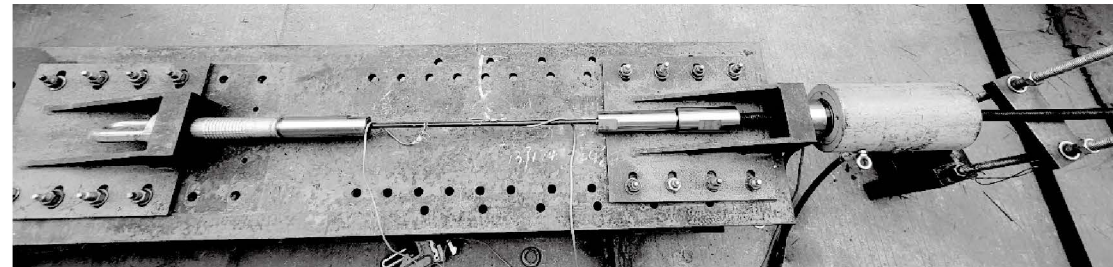


HM预应力碳纤维筋

悍马预应力碳纤维筋系统，由碳纤维筋及配套张拉锚固装置组成。
碳纤维筋通过刚性自锁式锚固系统与结构构件相连，形成共同受力体系。
采用千斤顶张拉或索力调节器对原构件施加预应力。

HM prestressed CFRP rod system consists of CFRP rod and tensioning devices.
CFRP rods work together with structural members through rigid self-locking anchoring system.
Tensioned using hydraulic jack or force adapter.



预应力碳纤维筋加固示意图



▲▲产品优势

- 碳纤维筋具有高强度，低密度，高弹性模量，耐疲劳及耐腐蚀等突出优点
- 碳纤维材料强度利用率高
- 碳筋锚具及其基座构造简单，体积小，布置灵活，不增加结构自重，对结构损伤小
- 施工简单、施工周期短，后期更换方便
- 预应力张拉吨位设计灵活，可布置多根碳筋
- 长期预应力损失不超过5%

▲▲Advantages

- High strength, low density, high modulus, excellent fatigue and corrosion resistance
- High strength utilization rate
- Low self-weight, flexible installation, non-destructive installation
- Easy and fast installation, renewable
- Multi-arranged for various designed load
- Long term prestress loss with in 5 percent.

Prestressed CFRP Rod

▲▲应用范围

- 适用于各类混凝土梁加固，可实现抗弯抗剪加固
- 旧桥承载力提升和病危桥梁病害修复
- 大跨度厂房钢结构屋面梁荷载提升
- 建筑、桥梁、铁路、市政、水利等领域大跨度工程结构

▲▲Application Range

- Strengthening RC beams subjected to bending and shear
- Capacity improvement and rehabilitation of old bridges
- Capacity improvement of steel structures
- Large-span structures



▲▲ 施工流程

- 限位框安装: 对碳纤维筋及锚具位置进行精确定位和放线, 按照设计要求在相应位置钻孔、打磨, 植入高强化学螺栓, 或采用高强机械锚栓, 锚栓等级不低于8.8级。应保证张拉端、固定端限位框中心线在一条直线且同一平面上。
- 碳纤维筋预紧: 将悍马碳纤维筋用锚具夹片夹紧, 穿入锚具套筒内, 通过旋紧预紧装置分别对碳纤维筋两端锚具预紧, 随后卸除预紧装置。
- 预应力碳纤维筋安装: 将预应力碳纤维筋布置至设计位置, 分别穿入固定端、张拉端限位框内, 在张拉端依次安装高强螺杆、垫片、螺母、挡块、千斤顶, 千斤顶受力方向与碳筋中心线重合。
- 预应力碳纤维筋预张拉: 现场做好防护措施, 确保施工安全。在开始正式张拉前须对预应力碳纤维筋预张拉, 使碳纤维筋整体拉直。
- 预应力碳纤维筋正式张拉: 随后进行逐级正式张拉, 按照0%-20%-40%-60%-80%-100%的碳筋设计拉力进行分级张拉, 每级张拉后需持荷3-5分钟, 同时记录相应的拉力及伸长量, 再进行下级张拉。全部张拉完成后持荷10分钟, 并锁紧螺母, 卸除千斤顶。
- 锚固防护: 使用防护罩对碳纤维筋、锚具及限位框进行防护处理。

▲▲ Installation Instructions

- Installation of fixture: locating and marking the position of CFRP rod and anchor system. Drilling holes and planting anchor bolts according to the drawings. Grade 8.8 bolts are required. Ensure the tensioning end and fix end have the same center line.
- Presetting of CFRP rod: Passing the CFRP rod through the barrel and tighten with wedge.
- Installation of CFRP: Placing the CFRP on the designed position; install the high strength steel threaded bar, washers, nuts, reaction block and hydraulic jack. Ensure the CFRP rod and the jack have a coincident center line.
- Pre-tensioning of CFRP: Ensure the CFRP is in a straight shape.
- Formal tensioning: tensioning the CFRP rod with a load level of 20%-40%-60%-80%-100% of the control stress. Keep the load for 3-5 minutes before further loading. Record the tensioning force and corresponding elongation. Tightening the nuts and remove the hydraulic jack after keeping the force for 10 minutes.
- Protection: Protecting the CFRP rod and the anchoring system with shields or specified systems.

▲▲ 技术参数

产品名称	型号	规格/直径 (mm)	抗拉强度标准值 (MPa)	弹性模量 (GPa)	极限应变 (%)
预应力碳纤维筋	HM-08PB	8	≥2400	≥170	≥1.6
	HM-10PB	10			
	HM-12PB	12	≥2200	≥160	≥1.6
	HM-16PB	16	≥1800	≥140	≥1.5
	HM-20PB	20	≥1500	≥130	≥1.0
产品名称	型号				
刚性自锁式锚具	HM-PBMJ08, HM-PBMJ10, HM-PBMJ12, HM-PBMJ16, HM-PBMJ20				



▲▲ Technical Parameters

Product	Mode	Diameter (mm)	Tensile Strength (MPa)	Modulus (GPa)	Elongation at Break (%)
Prestressed CFRP Rods	HM-08PB	8	≥2400	≥170	≥1.6
	HM-10PB	10			
	HM-12PB	12	≥2200	≥160	≥1.6
	HM-16PB	16	≥1800	≥140	≥1.5
	HM-20PB	20	≥1500	≥130	≥1.0
Product	Specification				
Self Lock Anchorage	HM-PBMJ08, HM-PBMJ10, HM-PBMJ12, HM-PBMJ16, HM-PBMJ20				

锚具锚固效率: 超过95%

疲劳性能: 能承受超200万次应力幅为200MPa (超过桥梁加固设计应力幅) 的循环荷载作用

耐久性: 碳纤维筋材能满足50年设计耐久性要求

Anchoring Efficiency: >95%

Fatigue Performance: >2 million under 200 MPa fatigue load

Durability: >50 years