶粉聚苯颗粒外墙外保温系统、现浇混凝土燕尾槽聚苯板外墙外保温系统、现浇混凝土斜嵌入式钢丝网架聚苯板外墙外保温系统、胶粉聚苯颗粒贴砌聚苯板外墙外保温系统、喷涂硬泡聚氨酯外墙外保温系统和岩棉板外墙外保温系统。抗裂防护层的厚度宜控制在：涂料饰面普通型 3～5mm，涂料饰面加强型 5～7mm，面砖饰面 8～12mm。

3.2

胶粉聚苯颗粒外墙外保温系统 external thermal insulating rendering systems made of mortar with mineral binder and using expanded polystyrene granule as aggregate

置于建筑物外墙外侧的保温及饰面系统，涂料饰面时是由基层界面砂浆、胶粉聚苯颗粒保温浆料、抗裂砂浆复合耐碱网格布和涂料等组成的系统产品（表 1）；面砖饰面时是由基层界面砂浆、胶粉聚苯颗粒保温浆料、抗裂砂浆复合热镀锌钢丝网（四角电焊网或六角编织网）、塑料锚栓和面砖等组成的系统产品（表 2）。

表 1 胶粉聚苯颗粒外墙外保温系统涂料饰面基本构造

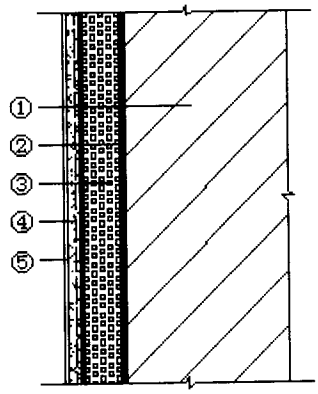
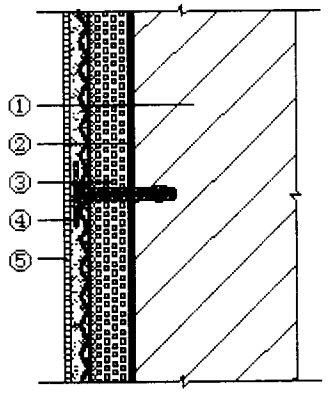
基层墙体 ①	系统的基本构造				构造示意图
	界面层 ②	保温层 ③	抗裂防护层 ④	饰面层 ⑤	
混凝土墙或砌体墙	基层界面砂浆	胶粉聚苯颗粒保温浆料	抗裂砂浆复合耐碱网格布 + 弹性底涂	柔性耐水腻子 + 涂料	

表 2　胶粉聚苯颗粒外墙外保温系统面砖饰面基本构造

基层墙体	系统的基本构造				构造示意图
	界面层 ②	保温层 ③	抗裂防护层 ④	饰面层 ⑤	
现浇混凝土墙 砌体墙	基层界面砂浆	胶粉聚苯颗粒保温浆料	第一遍抗裂砂浆 + 热镀锌钢丝网（用塑料锚栓与基层锚固） + 第二遍抗裂砂浆	面砖粘结砂浆 + 面砖 + 勾缝料	

3.3

现浇混凝土燕尾槽聚苯板外墙外保温系统（简称现浇无网聚苯板外保温系统） external thermal insulation composite systems based on polystyrene panel without steel mesh in cast-in-place concrete form

置于全现浇混凝土建筑物外墙外侧的保温及饰面系统，涂料饰面时是由燕尾槽聚苯板、胶粉聚苯颗粒保温浆料或胶粉聚苯颗粒粘结找平浆料、抗裂砂浆复合耐碱网格布和涂料等组成的系统产品（表 3）；面砖饰面时是由燕尾槽聚苯板、胶粉聚苯颗粒保温浆料或胶粉聚苯颗粒粘结找平浆料、抗裂砂浆复合热镀锌钢丝网（四角电焊网或六角编织网）、塑料锚栓和面砖等组成的系统产品（表 4）。燕尾槽聚苯板双面应该在使用前用聚苯板界面砂浆处理。该系统采用燕尾槽聚苯板与混凝土墙体一次浇筑成型方式固定保温层，在浇筑混凝土前，将燕尾槽聚苯板置于外模内侧，阴阳角处为预制直角形燕尾槽聚苯板，浇筑混凝土完毕后，保温层与墙体即紧密地结合在一起。

表 3　现浇无网聚苯板外保温系统涂料饰面基本构造

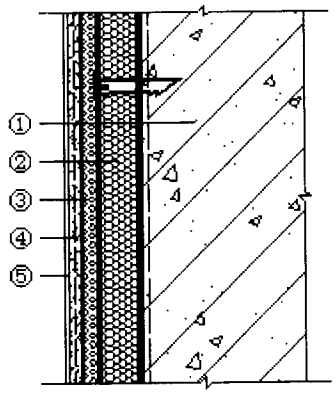
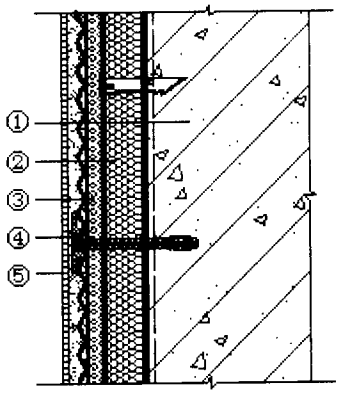
基层墙体 ①	系统的基本构造				构造示意图
	保温层 ②	找平层 ③	抗裂防护层 ④	饰面层 ⑤	
现浇混凝土墙体	经聚苯板界面砂浆处理的燕尾槽聚苯板（竖向燕尾槽，聚苯板上安装有塑料卡钉，聚苯板可以是模塑聚苯板，也可以是挤塑聚苯板，阴阳角处为预制直角形燕尾槽聚苯板）	胶粉聚苯颗粒保温浆料（或胶粉聚苯颗粒粘结找平浆料）	抗裂砂浆复合耐碱网格布 + 弹性底涂	柔性耐水腻子 + 涂料	

表 4　现浇无网聚苯板外保温系统面砖饰面基本构造

基层墙体 ①	系统的基本构造				构造示意图
	保温层 ②	找平层 ③	抗裂防护层 ④	饰面层 ⑤	
现浇混凝土墙体	经聚苯板界面砂浆处理的燕尾槽聚苯板（竖向燕尾槽，聚苯板上安装有塑料卡钉，聚苯板可以是模塑聚苯板，也可以是挤塑聚苯板，阴阳角处为预制直角形燕尾槽聚苯板）	胶粉聚苯颗粒保温浆料（或胶粉聚苯颗粒粘结找平浆料）	第一遍抗裂砂浆 + 热镀锌钢丝网（用塑料锚栓与基层锚固） + 第二遍抗裂砂浆	面砖粘结砂浆 + 面砖 + 勾缝料	

3.4

现浇混凝土斜嵌入式钢丝网架聚苯板外墙外保温系统（简称现浇有网聚苯板外保温系统） external thermal insulation composite systems based on steel mesh polystyrene panel in cast-in-place concrete form

置于全现浇混凝土建筑物外墙外侧的保温及饰面系统，涂料饰面时是由斜嵌入式钢丝网架聚苯板、胶粉聚苯颗粒保温浆料或胶粉聚苯颗粒粘结找平浆料、抗裂砂浆复合耐碱网格布和涂料等组成的系统产品（表 5）；面砖饰面时是由斜嵌入式钢丝网架聚苯板、胶粉聚苯颗粒保温浆料或胶粉聚苯颗粒粘结找平浆料、抗裂砂浆复合热镀锌钢丝网（四角电焊网或六角编织网）、塑料锚栓和面砖等组成的系统产品（表 6）。斜嵌入式钢丝网架聚苯板双面应该在使用前用聚苯板界面砂浆处理。该系统采用斜嵌入式钢丝网架聚苯板与混凝土墙体一次浇筑成型方式固定保温层，在浇筑混凝土前，将斜嵌入式钢丝网架聚苯板置于外模内侧，浇筑混凝土完毕后，保温层与墙体即紧密地结合在一起。

表 5　现浇有网聚苯板外保温系统涂料饰面基本构造

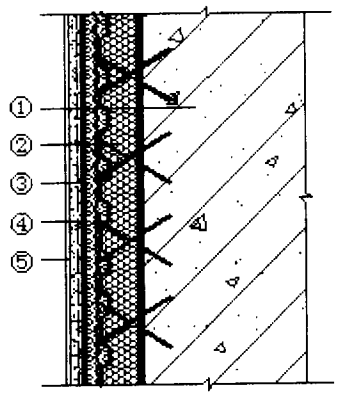
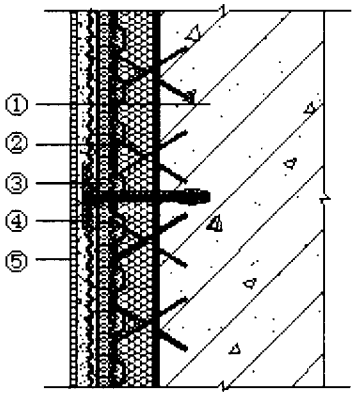
基层墙体 ①	系统的基本构造				构造示意图
	保温层 ②	找平层 ③	抗裂防护层 ④	饰面层 ⑤	
现浇混凝土墙体	经聚苯板界面砂浆处理的斜嵌入式钢丝网架聚苯板（聚苯板可以是模塑聚苯板，也可以是挤塑聚苯板）	胶粉聚苯颗粒保温浆料（或胶粉聚苯颗粒粘结找平浆料）	抗裂砂浆复合耐碱网格布 + 弹性底涂	柔性耐水腻子 + 涂料	

表 6　现浇有网聚苯板外保温系统面砖饰面基本构造

基层墙体 ①	系统的基本构造				构造示意图
	保温层 ②	找平层 ③	抗裂防护层 ④	饰面层 ⑤	
现浇混凝土墙体	经聚苯板界面砂浆处理的斜嵌入式钢丝网架聚苯板（聚苯板可以是模塑聚苯板，也可以是挤塑聚苯板）	胶粉聚苯颗粒保温浆料（或胶粉聚苯颗粒粘结找平浆料）	第一遍抗裂砂浆（干拌型） + 热镀锌钢丝网（用塑料锚栓与基层锚固） + 第二遍抗裂砂浆（干拌型）	面砖粘结砂浆 + 面砖 + 勾缝料	

3.5

胶粉聚苯颗粒贴砌聚苯板外墙外保温系统　external thermal insulation composite systems based on polystyrene panel affixing and bricklaying with mineral binder and expanded polystyrene granule material for adhesion and making level

置于建筑物外墙外侧的保温及饰面系统，涂料饰面时是由胶粉聚苯颗粒粘结找平浆料、双孔聚苯板、抗裂砂浆复合耐碱网格布和涂料等组成的系统产品（表 7、表 9）；面砖饰面时是由胶粉聚苯颗粒粘结找平浆料、双孔聚苯板、抗裂砂浆复合热镀锌钢丝网（四角电焊网或六角编织网）、塑料锚栓和面砖等组成的系统产品（表 8、表 10）。聚苯板面层有胶粉聚苯颗粒粘结找平浆料找平层时称为“贴砌聚苯板 LBL 型”外墙外保温系统，聚苯板面层没有胶粉聚苯颗粒粘结找平浆料找平层时称为“贴砌聚苯板 LB 型”外墙外保温系统，其中“L”表示胶粉聚苯颗粒粘结找平浆料，“B”表示保温板。

表 7　“贴砌聚苯板 LBL 型”外墙外保温系统涂料饰面基本构造

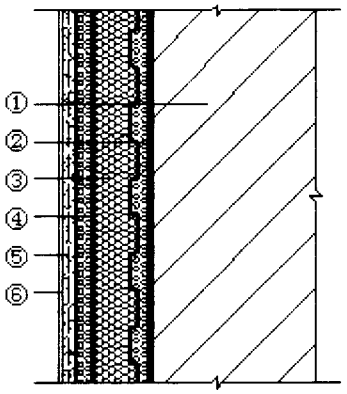
基层墙体 ①	系统的基本构造					构造示意图
	粘结层 ②	保温层 ③	找平层 ④	抗裂防护层 ⑤	饰面层 ⑥	
混凝土墙或砌体墙	基层界面砂浆 + 胶粉聚苯颗粒粘结找平浆料	经聚苯板界面砂浆处理的双孔聚苯板、表面开有梯形槽（聚苯板可以是模塑聚苯板，也可以是挤塑聚苯板，挤塑聚苯板可不开槽）	胶粉聚苯颗粒粘结找平浆料	抗裂砂浆复合耐碱网格布 + 弹性底涂	柔性耐水腻子 + 涂料	

表 8 “贴砌聚苯板 LBL 型”外墙外保温系统面砖饰面基本构造

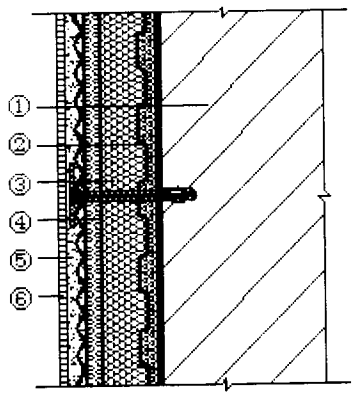
基层墙体①	系统的基本构造					构造示意图
	粘结层②	保温层③	找平层④	抗裂防护层⑤	饰面层⑥	
混凝土墙或砌体墙	基层界面砂浆+胶粉聚苯颗粒粘结找平浆料	经聚苯板界面砂浆处理的双孔聚苯板、表面开有梯形槽（聚苯板可以是模塑聚苯板，也可以是挤塑聚苯板，挤塑聚苯板可不开槽）	胶粉聚苯颗粒粘结找平浆料	第一遍抗裂砂浆+热镀锌钢丝网（用塑料锚栓与基层锚固）+第二遍抗裂砂浆	面砖粘结砂浆+面砖+勾缝料	

表 9 “贴砌聚苯板 LB 型”外墙外保温系统涂料饰面基本构造

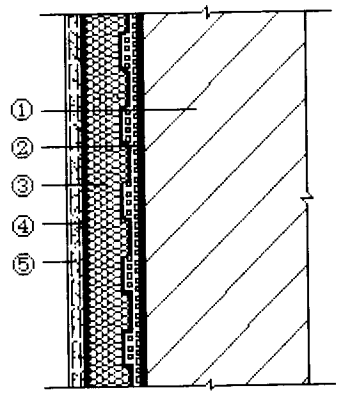
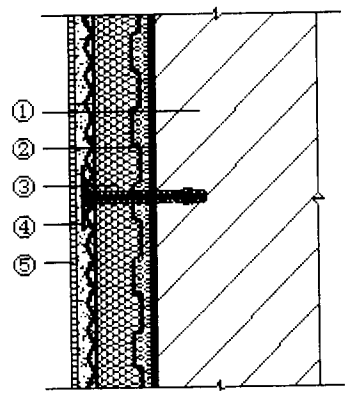
基层墙体①	系统的基本构造				构造示意图
	粘结层②	保温层③	抗裂防护层④	饰面层⑤	
混凝土墙或砌体墙	基层界面砂浆+胶粉聚苯颗粒粘结找平浆料	经聚苯板界面砂浆处理的双孔聚苯板、表面开有梯形槽（聚苯板可以是模塑聚苯板，也可以是挤塑聚苯板，挤塑聚苯板可不开槽）	抗裂砂浆复合耐碱网格布+弹性底涂	柔性耐水腻子+涂料	

表 10 “贴砌聚苯板 LB 型”外墙外保温系统面砖饰面基本构造

基层墙体①	系统的基本构造				构造示意图
	粘结层②	保温层③	抗裂防护层④	饰面层⑤	
混凝土墙或砌体墙	基层界面砂浆+胶粉聚苯颗粒粘结找平浆料	经聚苯板界面砂浆处理的双孔聚苯板、表面开有梯形槽（聚苯板可以是模塑聚苯板，也可以是挤塑聚苯板，挤塑聚苯板可不开槽）	第一遍抗裂砂浆+热镀锌钢丝网（用塑料锚栓与基层锚固）+第二遍抗裂砂浆	面砖粘结砂浆+面砖+勾缝料	

3.6

喷涂硬泡聚氨酯外墙外保温系统 external thermal insulation composite systems based on spraying rigid polyurethane foam

置于建筑物外墙外侧的保温及饰面系统，涂料饰面时是由聚氨酯防潮底漆、硬泡聚氨酯、聚氨酯界面砂浆、胶粉聚苯颗粒保温浆料或胶粉聚苯颗粒粘结找平浆料、抗裂砂浆复合耐碱网格布和涂料等组成的系统产品（表 11）；面砖饰面时是由聚氨酯防潮底漆、硬泡聚氨酯、聚氨酯界面砂浆、胶粉聚苯颗粒保温浆料或胶粉聚苯颗粒粘结找平浆料、抗裂砂浆复合热镀锌钢丝网（四角电焊网或六角编织网）、塑料锚栓和面砖等组成的系统产品（表 12）。硬泡聚氨酯采用现场喷涂的方法施工于基层墙体上，边角处及门窗洞口处采用聚氨酯胶粘剂将聚氨酯预制件粘贴在基层墙体上。

表 11　喷涂硬泡聚氨酯外墙外保温系统涂料饰面基本构造

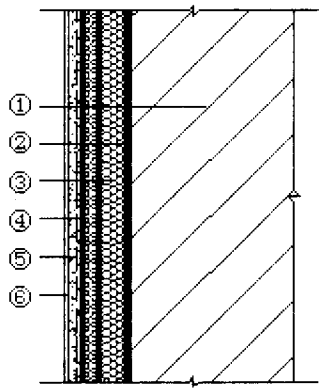
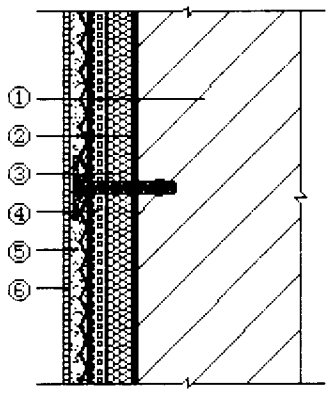
基层墙体①	系统的基本构造					构造示意图
	界面层②	保温层③	找平层④	抗裂防护层⑤	饰面层⑥	
混凝土墙或砌体墙（砌体墙需用水泥砂浆找平）	聚氨酯防潮底漆	喷涂的硬泡聚氨酯 + 聚氨酯界面砂浆 （边角、洞口处用聚氨酯胶粘剂粘贴聚氨酯预制件）	胶粉聚苯颗粒保温浆料（或胶粉聚苯颗粒粘结找平浆料）	抗裂砂浆复合耐碱网格布	柔性耐水腻子 + 涂料	

表 12　喷涂硬泡聚氨酯外墙外保温系统面砖饰面基本构造

基层墙体①	系统的基本构造					构造示意图
	界面层②	保温层③	找平层④	抗裂防护层⑤	饰面层⑥	
混凝土墙或砌体墙（砌体墙需用水泥砂浆找平）	聚氨酯防潮底漆	喷涂的硬泡聚氨酯 + 聚氨酯界面砂浆 （边角、洞口处用聚氨酯胶粘剂粘贴聚氨酯预制件）	胶粉聚苯颗粒保温浆料（或胶粉聚苯颗粒粘结找平浆料）	第一遍抗裂砂浆 + 热镀锌钢丝网（用塑料锚栓与基层锚固） + 第二遍抗裂砂浆	面砖粘结砂浆 + 面砖 + 勾缝料	

