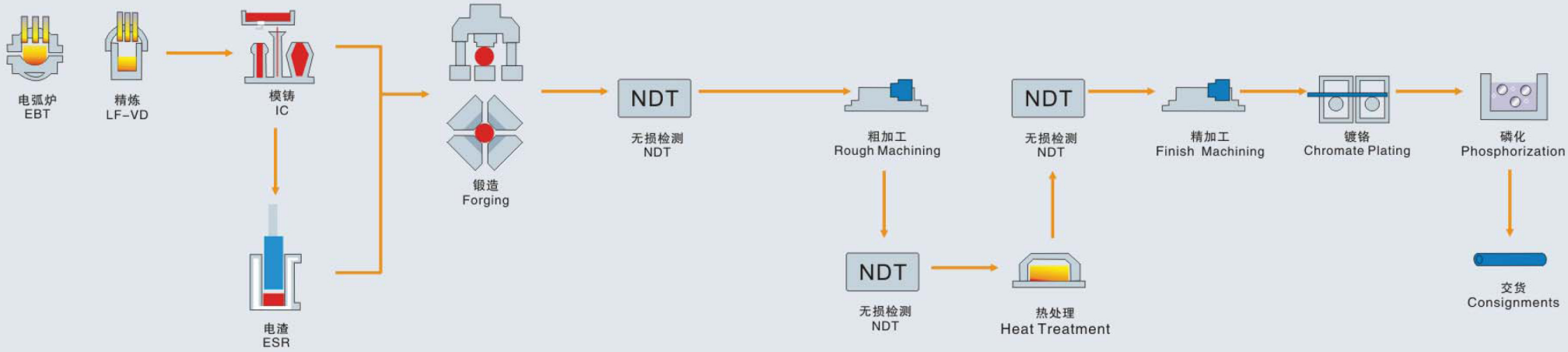
限动芯棒产品简介
Introduction of Mandrel Bar

工艺流程 Process Flow Chart



限动芯棒品种及规格 Mandrel Bar

芯棒是现代技术生产大口径无缝钢管所必需的最重要的工具之一，该产品在无缝钢管轧制过程中所处的环境恶劣，轧制过程中要承受大而复杂的拉伸、压缩接触应力和高速循环的高温冷热疲劳应力，所以该产品对钢的化学成份、力学性能、非金属夹杂物、晶粒度、显微组织、超声波探伤、尺寸精度、粗糙度等均提出了严格要求。

Mandrel bar plays a crucial role in producing large diameter seamless pipes in modern industries. During producing , it has to bear strong and complicate stretch, compressing touching stress and high temperature cold- hot yield stress under high speed cycling. Under these circumstance, chemical components, mechanical properties, no-metallic inclusion, grain size, microstructure, ultrasonic test, size precision, surface finish, all such factores of steel are required very strictly. In ZYSCO, mandrel bar is made from H13 (4Cr5MoSiV1), with annual output of 15 thousand tons, its quality and service life have reached to first class world level.

I | II | III

Ⅰ. XBH 100-460长芯棒连续镀铬生产线（镀铬层厚度：0.055-0.070 mm)

XBH 100-460 Electroplating Line for Mandrel Bar(Chrome Plating Thickness:0.055-0.070mm)

Ⅱ. 芯棒热处理车间 Workshop for Mandrel's Heat Treatment

Ⅲ. 1600t油压校直机 1600t Hydraulic Straightener

化学成分(m %)

Chemical Composition (m %)

牌号 Grade	C	Si	Mn	S	P	Cr
AISI H13 (4Cr5MoSiV1)	0.32~0.45	0.80~1.20	0.20~0.50	≤ 0.008	≤ 0.012	4.75~5.50
	Mo	Ni	V	H	O	
	1.10~1.75	≤ 0.25	0.80~1.20	≤ 2PPm	≤ 20PPm	

力学性能

Mechanical Property

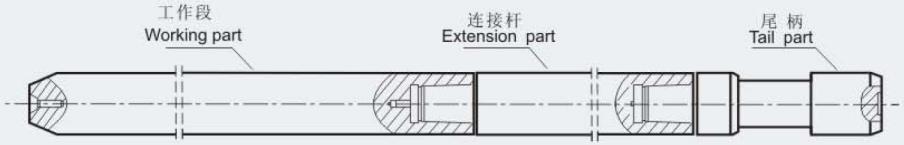
规格Size (mm)	抗拉强度Rm Tensile strength Mpa	屈服强度Rp0.2 Yield strength Mpa	延伸率A Elongation（%）
≤ 200	1127-1274	≥ 931	≥ 8
≥ 200	1078-1274	≥ 882	≥ 8

