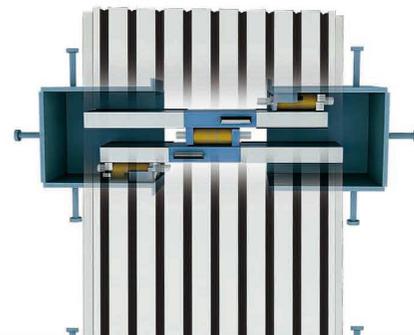
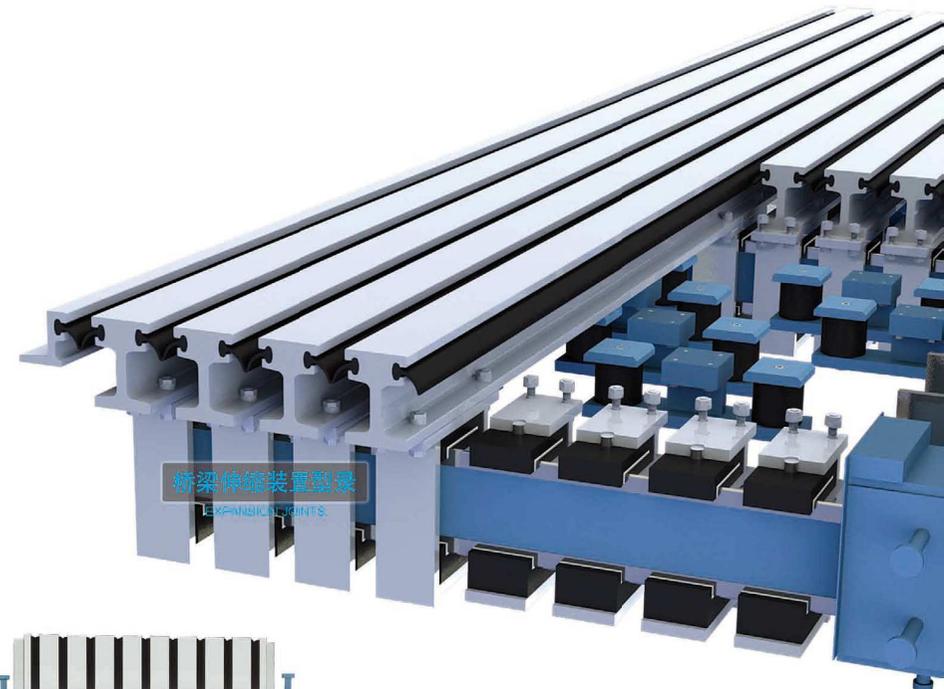
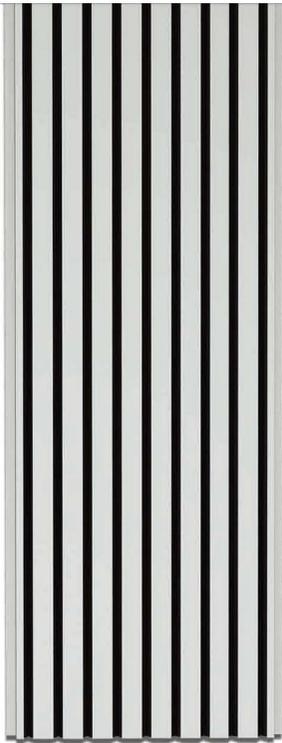


EXPANSION  
JOINTS



苏州海德工程材料科技有限公司

Suzhou Haider Engineering Materials Technology Co., Ltd

Address: NO.5 Jinmen Road Changshu Southeast Economy

Development Zone of Jiangsu China

Tel: 0512-52577866

Fax: 0512-52577966

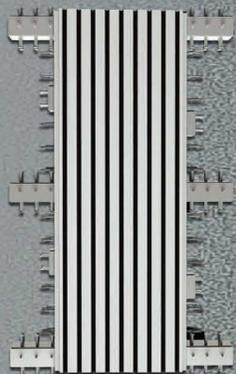
Mail: info@haider.com

Web: www.haider.com



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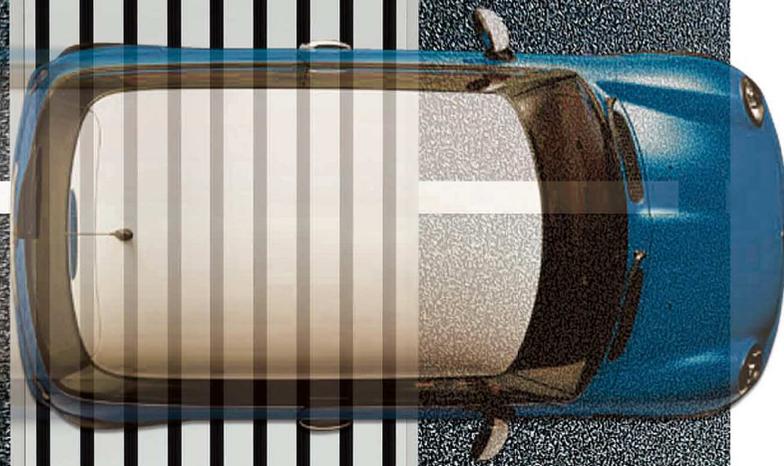


## GENERAL INTRODUCTION ON BRIDGE EXPANSION JOINT 桥梁伸缩装置简介

HAIDER has professional experience in bridge expansion joint for more than 10 years, with large scale and professional capacity for rolling section steel, rubber vulcanization, machining and installation. The annual capacity of producing and installing is about 200,000 meters. The large displacement and various damping and noise reducing expansion joint designed and developed all by HAIDER have gained many National Patents.

Various road and railway bridge expansion joints produced by HAIDER have been widely used in key highway and railway project and exported abroad. HAIDER has been awarded as First Tenth Enterprise of Bridge Expansion Joint in China by China Quality Certification Center and User's Satisfied Enterprise by China Quality Control Association.

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ZL SERIES SECTION STEEL EXPANSION JOINT

## ZL型钢伸缩装置

ZL系列型钢伸缩装置是在总结国内外各种大位移伸缩装置特点的基础上，针对重载高密度交通的状况成功研发出的一种新型大位移伸缩装置，被列为国家级重点技术创新项目。

ZL系列型钢伸缩装置是基于动力学抗疲劳原理而设计，采用了单支承横梁的弹性支承系统以及由串联的剪切弹簧共同作用的位移控制系统。具有承载能力强，抗疲劳性能优越，位移控制均匀等特点。

ZL系列型钢伸缩装置适应桥梁三维变位的能力强，具有行车舒适、使用寿命长、结构紧凑维护方便等诸多优点。适用各类公路桥梁，是悬索桥、斜拉桥和连续混凝土桥的首选结构。

ZL series section steel expansion joint is special designed large displacement expansion joint for heavy high-density traffic based on characteristics both home and abroad and is classified as national level initiative invention key project.