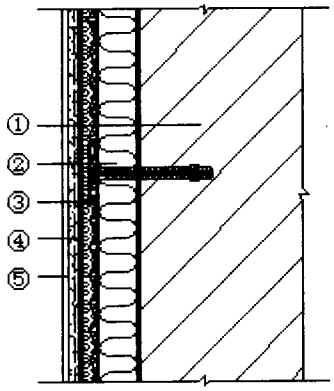
3.7

岩棉板外墙外保温系统 external thermal insulation composite systems based on rock wool panel

置于建筑物外墙外侧的保温及饰面系统，由岩棉板、热镀锌钢丝网（四角电焊网）、塑料锚栓、岩棉板界面砂浆、胶粉聚苯颗粒保温浆料或胶粉聚苯颗粒粘结找平浆料、抗裂砂浆复合耐碱网格布和涂

料等组成的系统产品（表 13）。岩棉板采用塑料锚栓配合热镀锌钢丝网（四角电焊网）固定在基层墙体上。

表 13　岩棉板外墙外保温系统涂料饰面基本构造

基层墙体 ①	系统的基本构造				构造示意图
	保温层 ②	找平层 ③	抗裂防护层 ④	饰面层 ⑤	
混凝土墙或砌体墙	经岩棉板界面砂浆处理的岩棉板 + 热镀锌钢丝网（用塑料锚栓与基层锚固）	胶粉聚苯颗粒保温浆料（或胶粉聚苯颗粒粘结找平浆料）	抗裂砂浆复合耐碱网格布 + 弹性底涂	柔性耐水腻子 + 涂料	

3.8

燕尾槽聚苯板（简称无网聚苯板）　swallow-tailed groove polystyrene panel

在聚苯板一表面开有与高度方向平行的燕尾型槽的保温板（参见图 1）。

3.9

塑料卡钉　plastic fastener

由一个矩形片状钉帽和两个片状钉身呈双 T 形连成一体，用 ABS 工程塑料制成用于现浇无网聚苯板外保温系统中卡住聚苯板缝，并起辅助固定聚苯板于基层墙体上的专用连接件（参见图 2）。

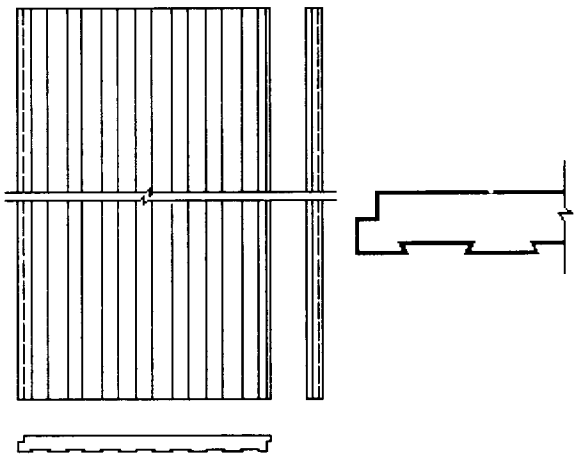


图 1　燕尾槽聚苯板的板型

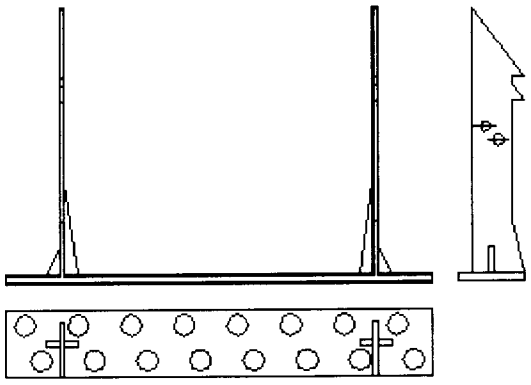


图 2　塑料卡钉

3.10

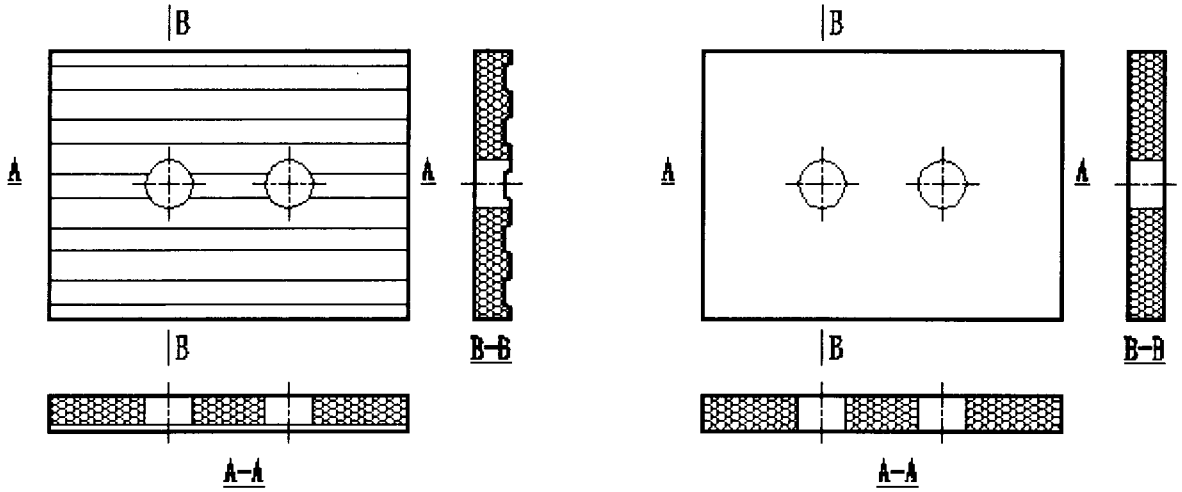
斜嵌入式钢丝网架聚苯板（简称有网聚苯板）　steel mesh polystyrene panel

在聚苯板一表面带有钢丝网片并与穿过聚苯板的斜插丝（又称腹丝）焊接而成的保温板。

3.11

双孔聚苯板　double hole polystyrene panel

在聚苯板长度方向的中轴线上开有两个垂直于板表面通孔的保温板，两通孔相对于宽度方向的中轴线对称。模塑聚苯板一表面开有与长度方向平行的梯形槽，挤塑聚苯板可不开槽（参见图3）



a　双孔模塑聚苯板　　b　双孔挤塑聚苯板

图3　双孔聚苯板的板型

3.12

硬泡聚氨酯 rigid polyurethane foam

由不含氟里昂的双组份材料通过高压无气喷涂发泡机现场发泡成型硬化而成的泡沫塑料。

3.13

聚氨酯防潮底漆 polyurethane moistureproof primer

由高分子树脂及各种助剂、稀释剂配制而成的底漆，用于封闭基层水汽等以满足硬泡聚氨酯与墙体的粘结。

3.14

聚苯板界面砂浆　polystyrene board interface treating mortar

由水泥、骨料、高分子聚合物粘结材料及各种助剂配制而成的与聚苯板具有良好粘结性能的界面砂浆，涂覆于聚苯板表面用以提高聚苯板与粘结层、找平层的粘结力，分为模塑聚苯板界面砂浆和挤塑聚苯板界面砂浆。

3.15

聚氨酯界面砂浆 polyurethane interface treating mortar

由与聚氨酯具有良好粘结性能的合成树脂乳液为主要粘结剂复合各种助剂、砂子和填料配制成的界面处理剂，使用时与水泥按比例混合配制成界面砂浆，涂覆于聚氨酯保温层上用于提高与找平层的粘结力。

3.16

岩棉板界面砂浆　rock-wool panel interface treating mortar

由防水乳液、填料、助剂与中砂按一定比例混合制成的砂浆，用以提高岩棉板的表面硬度、粘结能力、防水性能以及提高钢丝网的防腐粘结能力。

3.17

胶粉聚苯颗粒粘结找平浆料　mineral binder and expanded polystyrene granule material for adhesion and making level

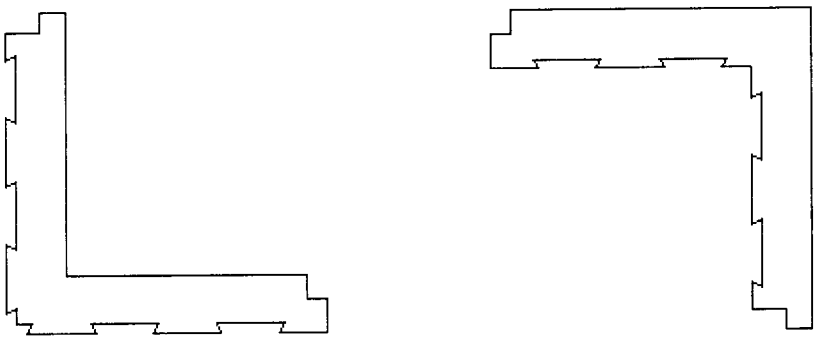
由专用粘结找平胶粉料和细聚苯颗粒复合轻骨料组成的浆体材料，用于保温板的粘结或保温层面层

的找平，兼起保温作用。

3.18

直角形燕尾槽聚苯板 right-angle and swallow-tailed groove polystyrene panel

在工厂预制成型的直角形燕尾槽聚苯板，两直角边长200mm，分为阴角燕尾槽聚苯板和阳角燕尾槽聚苯板两种类型，分别用于墙体阴角或阳角（参见图4）。



a 阴角燕尾槽聚苯板　　b 阳角燕尾槽聚苯板

图4 直角形燕尾槽聚苯板

3.19

聚氨酯预制件 precast polyurethane panel

在工厂预制成型的角形或其它形状的硬泡聚氨酯保温模块，用于粘贴在基层边角、洞口等部位。

3.20

聚氨酯胶粘剂 adhesive for polyurethane panel

以合成树脂为胶粘料，现场加入固化剂等添加剂而制得的双组分胶粘剂，用于聚氨酯预制件与基层墙体的粘结。

4 分类

胶粉聚苯颗粒复合型外墙外保温系统按饰面装饰和抗冲击能力分为涂料饰面普通型（缩写为CP型）、涂料饰面加强型（缩写为CQ型）、面砖饰面型（缩写为T型）三种类型：

——CP型胶粉聚苯颗粒复合型外墙外保温系统用于涂料饰面的建筑物2m以上墙面；

——CQ型胶粉聚苯颗粒复合型外墙外保温系统主要用于涂料饰面的建筑首层或2m以下墙面，以及对抗冲击有特殊要求的部位；

——T型胶粉聚苯颗粒复合型外墙外保温系统用于面砖饰面的建筑物。

5 要求

5.1 外保温系统应经耐候性试验验证。对于面砖饰面外保温系统，还应经抗震试验验证并确保其在设防烈度地震作用下面砖饰面及外保温系统无脱落。

5.2 胶粉聚苯颗粒复合型外墙外保温系统的性能应符合表14的要求。

表 14　胶粉聚苯颗粒复合型外墙外保温系统的性能指标

试　验　项　目		性　能　指　标
耐候性		表面无裂纹、粉化、剥落现象，抗裂防护层与找平层的拉伸粘结强度不应小于 0.1MPa，破坏界面应位于找平层
吸水量（浸水 1h）/g/m²		≤1000
抗冲击强度	涂料饰面普通型(CP 型)、面砖饰面型(T 型)	3.0J 冲击合格
	涂料饰面加强型（CQ 型）	10.0J 冲击合格
抗风压值		不小于工程项目的风荷载设计值
耐冻融		表面无裂纹、空鼓、起泡、剥离现象，抗裂防护层与找平层的拉伸粘结强度不应小于 0.1MPa，破坏界面应位于找平层
水蒸气湿流密度/g/(m²·h)		≥0.85
不透水性		试样防护层内侧无水渗透
耐磨损，500L 砂		无开裂，龟裂或表面保护层剥落、损伤
系统抗拉强度（CP 型、CQ 型，岩棉板外墙外保温系统除外）/MPa		≥0.1 并且破坏部位不得位于各层界面
面砖粘结强度（T 型）/MPa　（现场抽测）		≥0.4
火反应性		不应被点燃，试验结束后试件厚度变化不超过 10%
热阻		复合墙体热阻符合设计要求

5.3　聚氨酯防潮底漆

聚氨酯防潮底漆的性能指标应符合表 15 的要求。

表 15　聚氨酯防潮底漆的性能指标

项　　目	单位	性　能　指　标
原漆外观	—	淡黄至棕黄色液体、无机械杂质
施工性	—	刷涂无困难
干燥时间	h	表干≤4，实干≤24
涂层附着力（干燥基层及潮湿基层）	级	≤1
耐碱性	—	48h 不起泡、不起皱、不脱落

5.4　胶粉聚苯颗粒粘结找平浆料

胶粉聚苯颗粒粘结找平浆料的性能指标应符合表 16 的要求。

表 16　胶粉聚苯颗粒粘结找平浆料的性能指标

项　　目		单位	性　能　指　标
湿表观密度		kg/m³	≤520
干表观密度		kg/m³	≤300
导热系数		W/(m·K)	≤0.07
抗压强度(56d)		MPa	≥0.3
燃烧性能		—	难燃 B_1 级
拉伸粘结强度(标准状态 56d)	与带基层界面砂浆的水泥砂浆试块	MPa	≥0.12
	与带保温层界面砂浆的聚苯板、聚氨酯或岩棉板试块	MPa	≥0.10 或聚苯板、聚氨酯或岩棉板试块破坏

5.5 聚苯板

模塑聚苯板的性能指标应符合 JG 149—2003 中 5.3 的要求。挤塑聚苯板为阻燃型的，其性能指标除应符合表 17 的要求外，还应符合 GB/T 10801.2—2002 的要求。

表 17 挤塑聚苯板性能指标

项 目	单 位	指 标
表观密度	kg/m^3	28～32
导热系数	W/(m·K)	≤0.030
垂直于板面方向的抗拉强度	MPa	≥0.15
尺寸稳定性（70℃，48h）	%	≤1.0

5.6 燕尾槽聚苯板

燕尾槽聚苯板的质量及规格尺寸应符合表 18～表 20 的要求。

表 18 燕尾槽聚苯板的质量要求

项 目	质 量 要 求
燕尾槽	燕尾槽角度为 60°±10°，槽宽 40～120mm，槽深应为 10mm±2mm，间距 40～120mm，平行长度方向。
企口	聚苯板两长边设高低槽，宽 20～25mm，深 1/2 板厚，要求尺寸准确。
界面处理	聚苯板双面均匀喷涂聚苯板界面砂浆，聚苯板界面砂浆与聚苯板的粘结牢固，涂层均匀一致，不得露底，干擦不掉粉。

表 19 燕尾槽聚苯板的规格尺寸 单位：mm

层 高	长	宽	厚
2800	2825～2850	1220	40～150
2900	2925～2950		
3000	3025～3050		
其 它	其它规格可根据实际层高协商确定		
注：聚苯板的厚度包括燕尾槽凸起部分的厚度，厚度根据保温要求计算确定。			

表 20 燕尾槽聚苯板的规格尺寸允许偏差 单位：mm

项 目		允许偏差	项 目		允许偏差
长度、宽度	<1000	±5	厚度	<50	±2
	1000～2000	±8		50～75	±3
	2000～4000	±10		75～150	±4
	>4000	正偏差不限，-10	两对角线偏差		≤10

5.7 斜嵌入式钢丝网架聚苯板

斜嵌入式钢丝网架聚苯板的质量及规格尺寸应符合表 21～表 24 的要求。

表 21 斜嵌入式钢丝网架聚苯板的质量要求

项 目	质 量 要 求
凹槽	钢丝网片一侧的聚苯板面上凹槽宽 20～30mm，凹槽深 10mm±2mm，并且间距均匀。
企口	聚苯板两长边设高低槽，宽 20～25mm，深 1/2 板厚，要求尺寸准确。
界面处理	聚苯板的两面及钢丝网架上均匀喷涂聚苯板界面砂浆，聚苯板界面砂浆与聚苯板的粘结牢固，涂层均匀一致，不得露底，干擦不掉粉。

表 22　斜嵌入式钢丝网架的质量要求

项　目	质　量　要　求
镀锌低碳钢丝	用于钢丝网片的镀锌低碳钢丝的直径为 2.00mm、2.20mm，用于斜插丝的镀锌低碳钢丝的直径为 2.20mm、2.50mm，误差为±0.05mm，其性能指标应符合 YB/T 126—1997 的要求。
焊点强度	抗拉力≥330N，无过烧现象。
焊点质量	网片漏焊、脱焊点不超过焊点数的 8‰，且不应集中在一处，连续脱焊点不应多于 2 点，板端 200mm 区段内的焊点不允许脱焊、虚焊，斜插丝脱焊点不超过 2%。
斜插钢丝（腹丝）密度	（100～150）根/m^2
斜插钢丝与钢丝网片所夹锐角	60°±5°
钢丝挑头	网边挑头长度≤6mm，插丝挑头≤5mm。
穿透聚苯板挑头	聚苯板厚度小于等于 50mm，穿透聚苯板挑头离板面垂直距离≥30mm； 聚苯板厚度大于 50mm 小于等于 80mm，穿透聚苯板挑头离板面垂直距离≥35mm； 聚苯板厚度大于 80mm 小于等于 150mm，穿透聚苯板挑头离板面垂直距离≥40mm。
聚苯板对接	≤3000mm 长板中聚苯板对接不得多于两处，且对接处需用聚氨酯胶粘牢。
钢丝网片与聚苯板的最小间距	10mm±1mm
注：横向钢丝应对准凹槽中心。	

表 23　斜嵌入式钢丝网架聚苯板的规格　　单位：mm

层　高	长	宽	厚
2800	2825～2850	1220	40～150
2900	2925～2950		
3000	3025～3050		
其　它	其它规格可根据实际层高协商确定		
注 1：斜嵌入式钢丝网架聚苯板的钢丝网片尺寸应略小于聚苯板的尺寸。 注 2：聚苯板的厚度包括梯形槽部分的厚度，厚度根据保温要求计算确定。			

表 24　斜嵌入式钢丝网架聚苯板的规格尺寸允许偏差　　单位：mm

项　目		允许偏差	项　目		允许偏差
长度、宽度	<1000	±5	厚度	<50	±2
	1000～2000	±8		50～75	±3
	2000～4000	±10		75～150	±4
	>4000	正偏差不限，-10		含钢丝网时	±5
两对角线偏差		≤10	钢丝网两对角线偏差		≤10

5.8　双孔聚苯板

双孔聚苯板的质量要求应符合表 25 的规定。

表 25　双孔聚苯板的质量要求

项　目		单位	指　标	允许偏差	项　目	单位	指　标	允许偏差
通孔	孔径	mm	50～80	±3	板长	mm	600	±5
	孔中心距	mm	200	±5	板宽	mm	450	±5
梯形槽	槽宽	mm	30～60	±2	板厚	mm	40～150	±4
	槽深	mm	5	±1	界面处理	—	聚苯板双面均匀喷涂聚苯板界面砂浆，聚苯板界面砂浆与聚苯板的粘结牢固，涂层均匀一致，不得露底，干擦不掉粉。	
	槽间距	mm	30～60	±2				
注：聚苯板的厚度包括梯形槽部分的厚度，厚度根据保温要求计算确定。								

5.9　硬泡聚氨酯

硬泡聚氨酯的性能指标除符合表 26 的要求外，还应符合 QB/T 3806－1999 中类型 II 的要求。

表 26　硬泡聚氨酯的性能指标

项　目		单　位	性　能　指　标
密度		kg/m^3	30～50
抗拉强度		kPa	≥150
导热系数		W/(m·K)	≤0.025
燃烧性(垂直燃烧法)	平均燃烧时间	s	≤30
	平均燃烧高度	mm	≤250

