

## ARORA IRON & STEEL ROLLING MILLS (P) LTD.

DHANDARI KHURD, NEAR PHASE-VII, FOCAL POINT, LUDHIANA- 141 010.

Website: www.arorairon.com

## METALLURGICAL TEST REPORT



Custo																			
LUSCO	mer Addre	ss:				Mater			Billet R						rtificate	No.	117446		
						s Route		120/08 VS#8000	-VD-CCN	M-AMLC	-EMS-R	M	Date			07-07-20			
M/S ARIHANT ENGINEERING WORKS						Specifi	cation		Standa	rd				Invoice	No.		3494/201	9-20	
58/A. INDUSTRIAL AREA NO. 1														Weight (MT.)			36.890		
A.B. ROAD, DEWAS -455001						Heat N	lo.		A11174					Input/I	Billet Siz	e	160X160 MM		
(M.P.)						Grade			20MnCr5				Reduction Ratio			9.06:1			
						Supply Size			60 MMØ				No's of Pcs			NA			
						Supply Condition			AS HOT ROLLED				No's of Bundle			NA			
						Colour Code			BLUE+YELLOW					Multiple			NA		
						Coloui	code	9	TEST					ividitip			INA		
					-	155.014						4 / 16	0044	1000	v.				
	F1 .	60/	T 8.6.0/	C'n/					IS (AS	_				1		6-0/	6-0/	CEN/	C 21' - 2.2
t	Element	C%	Mn%	Si%	5%	P%	Cr%	Ni%	Mo%	V%	Al%	Cu%	Ti%	Sn%	В%	Ca%	Co%	CE%	Cr+Ni+M
Spec.	Min	0.170	1.100	0.150		-	1.000	-	-	-	-	-	-	-	-	-	-	-	-
	Max	0.220	1.400	0.350		0.035	1.300	-	-	-	-	-	-	-	-	-	-	-	-
Α	Achieved	0.170	1.100	0.270	0.020	0.018	1.030	0.080	0.020	0.006	0.026	0.125	-	-	-	0.0006	-	-	
					Н	ARDE	NABIL	ITY TI	EST (IS	:3848	. AST	VI A2!	55. SA	AE J406	5)				
Γ	Distance	4/16"							1 (13	.5546	, , , , , , ,	J. P. Min	, 57	1 7 700	- 1				
Spec.	Min	33							1										
(HRC)	Max	37																	
	ieved (HRC)	36.0																	
7.011		00.0															1		
						Me	chanic	al Pro	pertie	es (IS :	1608	/ ASTI	M A3	70)					
		Ten	sile	Yi	eld	Elong	ation	Redu	uction		Impo	ct Stre	ngth		D.I.	Value	Su	rface Hard	dness
Parameters		Strength Str		Stre	ngth		A	Area IZOD		/Charpy V-notch/U-r			notch AST		1 A255	As Rolled			
	.,	(Kg/mm²)			(Kg/mm <sup>2</sup> )		(%)		(%)			Joules		(Inch)		(mm)	(BHN)		
	Min	(Kg/II	(Kg/mm)		, ,	(70)		-	(70)		(Joules)			-	-		(BITIV)		
Spec.			_							-									
Max					-				-		-				170/187				
	Achieved		-		-		-		-						-	_		1/0/10	/
								Meta	llogra	nhic P	rone	ties							
		Incli	usion Po	sting /19	. 1162	/ ASTA				pilicr		rain Siz	70		Depth o	of.	Λ.	licro Struc	ture
WROST FIEL				/ ASTM : E45A / JK Chart)						s 4748		Decarburization			Where structure				
Paran	neters		<del>                                     </del>				C D				ASTM E112		IS 6396/ASTM E1077						
	Туре		_	Thin						DS	(No.)				Uniform Banding Str		Structure		
	Serie	Thin	Thin Thick		THICK	Thin	INICK	Inin	INICK		(100.)			Com	nplete Partial		Unijorini	bunuing	Structure