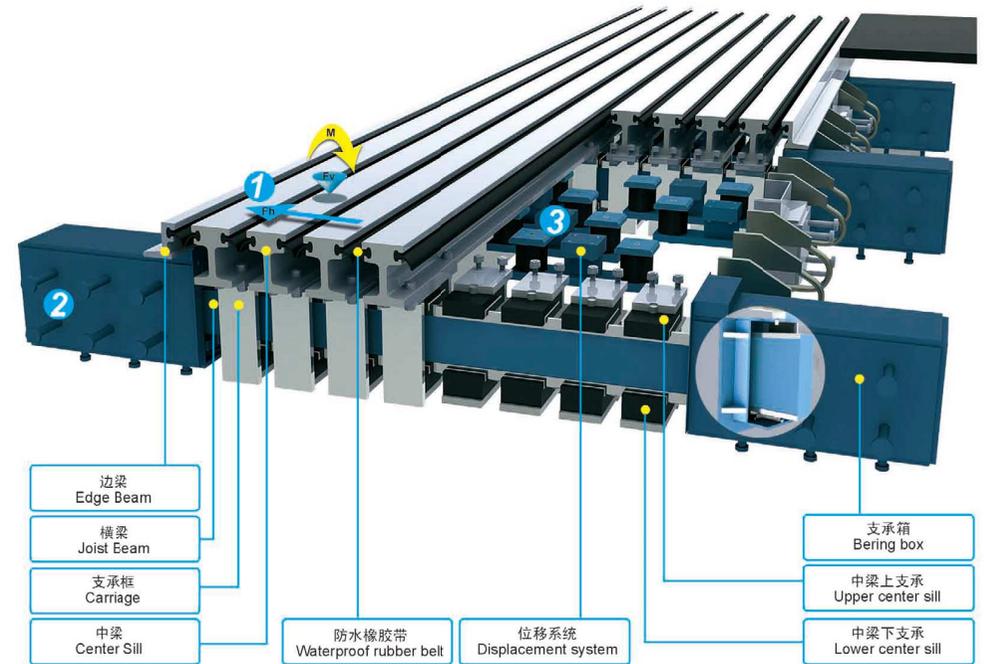
ZL series section steel expansion joint is designed on the basis of dynamic anti-fatigue principle. The displacement control system is a cooperation of elastic supporting system of single support beam and serial shear spring. It has characters of high bearing capacity, good anti-fatigue ability and even displacement control ability.

ZL series section steel expansion joint has the advantages of strong three-dimension displacement ability, compact conformation, easy to maintenance, long service life, etc. It suitable for all types of highway bridges, especially for suspension bridge, cable-stayed bridge and continuous concrete girder bridges.



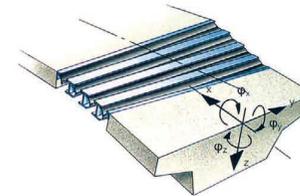
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ZL



- 边梁  
Edge Beam
- 横梁  
Joist Beam
- 支承框  
Carriage
- 中梁  
Center Sill
- 防水橡胶带  
Waterproof rubber belt
- 位移系统  
Displacement system
- 支承箱  
Bearing box
- 中梁上支承  
Upper center sill
- 中梁下支承  
Lower center sill

桥梁运动示意图  
THE BRIDGE MOVEMENT DIAGRAMMATIC SKETCH



## 1 支承系统 BEAR SYSTEM

车辆通过伸缩装置时，产生水平、竖向、扭转等冲击荷载。通过中梁、边梁、横梁以及弹性支承传递竖向力和扭矩，通过位移弹簧传递水平作用力，利用橡胶的阻尼特性缓冲荷载，将冲击荷载安全可靠的传递给梁体和墩台上。

Vehicle passing through the expansion joint will caused impact load of level, vertical and torsion. Vertical force and torsion force through the center beam, edge beam, joist and elastic bearing and level force through displacement spring, using the damping property of rubber to cushion the load, transfer the load to the girder and abutment.

当桥梁结构受到温度变化的影响时，桥梁会从 $U_x$ 、 $U_y$ 、 $U_z$ 、三个方向产生运动，ZL伸缩装置设置了球形的弹性支承满足桥梁上部结构的三维运动的需要。

When the bridge structure under the influence of temperature changes, bridge will moves to direction of  $U_x$ ,  $U_y$  and  $U_z$ . The sphere elastic bearing of ZL expansion joint meet the needs of three-dimensional movement.

海德在桥梁装置领域拥有十多年的专业经验，具备从型钢轧制、橡胶硫化、成品加工到产品安装的规模化、专业化生产力，各类伸缩装置的制造和安装能力达到20万米/年。自主研发的超大位移桥梁伸缩装置，以及各类减震或吸噪桥梁伸缩装置，获得多项国家专利。

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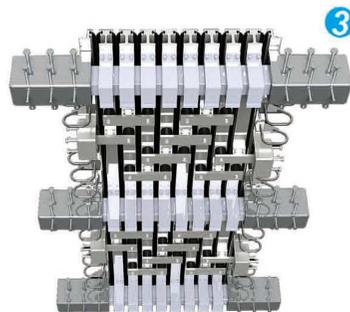
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## 2 位移控制系统 DISPLACEMENT CONTROL SYSTEM

位移控制系统是依靠串联、对称布置在中梁下的位移弹簧推动中梁均匀运动来实现缝宽的均匀控制，使各单元缝宽保持一致；该对称布置的结构具有双重保护功能。

The displacement springs distributed in series and symmetrically under center sill push the center sill moves in uniform motion to control the uniformity of the joint width. The symmetric structure provides double protection.



## 3 联接方式 CONNECTION

伸缩装置系统内部采用高强螺栓联接，能有效避免焊接产生的应力集中，确保伸缩装置在重载高密度交通的状况下的疲劳寿命以及维修更换的可行性。

Expansion joint inner system connected by high-strength screws which can effectively avoid the centralized stress generated by welding, to ensure the service life of expansion joint under heavy high-density traffic and its replaceability.