5.10　岩棉板

岩棉板的性能指标除符合表 27 的要求外，还应符合 GB/T 11835－1998 的要求。

表 27　岩棉板的性能指标

项　目	单　位	性　能　指　标
密度	kg/m^3	≥150
导热系数（70℃）	W/(m·K)	≤0.044
质量吸湿率	%	≤3.0
憎水率	%	≥98
抗压强度(10%压缩量)	kPa	≥40
燃烧性能	—	不燃

5.11　保温层界面砂浆

保温层界面砂浆（聚苯板界面砂浆、聚氨酯界面砂浆、岩棉板界面砂浆）的性能指标应符合表 28 的要求。

表 28　保温层界面砂浆的性能指标

项　　目			性　能　指　标			
			模塑聚苯板界面砂浆	挤塑聚苯板界面砂浆	聚氨酯界面砂浆	岩棉板界面砂浆
拉伸粘结强度	与水泥砂浆试块	标准状态 7d	≥0.30MPa			
		标准状态 14d	≥0.50MPa			
		浸水后	≥0.30MPa			
	与聚苯板、聚氨酯或岩棉板试块（标准状态或浸水后）		≥0.10MPa 或模塑聚苯板破坏	≥0.15MPa 或挤塑聚苯板破坏	≥0.15MPa 或聚氨酯破坏	—
	与胶粉聚苯颗粒粘结找平浆料试块（标准状态）		≥0.10MPa 或胶粉聚苯颗粒粘结找平浆料试块破坏			

5.12　塑料卡钉

塑料卡钉应采用聚酰胺（polyamide 6、polyamide 6.6）、聚乙烯(polyethylene)或聚丙烯(polypropylene)制成，制作塑料卡钉和塑料套管的材料不得使用回收的再生材料。其性能指标应符合表 29 的要求。

表 29　塑料卡钉的性能指标

项　　目		单位	性　能　指　标
外　　观		—	乳白色、色泽均匀
规格尺寸	钉帽长度	mm	160±1
	钉帽宽度	mm	≥20
	钉帽厚度	mm	3±0.5
	钉帽上小孔孔径	mm	8±1
	钉身长度	mm	≥聚苯板的厚度+50
	钉身宽度	mm	≥15
	钉身厚度	mm	2±0.5
	钉身上小孔孔径	mm	4±1
	两钉身间距	mm	120±1
	钉帽与钉身上小孔的垂直距离	mm	≥聚苯板的厚度
抗拉承载力		kN	≥0.15
抗弯曲性		—	钉身、钉帽弯曲 30°～45°不折断、无折痕、无裂纹并可回复原状

5.13　聚氨酯胶粘剂

聚氨酯胶粘剂的性能指标应符合表 30 的要求。

表 30　聚氨酯胶粘剂的性能指标

项　　目		单位	性　能　指　标
容器中状态	A 组份	—	均匀膏状物，无结块、凝胶、结皮或不易分散的固体团块
	B 组份		均匀棕黄色胶状物
干燥时间	表干时间	h	≤4
	实干时间		≤24
拉伸粘结强度（与水泥砂浆试块）	标准状态	MPa	≥0.50
	浸水后		≥0.30
拉伸粘结强度（与聚氨酯）	标准状态	MPa	≥0.15 或聚氨酯试块破坏
	浸水后		≥0.15 或聚氨酯试块破坏

5.14　其他材料

胶粉聚苯颗粒复合型外墙外保温系统所用基层界面砂浆、胶粉聚苯颗粒保温浆料、抗裂砂浆（含干拌型）、耐碱网格布、热镀锌钢丝网（四角电焊网）、塑料锚栓、弹性底涂、柔性耐水腻子、饰面涂料、面砖粘结砂浆、面砖勾缝料、饰面砖的性能指标应符合 JG 158—2004 中 5.2、5.5～5.15 的要求。热镀锌钢丝网（六角编织网）应采用热镀锌工艺，其性能指标应符合 QB/T 1925.2—1993 的相关要求

5.15　附件

在胶粉聚苯颗粒复合型外墙外保温系统中所采用的附件，包括密封膏、密封条、金属护角、盖口条等应分别符合相应产品标准的要求。

6　试验方法

标准试验室环境温度（23±2）℃，相对湿度（50±10）%。在非标准试验室环境下试验时，应记录温度和相对湿度。

6.1　胶粉聚苯颗粒复合型外墙外保温系统

6.1.1　试样制备、养护和状态调节

按JGJ 144—2004附录A中A.1的规定进行。

6.1.2　耐候性

按JGJ 144—2004附录A中A.2的规定及JG 158—2004中6.1.1的规定进行。

6.1.3　吸水量

试样由保温层、找平层和抗裂防护层构成，按JGJ 144—2004附录A中A.6的规定及JG 158—2004中6.1.2的规定进行。

6.1.4　抗冲击强度

试样由保温层、找平层和抗裂防护层构成，按JGJ 144—2004附录A中A.5的规定及JG 158—2004中6.1.3的规定进行。

6.1.5　抗风压

按JGJ 144—2004附录A中A.3的规定及JG 158—2004中6.1.4的规定进行。

6.1.6　耐冻融

按JGJ 144—2004附录A中A.4的规定及JG 158—2004中6.1.5的规定进行。

6.1.7　水蒸气湿流密度

按JG 158—2004中6.1.6的规定进行。

6.1.8　不透水性

试样由保温层、找平层和抗裂防护层构成，按JG 158—2004中6.1.7的规定进行。

6.1.9 耐磨损

试样由保温层、找平层和抗裂防护层构成，按JG 158—2004中6.1.8的规定进行。

6.1.10 系统抗拉强度

按JGJ 144—2004附录A中A.7的规定及JG 158—2004中6.1.9的规定进行。

6.1.11 面砖粘结强度

系统成型56d后，按JGJ 110—1997的规定进行面砖粘结强度拉拔试验。断缝应从面砖表面切割至抗裂防护层表面（不应露出热镀锌钢丝网），深度应一致。

6.1.12 火反应性

试样规格为100mm×100mm，共6个。试样由10mm厚水泥砂浆底板+50mm厚保温层材料（含保温层界面砂浆）+20mm厚胶粉聚苯颗粒粘结找平浆料+4mm抗裂砂浆（压入耐碱网格布）构成，按JG 158—2004中6.1.12的规定进行。

6.1.13 热阻

按JGJ 144—2004附录A中A.9的规定进行。

6.1.14 抗震性能

试样由基层墙体、界面层、保温层、找平层、抗裂防护层和饰面层构成，按JG 158—2004中6.1.11的规定进行。

6.2 聚氨酯防潮底漆

6.2.1 取样

产品按GB 3186的规定进行取样。取样量根据检验需要而定。

6.2.2 试验的一般条件

6.2.2.1 试验环境

试板的状态调节和试验的温湿度应符合GB 9278的规定。

6.2.2.2 试验样板的制备

6.2.2.2.1 用使用说明书规定的稀释剂、按比例将聚氨酯防潮底漆稀释到适宜的施工粘度，以备制板。

6.2.2.2.2 本标准中检验用试板的底材应符合JC/T 412—1991表2中1类板（加压板，厚度为4mm～6mm）技术要求的石棉水平板，其表面处理按GB/T 9271—1998中7.3的规定进行，试板规格均为150mm×70mm×（4～6）mm。

6.2.2.2.3 本标准样板制作均采用刷涂制板。干燥时间试板涂刷一道，涂布量为湿膜厚约100μm。耐碱性试板涂刷两道，涂布量为第一道1.6g±0.1g，第二道为1.0g±0.1g，两道之间的间隔时间不小于24h。测涂层脱离的抗性检验中干燥基层试板应符合6.2.2.2.2的要求，潮湿基层试板是将符合6.2.2.2.2要求的试板在清水中浸泡24h再用干布将表面明水擦干后的试板。试板涂刷时以一遍为宜，涂布量为干膜厚度不超过15μm。涂刷完氨酯防潮底漆的试板应水平放置在水槽底部标准砂上面，然后注水到水面距离石棉水泥平板表面约2mm处，静置24h后，测涂层脱离的抗性。

6.2.3 原漆外观

按GB/T 1721—1979规定中“外观的测定”进行。

6.2.4 施工性

刷涂或滚涂应无困难。

6.2.5 干燥时间

按GB/T 1728—1979(1989)规定，其中表干按乙法，实干按甲法进行。

6.2.6 涂层附着力

按GB/T 9286—1998的规定进行。

6.2.7 耐碱性

按 GB/T 9265—1998 的规定进行。如三块试板中有两块未出现起泡、起皱、脱落等现象，可评定为“合格”。

6.3 胶粉聚苯颗粒粘结找平浆料

6.3.1 湿表观密度

按 JG 158—2004 中 6.5.1 的规定进行。

6.3.2 干表观密度

按 JG 158—2004 中 6.5.2 的规定进行。

6.3.3 导热系数

测试干表观密度后的试件，按GB/T 10294的规定测试导热系数。

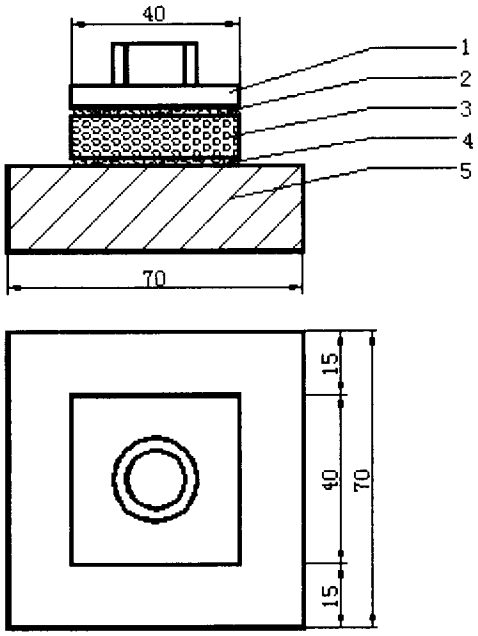
6.3.4 抗压强度

按JG 158—2004中6.5.5的规定进行。

6.3.5 燃烧性能

按 GB/T 8625 的规定进行。

6.3.6 拉伸粘结强度



1——抗拉用钢质夹具；

2——粘贴钢质夹具用胶粘剂（1～3mm 厚）；

3——胶粉聚苯颗粒粘结找平浆料（40mm×40mm×10mm）；

4——基层界面砂浆涂层（1～3mm 厚）；

5——水泥砂浆块（70mm×70mm×20mm）。

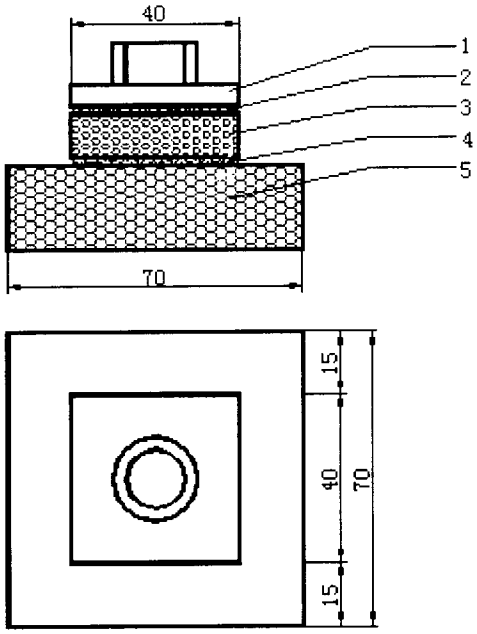
图 5 与带基层界面砂浆的水泥砂浆块粘结强度试件

6.3.6.1 与带基层界面砂浆的水泥砂浆试块

同时制作 5 个试件（试件制作尺寸如图 5），常温常态养护 56d 后，按 JG/T 24—2000 中 6.14.2.2 规定的方法测拉伸粘结强度。

6.3.6.2 与带保温层界面砂浆的聚苯板、聚氨酯或岩棉板试块

同时制作 5 个试件（试件制作尺寸如图 6），常温常态养护 56d 后，按 JG/T 24—2000 中 6.14.2.2 规定的方法测拉伸粘结强度。



1——抗拉用钢质夹具；

2——粘贴钢质夹具用胶粘剂（1～3mm 厚）；

3——胶粉聚苯颗粒粘结找平浆料（40mm×40mm×10mm）；

4——保温层界面砂浆涂层（1～3mm 厚）；

5——聚苯板、聚氨酯或岩棉板（70mm×70mm×20mm）。

图 6 与带保温层界面砂浆的聚苯板、聚氨酯或岩棉板粘结强度试件

6.4 挤塑聚苯板

6.4.1 表观密度

按 GB/T 6343—1995 的规定进行，试样尺寸(100±1)mm×(100±1)mm×(50±1)mm，试样数量 3 个。

6.4.2 垂直于板面方向的抗拉强度

按 JG 149—2003 中 6.4.1 的规定进行。

6.4.3 其他性能

按 GB/T 10801.2—2002 的规定进行。

6.5 燕尾槽聚苯板

6.5.1 质量要求

用肉眼观察和用精度 0.5mm 钢直尺测量。

6.5.2 规格尺寸及允许偏差

6.5.2.1 长度及长度偏差

长度：在距聚苯板两边 100mm 并平行于板长度方向测两处，在板纵向中心线测一处，用精度 1mm 钢卷尺测量，取 3 个测量值的算术平均值，精确至 1mm。

长度偏差：用精度 1mm 钢卷尺测量平行于聚苯板长度方向的任意部位，以测得的最大值和最小值与规定尺寸之差即为尺寸偏差，精确至 1mm。

6.5.2.2 宽度及宽度偏差

宽度：在距聚苯板两边 100mm 并平行于板宽度方向测两处，在板横向中心线测一处，用精度 1mm 钢卷尺测量，取 3 个测量值的算术平均值，精确至 1mm。

宽度偏差：用精度 1mm 钢卷尺测量平行于聚苯板宽度方向的任意部位，以测得的最大值和最小值与规定尺寸之差即为尺寸偏差，精确至 1mm。

6.5.2.3 厚度及厚度偏差

厚度：在距聚苯板两端、两边各 100mm 交会处各测 1 处（4 处，应避开凹槽处；如遇凹槽，可在相邻的板面测量），同时在距聚苯板两边 100mm 与横向中心线交会点各测 1 处（2 处，应避开凹槽处；如遇凹槽，可在相邻的板面测量），共测 6 处，用外卡钳与钢直尺配合测量，取 6 个测量值的算术平均值，精确至 1mm。

厚度偏差：用上述测得的 6 个测量值与规定尺寸之差即为尺寸偏差，精确至 1mm。

6.5.2.4 两对角线偏差

用精度 1mm 钢卷尺测量聚苯板两对角线的长度，取其差值为检测结果。

6.6 斜嵌入式钢丝网架聚苯板

6.6.1 斜嵌入式钢丝网架聚苯板的质量要求

用肉眼观察和用精度 0.5mm 钢直尺测量。

6.6.2 斜嵌入式钢丝网架

6.6.2.1 镀锌低碳钢丝

按 YB/T 126—1997 的规定进行。

6.6.2.2 焊点强度

按 QB/T 3897—1999 中 5.5 的规定进行。

6.6.2.3 焊点质量

用手抓或拉动钢丝使之变形，力度以能使钢丝网恢复原形为限，在抓或拉中开脱的焊点为脱焊或虚焊，计数统计。

6.6.2.4 斜插钢丝（腹丝）密度

统计整块板上斜插丝的根数，然后再除以整板的面积，即为测定结果，精确至 1 根/m^2。

6.6.2.5 斜插钢丝与钢丝网片所夹锐角

用精度为 1°的量角器和三角尺测量。

6.6.2.6 钢丝挑头、穿透聚苯板挑头、聚苯板对接

用肉眼观察和用精度 0.5mm 钢直尺测量。

6.6.2.7 钢丝网片与聚苯板的最小间距

用外卡钳与钢直尺配合测量，精确至 1mm。

6.6.3 斜嵌入式钢丝网架聚苯板的规格及尺寸

6.6.3.1 长度及长度偏差

长度：在距聚苯板两边 100mm 并平行于板长度方向测两处，在板纵向中心线测一处，用精度 1mm 钢卷尺测量，取 3 个测量值的算术平均值，精确至 1mm。

长度偏差：用精度 1mm 钢卷尺测量平行于聚苯板长度方向的任意部位，以测得的最大值和最小值与规定尺寸之差即为尺寸偏差，精确至 1mm。

6.6.3.2 宽度及宽度偏差

宽度：在距聚苯板两边 100mm 并平行于板宽度方向测两处，在板横向中心线测一处，用精度 1mm 钢卷尺测量，取 3 个测量值的算术平均值，精确至 1mm。

宽度偏差：用精度 1mm 钢卷尺测量平行于聚苯板宽度方向的任意部位，以测得的最大值和最小值与规定尺寸之差即为尺寸偏差，精确至 1mm。

6.6.3.3 厚度及厚度偏差

厚度：在距聚苯板两端、两边各 100mm 交会处各测 1 处（4 处，应避开凹槽处；如遇凹槽，可在相邻的板面测量），同时在距聚苯板两边 100mm 与横向中心线交会点各测 1 处（2 处，应避开凹槽处；如遇凹槽，可在相邻的板面测量），共测 6 处，用外卡钳与钢直尺配合测量，取 6 个测量值的算术平均值，精确至 1mm。

厚度偏差：用上述测得的 6 个测量值与规定尺寸之差即为尺寸偏差，精确至 1mm。

厚度（含钢丝网）偏差：用外卡钳与钢直尺配合测量，测量钢丝网外表面与聚苯板外表面的中距，以测得的最大值和最小值与规定尺寸之差作为尺寸偏差，精确至 1mm。

6.6.3.4 两对角线偏差

聚苯板两对角线偏差：用精度 1mm 钢卷尺测量聚苯板两对角线的长度，取其差值为检测结果。

钢丝网两对角线偏差：用精度 1mm 钢卷尺测量钢丝网两对角线的长度，取其差值为检测结果。

6.7 双孔聚苯板

用肉眼观察和用精度 0.5mm 钢直尺测量。

6.8 硬泡聚氨酯

6.8.1 抗拉强度

6.8.1.1 试验仪器

按 GB/T 9779-1988 中 5.6.1 的规定进行。

6.8.1.2 测试方法

测试块大小为 40mm×40mm×40mm。将环氧树脂胶均匀涂布于测试块的上表面和下表面，将试块下表面粘在 70mm×70mm×20mm 的砂浆板（按 GB/T 9779-1988 中 5.2.2 的规定制备）的中心位置，并在其上表面轻放钢质上夹具，加约 1 kg砝码，小心地除去周围溢出的环氧树脂胶，放置 24h，除去砝码，安装好下夹具和钢质垫片，在拉力试验机上沿试件表面垂直方向以 5mm/min 拉伸速度测定最大抗拉强度。

6.8.2 其他性能

按 QB/T 3806—1999 的规定进行。

6.9 岩棉板

6.9.1 抗压强度

按 GB/T 13480 的规定进行。

6.9.2 其他性能

按 GB/T 11835—1998 的规定进行。

6.10 保温层界面砂浆

6.10.1 与水泥砂浆试块拉伸粘结强度

按 JC/T 907—2002 中 5.4 的规定进行。

6.10.2 与聚苯板、聚氨酯、岩棉板或胶粉聚苯颗粒粘结找平浆料试块拉伸粘结强度

按 JC/T 907—2002 中 5.4 的规定进行。测试时，将 40mm×40mm×10mm 的砂浆试块替换为 40mm×40mm×40mm 的聚苯板、聚氨酯、岩棉板或胶粉聚苯颗粒粘结找平浆料试块。