规格Size (mm)	断面收缩率Z Reduction of area（%）	冲击功Akv Impact value（J）	镀铬后硬度HRC Hardness
≤ 200	≥ 25	≥ 20	60-62
≥ 200	≥ 25	≥ 20	60-62

连轧机组MPM或PQF

材料（Material）：H13（4Cr5MoSiV1）
芯棒规格尺寸：ϕ90mm～ϕ500mm，长度≤18.5米；连接螺纹为偏梯型螺纹，执行标准API 5B，
螺纹主要规格有：2 3/8″、2 7/8″、3 1/2″、4 1/2″、5″、5 1/2″、6 5/8″、7 5/8″、8 5/8″、9 5/8″。

Sizes of bar：ϕ90mm～ϕ500mm, length ≤18.5m, and connection is buttress thread, complying to API 5B. Main thread specifications include 2 3/8″, 2 7/8″, 3 1/2″, 4 1/2″, 5″, 5 1/2″, 6 5/8″, 7 5/8″, 8 5/8″, 9 5/8″.



芯棒 Mandrel Bar

精密轧管机组

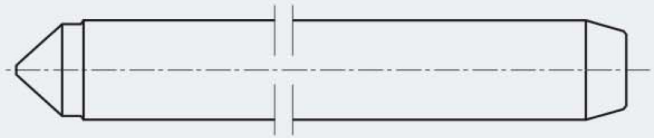
Accu Roll

材料：H13（4Cr5MoSiV1），还可以按用户要求生产H11（4Cr5MoSiV）、28CrNiMoV10、40CrNiMo等材料的芯棒产品。

芯棒规格尺寸：φ90mm～φ300mm，长度≤20米。

Material: H13（4Cr5MoSiV1）, H11（4Cr5MoSiV）, 28CrNiMoV10, 40CrNiMo are complying to customers' requirement.

Size of bar: φ90mm～φ300mm，length≤20m.



芯棒 Mandrel bar

周期轧管机组

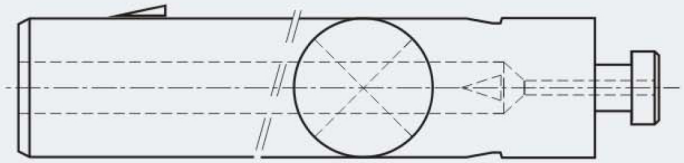
Pilger Mill

材料：34CrNiMo6、42CrMoA、40CrNiMo等，化学成分、力学性能、硬度等结合用户要求。

芯棒规格尺寸：φ200mm～φ800mm，长度≤9米。

Material: 34CrNiMo6、42CrMoA、40CrNiMo, chemical components and mechanical properties are complying to customers' requirement.

Size of bar: φ200mm～φ800mm, length≤9m.



芯棒 Mandrel bar

空心芯棒

Hollow Mandrel Bar

公司可以提供H13材料的大规格空心芯棒，也可以根据客户要求提供特殊材料的芯棒。通过降低工具重量达到降低设备负荷，实现节约轧制成本的目的。

Our company can produce hollow mandrel bars of big size with the material H13, or such hollow bar of other special materials as the requirements. The aim is to reduce the equipment loading and save rolling cost by reducing the tools weight.

芯棒变径修复

Rolling Tools Repair

公司采用自主研发的高性能复合材料配合特有的堆焊技术进行各种轧制工具的等/变径修复，该材料保证了修复后工具的耐用性和可靠性，可修复的轧制工具包括芯棒、顶杆、顶头、矫直辊、传送辊道用V型辊等。

Our company repair the mandrel bars' same diameter/ reducer with its unique overlaying welding technology and using high performance composite. Such material can guarantee the tools' durability and reliability after repairing.

普通芯棒修复工艺 Core rod repair process

粗车→堆焊→热处理→精车→抛光→镀铬→除氢→磷化

Rough turning→Surfacing→Heat treatmeat→Finish turning→ Polishing → Chrome plating → Dehydrogenating→ Phosphorization

修复前
Before repairing

修复中
During repairing

修复后 Aafter repairing