## 防水结构 WATERPROOF STRUCTURE

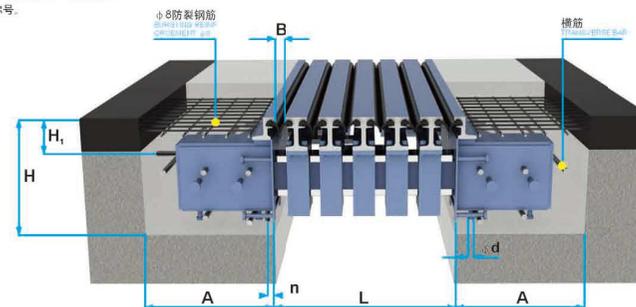


伸缩装置的中梁和边梁上设置了机加工成形的型腔，橡胶密封带通过专用卡具被预压嵌装在腔里，与型腔紧密贴合；能可靠地将桥面的雨水隔离桥面上，避免桥梁下部结构遭受雨水的侵蚀。

The special design of waterproof structure provides the full protection for the substructure of bridge from rainwater.

ZL series section steel expansion joint is special designed large displacement expansion joint for heavy high-density traffic.

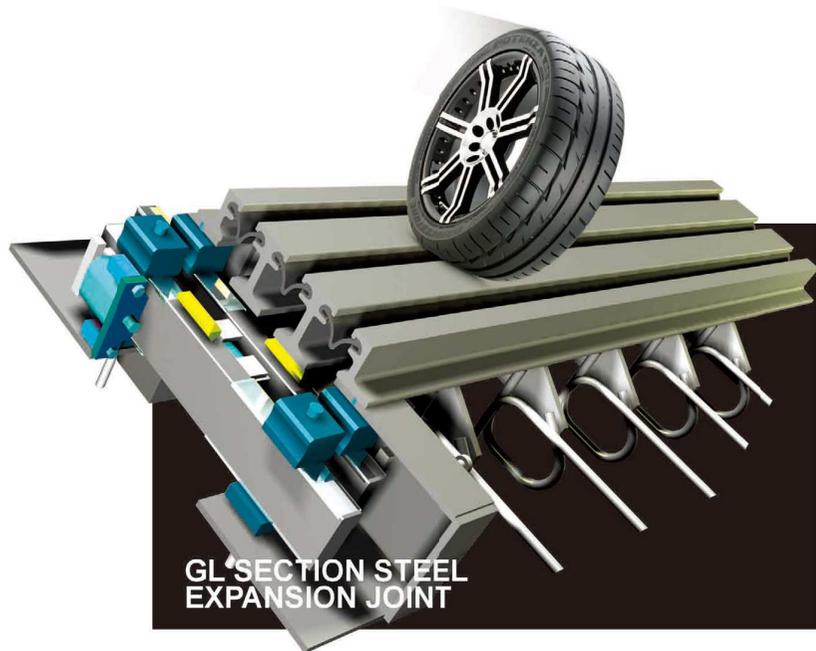
ZL



钢伸缩装置  
预留槽尺寸示意图  
The design of preformed groove in steel expansion device

## 伸缩装置主要设计参数 THE MAIN DESIGN PARAMETER OF EXPANSION JOINT

规格 Specification	缝数 Numbers of joints	位移量 Displacement	梁端间隙 Clearance	预留槽尺寸 Size of preformed groove		钢筋尺寸 Steel bar size		
	N	B	L	A	H	H <sub>1</sub>	n	d
ZL160	2	160	110-270	440	400	145	90	16
ZL240	3	240	190-430	440	400	145	90	16
ZL320	4	320	270-590	480	400	145	90	16
ZL400	5	400	350-750	520	400	145	90	16
ZL480	6	480	422-902	560	420	145	90	16
ZL560	7	560	510-1070	600	420	145	90	16
ZL640	8	640	590-1230	640	440	145	90	20
ZL720	9	720	670-1390	680	450	145	90	20
ZL800	10	800	750-1550	720	460	145	90	20
ZL880	11	880	830-1710	760	500	145	90	20
ZL960	12	960	910-1870	800	500	145	90	20
ZL1040	13	1040	900-2030	840	540	145	90	20
ZL1120	14	1120	1070-2190	880	560	145	90	20
ZL1200	15	1200	1150-2350	920	590	145	90	20
ZL1280	16	1280	1230-2510	960	590	145	90	25
ZL1360	17	1360	1310-2670	1000	620	145	90	25
ZL1440	18	1390	1390-2830	620	145	145	90	25
ZL1520	19	1520	1470-2990	1080	650	145	90	25
ZL1600	20	1600	1550-3150	1120	650	145	90	25
ZL1680	21	1680	1630-3310	1160	680	145	90	25
ZL1760	22	1760	1710-3470	1200	680	145	90	25
ZL1840	23	1840	1790-3630	1240	720	145	90	25
ZL1920	24	1920	1870-3799	1300	720	145	90	32
ZL2000	25	2000	1950-3950	1340	750	145	90	32



GL SECTION STEEL EXPANSION JOINT

## GL型钢伸缩装置

GL系列型钢伸缩装置是基于动力学抗疲劳原理而设计，由多个支承单元组成弹性支承系统，各位移弹簧将支承单元串联起来形成位移控制系统。具有承载能力强，抗疲劳性能优越，位移控制均匀等特点。

GL系列型钢伸缩装置适应桥梁三维变位的能力强，具有行车舒适、使用寿命长、结构紧凑、维护方便等诸多优点。

The design of GL series section steel expansion joint is in accordance with Dynamics of anti-fatigue theory. Elastic bearing systems consist of multiple units and connected in series by springs to form displacement control system and have advantages of strong capacity of bearing, anti superior fatigue, displacement control in uniform motion and so on.

GL series section steel expansion joint has the advantages of long service life, compact, easy to maintain, driving comfort, etc.