6.11 塑料卡钉

6.11.1 外观

肉眼观察。

6.11.2 规格尺寸

用精度 0.5mm 钢直尺测量，取 3 个测量值的算术平均值，精确至 0.5mm。

6.11.3 抗拉承载力

将塑料卡钉的钉帽和钉身切成 70mm 长的小片，用钢质夹具夹住钉帽片或钉身片的两端，将其固定在拉力试验机上，开启拉力试验机，以（5±1）mm/min 的恒定速度加荷，直至钉帽片或钉身片被破坏。最大拉力以 kN 表示。共测 5 块试件，取 5 个测试值的算术平均值为拉伸承载力。

6.11.4 抗弯曲性

用双手握住塑料卡钉钉帽或钉身的两端用力弯曲，弯曲弧度 30°～45°，弯曲方向为正反两个方向。

6.12 聚氨酯胶粘剂

6.12.1 容器中状态

目测：A 组份为均匀膏状物，无结块、凝胶、结皮或不易分散的固体团块；B 组份为均匀棕黄色胶状物。

6.12.2 表干时间

按GB/T 16777—1997中12.2.1.3的规定进行。A、B两组份的配合比为按产品使用说明书。

6.12.3 实干时间

按GB/T 16777—1997中12.2.2.2的规定进行。标准养护温度为（23±2）℃，湿度为45%～70%。

6.12.4 拉伸粘结强度

6.12.4.1 试验仪器

应符合GB/T 9779—1988中5.6.1的规定进行。

6.12.4.2 标准状态下的拉伸粘结强度

6.12.4.2.1 将聚氨酯胶粘剂的 A、B 两组份，按产品使用说明书规定的比例混合均匀后，将硬聚氯乙烯或金属型框置于 70mm×70mm×20mm 水泥砂浆块或聚氨酯块上，将聚氨酯胶粘剂填满型框（面积 40mm×40mm），用刮刀平整表面，立即除去型框，放置 24h，在试验条件下养护 7d，即为试件。这项试验，同时制作 5 个试件。

6.12.4.2.2 将试件置于水平状态，用双组分环氧树脂或类似常温固化粘结剂涂布试件表面，并在其上面轻放钢质上夹具，加约 1kg 砝码，小心地除去周围溢出的粘结剂，放置 24h，除去砝码。然后在拉力试验机上按 GB/T 9779—1998 中 5.6.2 规定的方法 5mm/min 的拉伸速度测定最大抗拉强度，即为拉伸粘结强度。

6.12.4.3 浸水后的拉伸粘结强度

6.12.4.3.1 按 6.12.4.2.1 同时制作 5 个试件，但在放置时间结束前 3d，将试件的四个侧面用环氧树脂封边。

6.12.4.3.2 将试件水平置于水槽底部符合GB/T 17671—1999要求的标准砂上面，然后注水到水面距离水泥砂浆板或聚氨酯板表面约5mm处，静置10d后，取出，试件侧面朝下，在（50±2）℃恒温箱内干燥24h，再置于试验条件下24h，然后按6.12.4.2.2测定并计算浸水后拉伸粘结强度。

7 检验规则

产品检验分出厂检验和型式检验。

7.1 检验分类

7.1.1 出厂检验

以下指标为出厂必检项目，企业可根据实际增加其它出厂检验项目。出厂检验应按第 6 章的要求进行，检验合格并附有合格证方可出厂。

a） 聚氨酯防潮底漆：原漆外观、施工性、干燥时间；

b） 胶粉聚苯颗粒粘结找平浆料：湿表观密度；

c） 模塑聚苯板：按 JG 149—2003 所规定的出厂检验项目；

d） 挤塑聚苯板：垂直于板面方向的抗拉强度及 GB/T 10801.2—2002 所规定的出厂检验项目；

e） 燕尾槽聚苯板：质量要求、规格尺寸及允许偏差；

f） 斜嵌入式钢丝网架聚苯板：斜嵌入式钢丝网架的焊点质量、钢丝挑头、穿透聚苯板挑头，斜嵌入式钢丝网架聚苯板的质量要求、规格尺寸及允许偏差；

g） 双孔聚苯板：质量要求；

h） 硬泡聚氨酯：按 QB/T 3806－1999 所规定的出厂检验项目；

i） 岩棉板：按 GB/T 11835－1998 所规定的出厂检验项目；

j） 保温层界面砂浆：与水泥砂浆试块标准状态 7d 拉伸粘结强度；

k） 塑料卡钉：外观、规格尺寸、抗弯曲性；

l） 聚氨酯胶粘剂：容器中状态、干燥时间、与水泥砂浆试块标准状态拉伸粘结强度；

m） 基层界面砂浆、胶粉聚苯颗粒保温浆料、抗裂砂浆（含干拌型）、耐碱网格布、热镀锌四角电焊网、塑料锚栓、弹性底涂、柔性耐水腻子、饰面涂料、面砖粘结砂浆、面砖勾缝料、饰面砖：按 JG 158—2004 所规定的出厂检验项目；

n） 热镀钢丝网（六角编织网）：按 QB/T 1925.2—1993 所规定的出厂检验项目。

7.1.2 型式检验

第 5 章所列的全部技术要求为型式检验项目。在正常情况下，型式检验项目每两年进行一次。有下列情况之一时，应进行型式检验：

a） 新产品定型鉴定时；

b） 产品主要原材料及用量或生产工艺有重大变更时；

c） 停产半年以上恢复生产时；

d） 国家质量监督机构提出型式检验要求时。

7.2 组批规则与抽样方法

a） 聚苯板：同一规格的产品数量不超过 2000m^3 为一批，每批随机抽取 5 块作为检验样；

b） 岩棉板：按 GB/T 11835－1998 的组批与抽样规定进行；

c） 塑料卡钉：同一规格的产品数量不超过 5000 支为一批，每批随机抽取 5 支作为检验样；

d） 耐碱网格布、热镀锌钢丝网（四角电焊网或六角编织网）：同一规格的产品数量不超过 50000m^2 为一批，每批随机抽取 5 个包装单位，每个包装单位随机抽取 1m^2 作为检验样；

e） 粉状材料：以同种产品、同一级别、同一规格产品 30 吨为一批，不足一批以一批计，从每批任抽 10 袋，从每袋中分别取试样不少于 500g，混合均匀，按四分法缩取出比试验所需量大 1.5 倍的试样为检验样；

f） 液态剂类材料：以同种产品、同一级别、同一规格产品 10 吨为一批，不足一批以一批计，取样方法按 GB 3186 的规定进行。

7.3 判定规则

若全部检验项目符合本标准规定的技术指标，则判定为合格；若有两项或两项以上指标不符合规定时，则判定为不合格；若有一项指标不符合规定时，应对同一批产品进行加倍抽样复检不合格项，如该项指标仍不合格，则判定为不合格。若复检项目符合本标准规定的技术指标，则判定为合格。

8 标志和标签

8.1 包装或标签上应标明材料名称、标准编号、商标、生产企业名称、地址、产品规格型号、等级、数量、净含量、生产日期、质量保证期。

8.2 包装或标签上还可标明对保证产品质量有益的具有提示或警示作用的其它信息。

9 包装、运输和贮存

9.1 包装

9.1.1 聚苯板一般单块裸装，也可应用户要求将2～10块捆扎成一件。

9.1.2 岩棉板按GB/T 11835－1998的包装规定进行。

9.1.3 塑料卡钉用普通硬纸箱包装，每30～50支捆扎成一件。

9.1.4 热镀锌钢丝网（六角编织网）按QB/T 1925.2—1993的包装规定进行。

9.1.5 其它产品按JG 158—2004的包装规定进行。

9.2 运输

9.2.1 聚氨酯防潮底漆、保温层界面砂浆、聚氨酯胶粘剂可按一般运输方式办理，运输、装卸过程中，应整齐码放装。应注意防冻并防止雨淋、曝晒、挤压、碰撞、扔摔，保持包装完好无损。

9.2.2 胶粉聚苯颗粒粘结找平浆料在运输时应防止日晒、雨淋、高温、潮湿、重压，按一般运输方式办理。

9.2.3 聚苯板应侧立搬运，在搬运过程中应侧立贴实，并用包装带或麻绳与运输设备固定好；严禁烟火，不应长期露天曝晒和雨淋；不得重压猛摔或与锋利物品碰撞，以避免破坏和变形。

9.2.4 硬泡聚氨酯在运输时应防止日晒、雨淋、高温、撞击、倒置，按一般运输方式办理。

9.2.5 岩棉板按GB/T 11835－1998的运输规定进行。

9.2.6 塑料卡钉可按一般运输方式办理。运输、装卸过程中，应整齐码装，并注意防雨防潮。

9.2.7 热镀锌钢丝网（六角编织网）按QB/T 1925.2—1993的运输规定进行

9.2.8 其它产品运输按JG 158—2004的规定进行。

9.3 贮存

9.3.1 所有系统组成材料均应防止与腐蚀性介质接触，远离火源，不应露天长期曝晒；存放场地应干燥、通风、防冻。

9.3.2 所有材料应按型号、规格分类贮存，贮存期不得超过材料保质期。

9.4 产品随行文件的要求

9.4.1 产品合格证

9.4.1.1 系统组成的材料应有产品合格证，产品合格证应包括下列内容：

a） 产品名称、标准编号、商标；

b） 生产企业名称、地址；

c） 产品规格及分类；

d） 生产日期、质量保证期；

e） 检验部门印章、检验人员代号。

9.4.1.2 产品合格证应于产品交付时提供。

9.4.2 使用说明书

9.4.2.1 使用说明书是交付产品的组成部分。

9.4.2.2 使用说明书应包括下列主要内容：

a） 产品用途及使用范围；

b） 产品特点及选用方法；

c） 产品结构及组成材料；

d） 使用环境条件；

e） 使用方法；

f） 材料贮存方式；

g） 成品保护措施；

h） 验收标准；

i） 安全及其它注意事项。

9.4.2.3 应标明使用说明书的出版日期。

9.4.2.4 生产厂家可根据产品特点编制施工技术规程，若施工技术规程能满足用户对使用说明书的需要时，可用其代替使用说明书。

9.4.3 面砖饰面系统还应附有抗震试验报告。

9.4.4 其他有关技术资料。

本标准起草工作组构成：

姓　名	单　　位
张锡虎	建设部建筑节能专家委员会
张树君	中国建筑标准设计研究院
冯金秋	中国建筑科学研究院物理所
刘振贤	中国建筑材料科学研究院
张玉祥	中国建筑材料企业管理协会
陶驷骥	华北地区建筑设计标准办公室
游广才	北京市建筑节能与墙体材料革新办公室
王庆生	北京市建筑节能专业委员会
费慧慧	北京中建建筑技术研究院
陈丹林	北京建工集团第六建筑公司
郭玉顺	北京清华大学土木水利学院
王建康	天津市建筑标准设计办公室
冯高磊	山西省建筑设计研究院
巴特尔	内蒙古自治区建筑科学研究所
周占环	辽宁省建筑标准设计研究院
荆延武	沈阳都市建筑设计有限公司
安艳华	沈阳建筑大学建筑与规划学院
公尚彦	吉林省建筑标准化管理所
李德荣	甘肃省建设科技专家委员会
常自奋	甘肃省墙改办
拜合提亚	新疆维吾尔自治区建设厅标准定额处
李金保	宁夏回族自治区建筑标准设计办公室
潘维礼	山东省标准设计办公室
龚福根	江西省建设工程质量监督管理总站
王洪涛	浙江省标准设计站
许锦峰	江苏省建筑科学研究院
刘珠雄	福建省建设厅科技处
李　跃	湖北省建筑标准设计研究院
刘宏成	湖南大学建筑系
冯　雅	西南建筑设计研究院
徐　湛	重庆市建设技术发展中心
黄振利	北京振利高新技术有限公司
朱　青	北京振利高新技术有限公司
陈全良	北京振利高新技术有限公司
钱艳荣	北京振利高新技术有限公司
郑金丽	北京振利高新技术有限公司
曹德军	北京振利高新技术有限公司
林燕成	北京振利高新技术有限公司
宋长友	北京振利高新技术有限公司
杨　军	北京振利高新技术有限公司
孙　侠	北京振利高新技术有限公司
陈志豪	北京振利高新技术有限公司
姚卫国	北京振利高新技术有限公司
黄　凯	北京振利高新技术有限公司

STANDARDS OF CHINA ASSOCIATION FOR STANDARDIZATION

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External Thermal Insulation Composite Systems Based on Mineral Binder and Expanded Polystyrene Granule Insulating Material with Other Insulating Material

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Contents

External Thermal Insulation Composite Systems Based on Mineral Binder and Expanded Polystyrene Granule Insulating Material with Other Insulating Material

1 Scope

This standard specifies the terms, definitions, classification, technical requirements, test methods, inspection rules as well as product marking, labeling, packing, transport and storage of external thermal insulation composite systems based on mineral binder and expanded polystyrene granule insulating material with other insulating material.

This standard applies to external thermal insulation composite systems based on mineral binder and expanded polystyrene granule insulating material with other insulating material. All constituent materials of these systems shall be supplied by systematic product manufacturers.

2 Normative references

The following normative documents contain provisions that, through reference in this text, constitute provisions of this national standard. For dated reference, subsequent amendments to, or revisions of, any of these publications do not apply. For undated references, the latest edition of the normative document referred to applies.

GB/T 1721—1979 Test methods for appearance and transparency of varnishes, oil varnishes and thinners

GB/T 1728—1979（1989） Test methods for drying time of varnish film and paint filler film

GB 3186 Sampling paint products (neq ISO 1512:1974)

GB/T 6343—1995 Cellular plastics and rubbers—Determination of apparent (bulk) density（neq ISO 845:1988）

GB/T 8625 Test method for difficult-flammability for building materials

GB/T 9265—1998 Determination for alkali resistance of film of architectural paints and coatings

GB/T 9271—1988 Paints and varnishes—Standard panels for testing （eqv ISO 1514:1984）

GB 9278 Temperatures and humidities for conditioning and testing of paint specimens (eqv ISO 3270:1984)

GB/T 9286—1998 Paints and varnishes—Cross cut test for films（eqv ISO 2409:1992）

GB/T 9779—1988 Multi wall architectural coatings

GB/T 10294 Thermal insulation—Determination of steady-state thermal resistance and related properties—Guarded hot plate apparatus

GB/T 10801.2—2002 Rigid extruded polystyrene foam board for thermal insulation (XPS)

GB/T 11835—1998 Rock wool, slag wool and their products for thermal insulation

GB/T 13480 Test method for measuring compressive properties of mineral wool products

GB/T 16777—1997 Test methods for building waterproof coatings

GB/T 17671—1999 Method of testing cements—Determination of strength (ISO method)

JC/T 412—1991 Asbestos cement board for building materials

JC/T 907—2002 Interface treating agent for concrete

JG/T 24—2000 Sand textured building coating based on synthetic resin emulsion

JGJ 110—1997 Testing standard of adhesive strength of tapestry brick for construction engineering

JGJ 144—2004 Technical specification for external thermal insulation on wall

JG 149—2003 External thermal insulation composite systems based on expanded polystyrene

JG 158—2004 External thermal insulating rendering systems made of mortar with mineral binder and using expanded polystyrene granule as aggregate

QB/T 1925.2—1993 Galvanized low carbon steel wire mesh for general uses (Hexagonal mesh)

QB/T 3806—1999 Cellular plastics—Specification of polyurethane for rigid materials used in the thermal insulation of building

QB/T 3897—1999 Welded wire fabric coated with zinc

YB/T 126—1997 Steel wires for steel net frame core board

3 Terms and definitions

For the purposes of this national standard, the terms and definitions given in JGJ 144—2004, JG 149—2003, JG 158—2004 and the following apply.

3.1 External thermal insulation composite systems based on mineral binder and expanded polystyrene granule insulating material with other insulating material

These thermal insulation systems are installed at the outside of the exterior wall for thermal insulation, protection and decoration. They are composed of mineral binder and polystyrene granule insulating material laminated with wall substrate or mineral binder and polystyrene granule material for adhesion and making level laminated with other thermal insulating mortar and have function of thermal insulation, protection and decoration. These systems mainly include external thermal insulating rendering system made of mortar with mineral binder and using expanded polystyrene granule as aggregate, external thermal insulation composite system based on polystyrene panel without steel mesh in cast-in-place concrete form, external thermal insulation composite system based on steel mesh polystyrene panel in cast-in-place concrete form, external thermal insulation composite system based on polystyrene panel affixing and bricklaying with mineral binder and expanded polystyrene granule material for adhesion and making level, external thermal insulation composite system based on spraying rigid polyurethane foam, and external thermal insulation composite system based on rock wool panel. The thickness of its anti-crack protection layer shall be limited within: 3～5mm (for common paint finish type), 5～7mm (for reinforced paint finish type), and 8～12mm (for tile finish type).

3.2 External thermal insulating rendering system made of mortar with mineral binder and using expanded polystyrene granule as aggregate

It is an external thermal insulation and surface decoration system installed at the outside of the exterior wall of buildings. When paint is used for surface decoration it is composed of substrate interface treating mortar, mineral binder and expanded polystyrene granule insulating material, anti-crack mortar laminated alkali-resistant fiberglass mesh, and paint etc. (Table 1); When tile is used for surface decoration, it is

composed of substrate interface treating mortar, mineral binder and expanded polystyrene granule insulating material, anti-crack mortar laminated thermal galvanized steel wire mesh (tetragonal welded mesh or hexagonal woven mesh), plastic anchor bolts and tiles etc. (Table 2).

Table 1: Basic texture of paint decoration in external thermal insulating rendering systems made of mortar with mineral binder and using expanded polystyrene granule as aggregate

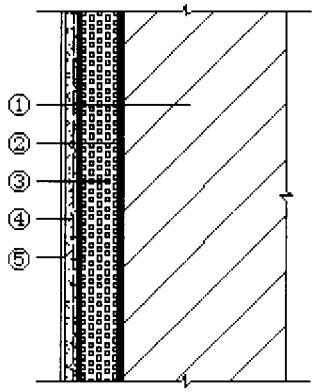
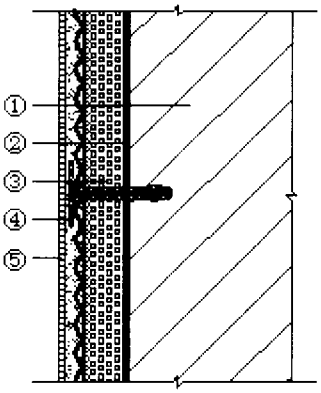
Wall substrate ①	Basic Texture of System				Schematic Diagram of Texture
	Interface layer ②	Thermal insulation layer ③	Anti-crack layer ④	Finish coat ⑤	
Concrete wall or masonry wall	Interface treating mortar for substrate	Mineral binder and expanded polystyrene granule insulating material	anti-crack mortar laminated alkali-resistant fiberglass mesh + elastic base coat	Waterproof flexible putty + paint	

Table 2: Basic texture of tile decoration in external thermal insulating rendering systems made of mortar with mineral binder and using expanded polystyrene granule as aggregate

Wall substrate ①	Basic Texture of System				Schematic Diagram of Texture
	Interface layer ②	Thermal insulation layer ③	Anti-crack layer ④	Finish coat ⑤	
Concrete wall or masonry wall	Interface treating mortar for substrate	Mineral binder and expanded polystyrene granule insulating material	1st layer anti-crack mortar + thermal galvanized steel wire mesh (anchored with the substrate with plastic anchor bolt) + 2nd layer anti-crack mortar	Tile adhesive mortar + tile + pointing stuff	

3.3 External thermal insulation composite system based on polystyrene panel without steel mesh in cast-in-place concrete form

It is an external thermal insulation and surface decoration system installed at the outside of the exterior wall of cast-in-place concrete buildings. When paint is used for surface decoration , it is composed of swallow-tailed groove polystyrene panel, mineral binder and expanded polystyrene granule insulating material,

anti-crack mortar laminated alkali-resistant fiberglass mesh, and paint (table 3); when tile is used for surface decoration, it is composed of swallow-tailed groove polystyrene panel, mineral binder and expanded polystyrene granule insulating material or mineral binder and expanded polystyrene granule for adhesion and leveling, anti-crack mortar laminated thermal galvanized steel wire mesh, (tetragonal welded mesh or hexagonal woven mesh), plastic anchor bolts and tile（table 4）. Both sides of swallow-tailed groove polystyrene panel shall be treated with polystyrene panel interface treating mortar before use. The system fastens the thermal insulation layer by one-time-forming method for casting the swallow-tailed groove polystyrene panel and the concrete wall substrate. Before concrete casting, the swallow-tailed groove polystyrene panel is installed at the internal side of the outer mold, with precast right-angle swallow-tailed groove polystyrene panels at the positive and negative angles. After concrete casting, the thermal insulation layer and the wall substrate are firmly bonded together.

