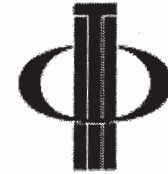


2.81 FB-2 PACKING NUT 9 CHROME

**APPROVED****By John at 11:20 am, Jul 06, 2017**

DAYE SPECIAL STEEL CO., LTD.
NO. 316 HUANGSHI AVENUE, HUANGSHI, HUBEI, CHINA PC:435000
QUALITY CERTIFICATE
ACC TO EN10204 3.1



INVOICE NO: GBUSA1780406FEAC

DESCRIPTION OF GOODS: HOT ROLLED QUENCHING AND TEMPERING STEEL BAR

EA PO:1092791 OP, SPEC:EAGL-600 REV.6

Grade	Batch No.	Heat No.	Size	Pieces	Bundles	Weight (MT)	Total Length(FT)	Manufacture Process	Delivery Condition
9Cr-1Mo	H617068550	7050285M	3"	31	4	6.38	589.924	EAF+LF+VD+IC	quenched and tempered

Chemical Composition (Wt %)																									DI	Hard factor	CEV /CEQ
	C	Mn	Si	P	S	Cr	Ni	Mo	Cu	W	Al	V	Nb	Ti	Ca	B	As	Sn	Pb	Sb	Zn	Zr	Co	Cd	[N]	[O]	[H]
Min	0.09	0.30	0.25	0	0	8.00	0	0.90	0																		
Max	0.15	0.50	0.60	0.020	0.010	10.00	0.50	1.10	0.25																		
Ladle	0.12	0.44	0.36	0.009	0.004	8.74	0.22	0.95	0.04																		
Product1																											
Product2																											

Macrostructure Examination(Level)			Non-metallic inclusion (Level)								K4 Method Oxides	Ds	Microstructure		Jominy Test (ASTM A255 HRC-1/16 inch)				Hydrostatic Pressure Test			Drift result	Dimensional inspection	Visual examination
S	R	C	A	H	T	H	T	H	T	H			Grain Size	Decarburizing Layer					time	pressure	conclusion			
													ASTM E112	pcs	mm								good	good
													9-8											

Mechanical Properties (ASTM E8)				Quadrant hardness				Hardness (ASTM E10)				Charpy Impact Test (ASTM E23)									
Yield Strength	Tensile Strength	YS/TS	Elongation	Reduction Area	Mid WALL	ID	OD	max. deviation	1/2 R from surface	1/2 R from surface	Surface	Longitudinal 10*10(mm)									
(KSI)	(KSI)		A(%)	Z(%)	(HRC)	(HRC)	(HRC)		HBW	HRC	(HBW)	14.00(F)	Shear	Lateral Expansion	(F)	Shear	Lateral Expansion	(F)	Shear	Lateral Expansion	
87,290	Rp0.2 105,850		24.5	71					235	21.0		(ft-lbs)	(%)	(mm)	(ft-lbs)	(%)	(mm)	(ft-lbs)	(%)	(mm)	
89,610	Rp0.5											116	100	1,675							
												119	100	1,725							
												122	100	1,725							

Mechanical Properties Inspection			Depth of specimens	Gauge Length	Tensile Diameter	Reduction Ratio	customer's specification	QTC Size	Radio-activity	Residual magnetic-field	NDT(Non -destructive Test)									
Standard	Location	Direction									Ultrasonic Test				Eddy Current Test			Magnetic Particle Test		
											standard	testing level	external imperfection	internal imperfection	conclusion	standard	testing level	conclusion	standard	testing level
ASTM A370	1/2 R from surface	Longitudinal	4D	0.5"	56.6				ASTMA388	API6A PSL 3		good								

Normalizing			Quenching			Temperature of Quench Media		Tempering			Furnace hearth survey & calibration		Stress Relieve		Quality System
Temperature(°C)	Time(min)	Cooling Method	Temperature(°C)	Time(min)	Cooling Method	Starting(°C)	Finishing(°C)	Temperature(°C)	Time(min)	Cooling Method	Time	Standard	Temp(°C)	Time(min)	Process
			920	100	water cooling	10	14	735	200	air cooling	2017-02-09	AMS-2750	705	200	anneal

Note: (1) No impermissible macro-structural defects, such as flakes, subsurface bubbles and pipes are available. This material is free from mercury and radioactivity. No welding repair.
(2) When there is any complaint, you are kindly requested to mark the Steel Grade, Heat No., Size, Delivery Date, Causes and reserve the material in the condition of delivery
(3) Our company's quality management system has been certified by TÜV SÜD for fulfilling all requirements of ISO9001:2008, ISO/TS 16949.
(4) Straightening: cold rotary straightening

Signature of quality assurance manager: ZhangZhiCheng
Date: 2017-05-27