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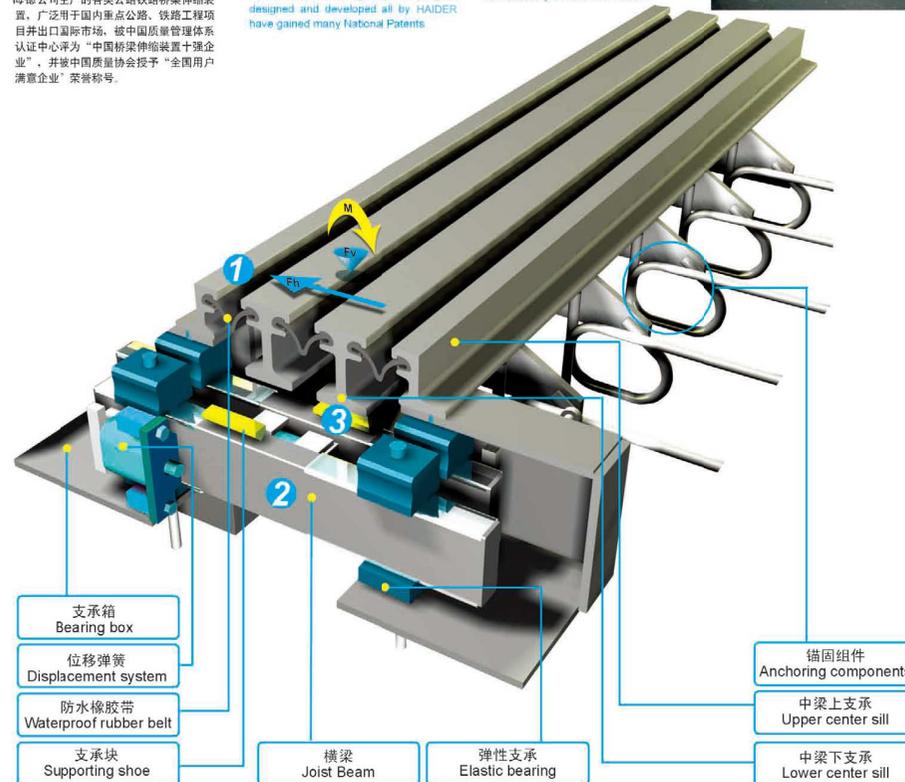
GL

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1 支承箱  
Bearing box

2 位移弹簧  
Displacement system

3 防水橡胶带  
Waterproof rubber belt

支承块  
Supporting shoe

横梁  
Joist Beam

弹性支承  
Elastic bearing

锚固组件  
Anchoring components

中梁上支承  
Upper center sill

中梁下支承  
Lower center sill

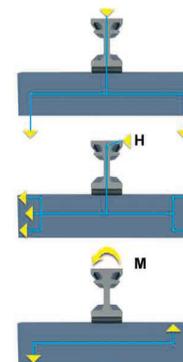
## 1 支承系统 BEAR SYSTEM

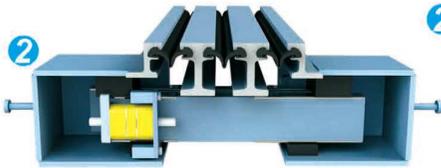
支承系统通过中梁、边梁、横梁以及弹性支承传递竖向力和扭矩，通过位移弹簧传递水平力，将各种载荷安全可靠的传递到梁体和墩台上。

在每组支承箱内，有多根横梁，每根横梁与相对应的中梁焊接，形成一个独立的支承、位移控制单元；各支承单元分别被弹性预压在支承箱内，通过支承箱内弹性支承的变形来实现立面转角，通过横梁的平移来实现水平移动，适应桥梁运动引起的梁端变位。

Vertical force and torsion force through the center beam, edge beam, joist and elastic bearing and level force through displacement spring, deliver loads to the girder and abutment.

In each of the bearing box, there are several joist beams each of which welded with edge beam to form an independent supportive displacement control unit, pre-pressed elastically in the bearing box. Elevating angle by the deformation of elastic support bearing in the bearing box and achieving the level translational movement by the translation of joist beam to adapt to the deflection of the beam caused by bridge movement.





## 2 位移控制系统 DISPLACEMENT CONTROL SYSTEM

各横梁之间布置有位移弹簧，将各位移控制单元串联连接起来，梁端伸缩变化时，串联布置的位移弹簧产生等量变形来实现位移控制单元的等距控制。

Between joist beams there are displacement springs by which the displacement units connected into series, to achieve the uniform control of displacement units by the uniformly deformation of the springs as the change of beams.

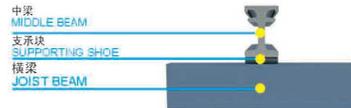
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## 3 联接方式 CONNECTION

每根中梁通过支承块与相对应的横梁刚性连接，形成一个相对独立的支承和位移控制单元，结构稳定，可靠。

With supporting shoe each center sill connect to joist beam to form an independent bearing and displacement control unit steady and reliable.



## 防水结构 WATERPROOF STRUCTURE



伸缩装置的中梁和边梁上设置了机加工成形的型腔，橡胶密封带通过专用卡具被预压嵌装在腔里，与型腔紧密贴合；能可靠地将桥面的雨水隔离在伸缩装置的上部，避免桥梁下部结构遭受雨水的侵蚀。

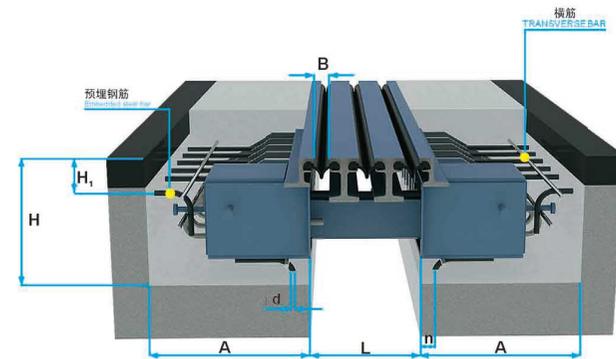
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钢伸缩装置预留槽尺寸示意图  
Preformed groove of steel expansion joint design

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GL320	4	320	270-590	530	400	135	90	16
GL400	5	400	350-750	610	450	135	90	16
GL480	6	480	430-910	690	470	135	90	16

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海德公司生产的各类公路铁路桥梁伸缩装置，广泛用于国内重点公路、铁路工程项目并出口国际市场。被中国质量管理体系认证中心评为“中国桥梁伸缩装置十强企业”，并被中国质量协会授予“全国用户满意企业”荣誉称号。

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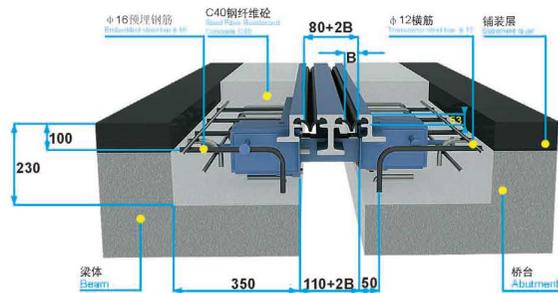
### QMSF160型钢伸缩装置

QMSF160是在GL160双缝的基础上改进的一种浅埋型钢伸缩装置，安装槽较浅，适合于各种安装槽较浅和旧桥换缝工程，该产品已获国家专利。

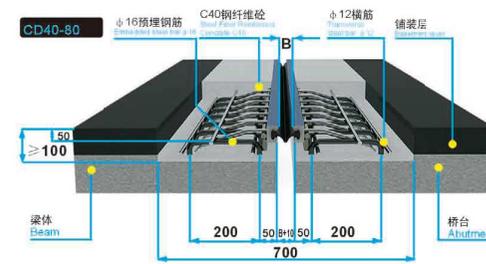
QMSF160 section steel expansion joint is a modified shallow burial expansion joint with shallow groove, was national patent product, based on GL160 and suitable for projects of shallow groove and joint replacement.