Table 3: Basic texture of paint decoration in external thermal insulation composite systems based on polystyrene panel without steel mesh in cast-in-place concrete form

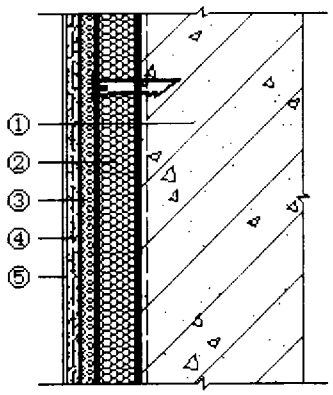
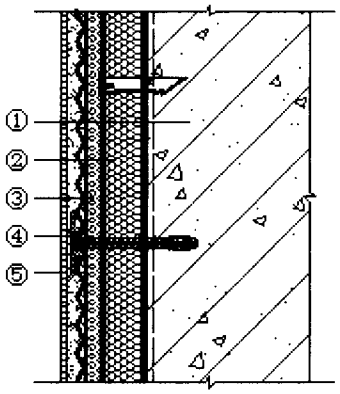
Wall substrate ①	Basic Texture of System				Schematic Diagram of Texture
	Thermal insulation layer ②	Leveling layer ③	Anti-crack layer ④	Finish coat ⑤	
Cast-in-place concrete wall	Swallow-tailed groove polystyrene panel swallow-tailed groove polystyrene panel treated with polystyrene panel interface treating mortar (vertical swallow-tailed groove polystyrene panel is fitted with plastic fastener; the polystyrene panel can be molded polystyrene panel or extruded polystyrene panel; at the positive and negative angles are precast right-angle swallow-tailed groove polystyrene panel).	Mineral binder and expanded polystyrene granule insulating material (or mineral binder and polystyrene foaming granule material for adhesion and leveling)	Anti-crack mortar laminated alkali-resistant fiberglass mesh + elastic base coat	Waterproof flexible putty + paint	

Table 4: Basic texture of tile decoration in external thermal insulation composite systems based on polystyrene panel without steel mesh in cast-in-place concrete form

Wall substrate ①	Basic Texture of System				Schematic Diagram of Texture
	Thermal insulation layer ②	Leveling layer ③	Anti-crack layer ④	Finish coat ⑤	
Cast-in-place concrete wall	Swallow-tailed groove polystyrene panel swallow-tailed groove polystyrene panel treated with polystyrene panel interface treating mortar (vertical swallow-tailed groove polystyrene panel is fitted with plastic fastener; the polystyrene panel can be molded polystyrene panel or extruded polystyrene panel; at the positive and negative angles are precast right-angle swallow-tailed groove polystyrene panel).	Mineral binder and expanded polystyrene granule insulating material (or mineral binder and polystyrene foaming granule material for adhesion and leveling)	1st layer anti-crack mortar + thermal galvanized steel wire mesh (anchored with the substrate with plastic anchor bolt) + 2nd layer anti-crack mortar	Tile adhesive mortar + tile + pointing stuff	

3.4 External thermal insulation composite system based on steel mesh polystyrene panel in cast-in-place concrete form

It is an external thermal insulation and surface decoration system installed at the outside of the exterior wall of cast-in-place concrete buildings. With paint finish, it is composed of steel mesh polystyrene panel, mineral binder and expanded polystyrene granule insulating material or mineral binder and polystyrene foaming granule material for adhesion and leveling, anti-crack mortar laminated alkali-resistant fiberglass mesh, and paint (table 5); with tile finish, it is composed of steel mesh polystyrene panel, anti-crack mortar (dry-mixed type) and tile (table 6). Both sides of steel mesh polystyrene panel shall be treated with polystyrene panel interface treating mortar before use. The system fastens the thermal insulation layer by one-time-forming method for casting the steel mesh polystyrene panel and the concrete wall substrate. Before concrete casting, the steel mesh polystyrene panel is installed at the internal side of the outer mold. After concrete casting, the thermal insulation layer and the wall substrate are firmly bonded together.

Table 9: Basic texture of paint decoration in "affixing and bricklaying polystyrene panel BL type" external thermal insulation composite system

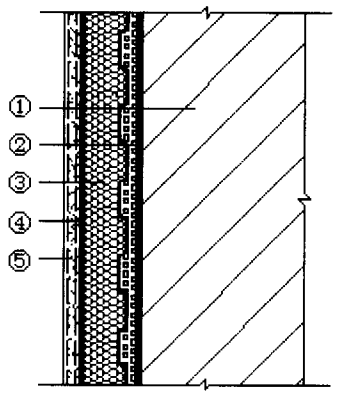
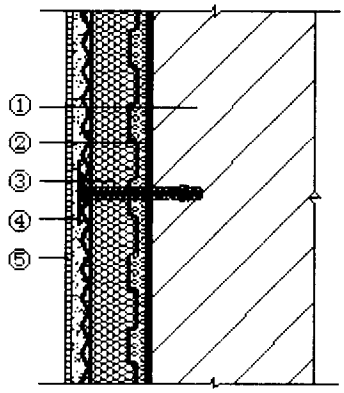
基层墙体 ①	Basic Texture of System				Schematic Diagram of Texture
	Adhesion layer ②	Thermal insulation layer ③	Anti-crack layer ④	Finish coat ⑤	
Concrete wall or masonry wall	Substrate interface treating mortar + mineral binder and expanded polystyrene granule material for adhesion and making level	Double hole polystyrene panel with trapezium groove on surface that has been treated with polystyrene panel interface treating mortar (the polystyrene panel can be molded polystyrene panel or extruded polystyrene panel; for extruded polystyrene panel, no groove is necessary).	Anti-crack mortar laminated alkali-resistant mesh + elastic base coat	Waterproof flexible putty + paint	

Table 10: Basic texture of tile decoration in "affixing and bricklaying polystyrene panel BL type" external thermal insulation composite system

基层墙体 ①	Basic Texture of System				Schematic Diagram of Texture
	Adhesion layer ②	Thermal insulation layer ③	Anti-crack layer ④	Finish coat ⑤	
Concrete wall or masonry wall	Substrate interface treating mortar + mineral binder and expanded polystyrene granule material for adhesion and making level	Double hole polystyrene panel with trapezium groove on surface that has been treated with polystyrene panel interface treating mortar (the polystyrene panel can be molded polystyrene panel or extruded polystyrene panel; for extruded polystyrene panel, no groove is necessary).	1st layer anti-crack mortar + thermal galvanized steel wire mesh (anchored with the substrate with plastic anchor bolt) + 2nd layer anti-crack mortar	Tile adhesive mortar + tile + pointing stuff	

material for adhesion and making level, double hole polystyrene panel, anti-crack mortar laminated alkali-resistant fiberglass mesh, and paint (table 7 and 9); with tile finish, it is composed of mineral binder and expanded polystyrene granule material for adhesion and making level, double hole polystyrene panel, anti-crack mortar laminated thermal galvanized steel wire mesh (tetragonal welded mesh or hexagonal woven mesh), plastic anchor bolts tile etc. (table 8 and 10). If there is a leveling layer composed of mineral binder and expanded polystyrene granule material for adhesion and making level on the surface of polystyrene panel, such external thermal insulation composite system is called "affixing and bricklaying polystyrene panel LBL type" external thermal insulation composite system; if there isn't such a leveling layer composed of mineral binder and expanded polystyrene granule material for adhesion and making level on the surface of polystyrene panel, such external thermal insulation composite system is called "affixing and bricklaying polystyrene panel LB type". External thermal insulation composite system, in which "L" stands for mineral binder and expanded polystyrene granule material for adhesion and making level, and "B" for insulation panel.

Table 7: Basic texture of paint decoration in "affixing and bricklaying polystyrene panel LBL type" external thermal insulation composite system

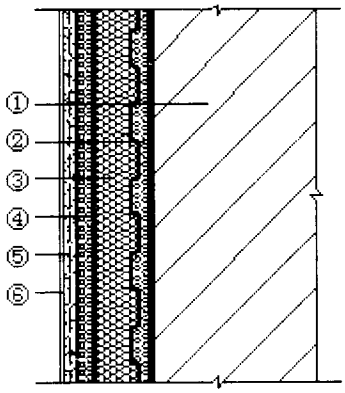
Wall substrate ①	Basic Texture of System					Schematic Diagram of Texture
	Adhesion layer ②	Thermal insulation layer ③	Leveling layer ④	Anti-crack layer ⑤	Finish coat ⑥	
Concrete wall or masonry wall	Substrate interface treating mortar + mineral binder and expanded polystyrene granule material for adhesion and making level	Double hole polystyrene panel with trapezium groove on surface that has been treated with polystyrene panel interface treating mortar (the polystyrene panel can be molded polystyrene panel or extruded polystyrene panel; for extruded polystyrene panel, no groove is necessary).	Mineral binder and polystyrene foaming granule material for adhesion and leveling	Anti-crack mortar laminated alkali-resistant mesh + elastic base coat	Waterproof flexible putty + paint	

Table 8: Basic texture of tile decoration in "affixing and bricklaying polystyrene panel LBL type" external thermal insulation composite system (with tile finish)

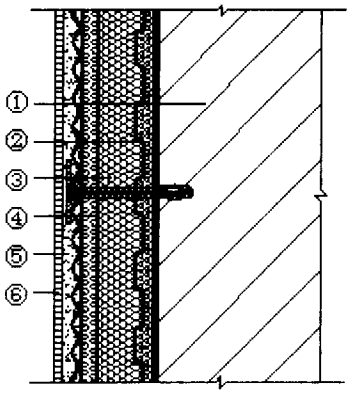
Wall substrate ①	Basic Texture of System					Schematic Diagram of Texture
	Adhesion layer ②	Thermal insulation layer ③	Leveling layer ④	Anti-crack layer ⑤	Finish coat ⑥	
Concrete wall or masonry wall	Substrate interface treating mortar + mineral binder and expanded polystyrene granule material for adhesion and making level	Double hole polystyrene panel with trapezium groove on surface that has been treated with polystyrene panel interface treating mortar (the polystyrene panel can be molded polystyrene panel or extruded polystyrene panel; for extruded polystyrene panel, no groove is necessary).	Mineral binder and polystyrene foaming granule material for adhesion and leveling	1st layer anti-crack mortar + thermal galvanized steel wire mesh (anchored with the substrate with plastic anchor bolt) + 2nd layer anti-crack mortar	Tile adhesive mortar + tile + pointing stuff	

Table 9: Basic texture of paint decoration in "affixing and bricklaying polystyrene panel BL type" external thermal insulation composite system

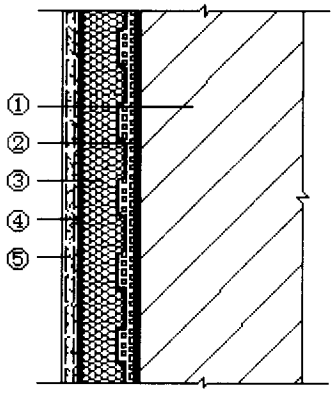
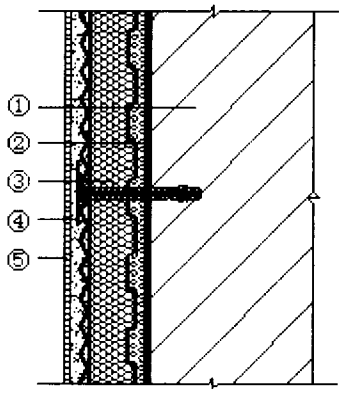
基层墙体 ①	Basic Texture of System				Schematic Diagram of Texture
	Adhesion layer ②	Thermal insulation layer ③	Anti-crack layer ④	Finish coat ⑤	
Concrete wall or masonry wall	Substrate interface treating mortar + mineral binder and expanded polystyrene granule material for adhesion and making level	Double hole polystyrene panel with trapezium groove on surface that has been treated with polystyrene panel interface treating mortar (the polystyrene panel can be molded polystyrene panel or extruded polystyrene panel; for extruded polystyrene panel, no groove is necessary).	Anti-crack mortar laminated alkali-resistant mesh + elastic base coat	Waterproof flexible putty + paint	

Table 10: Basic texture of tile decoration in "affixing and bricklaying polystyrene panel BL type" external thermal insulation composite system

基层墙体 ①	Basic Texture of System				Schematic Diagram of Texture
	Adhesion layer ②	Thermal insulation layer ③	Anti-crack layer ④	Finish coat ⑤	
Concrete wall or masonry wall	Substrate interface treating mortar + mineral binder and expanded polystyrene granule material for adhesion and making level	Double hole polystyrene panel with trapezium groove on surface that has been treated with polystyrene panel interface treating mortar (the polystyrene panel can be molded polystyrene panel or extruded polystyrene panel; for extruded polystyrene panel, no groove is necessary).	1st layer anti-crack mortar + thermal galvanized steel wire mesh (anchored with the substrate with plastic anchor bolt) + 2nd layer anti-crack mortar	Tile adhesive mortar + tile + pointing stuff	

3.6 External thermal insulation composite system based on spraying rigid polyurethane foam

It is an external thermal insulation and surface decoration system installed at the outside of the exterior wall of buildings. With paint decoration, it is composed of polyurethane moisture proof primer, rigid polyurethane foam, polyurethane interface treating mortar, mineral binder and expanded polystyrene granule insulating material or mineral binder and polystyrene foaming granule material for adhesion and leveling, anti-crack mortar laminated alkali-resistant fiberglass mesh, paint etc. (table 11); with tile decoration, it is composed of polyurethane moisture proof primer, rigid polyurethane foam, polyurethane interface treating mortar, mineral binder and expanded polystyrene granule insulating material or mineral binder and polystyrene foaming granule material for adhesion and leveling, anti-crack mortar laminated thermal galvanized steel wire mesh (tetragonal welded mesh or hexagonal woven mesh), plastic anchor bolts, tile etc. (table 12). Rigid polyurethane foam is sprayed onto the wall substrate on site, and at edges, corners and door and window openings, precast polyurethane pieces are affixed onto the wall substrate with adhesive for polyurethane panel.

Table 11: Basic texture of paint decoration in external thermal insulation composite systems based on spraying rigid polyurethane foam

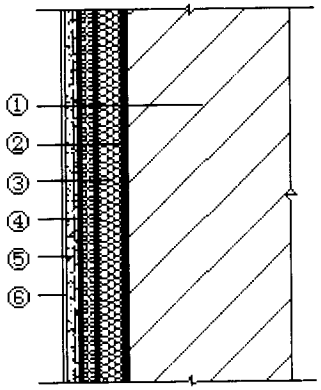
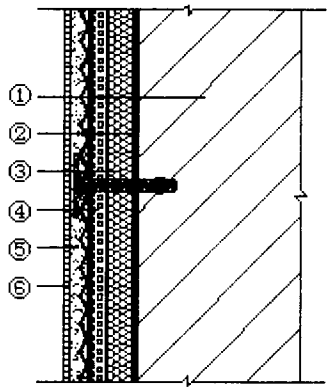
Wall substrate ①	Basic Texture of System					Schematic Diagram of Texture
	Interface layer ②	Thermal insulation layer ③	Leveling layer ④	Anti-crack layer ⑤	Finish coat ⑥	
Concrete wall or masonry wall (for masonry wall, cement mortar shall be used for leveling)	Polyurethane moisture proof primer	Sprayed rigid polyurethane foam + polyurethane interface treating mortar (at edges, corners and door and window openings, precast polyurethane pieces are affixed onto the wall substrate with polyurethane adhesive).	Mineral binder and expanded polystyrene granule insulating material (or mineral binder and polystyrene foaming granule material for adhesion and leveling)	Anti-crack mortar laminated alkali-resistant mesh	Waterproof flexible putty + paint	

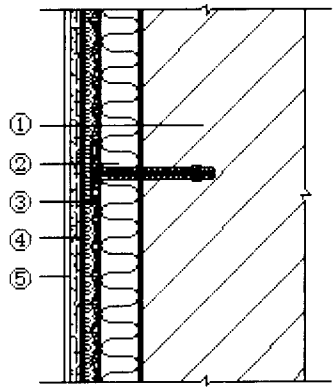
Table 12: Basic texture of tile decoration in thermal insulation composite systems based on spraying rigid polyurethane foam (with tile finish)

Wall substrate ①	Basic Texture of System					Schematic Diagram of Texture
	Interface layer ②	Thermal insulation layer ③	Leveling layer ④	Anti-crack layer ⑤	Finish coat ⑥	
Concrete wall or masonry wall (for masonry wall, cement mortar shall be used for leveling)	Polyurethane moisture proof primer	Sprayed rigid polyurethane foam + polyurethane interface treating mortar (at edges, corners and door and window openings, precast polyurethane pieces are affixed onto the wall substrate with polyurethane adhesive).	Mineral binder and expanded polystyrene granule insulating material (or mineral binder and polystyrene foaming granule material for adhesion and leveling)	1st layer anti-crack mortar + thermal galvanized steel wire mesh (anchored with the substrate with plastic anchor bolt) + 2nd layer anti-crack mortar	Tile adhesive mortar + tile + pointing stuff	

3.7 External thermal insulation composite system based on rock wool panel

It is an external thermal insulation and surface decoration system installed at the outside of the exterior wall of buildings. It is composed of rock-wool panel, thermal galvanized steel wire mesh (tetragonal welded mesh), plastic anchor bolt, rock-wool panel interface treating mortar, mineral binder and expanded polystyrene granule insulating material or mineral binder and polystyrene foaming granule material for adhesion and leveling, anti-crack mortar laminated alkali-resistant fiberglass mesh, paint etc. (table 13). Rock-wool panel is bonded on wall substrate with anchor bolt and thermal galvanized steel wire mesh (tetragonal welded mesh).

Table 13: Basic texture of paint decoration in external thermal insulation composite system based on rock wool panel

Wall substrate ①	Basic Texture of System				Schematic Diagram of Texture
	Thermal insulation layer ②	Leveling layer ③	Anti-crack layer ④	Finish coat ⑤	
Concrete wall or masonry wall	Rock wool panel treated with rock-wool panel interface treating mortar + thermal galvanized steel wire mesh (anchored with the substrate with plastic anchor bolt)	Mineral binder and expanded polystyrene granule insulating material (or mineral binder and polystyrene foaming granule material for adhesion and leveling)	Anti-crack mortar laminated alkali-resistant mesh + elastic primer	Waterproof flexible putty + paint	

3.8 Swallow-tailed groove polystyrene panel (called meshless polystyrene panel for short)

It is a thermal insulating polystyrene panel with a swallow-tailed groove on one side parallel in the height direction (see figure 1).

3.9 Plastic fastener

It is a special T-shaped connector consisting of a rectangular sheet-shaped fastener head and two sheet-shaped fastener bodies, which are connected together. Made of engineering plastics, it is used in external thermal insulation composite systems based on polystyrene panel without steel mesh in cast-in-place concrete form for locking polystyrene panel joints and helping fasten the polystyrene panel on the wall substrate (see Figure 2).

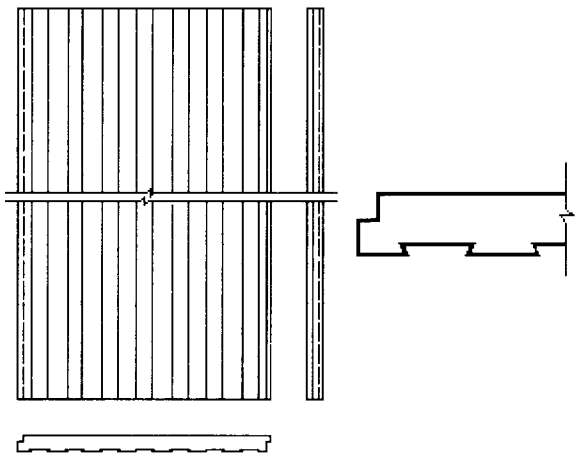


Figure 1: Profile of swallow-tailed groove polystyrene panel

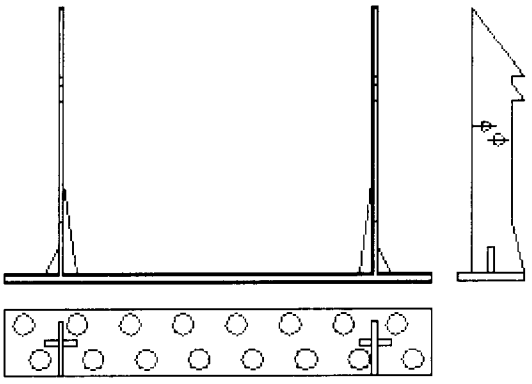


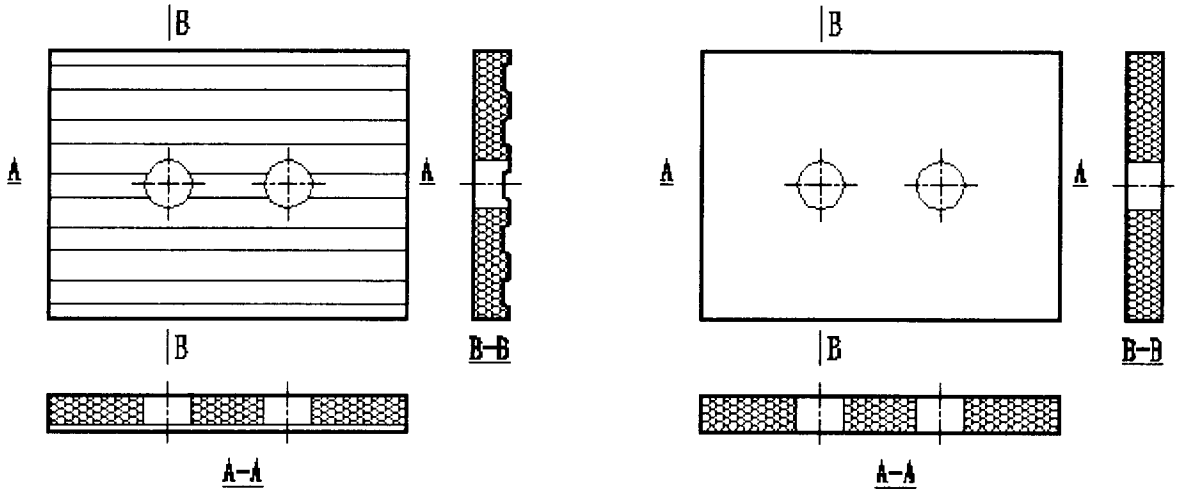
Figure 2: Plastic fastener

3.10 Steel mesh polystyrene panel (called mesh polystyrene panel for short)

It is a thermal insulating polystyrene panel with a steel wire mesh on the side welded with obliquely inserted wires that transfix the polystyrene panel.

3.11 Double holes polystyrene panel

It is a thermal insulating panel with two vertical holes on the central axis in the length direction. The two holes are vertical to the panel surface and symmetric to the central axis in the width direction. For molded polystyrene panel, there is a trapezium groove on one side parallel in the length direction; for extruded polystyrene panel, no groove is necessary (see Figure 3).



a. Double holes molded polystyrene panel

b. Double holes extruded polystyrene panel

Figure 3: Profile of double holes polystyrene panel

3.12 Rigid polyurethane foam

It is the plastic foam made from Freon-free bi-component materials via high-pressure airless spray foaming machine.

3.13 Polyurethane moisture proof primer

It is a primer made from high polymer resin, various additives and thinners for sealing water and steam on the substrate so that rigid polyurethane foam can be bonded with the wall substrate.

3.14 Polystyrene panel interface treating mortar

It is an interface treating mortar made from cement, aggregate, high polymer bonding material and various additives that has excellent bonding property with interface treating mortar. It is applied on the surface of polystyrene panel to increase the adhesive force between polystyrene panel and bonding layer and leveling layer. It includes the treating mortar for molded polystyrene panels and the treating mortar for extruded polystyrene panel.

3.15 Polyurethane interface treating mortar

It is an interface finishing agent made from synthetic resin emulsions (as main adhesives) and various additives, sand and fillings. It has good adhesive property. Before use, mix it in proportion with cement to prepare the interface treating mortar and apply the mortar on the polyurethane thermal insulating layer to increase its adhesive force with the leveling layer.

3.16 Rock-wool panel interface treating mortar

It is a mortar made through mixing in proportion waterproof emulsion, fillings, additive and medium sand.

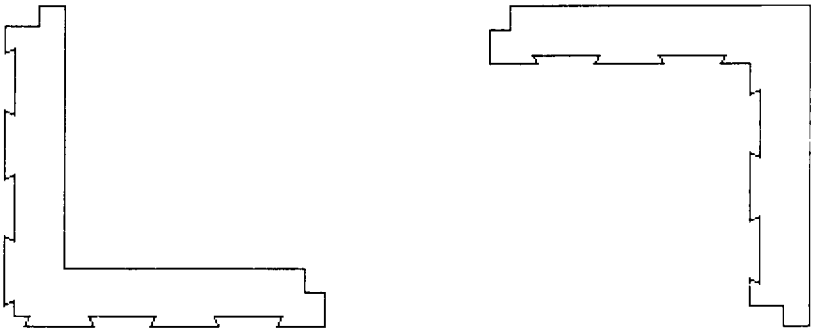
It is used to improve surface rigidity, adhesive force and waterproof property of rock-wool panel and corrosion resistance of steel wire mesh.

3.17 Mineral binder and expanded polystyrene granule material for adhesion and making level

It is a paste material made through integrating special mineral binder and fine polystyrene granule for adhesion and leveling with lightweight aggregate. It is used for bonding the thermal insulating layer and leveling the surface of the thermal insulating layer. It also plays the role of thermal insulation.

3.18 Right-angle swallow-tailed groove polystyrene panel

It is the right-angle swallow-tailed groove polystyrene panel precast at factory. The edge length of the two right angles is 200mm. It includes two types, i.e. negative angle swallow-tailed polystyrene panel and positive angle swallow-tailed polystyrene panel, which are used in negative and positive angles of wall respectively (see Figure 4).



a. Negative angle swallow-tailed polystyrene panel b. Positive angle swallow-tailed polystyrene panel

Figure 4: Right-angle swallow-tailed polystyrene panel

3.19 Precast polyurethane panel

It is the rigid polyurethane foam thermal insulation module with angle and other shapes that are precast at factory. It is used for bonding such parts as edges, angles and openings etc. of substrate.

3.20 Adhesive for polyurethane panel

It is a bi-component adhesive made from synthetic resin (as adhesive) and additive such as curing agent etc. It is used for bonding precast polyurethane panel with wall substrate.

4 Classification

External thermal insulation composite systems based on mineral binder and expanded polystyrene granule insulating material with other insulating material are classified into three types based on finish decoration and impact resistance, i.e. common paint finish type (abbreviated as CP type), reinforced paint finish type (abbreviated as CQ type), and tile finish type (abbreviated as T type):

——CP type external thermal insulation composite systems based on mineral binder and expanded polystyrene granule insulating material with other insulating material mainly apply to 2m+ high walls of buildings with paint finish;

——CQ type external thermal insulation composite systems based on mineral binder and expanded polystyrene granule insulating material with other insulating material mainly apply to 1st floor or 2m- walls of buildings with paint finish and parts with special impact requirements;

——T type external thermal insulation composite systems based on mineral binder and expanded

polystyrene granule insulating material with other insulating material mainly apply to buildings with tile finish.

5 Requirements

5.1 Exterior insulation systems shall undergo weathering test. Exterior insulation systems with tile finish shall also undergo shock resistance test to ensure that no tile finish and exterior insulation systems fall off under the action of earthquakes with seismic fortification intensity.

5.2 The properties of external thermal insulation composite systems based on mineral binder and expanded polystyrene granule insulating material with other insulating material shall meet the requirements given in Table 14.

Table 14: Property Indices of external thermal insulation composite systems based on mineral binder and expanded polystyrene granule insulating material with other insulating material

Test Item		Property Index
Weathering		No surface crack, powdering or peeling; the tensile bond strength of anti-crack protection layer and leveling layer shall be no less than 0.1Mpa, and the damaged interface shall be at the leveling layer.
Water absorbency (dipped in water for 1h) /g/m^2		≤1000
Impact resistance	Common paint finish type (CP type), tile finish type (T type)	3.0J impact conforming
	Reinforced paint finish type (CQ type)	10.0J impact conforming
Value of wind resistance		No less than the designed wind load of an engineering project.
Freezing-thawing resistance		No surface crack, void, blister or peeling; the tensile bond strength of anti-crack protection layer and leveling layer shall be no less than 0.1Mpa, and the damaged interface shall be at the leveling layer.
Water steam wet flow density /g/(m^2·h)		≥0.85
Water impermeability		No water permeability in the inner side of specimen protection layer.
Abrasion resistance, 500L sand		No crack, crazing or peeling or damage of surface protection layer chap
Tensile strength of system (excluding CP type, CQ type, thermal insulation composite systems based on rock wool panel) /MPa		≥0.1 and the damaged part shall not be at the interfaces of various layers.
Bond strength of tile (T type) /MPa (spot test on field)		≥0.4
Recreation to fire		Be not ignitable; the thickness change of specimen after testing shall be no greater than 10%.
Thermal resistance		Thermal resistance of composite wall conforms to the design requirement.

5.3 Polyurethane moisture proof primer

The property indices of polyurethane moisture proof primer shall meet the requirements given in Table 15.

Table 15: Property indices of polyurethane moisture proof primer

Item	Unit	Property Index
Appearance of raw primer	—	Light yellow to brown yellow liquid, no mechanical impurity
Constructability	—	No difficulty in brushing.
Drying time	h	Surface drying time ≤4, hard drying time≤24
Coating adhesion (dry substrate and wet substrate)	Grade	≤1
Alkali resistance	—	No blistering, wrinkling or peeling within 48h.

5.4 Mineral binder and expanded polystyrene granule material for adhesion and making level

The property indices of mineral binder and expanded polystyrene granule material for adhesion and making level shall meet the requirements given in Table 16.

Table 16: Property indices of mineral binder and expanded polystyrene granule material for adhesion and making level

Item		Unit	Property Index
Wet apparent density		kg/m^3	≤520
Dry apparent density		kg/m^3	≤300
Coefficient of thermal conductivity		W/(m·K)	≤0.07
Compressive strength (56d)		MPa	≥0.3
Combustion Property		—	Non-flammable grade B_1
Tensile bond strength (standard state 56d)	With cement mortar specimen block containing substrate interface treating mortar	MPa	≥0.12
	With polystyrene panel, polyurethane and rock-wool panel specimens containing thermal insulation layer interface treating mortar	MPa	≥0.10 or damage of polystyrene panel, polyurethane or rock-wool panel specimen block

5.5 Polystyrene panel

The property indices of molded polystyrene panel shall meet the requirements given in 5.3of JG 149—2003. If the extruded polystyrene panel is of flame-retardant type, its property indices shall meet the requirements given in Table 17 and the requirements of GB/T 10801.2—2002.

Table 17: property indices of extruded polystyrene panel

Item	Unit	Property Index
Apparent density	kg/m^3	28～32
Coefficient of thermal conductivity	W/(m·K)	≤0.030
Tensile strength vertical to the panel plane direction	MPa	≥0.15
Dimensional stability （70℃，48h）	%	≤1.0

5.6 Swallow-tailed groove polystyrene panel

The quality, specification and diminutions of swallow-tailed groove polystyrene panel shall meet the requirements given in Table 18～20.

Table 18: Quality requirements of swallow-tailed groove polystyrene panel

Item	Quality Requirements
Swallow-tailed groove	The swallow-tailed groove has the angle of 60° ±10°; the groove is 40～120mm wide, 10mm±2mm deep, at the interval of 0～120mm, and parallel in the length direction.
Tongue-groove	There are deep and shallow grooves at both long edges with the width of 20～25mm, depth of 1/2 panel thickness. The dimensions shall be accurate.
Interface treating	Both sides of polystyrene panel shall be evenly sprayed with polystyrene panel interface treating mortar; the polystyrene panel interface treating mortar shall be firmly bonded with the polystyrene panel; the coating shall be evenly distributed without powder falling off when dry wiping.

Table 19: Specification and dimensions of swallow-tailed groove polystyrene panel Unit: mm

Height of Layer	Length	Width	Thickness
2800	2825～2850	1220	40～150
2900	2925～2950		
3000	3025～3050		
Others	Other specifications are to be determined through consultation according to actual height of layer.		
Note: the thickness of polystyrene panel takes into account the thickness of the protruding part of swallow-tailed groove. The thickness is to be determined based on calculation of thermal insulation			

able 20: Allowable deviation of specification and dimensions of swallow-tailed groove polystyrene panel

Unit: mm

Item		Allow Deviation	Item		Allow Deviation
Length, width	<1000	±5	Thickness	<50	±2
	1000～2000	±8		50～75	±3
	2000～4000	±10		75～150	±4
	>4000	No limit for positive deviation, -10	Deviation of two diagonals		≤10

5.7 Steel mesh polystyrene panel

The quality, specification and dimensions of steel mesh polystyrene panel shall meet the requirements given in table 21～24.

Table 21: Quality requirements of steel mesh polystyrene panel

Item	Quality Requirements
Groove	The groove on polystyrene panel surface at one side of steel wire mesh sheet shall be 20～30mm wide and 10mm±2mm deep, and spaces between grooves are
Tongue-groove	At both long edges of polystyrene panel, there are shallow and deep grooves that are 20～25mm wide and 1/2 panel thickness deep, the dimensions shall be accurate.
Interface treating	Both sides of polystyrene panel and steel mesh shall be evenly sprayed with polystyrene panel interface treating mortar, the polystyrene panel interface treating mortar shall be firmly bonded with the polystyrene panel; the coating shall be evenly distributed without bottom exposure or powder falling off when dry wiping.

Table 22: Quality requirements of steel mesh

Item	Quality Requirements
Galvanized low carbon steel wire	The diameter of galvanized low-carbon steel wire for steel mesh sheet shall be 2.00mm-2.20mm, and the diameter of obliquely inserted galvanized low-carbon steel wire 2.20mm-2.50mm; the error shall be ±0.05mm; the property indices shall meet the requirement of YB/T 126—1997.
Strength of solder joint	Tensile strength ≥330N, no over burning.
Quality of solder joint	The solder skips and open soldering joints shall not exceed 8‰ of total solder joints and shall not concentrate at one point; The number of continuous opening soldering joints shall not exceed 2, no solder skip or pseudo soldering is allowed inside the 200mm area of panel ends, and open soldering rate of obliquely inserted wire shall not exceed 2%.
Density of obliquely inserted steel wire (transfixion wire)	（100～150）wire/m^2
Acute angle between obliquely inserted steel wire and steel wire mesh sheet	60° ±5°
End of steel wire	Length of mesh edge end≤6mm, inserted wire end ≤5mm.
End that transfixing polystyrene panel	If the thickness of polystyrene panel is less than 50mm, the vertical distance between the end that transfixing polystyrene panel and the panel surface shall be ≥30mm; If the thickness of polystyrene panel is greater than 50mm, the vertical distance between the end that transfixing polystyrene panel and the panel surface shall be ≥35mm; If the thickness of polystyrene panel is greater than 80mm to less than 150mm, the vertical distance between the end that transfixing polystyrene panel and the panel surface shall be ≥40mm.
Butt connection of polystyrene panel	In ≤3000mm long polystyrene panel, there shall be no more than two butt connections, and the butt connection point shall be firmly bonded with polyurethane adhesive.
Min. space between steel mesh sheet and polystyrene panel	5mm±1mm
Note: lateral steel wire shall be aligned to the center of the groove.	

Table 23: Specification of steel mesh polystyrene panel Unit: mm

Height of layer	Length	Width	Thickness
2800	2825～2850	1220	40～150
2900	2925～2950		
3000	3025～3050		
Others	Other specifications are to be determined according to actual layer height through consultation.		
Note 1: the dimensions of steel wire of steel mesh polystyrene panel shall be slightly less than the dimensions of polystyrene panel; Note 2: the thickness of polystyrene panel takes into account the thickness of the trapezium groove part, and the thickness shall be determined via calculation according to thermal insulation requirements.			

Table 24: Allowable deviation of specification and dimensions of steel mesh polystyrene panel Unit: mm

Item		Allowable Deviation	Item		Allowable Deviation
Length, width	<1000	±5	Thickness	<50	±2
	1000～2000	±8		50～75	±3
	2000～4000	±10		75～150	±4
	>4000	No limit for positive deviation, -10		Including steel wire.	±5
Deviation of the two diagonals		≤10	Deviation of the two diagonals of steel mesh		≤10

5.8 Double holes polystyrene panel

The quality requirements of double holes polystyrene panel shall meet the requirements given in Table 25.

Table 25: Quality requirements of double holes polystyrene panel

Item		Unit	Index	Allowable Deviation	Item	Unit	Index	Allowable Deviation
Hole	Aperture	mm	50～80	±3	Panel length	mm	600	±5
	Distance between hold centers	mm	200	±5	Panel width	mm	450	±5
Trapezium groove	Groove width	mm	30～60	±2	Panel thickness	mm	40～150	±4
	Groove depth	mm	5	±1	Interface treating	—	Both sides of polystyrene panel shall be evenly sprayed with polystyrene panel interface treating mortar; polystyrene panel interface treating mortar shall be firmly bonded with polystyrene panel; the coating shall be evenly distributed without bottom exposure or powder falling off when dry wiping.	
	Distance between grooves	mm	30～60	±2				
Note: the thickness of polystyrene panel takes into account the thickness of the trapezium groove part, and the thickness shall be determined via calculation according to thermal insulation requirements.								

5.9 Rigid polyurethane foam

The property indices of rigid polyurethane foam shall meet the requirements given in Table 26 and the requirements for Type II of QB/T 3806—1999.

Table 26: Property indices of rigid polyurethane foam

Item		Unit	Property Index
Density		kg/m^3	30～50
Tensile strength		kPa	≥150
Coefficient of thermal conductivity		W/(m·K)	≤0.025
Combustibility (vertical burning method)	Avg. combustion time	S	≤30
	Avg. combustion height	mm	≤250

5.10 Rock-wool panel

The property indices of rock-wool panel shall meet the requirements given in Table 27 and the requirements of GB/T 11835—1998.