### QMSF160

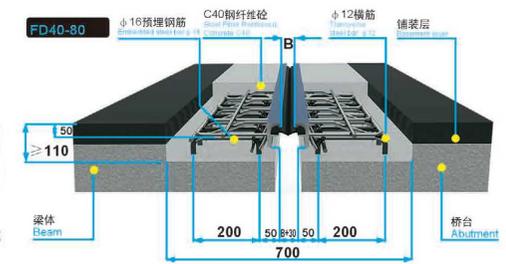
钢伸缩装置预留槽尺寸示意图  
Preformed groove of steel expansion joint design



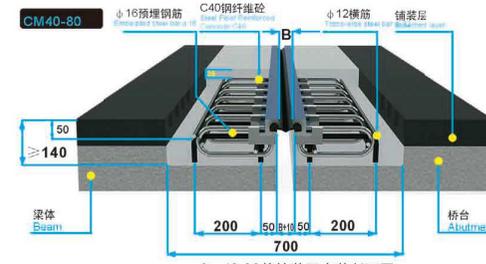
### 浅埋单缝型钢伸缩装置 SHALLOW BURIAL SINGLE SECTION EXPANSION JOINT



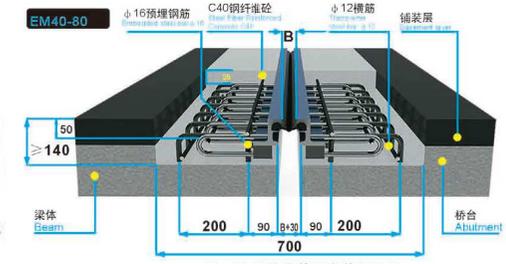
Cd40-80 expansion joint installation sectional drawing



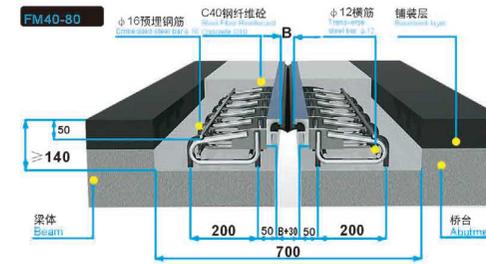
Fd40-80 expansion joint installation sectional drawing



Cm40-80 expansion joint installation sectional drawing



Em40-80 expansion joint installation sectional drawing



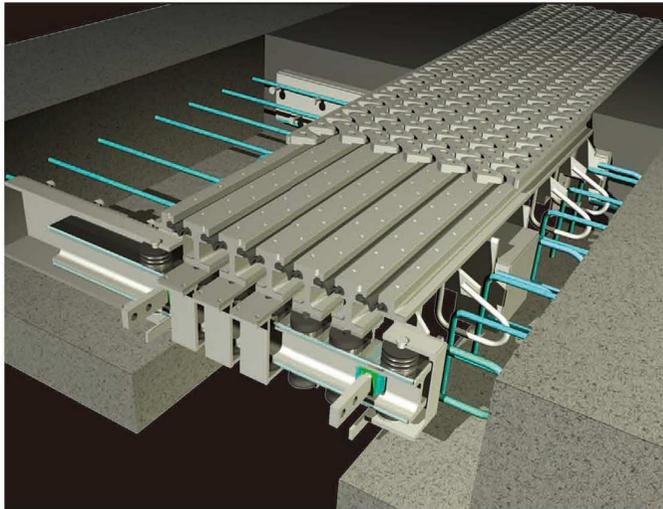
Fm40-80 expansion joint installation sectional drawing

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## JZSF系列减噪型伸缩装置

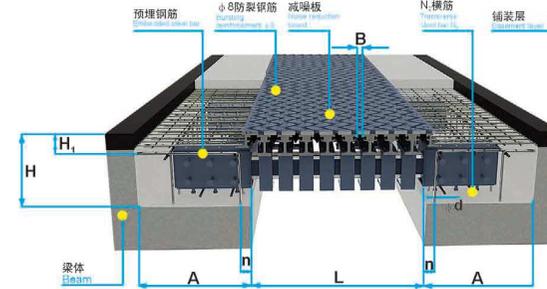
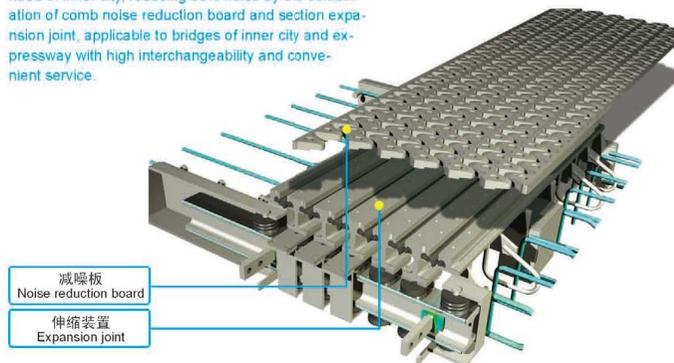
减噪型伸缩装置是我公司针对城市桥梁环保的要求研发出的一种新型伸缩装置，通过梳齿减噪板与型钢伸缩装置的组合，可以降低车辆通过型钢伸缩装置噪音的80%；适用于各类高速公路、城市桥梁，互换性强，维修方便快捷。

JZSF series noise reduction expansion joint is a new type expansion joint to meet the environmental friendly need of inner city, reducing 80% noise by the combination of comb noise reduction board and section expansion joint, applicable to bridges of inner city and expressway with high interchangeability and convenient service.



JZSF series noise reduction expansion joint is a new type expansion joint to meet the environmental friendly.....