Table 27: Property indices of rock-wool panel

Item	Unit	Property Index
Density	kg/m^3	≥150
coefficient of thermal conductivity （70℃）	W/(m·K)	≤0.044
moisture absorption rate per unit mass	%	≤3.0
Water proof rate	%	≥98
Compressive strength (10% compression)	kPa	≥40
Combustibility	—	Non-flammable

5.11 Thermal insulation layer interface treating mortar

The property indices of thermal insulation layer interface treating mortar (including polystyrene panel interface treating mortar, polyurethane interface treating mortar, rock-wool panel interface treating mortar) shall meet the requirements given in Table 28.

Table 28: Property indices of thermal insulation layer interface treating mortar

Item			Property Index			
			Molded polystyrene panel interface treating mortar	Extruded polystyrene panel interface treating mortar	Polyurethane interface treating mortar	Rock-wool panel interface treating mortar
Tensile bond strength	With cement mortar specimen block	Standard sate 7d	≥0.30MPa			
		Standard state 14d	≥0.50MPa			
		After dipping in water	≥0.30MPa			
	With polystyrene panel, polyurethane or rock-wool specimen block (under standard state of after dipping in water)		≥0.10Mpa or damage of molded polystyrene panel	≥0.15Mpa or damage of extruded polystyrene panel	≥0.15Mpa or damage of polyurethane	—
	With specimen block of mineral binder and expanded polystyrene granule material for adhesion and making level (standard state)		≥0.10Mpa or damage of specimen block of mineral binder and expanded polystyrene granule material for adhesion and making level			

5.12 Plastic fastener

Plastic fasteners shall be made from polyamide 6, polyamide 6.6, polyethylene, or polypropylene. Plastic fasteners and plastic sleeves shall not be made from recycled materials. Their property indices shall meet the requirements given in Table 29.

Table 29: Property indices of plastic fastener

Item		Unit	Property Index
Appearance		—	Ivory white, uniform color and luster
Specification and dimension	Length of fastener head	mm	160±1
	Width of fasten head	mm	≥20
	Thickness of fastener head	mm	3±0.5
	Aperture of the hole in fastener head	mm	8±1
	Length of fastener body	mm	≥ thickness of polystyrene panel +50
	Width of fastener body	mm	≥15
	Thickness of fastener body	mm	2±0.5
	Aperture of the hole in fastener body	mm	4±1
	Distance between two fastener bodies	mm	120±1
	Vertical distance between the hole in the fastener head and the hole in the fastener body	mm	≥ thickness of polystyrene panel
Tensile load		kN	≥0.15
Bending resistance		—	Fastener body and head shall not break, crease or crack at 30° ~45° bending, and can resume the original shape.

5.13 Adhesive for polyurethane panel

The property indices of adhesive for polyurethane panel shall meet the requirements given in Table 30.

Table 30: Property indices of polyurethane adhesive

Item		Unit	Property Index
State in container	Component A	—	Uniform paste, no agglomeration, gelatin, crusting or un-dispersive solid lump.
	Component B		Uniform brown-yellow jelly
Drying time	Surface drying time	h	≤4
	Hard drying time		≤24
Tensile bond strength (with cement mortar specimen block)	Standard state	MPa	≥0.50
	After dipping in water		≥0.30
Tensile bond strength (with polyurethane)	Standard state	MPa	≥0.15 or damage of polyurethane specimen block
	After dipping in water		≥0.15 or damage of polyurethane specimen block

5.14 Other materials

The property indices of the constituent materials of external thermal insulation composite system based on mineral binder and expanded polystyrene granule insulating material with other insulating material, such as

substrate interface treating mortar, mineral binder and expanded polystyrene granule insulating material, anti-crack mortar (including dry-mixed type), alkali-resistant fiberglass mesh, thermal galvanized steel mesh (tetragonal welded mesh), plastic anchor bolt, elastic primer, waterproof flexible putty, finish paint, tile bonding mortar, tile pointing stuff, and tile, shall meet the requirements in clause 5.2, 5.5～5.15 of JG 158—2004. thermal galvanizing process shall be used for making thermal galvanized steel mesh (hexagonal woven mesh), and its property indices shall meet the relevant requirements given in QB/T 1925.2—1993.

5.15 Accessories

The accessories used in external thermal insulation composite system based on mineral binder and expanded polystyrene granule insulating material with other insulating material, including sealant, sealing strip, metal corner protector, cover strip etc. shall meet the requirements of the relevant product standards.

6 Test method

Standard lab ambient temperature is (23±2)℃, and relative humidity (50±10)%. In case tests are conducted under non-standard lab environment, the temperature and relative humidity shall be recorded.

6.1 External thermal insulation composite system based on mineral binder and expanded polystyrene granule insulating material with other insulating material

6.1.1 Preparation, curing and state adjustment of specimen

Based on the requirements given in Annex A1 of JGJ 144—2004.

6.1.2 Weathering

Based on the requirements given in A.2 or Annex A of JGJ 144—2004 and the requirements in clause 6.1.1 of JG 158—2004.

6.1.3 Water absorbency

The specimen shall consist of thermal insulation layer, leveling layer and anti-crack protection layer. The test shall be conducted based on the requirements given in A.6 of Annex A of JGJ 144—2004 and the requirements in clause 6.1.2 of JG 158—2004.

6.1.4 Impact resistance

The specimen shall consist of thermal insulation layer, leveling layer and anti-crack protection layer. The test shall be conducted based on the requirements given in A.5 of Annex A of JGJ 144—2004 and the requirements in clause 6.1.3 of JG 158—2004.

6.1.5 Wind resistance

Based on the requirements given in A.3 of Annex A of JGJ 144—2004 and the requirements in clause. 6.1.4 of JG 158—2004.

6.1.6 Non-freezing and thawing resistance

Based on the requirements given in A.4 of Annex A of JGJ 144—2004 and the requirements in clause 6.1.5 of JG 158—2004.

6.1.7 Wet flow density of water steam

Based on the requirements given in clause 6.1.6 of JG 158—2004.

6.1.8 Water impermeability

The specimen shall consist of thermal insulation layer, leveling layer and anti-crack protection layer. The test shall be conducted based on the requirements given in clause 6.1.7 of JG 158—2004.

6.1.9 Abrasion resistance

The specimen shall consist of thermal insulation layer, leveling layer and anti-crack protection layer. The test shall be conducted based on the requirements given clause 6.1.8 of JG 158—2004.

6.1.10 Tensile strength of system

Based on the requirements given in A.7 of Annex A of JGJ 144—2004 and the requirements in clause 6.1.9 of JG 158—2004.

6.1.11 Bond strength of tile

After the system has formed for 56d, the pullout test shall be conducted to measure bond strength of tile based on the requirements of JGJ 110—1997. The break joint shall be cut from the surface of tile to the surface of anti-crack protection layer (no exposure of thermal galvanized steel mesh is allowed), and the depth shall be uniform.

6.1.12 Reaction to fire

Prepare 6 specimens with the size of 100mm×100mm. Each specimen shall consist of 10mm-thick cement mortar base panel+50mm-thick thermal insulation material (including thermal insulation layer interface treating mortar)+20mm-thick mineral binder and expanded polystyrene granule material for adhesion and making level +4mm-thick anti-crack mortar (compressed into the alkali-resistant fiberglass mesh). The test shall be conducted based on the requirements given in clause 6.1.12 of JG 158—2004.

6.1.13 Thermal resistance

Based on the requirements given in A.9 of Annex A of JGJ 144—2004.

6.1.14 Shock resistance

The specimen shall consist of wall substrate, interface layer, thermal insulation layer, leveling layer, anti-crack protection layer, and finish coat. The test shall be conducted based on the requirements given in clause 6.1.11 of JG 158—2004.

6.2 Polyurethane moisture proof primer

6.2.1 Sampling

Sample based on the requirements of GB 3186. Sampling size is to be determined according to test requirement.

6.2.2 General test conditions

6.2.2.1 Test environment

The state adjustment, temperature and relative humidity of specimen panel shall meet the requirements of GB 9278.

6.2.2.2 Preparation of specimen panel

6.2.2.2.1 Use the thinner specified in the use instructions, and dilute the polyurethane moisture proof primer in proportion to proper construction viscidity to prepare specimen panels.

6.2.2.2.2 Asbestos horizontal base panel that meets the requirements of Type I panel in Table 2 of JC/T 412—1991 (compressed panel with the thickness of 4mm～6mm) shall be used as the base materials for specimen panels in this standard. Its surface treatment shall be based on the requirements given in 7.3 of GB/T 9271—1998, and the specification of specimen panel is 150mm×70mm×(4～6)mm.

6.2.2.2.3 The specimen panels in this standard shall be prepared via bushing panel making process. Brush the specimen panel one round in the drying time, and the coating weight is around 100μm. Brush two rounds for alkali-resistant specimen panels, the coating weight of the 1st round is 1.6g±0.1g and that of the 2nd round 1.0g±0.1g, and the time interval between the two rounds is no less than 24h. In adhesion test, the drying base

The specimen shall consist of thermal insulation layer, leveling layer and anti-crack protection layer. The test shall be conducted based on the requirements given clause 6.1.8 of JG 158—2004.

6.1.10 Tensile strength of system

Based on the requirements given in A.7 of Annex A of JGJ 144—2004 and the requirements in clause 6.1.9 of JG 158—2004.

6.1.11 Bond strength of tile

After the system has formed for 56d, the pullout test shall be conducted to measure bond strength of tile based on the requirements of JGJ 110—1997. The break joint shall be cut from the surface of tile to the surface of anti-crack protection layer (no exposure of thermal galvanized steel mesh is allowed), and the depth shall be uniform.

6.1.12 Reaction to fire

Prepare 6 specimens with the size of 100mm×100mm. Each specimen shall consist of 10mm-thick cement mortar base panel+50mm-thick thermal insulation material (including thermal insulation layer interface treating mortar)+20mm-thick mineral binder and expanded polystyrene granule material for adhesion and making level +4mm-thick anti-crack mortar (compressed into the alkali-resistant fiberglass mesh). The test shall be conducted based on the requirements given in clause 6.1.12 of JG 158—2004.

6.1.13 Thermal resistance

Based on the requirements given in A.9 of Annex A of JGJ 144—2004.

6.1.14 Shock resistance

The specimen shall consist of wall substrate, interface layer, thermal insulation layer, leveling layer, anti-crack protection layer, and finish coat. The test shall be conducted based on the requirements given in clause 6.1.11 of JG 158—2004.

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Sample based on the requirements of GB 3186. Sampling size is to be determined according to test requirement.

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specimen panel shall meet the requirements of 6.2.2.2.2, and the wet base specimen panel shall be the specimen panel meeting the requirements of 6.2.2.2.2. The water on the surface of the wet base specimen panel shall be wiped out with dry cloth after it has been dipped in clear water for 24h. While brushing, one round of brushing is proper. The coating weight is no greater than 15 μ m of thickness of dry coating. After brushing, horizontally place the specimen panel of polyurethane moisture proof primer on the standard sand at the bottom of water tank, fill water to the level that is around 2mm from the asbestos cement horizontal base panel, let it stay statically for 24h, and measure the peeling resistance of coating.

6.2.3 Appearance of raw primer

Based on the requirements for "appearacne determination" of GB/T 1721—1979.

6.2.4 Constructability

No difficulty in brushing or roller coating.

6.2.5 Drying time

Based on the requiremetns of GB/T 1728—1979 (1989), in which surface drying time shall be based on method B and hard drying time on method A.

6.2.6 Adhesion of coating

Based on the erqureiments of GB/T 9286—1998.

6.2.7 Alkali resistance

Based on the requirements of GB/T 9265—1998. If no blister, wrinkle, peeling etc. is found on two of the three specimen panels, the alkali resistance of the specimen panels is regarded as "conforming".

6.3 Mineral binder and expanded polystyrene granule material for adhesion and making level

6.3.1 Wet apparent density

Based on the requirements given in 6.5.1 of JG 158—2004.

6.3.2 Dry apparent density

Based on the requirements given in 6.5.2 of JG 158—2004.

6.3.3 Coefficient of thermal conductivity

For the specimen that has undergone dry apparent density test, the oefficient of thermal conductivity test shall be conducted based on the requiremnts of GB/T 10294.

6.3.4 Compressive strength

Based on the requirements given in 6.5.5 of JG 158—2004.Combustibili.

6.3.5 Combustibility

Based on the requirements of GB/T 8625.

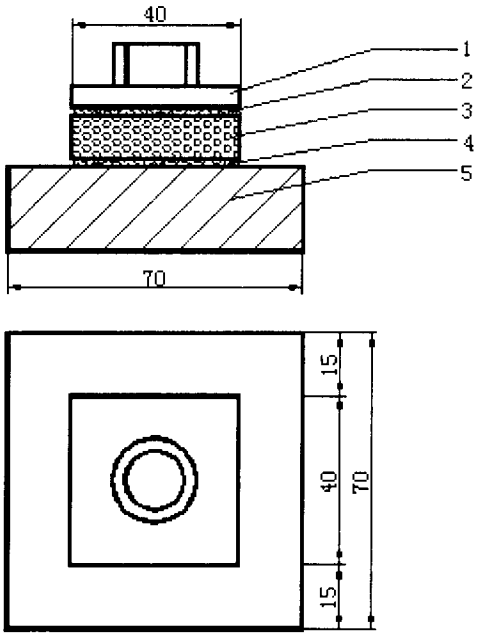
6.3.6 Tensile bond strength

6.3.6.1 With cement mortar specimen block containing substrate interface treating mortar

Make 5 specimens at the same time (refer to Figure 5 for the dimensions of specimen), cure them under normal state for 56d, and measure the tensile bond strength according to the method specified in 6.14.2.2 of JG/T 24－2000.

6.3.6.2 With polystyrene panel, polyurethane and rock-wool panel specimen blocks containing thermal insulation layer interface treating mortar

Make 5 specimens at the same time (refer to Figure 6 for the dimensions of specimen), cure them under normal state for 56d, and measure the tensile bond strength according to the method specified in 6.14.2.2 of JG/T 24－2000.



1——Steel clamp for tensile strength test;

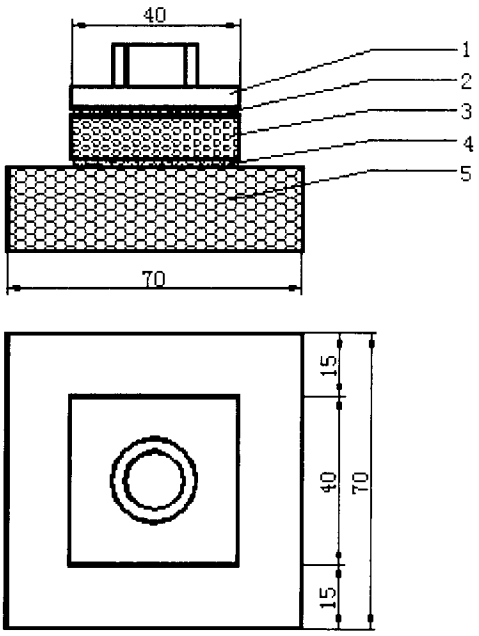
2——Adhesive for bonding steel clamp (thickness 1～3mm);

3——Mineral binder and expanded polystyrene granule material for adhesion and making level (40mm×40mm×10mm);

4——Substrate interface treating mortar coating (thickness 1～3mm);

5——Cement mortar block (70mm×70mm×20mm).

Figure 5: With cement mortar specimen block containing substrate interface treating mortar



1——Steel clamp for tensile strength test;

2——Adhesive for bonding steel clamp (thickness 1～3mm);

3——Mineral binder and expanded polystyrene granule material for adhesion and making level (40mm×40mm×10mm);

4——Thermal insulation layer interface treating mortar coating (thickness 1～3mm);

5——Polystyrene panel, polyurethane and rock-wool panel (70mm×70mm×20mm).

Figure 6: With polystyrene panel, polyurethane and rock-wool panel specimens containing thermal insulation layer interface treating mortar

6.4 Extruded polystyrene panel

6.4.1 Apparent density

Based on the requirements of GB/T 6343—1995; make 3 specimens with the dimensions of (100±1)mm ×(100±1)mm×(50±1)mm.

6.4.2 Tensile strength in the direction vertical to panel surface

Based on the requirements in 6.4.1 of JG 149—2003.

6.4.3 Other properties

Based on the requirements of GB/T 10801.2—2002.

6.5 Swallow-tailed groove polystyrene panel

6.5.1 Quality requirements

Visually observe and measure with a steel ruler with 0.5mm accuracy.

6.5.2 Specification and dimension and allowable deviations

6.5.2.1 Length and allowable length deviation

Length: measure with a steel tape with 1 mm accuracy at 2 points that are 100mm from both edges of polystyrene panel and parallel to the length direction, and at 1 point in the longitudinal central line; take the arithmetic mean of the 3 measurements, with an accuracy of 1 mm.

Length deviation: measure with a steel tape with 1 mm accuracy at any point in the length direction of polystyrene panel; the differences between the maximum measurement and the minimum measurement and the required dimensions are dimensional deviations, with an accuracy of 1 mm.

6.5.2.2 Width and width deviation

Width: measure with a steel tape with 1 mm accuracy at 2 points that are 100mm from both edges of polystyrene panel and parallel to the width direction, and at 1 point in the horizontal central line; take the arithmetic mean of the 3 measurements, with an accuracy of 1 mm.

Width deviation: measure with a steel tape with 1 mm accuracy at any point in the width direction of polystyrene panel; the differences between the maximum measurement and the minimum measurement and the required dimensions are dimensional deviations, with an accuracy of 1 mm.

6.5.2.3 Thickness and thickness deviation

Thickness: measure with an outer caliper and a steel ruler at 6 points, including 4 points at the intersections that are 100 mm from both ends and both edges of polystyrene panel (avoid any groove; if encountering a groove, measure at the neighboring panel surface), and 2 points at the intersections that are 100mm from both edges and the horizontal central line (avoid any groove; if encountering a groove, measure at the neighboring panel surface); take the arithmetic mean of the 6 measurements, with an accuracy of 1 mm.

Thickness deviation: the differences of the abovementioned 6 measurements and the required dimensions are dimensional deviations, with an accuracy of 1 mm.

6.5.2.4 Deviation of two diagonals

Measure the length of the two diagonals of polystyrene panel with a steel tape with 1mm accuracy; the difference of the 2 measurements is the deviation of two diagonals.

6.6 Steel mesh polystyrene panel

6.6.1 Quality requirements of steel mesh polystyrene panel

Visually observe and measure with a steel ruler with 0.5mm accuracy.

6.6.2 Steel mesh

6.6.2.1 Galvanized low-carbon steel wire

Based on the requirements of YB/T 126—1997.

6.6.2.2 Strength of solder joint

Based on the requirements given in 5.5 of QB/T 3897—1999.

6.6.2.3 Quality of solder joint

Grasp or pull the steel wire to deform it with the strength enabling the steel mesh to resume its original shape; during grasping or pulling, the peeled solder joints are open soldering and pseudo soldering; count the number of open soldering and pseudo soldering.

6.6.2.4 Density of obliquely inserted steel wire (transfixion wire)

Count the number of obliquely inserted steel wire in an entire polystyrene panel, and then divide it by the area of the entire panel, the result is the density of obliquely inserted steel wire, with an accuracy of 1 mm.

6.6.2.5 Acute angle between obliquely inserted steel wire and steel mesh

Measure with a protractor and a set square with 1° accuracy.