**JZSF**



JZSF型钢伸缩装置安装断面图  
JZSF EXPANSION JOINT INSTALLATION SECTIONAL DRAWING

## JZSF系列伸缩装置主要设计参数 JZSF EXPANSION JOINT DESIGN PARAMETER

规格 Specification	缝数 Numbers of joints	位移量 Displacement	梁端间隙 Clearance	预埋槽尺寸 Size of preformed groove		钢筋尺寸 Steel bar size	
	N	B	L	A	H	n	d
JZSF160	2	160	110-270	440	420	90	16
JZSF240	3	240	190-430	440	420	90	16
JZSF320	4	320	270-590	480	420	90	16
JZSF400	5	400	350-750	520	420	90	16
JZSF480	6	480	422-902	560	440	90	16
JZSF560	7	560	510-1070	600	440	90	16
JZSF640	8	640	590-1230	640	460	90	20
JZSF720	9	720	670-1390	680	470	90	20
JZSF800	10	800	750-1550	720	480	90	20
JZSF880	11	880	830-1710	760	520	90	20
JZSF960	12	960	910-1870	800	520	90	20
JZSF1040	13	1040	900-2030	840	560	90	20
JZSF1120	14	1120	1070-2190	880	580	90	20
JZSF1200	15	1200	1150-2350	920	610	90	20
JZSF1280	16	1280	1230-2510	960	610	90	25
JZSF1360	17	1360	1310-2670	1000	640	90	25
JZSF1440	18	1440	1390-2830	1040	640	90	25
JZSF1520	19	1520	1470-2990	1080	670	90	25
JZSF1600	20	1600	1550-3150	1120	670	90	25
JZSF1680	21	1680	1630-3310	1160	700	90	25
JZSF1760	22	1760	1710-3470	1200	700	90	25
JZSF1840	23	1840	1790-3630	1240	740	90	25
JZSF1920	24	1920	1870-3799	1300	740	90	32
JZSF2000	25	2000	1950-3950	1340	770	90	32

JZSF减噪伸缩装置将型钢伸缩装置与梳齿板的功能结合在一起，利用梳齿板工作面的连续性，将车轮切入伸缩装置的方式由直线变为斜线切入，避免了车轮跨越型钢伸缩装置间隙时形成冲击的噪音源。

JZSF expansion joint combine the function of section expansion joint and comb noise reduction board, using the continuity of comb board service to change the way wheels crossing the expansion joint from straight line to oblique to avoid the impacting noise.

### 维修与保养

定期清理橡胶密封带内杂物。  
定期检查伸缩装置平整度。  
定期检查型钢间隙是否均匀。  
定期检查型钢与桥面铺装连接处是否损坏。

### MAINTENANCE AND REPAIR

Regular clean up the rubber strip  
Regular inspect the flatness of expansion device  
Regular inspect the uniformity of gaps between section steels  
Regular inspect the connection between section and beam

## 主要零部件 MAIN COMPONENTS

简图 Sketch	名称 Name	材质 Material	功能 Function	备注 Remark
	边梁 Edge Beam	Q345	承受车辆荷载, 并将车辆荷载传递给梁体 Bear and transfer load to beam	异型钢, 整体热轧, 机加工型腔, 尺寸精度高 Hot-rolled profiled deformed steels, high precision
	中梁 Center Sill	Q345	承受车辆荷载, 并将车辆荷载传递给梁体 Bear and transfer load to beam	异型钢, 整体热轧, 机加工型腔, 尺寸精度高 Hot-rolled profiled deformed steels, high precision
	横梁 Joist Beam	Q345	承受中梁传递的车辆荷载 Bear load transferred from center sill	采用“工”字形断面, 有足够的强度与刚度, 为伸缩装置的伸缩提供滑移面 “工” style section with high strength and stiffness, provide sliding surface
	弹性支承 Elastic bearing	氯丁橡胶 Neoprene	承受竖向荷载, 减震、降噪 Bear vertical load, cushion and noise reduction	具有较高的弹性和光滑的滑移面 High elasticity and smooth sliding surface
	位移弹簧 Displacement system	特种材料 Special material  聚氨酯 Polyurethane	控制伸缩装置均匀位移, 减震、降噪 Control displacements uniformly, cushion and noise reduction	具有很好的弹性和足够的强度, 能充分适应梁体的三维变形, 保证撞击均匀 High elasticity and strong stiffness  具有很高的纵、横向变形能力, 压缩变形量可达80%, 永久变形小 High vertical and lateral deformation ability to 80%, small permanent deformation
	防水橡胶带 Waterproof rubber belt		满足桥梁伸缩, 密封桥面, 防水、防尘 Expansion, waterproof, dustproof	微波硫化加工, 变形阻力小, 密封可靠, 抗腐蚀、抗老化能力强 Micro wave curing, little deformation resistance, reliable seal, anti-corrosion, anti-aging

## 伸缩装置主要设计参数 THE MAIN DESIGN PARAMETER OF EXPANSION JOINT

### 型钢厂学性能和化学成分 THE MAIN DESIGN PARAMETER OF EXPANSION JOINT

性能 Performance	降伏强度 (Mpa) Yield strength	抗拉强度 (Mpa) Tensile strength	伸长率(%) Elongation	冲击韧性 (温度℃) Impact toughness (°C)	
Q345	≥3.45	470-630	≥22	34	
化学成分 Chemical composition	碳 % carbon	锰 % manganese	硅 % silicon	磷 % phosphorus	硫 % sulphur
Q345C	≤0.20	1.00-1.60	0.20-0.5	≤0.045	≤0.04

### 密封带物理机械性能

#### PHYSICAL AND MECHANICAL PROPERTIES OF SEAL BELT

项目 Items	要求 Requirement	中国检验标准 China Standard	国际检验标准 International Standard
硬度 Harcness	55±5	GB/T6031	ISO48
拉伸强度 Tension strength	≥14	GB/T528	ISO37
扯断伸长率 Elongation at break	≥350	BG/T528	ISO37
脆性温度(℃) Brittleness temperature	≤-60	GB/T1682	ISO812
恒定压缩永久变形(室温×24h) Constant compression permanent deformation	≤20	BG/T7759	ISO815

### 橡胶支承物机械性能 PHYSICAL AND MECHANICAL PROPERTIES OF RUBBER BEARING

项目 Items		压紧支承 Hold-down bearing	承压支承 Pressure bearing
硬度 Hardness		70±2	62±2
拉伸强度 Tension strength	天然胶 nature rubber	≥18.5	≥18.5
	氯丁胶 neoprene	≥17.5	≥17.5
扯断伸长率 Elongation at break	天然胶 nature rubber	≥350	≥350
	氯丁胶 neoprene	≥300	≥300

MAIN COMPONENTS

## THE INSTALLATION OF BRIDGE EXPANSION JOINT 桥梁伸缩装置安装

海德股份有限公司是国内唯一一家拥有桥梁伸缩装置专业安装队伍的公司, 公司下属的安装公司具备十年以上的安装经验和施工能力。从事安装调试的施工人员共460人, 其中施工技术人员和现场质量管理人员32人, 管理人员28人, 共有施工设备40余套。年安装能力达到12万延米, 曾多次单月安装调试伸缩装置突破1万延米。

HAIDER is the only company has specialized expansion installation team with ten years' experience. There are 460 professional people including 32 technicians and 28 management technicians with 40 sets construction equipments, annual installation capacity to 120,000 linear meters and several times as much as 10,000 linear meters in single month.

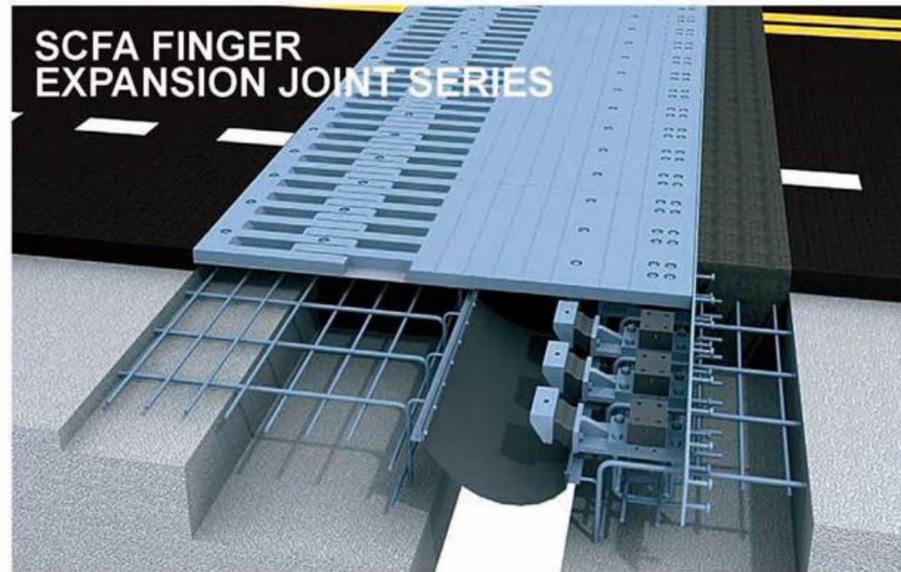


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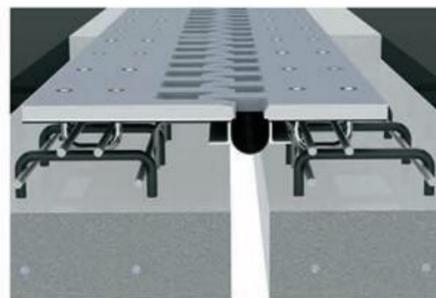
## SCF公路桥梁梳齿伸缩装置

SCF系列梳齿板伸缩装置是我公司近年来针对薄壁梁建筑高度低，为伸缩装置安装提供的预留槽深度较小的情况设计开发的新产品。该产品总结了国内外各种梳齿板伸缩装置的特点，适合于位移量小于480mm的各类钢结构桥和混凝土桥梁。

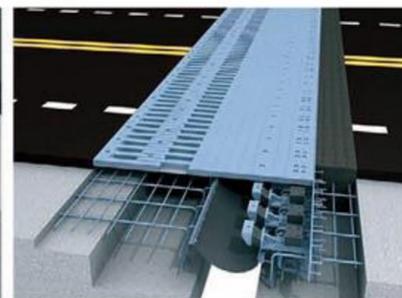
SCF series is newly designed highway bridge finger expansion joint for thin walled beam structures with low preformed groove and is suitable for bridges of displacement less than 480mm both in steel framework and concrete.

SCF series is newly designed highway bridge finger expansion joint for thin walled beam .....

## SCF A/B



SCFA系列梳齿板伸缩装置  
SCFA finger expansion joint series



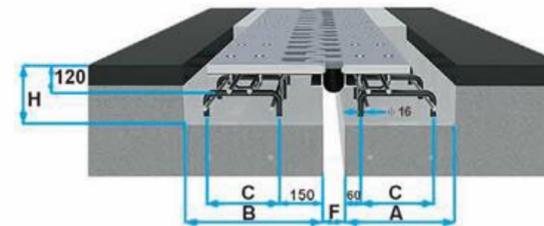
SCFB系列梳齿板伸缩装置  
SCFB finger expansion joint series

## 工作原理 OPERATING PRINCIPLE

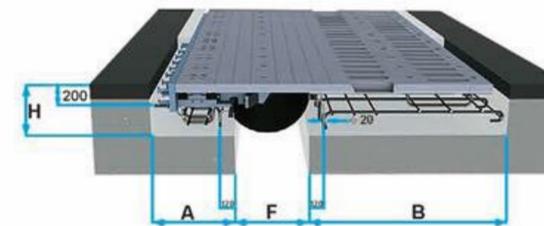
当桥梁因受温度变化而产生梁体的伸长或缩短时，锚固在梁体上的大小梳齿板通过两者之间齿根的间歇变化实现伸缩运动；与型钢伸缩装置相比，SCF梳齿板伸缩装置所特有的凹凸交错的结构，使得车辆通过时不会对其产生冲击，从而降低了噪音，增加了行车的舒适性。

When beams changes due to the changes of temperature, the comb plate anchored on beam changes. The special concave-convex design of SCFA finger expansion joint provides roadability and reduction of noise.