6.6.2.6 the end of steel wire, the end of transfixing polystyrene panel and butt connection of polystyrene panel

Visually observe and measure with a steel ruler with 0.5 mm accuracy.

6.6.2.7 Minimum distance between steel mesh and polystyrene panel

Measure with outer caliper and steel ruler with 1 mm accuracy.

6.6.3 Specification and dimension of steel mesh polystyrene panel

6.6.3.1 Length and length deviation

Length: measure with a steel ruler at 2 points that are 100 mm from the both sides of polystyrene panel and parallel to the length direction, and at 1 point at the longitudinal central line of the panel; take the arithmetic mean of the 3 measurements, with an accuracy of 1 mm.

Length deviation: measure with a steel tape with 1 mm accuracy at any point in the length direction of polystyrene panel; the differences between the maximum measurement and the minimum measurement and the required dimensions are dimensional deviations, with an accuracy of 1 mm.

6.6.3.2 Width and width deviation

Width: measure with a steel tape with 1 mm accuracy at 2 points that are 100 mm from both edges of polystyrene panel and parallel to the width direction, and at 1 point in the horizontal central line; take the arithmetic mean of the 3 measurements, with an accuracy of 1 mm.

Width deviation: measure with a steel tape with 1 mm accuracy at any point in the width direction of polystyrene panel; the differences between the maximum measurement and the minimum measurement and the required dimensions are dimensional deviations, with an accuracy of 1 mm.

6.6.3.3 Thickness and thickness deviation

Thickness: measure with an outer caliper and a steel ruler at 6 points, including 4 points at the intersections that are 100mm from both ends and both edges of polystyrene panel (avoid any groove; if encountering a groove, measure at the neighboring panel surface), and 2 points at the intersections that are 100mm from both edges and the horizontal central line (avoid any groove; if encountering a groove, measure at the neighboring

panel surface); take the arithmetic mean of the 6 measurements, with an accuracy of 1 mm.

Thickness deviation: the differences of the abovementioned 6 measurements and the required dimensions are dimensional deviations, with an accuracy of 1 mm.

Thickness deviation (including steel mesh): measure the central distance between the outer surface of steel mesh and the outer surface of polystyrene panel with an outer caliper and a steel ruler, the difference between the maximum measurement and the minimum measurement and the specified dimension is dimensional deviation, with an accuracy of 1 mm.

6.6.3.4 Deviation of two diagonals

Deviation between two diagonals of polystyrene panels: measure the length of the two diagonals of polystyrene panel with a steel tape with 1 mm accuracy; the difference of the 2 measurements is the deviation of two diagonals.

Deviation of two diagonals of steel mesh: measure the length of the two diagonals of steel mesh with a steel tape with 1mm accuracy; the difference of the 2 measurements is the deviation of two diagonals.

6.7 Double holes polystyrene panel

Visually observe and measure with a steel ruler with 0.5 mm accuracy.

6.8 Rigid polyurethane foam

6.8.1 Tensile strength

6.8.1.1 Test instrument

Based on the requirements of 5.6.1 of GB/T 9779—1988.

6.8.1.2 Test method

The size of specimen block shall be 40mm×40mm×40mm. Uniformly apply epoxy resin adhesive on the upper and lower surfaces of specimen block, bond the lower surface of specimen block at the central position of the 70mm×70mm×20mm mortar panel (prepare based on the requirement of 5.2.2 of GB/T 9779 – 1988), gently place a steel clamp on its upper surface, add a 1kg weight, carefully remove the spilled epoxy resin adhesive, let it stay for 24h, remove the weight, fix the lower clamp and steel gasket, and finally measure the maximum tensile strength by pulling the specimen on a tensile strength tester at 5mm/min along the vertical direction.

6.8.2 Other properties

Based on the requirements of QB/T 3806—1999.

6.9 Rock wool panel

6.9.1 Compressive strength

Based on the requirements of GB/T 13480.

6.9.2 Other properties

Based on the requirements of GB/T 11835—1998.

6.10 Thermal insulation layer interface treating mortar

6.10.1 Tensile bond strength with cement mortar specimen block

Based on the requirements of 5.4 of JC/T 907—2002.

6.10.2 Tensile bond strength with polystyrene panel, polyurethane or rock wool panel specimen block or specimen block of mineral binder and expanded polystyrene granule material for adhesion and making level.

Based on the requirement of 5.4 of JC/T 907 – 2002. During testing, replace the 40mm × 40mm × 10mm mortar specimen block by 40mm×40mm×40mm polystyrene panel, polyurethane or rock-wool panel

specimen block, or specimen block of mineral binder and expanded polystyrene granule material for adhesion and making level.

6.11 Plastic fastener

6.11.1 Appearance

Visually observe.

6.11.2 Specifications and dimension

Measure with a steel ruler with 0.5 accuracy, take the arithmetic mean of the 3 measurements with an accuracy of 0.5mm.

6.11.3 Tensile load

Cut the plastic fastener head and body 70mm-long pieces, clamp both ends of the small pieces with steel clamps, fix them onto a tensile-testing machine, start up the machine, and add loads at a constant speed of 5±1 mm/min until the small pieces are damaged. The maximum tensile strength is expressed in kN. A total of 5 specimens shall be tested and the arithmetic mean of the 5 measurements is the tensile load.

6.11.4 Bending resistance property

Hold and bend both ends of the head or body of plastic fastener into a radian of 30°～45° in both positive and negative directions.

6.12 Adhesive for polyurethane panel

6.12.1 State in container

Visual observation: component A is a uniform paste without any agglomeration, gelatin, crusting or un-dispersive solid lump; component B is a uniform brown-yellow jelly.

6.12.2 Surface drying time

Based on the requirement of 12.2.1.3 of GB/T 16777—1997. The mixing proportion for component A and B shall be based on the requirement of product instructions.

6.12.3 Hard drying time

Based on the requirement of 12.2.2.2 of GB/T 16777—1997. The standard curing temperature is 23±2℃, and relative humidity 45%～70%.

6.12.4 Tensile bond strength

6.12.4.1 Test instrument

Based on the requirements of 5.6.1 in GB/T 9779—1988.

6.12.4.2 Tensile bond strength under standard state

6.12.4.2.1 Mix component A and B of adhesive for polyurethane panel in proportion according to the requirement of product instructions, place the rigid PVC or metal frame on a 70mm×70mm×20mm cement mortar block or a polyurethane block, fill the frame (40mm×40mm) with adhesive for polyurethane panel, then level the surface with a scraper, remove the frame immediately, let it stay for 24h, cure it for 7d under test conditions, and thus the test specimen is made. 5 test specimens shall be made for this test.

6.12.4.2.2 Place the test specimen horizontally, apply bi-component epoxy resin adhesive or similar ambient-solidifying-temperature adhesive on the surface of test specimen, gently place a steel clamp on it, add about 1kg weight, carefully remove the spilled adhesive, let it stay for 24h, remove the weight, fix the lower clamp and steel gasket, and finally measure the max. tensile strength by pulling the specimen on a tensile strength tester at 5mm/min according to the method specified in 5.6.2 of GB/T 9779 – 1998. The result is the tensile bond strength.

6.12.4.3 Tensile bond strength after dipping in water

6.12.4.3.1 Prepare five specimens according to the requirement of 6.12.4.2.1, and seal the four side faces of the test specimen with epoxy resin adhesive within 3d before the end of staying time.

6.12.4.3.2 Place the test specimen on standard sand horizontally at the bottom of a water tank according to the requirement of GB/T 17671 – 1999, fill water to the level that is around 5mm from the cement mortar panel or polyurethane panel, let it stay statically for 10d, take out the specimen, place it up-side-down in a 50 ±2 ℃ constant temperature box for 24h, and place it under test conditions for 24h, and measure and calcualte the tensile bond strength after dipping in water according to the requiement of 6.12.4.2.2.

7 Inspection rules

Product inspection includes ex-factory inspection and type inspection.

7.1 Classification of inspection

7.1.1 Ex-factory inspection

The following targets are the necessary items for ex-factory inspection. Enterprises may add other ex-factory inspection items based on actual needs. Ex-factory inspection shall be conducted according to the requirement of Chapter 6. Only conforming products with inspection certificate can be delivered out of factory.

a） Polyurethane moisture proof primer: appearance, constructability and drying time of raw primer;

b） Mineral binder and expanded polystyrene granule material for adhesion and making level: wet apparent density;

c） Molded polystyrene panel: the ex-factory inspection items required in JG 149—2003;

d） Extruded polystyrene panel: tensile strength in vertical direction to panel surface and ex-factory inspection items required in GB/T 10801.2—2002;

e） Swallow-tailed groove polystyrene panel: quality requirement, specification and dimension and allowable variation;

f） Steel mesh polystyrene panel: quality of solder joint, steel wire end and end that transfixing polystyrene panel of steel mesh; quality requirement, specifications and dimension and allowable variation of steel mesh polystyrene panel;

g） Double hole polystyrene panel: quality requirement;

h） Rigid polyurethane foam: ex-factory inspection items required in QB/T 3806—1999;

i） Rock wool panel: ex-factory inspection items required in GB/T 11835—1998;

j） Thermal insulation layer interface treating mortar: tensile bond strength under standard state 7d of cement mortar specimen block;

k） Plastic fastener: appearance, specification and dimension, bending resistance;

l） Adhesive for polyurethane panel: state in container, drying time, tensile bond strength with cement mortar specimen block under standard state;

m） Substrate interface treating mortar, mineral binder and expanded polystyrene granule insulating material, anti-crack mortar (including dry-mixed type), alkali-resistant fiberglass mesh，thermal galvanized tetragonal welded mesh，plastic anchor bolts, elastic primer, flexible waterproof putty, finish paint, tile bonding mortar, tile pointing stuff and tile: ex-factory inspection items required in JG 158—2004.

n） Thermal galvanized steel mesh (hexagonal woven mesh): ex-factory inspection items required in QB/T 1925.2—1993.

7.1.2 Type inspection

All the technical requirements listed in Chapter 5 are type inspection items. Under normal conditions, type inspection items will be conducted once every two years. However, type inspection shall be conducted in case one of the following conditions appear:

a) finalization appraisal for new product;

b) major change in main raw material and consumption of product or in production process;

c) recovery of production after stop production for at least half a year;

d) type inspection is required by the state quality supervision authorities.

7.2 Batching rules and sampling method

a) polystyrene panel: the quantity of one batch of products with the same specification shall not exceed 2000m^3; randomly sample 5 panels from each batch as test specimens;

b) rock wool panel: based on the requirements for batching and sampling of GB/T 11835—1998;

c) plastic fastener: the quantity of one batch of products with the same specification shall not exceed 5000 pieces, randomly sample 5 pieces from each batch as test specimens;

d) alkali-resistant fiberglass mesh, thermal galvanized steel mesh (tetragonal welded mesh or hexagonal woven mesh): the quantity of one batch of products with the same specification shall not exceed 50000m^2, randomly sample 5 packing units from each batch, and randomly sample 1m^2 from each packing unit as test specimens;

e) powder materials: the quantity of one batch of products with the same type, grade and specification is 30 tons; the products with the quantity less than 30 tons shall be taken as one batch; randomly sample 10 bags from each batch, and sample no less than 500g from each bag, mix them evenly, and finally select the specimen with the quantity that is 1.5 times greater than the necessary quality for inspection according to quartering method as test specimens;

f) liquid agents: the quantity of one batch of products with the same type, grade and specification is 30 tons; the products with the quantity less than 10 tons shall be taken as one batch; sampling shall be made according to the methods required in GB 3186.

7.3 Judgment rules

If all inspection items meet the technical indices required in this standard, the product shall be considered as conforming; if two or more than two items of the indices do not meet the requirement, the product shall be considered as nonconforming; if one index does not meet the requirement, then double sampling from the same batch for re-inspection is required, if the index still does not meet the requirement, the product is considered as nonconforming. If the index meets the requirement in the re-inspection, the product shall be considered as conforming.

8 Marking and labeling

8.1 The following contents shall be marked in product packing or label: material name, standard number, trademark, name and address of manufacturer, product specification and model, grade, quantity, net content, production date, and warranty period.

8.2 Other information, such as prompt or warning information that help to ensure product quality, can also be marked on product packing or label.

9 Packing, transportation and storage

9.1 Packing

9.1.1 Polystyrene panel is usually packed in single piece nakedly, or packed in 2-10 pieces bundled together as one piece according to customers' requirements.

9.1.2 Rock wool panel shall be packed according to requirement of GB/T 11835—1998.

9.1.3 Plastic fastener may be packed with ordinary carton box, with 30 – 50 pieces in a bundle.

9.1.4 Thermal galvanized steel mesh (hexagonal woven mesh) shall be packed according to the requirement of QB/T 1925.2—1993.

9.1.5 Other products shall be packed according to the requirement of JG 158—2004.

9.2 Transportation

9.2.1 Ordinary transport method may be used for transport of polyurethane moisture proof primer, thermal insulation layer surface treating mortar and adhesive for polyurethane panel; during their loading and unloading, these materials shall be place in row-by-row pattern, and measures shall be taken to prevent freezing, rains, exposure to sunlight, squeezing and collision and to keep the packing in good conditions.

9.2.2 Mineral binder and expanded polystyrene granule material for adhesion and making level can be transported in ordinary means, but measures shall be taken to prevent exposure to sunlight, rains, high temperature, moisture and heavy pressure.

9.2.3 Polystyrene panel shall be handled in side upright way, attach closely in side upright way and fixed firmly with packing-strip, rope or transport fixtures; Smoking and lighting fire are strictly forbidden, measures shall be take to prevent long exposure to sunlight and rains, heavy pressure, or collision with sharp object so as to avoid damage and deformation.

9.2.4 Rigid polyurethane foam can be transported in ordinary means, with measures taken to prevent exposure to sunlight and rains, high temperature, collision, and upside down placement.

9.2.5 Rock-wool panel shall be transported according to the requirements of GB/T 11835—1998.

9.2.6 Plastic fastener may be transported in ordinary means. During transport, loading and unloading, it shall be place in row-by-row pattern, and measures shall be taken to prevent rains and moisture.

9.2.7 Transportation for thermal galvanized steel wire mesh (hexagonal woven mesh) shall meet the requirements of QB/T 1925.2—1993.

9.2.8 Transportation of other products shall meet the requirements of JG 158—2004.

9.3 Storage

9.3.1 All constituent materials of the systems shall be prevented from contacting with erosive medium and long exposure to sunlight in the open air, and kept away from fire source; the storage place shall be dry, ventilated and frost-proof.

9.3.2 All materials shall be stored by models and specifications, their storage period shall be not longer than their warranty periods.

9.4 Requirements for the documents delivered together with products

9.4.1 Quality certificate

9.4.1.1 Constituent materials of the systems shall have quality certificate, and the quality certificate shall include the following contents:

a) Product name, standard number, brand;

b) Name and address of producer;

c) Product specifications and classification;

d） Production date, warranty period;

e） Seal of inspection department, inspector code.

9.4.1.2 Quality certificate shall be provided when a product is delivered.

9.4.2 Use instructions

9.4.2.1 Use instructions shall be an integral part of a product to be delivered.

9.4.2.2 Use instructions should include the following contents:

a） product applications and application scope;

b） product features and selection method;

c） product structures and constituent materials;

d） use environment conditions;

e） Use method;

f） material storage method;

g） finished product protective measures;

h） acceptance standard;

i） safety and other attentions.

9.4.2.3 The publication date of use instructions shall be marked.

9.4.2.4 Manufacturers may prepare construction technical specifications according to their products features, if the construction technical specifications meet users' requirements for use instructions, they can replace use instructions.

9.4.3 Shock resistance test report shall be attached for tile finish systems.

9.4.4 Other relevant technical data.

External Thermal Insulation Composite Systems Based on Mineral Binder and Expanded Polystyrene Granule Insulating Material with Other Insulating Material

1 Scope

This standard specifies the terms, definitions, classification, technical requirements, test methods, inspection rules as well as product marking, labeling, packing, transport and storage of external thermal insulation composite systems based on mineral binder and expanded polystyrene granule insulating material with other insulating material.

This standard applies to external thermal insulation composite systems based on mineral binder and expanded polystyrene granule insulating material with other insulating material. All constituent materials of these systems shall be supplied by systematic product manufacturers.

2 Normative references

The following normative documents contain provisions that, through reference in this text, constitute provisions of this national standard. For dated reference, subsequent amendments to, or revisions of, any of these publications do not apply. For undated references, the latest edition of the normative document referred to applies.

GB/T 1721—1979 Test methods for appearance and transparency of varnishes, oil varnishes and thinners

GB/T 1728—1979（1989） Test methods for drying time of varnish film and paint filler film

GB 3186 Sampling paint products (neq ISO 1512:1974)

GB/T 6343—1995 Cellular plastics and rubbers—Determination of apparent (bulk) density（neq ISO 845:1988）

GB/T 8625 Test method for difficult-flammability for building materials

GB/T 9265—1998 Determination for alkali resistance of film of architectural paints and coatings

GB/T 9271—1988 Paints and varnishes—Standard panels for testing （eqv ISO 1514:1984）

GB 9278 Temperatures and humidities for conditioning and testing of paint specimens (eqv ISO 3270:1984)

GB/T 9286—1998 Paints and varnishes—Cross cut test for films（eqv ISO 2409:1992）

GB/T 9779—1988 Multi wall architectural coatings

GB/T 10294 Thermal insulation—Determination of steady-state thermal resistance and related properties—Guarded hot plate apparatus

GB/T 10801.2—2002 Rigid extruded polystyrene foam board for thermal insulation (XPS)

GB/T 11835—1998 Rock wool, slag wool and their products for thermal insulation

GB/T 13480 Test method for measuring compressive properties of mineral wool products

material for adhesion and making level, double hole polystyrene panel, anti-crack mortar laminated alkali-resistant fiberglass mesh, and paint (table 7 and 9); with tile finish, it is composed of mineral binder and expanded polystyrene granule material for adhesion and making level, double hole polystyrene panel, anti-crack mortar laminated thermal galvanized steel wire mesh (tetragonal welded mesh or hexagonal woven mesh), plastic anchor bolts tile etc. (table 8 and 10). If there is a leveling layer composed of mineral binder and expanded polystyrene granule material for adhesion and making level on the surface of polystyrene panel, such external thermal insulation composite system is called "affixing and bricklaying polystyrene panel LBL type" external thermal insulation composite system; if there isn't such a leveling layer composed of mineral binder and expanded polystyrene granule material for adhesion and making level on the surface of polystyrene panel, such external thermal insulation composite system is called "affixing and bricklaying polystyrene panel LB type". External thermal insulation composite system, in which "L" stands for mineral binder and expanded polystyrene granule material for adhesion and making level, and "B" for insulation panel.

Table 7: Basic texture of paint decoration in "affixing and bricklaying polystyrene panel LBL type" external thermal insulation composite system

Wall substrate ①	Basic Texture of System					Schematic Diagram of Texture
	Adhesion layer ②	Thermal insulation layer ③	Leveling layer ④	Anti-crack layer ⑤	Finish coat ⑥	
Concrete wall or masonry wall	Substrate interface treating mortar + mineral binder and expanded polystyrene granule material for adhesion and making level	Double hole polystyrene panel with trapezium groove on surface that has been treated with polystyrene panel interface treating mortar (the polystyrene panel can be molded polystyrene panel or extruded polystyrene panel; for extruded polystyrene panel, no groove is necessary).	Mineral binder and polystyrene foaming granule material for adhesion and leveling	Anti-crack mortar laminated alkali-resistant mesh + elastic base coat	Waterproof flexible putty + paint