## 型号规格 SPECIFICATION



SCFA系列伸缩装置预留槽断面图  
SCFA series expansion joint preformed groove sectional drawing



SCFB系列伸缩装置预留槽断面图  
SCFB series expansion joint preformed groove sectional drawing

## 性能特点 PERFORMANCE

- 采用了全封闭的防水措施，彻底解决梁缝渗水的问题，避免桥梁结构受到雨水的侵蚀。
- 依据动力学原理进行设计，利用橡胶元件的弹性和阻尼特性，对车轮荷载进行缓冲，有效地保护梁体；车辆通过时，震动小，噪声小，增加了行车的舒适性。
- 固定和活动梳齿板随着梁体作相应的伸缩运动，伸缩灵活自如；齿顶和齿根特有的排渣设计能确保将齿缝间的石块和淤泥顺利排出。
- 以1M为单元的模块化设计非常有利于制造精度的保证，可在不切断交通的情况下进行伸缩装置的更换和维修。
- 建筑高度小，安装要求的埋深浅，无需对梁端进行特殊设计，非常适合于新桥安装和旧桥换缝工程。
- Fully closed waterproof measures, fully protect bridge from rain-water.
- The design of expansion joint in accordance with Dynamic principle, the elasticity and damp characteristics provide fully protection to the beam form vehicle load by lower noise and vibration.
- The expansion joint is flexible and special design of comb exhaust stone and silt.
- Modular design of 1M assured precision and easy to maintenance without interrupt traffic.
- Simple request for installation.

## 规格 Specification

规格 Specification	伸缩量 Volume expansion	尺寸				
		H	A	B	C	F
SCFA80	80	160	300	510	200	100
SCFA100	100	160	300	550	225	110
SCFA120	120	160	300	590	250	120
SCFB160	160	300	300	670		140
SCFB200	200	300	300	750		160
SCFB240	240	310	300	830		180
SCFB320	320	320	600	990		320
SCFB400	400	330	600	1160		360
SCFB480	480	350	600	1320		400

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## TSSF RAILWAY EXPANSION JOINT



### TSSF铁路桥梁伸缩装置

TSSF铁路型钢伸缩装置是根据铁路桥梁对伸缩装置的使用要求，按《客运专线桥梁伸缩装置暂行技术条件》要求开发的新型铁路伸缩装置；该产品具有结构简单、伸缩灵活、使用寿命长、防水可靠及安装方便快捷等优点，适用于各类铁路桥梁。

TSSF railway expansion joint is designed to meet requirements for railway in accordance with <Temporary Technical Conditions for Express Railway>, and has advantages of simple structure, convenient maintain, long service life, waterproof and easy to install.

#### 性能特点 PERFORMANCE

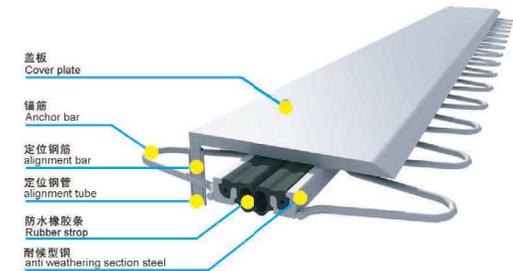
- 伸缩装置按铁路荷载设计，通过钢枕、支承梁、支承箱内的弹性支座将车轮荷载传递到梁体和墩台上。
- 侧向导轨作为脱轨的安全措施，同时限制了钢枕在横向的超范围摆动。
- 摩擦副采用高性能、低磨损的改性超高分子量聚乙烯和不锈钢板组成，提高其使用寿命。
- 通过柔性铰链实现活动轨枕间缝宽等距控制。
- 适用于位移量500—2000mm特大铁路桥梁工程。
- Expansion joint device is special designed for railway to transfer load through steel tie, bearing beam and elastic bearing to beam and abutment.
- Side guide worked as safety measures limited movement of steel tie in a designed range.
- The rubbing pair material of high wear-resistant ultrahigh molecular weight polyethylene (UHMWPE) and stainless steel plate improve its service life.
- Flexure hinge control the gap between steel ties uniformly.
- It is suitable for super-large railway bridge with displacement at 500-2000mm.

Expansion joint device is special designed for railway to transfer load through steel tie.

# TSSF

### 无碴轨伸缩装置结构组成 STRUCTURE OF BALLASTLESS TRACK

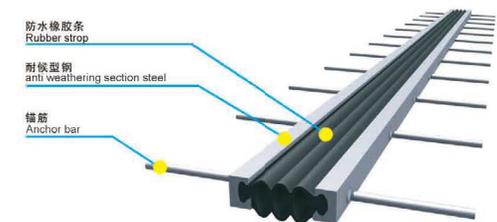
性能 Performance	降伏强度 (Mpa) Yield strength	抗拉强度 (Mpa) Tensile strength	伸长率(%) Elongation	预留槽尺寸 Size of preformed groove	
Q345	≥3.45	470-630	≥22	34	
化学成分 Chemical composition	碳 % carbon	锰 % manganese	硅 % silicon	磷 % phosphorus	硫 % sulphur
Q345C	≤0.20	1.00-1.60	0.20-0.5	≤0.045	≤0.04



- 位移量范围：30-160mm，适合于无碴轨道梁使用。
- 型钢采用Q355NH耐候钢整体热轧加工成形，同时对其外露表面进行重防腐处理，确保伸缩装置具备良好的防腐性能。
- 机加工成形的型腔与防水橡胶条配合精度高，防水性能良好。
- 由三元乙丙橡胶挤压成型的防水橡胶条采用大断面箱形结构，延长了整体老化时间。
- 伸缩装置安装深度浅，施工方便快捷，无需对标准梁做特殊设计。
- Displacement ranges: 30-160mm, suitable for ballastless track.
- The section steel is made of Q355NH with hot rolling process and galvanizing.
- The machine shaped die space fit closely with waterproof rubber providing good waterproof.
- Waterproof rubber extrusion forming from ethylene propylene diene rubber with large cross-section box structure provides ageing resistance.
- Low installation depth, easy to install without need to redesign beam.

### 有碴轨伸缩装置结构组成 STRUCTURE OF BALLASTED TRACK EXPANSION JOINT

性能 Performance	降伏强度 (Mpa) Yield strength	抗拉强度 (Mpa) Tensile strength	伸长率(%) Elongation	预留槽尺寸 Size of preformed groove	
Q345	≥3.45	470-630	≥22	34	
化学成分 Chemical composition	碳 % carbon	锰 % manganese	硅 % silicon	磷 % phosphorus	硫 % sulphur
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- 伸缩装置安装深度浅，施工方便快捷，无需对标准梁做特殊设计。
- Displacement range: 30-160mm, suitable for ballasted track.
- The section steel is made of Q355NH section steel with rolling process and galvanizing.
- The machine shaped die space fit closely with waterproof rubber providing good waterproof.
- Waterproof rubber extrusion forming from ethylene propylene diene rubber with large cross-section box structure provides ageing resistance.
- Low installation depth, easy to install without need to redesign beam.