Spec.	Min		-	-	-	-	-	-	-	-		_							-
spec.			-				-			-							-	_	
	Max	-	-					10.00	0.0		60 1 65								-
					0.0	0.0					60	+0	6.5			2000	Vos	15micron	Pearlite+Fer
F	Achieved	1.5	0.0	0.5	0.0	0.0	0.0	1.0	0.0	-	6.0	to	6.5		-	-	Yes	15micron max	Pearlite+Fer te
- 1												-			-	-	Yes		
4		1.5	0.0	0.5	Ph	ysical	Prope	erties	, Non	Destru	uctive	Test	& Otl	_		-	Yes	max	
ļ			0.0	0.5	Ph	ysical ep Dov	Prope	erties	, Non	Destru ection	uctive	Test netic Po	& Otl	UI	trasonic		Yes	max Upsettin	te
		1.5	0.0	0.5	Ph	ysical	Prope	erties	, Non	Destru ection	uctive	Test	& Otl	UI	trasonic	Test	Yes	max	te
	Achieved	1.5	0.0	0.5	Ph	ysical ep Dov	Prope	erties	, Non	Destru ection	uctive Magi	Test netic Po	& Otl	UI	trasonic		Yes	max Upsettin	te e
Paran	Achieved	1.5  Internal S  ASTM	0.0	0.5	Ph	ysical ep Dov Test	Prope	erties	, Non	Destru ection	uctive Magi	Test netic Po	& Otl	UI	trasonic		Yes	Upsettin Test	te e
<b>Paran</b> Sp	Achieved	1.5  Internal S  ASTM	0.0 Goundne 1 E381	0.5	Ph	ysical ep Dov Test IS 4075	Prope	Surfa	, Non	Destru ection 2	uctive Magi	Test netic Po nspect	& Otl	UI	trasonio 1 A388 /	' IS 2417	Yes	Upsettin Test IS 1116	te g
<b>Paran</b> Sp	Achieved  meters	1.5  Internal S  ASTM	0.0 Goundne 1 E381	0.5	Ph	ysical ep Dov Test IS 4075	Prope	Surfa	, Non	Destru ection 2	uctive Magi	Test netic Po nspect	& Otl	UI	trasonic 1 A388 / -	' IS 2417	Yes	Upsettin Test IS 1116	te g
<b>Paran</b> Sp	Achieved  meters	1.5  Internal S  ASTM	0.0 Goundne 1 E381	0.5	Ph St	ysical ep Dov Test IS 4075	Prope	Surfa	, Non	Destru ection 2	uctive Magi	Test netic Po nspect	& Otl	UI ASTN	1 A388 / - 100%	' IS 2417		Upsettin Test IS 1116	te e
<b>Paran</b> Sp Achi	Achieved  meters	Internal S ASTM	0.0 Goundne. 1 E381	0.5	Ph St	ysical rep Dov Test IS 4075	Prope	Surfa	, Non	Destru ection 2	uctive Magi	Test netic Po nspect	& Otl	UI ASTN	1 A388 / 1 100%	Is 2417	eport	Upsettin Test IS 1116	te g
Paran Sp Achi	neters pec. ieved	Internal S ASTM  Better tha	0.0  Soundne. 1E381  In C2,R1, Insional	0.5	Ph St	ysical rep Dov Test IS 4075	Prope	Surfa	, Non	Destru ection 2	uctive Magn	Test netic Po nspect IS 1013	& Otl article in 8	UI ASTN	1 A388 / 1 A388 / 100% Tas And	alysis Renethod-Le	eport	Upsettin Test IS 1116	te gg
Sp Achi Paran	meters  pec. pec. pected  meters	Internal S ASTM  Better tha	0.0 Goundne. 1 E381	0.5	Ph St	ysical rep Dov Test IS 4075	Prope	Surfa	, Non	Destru ection 2	uctive Magn	Test netic Po nspect	& Otl article in 8	UI ASTN	1 A388 / 1 100%	alysis Renethod-Le	eport	Upsettin Test IS 1116	te gg
Sp Achi Paran	meters Dec. Dec. Dec. Dec.	Internal S ASTM  Better tha  Dimen Toler IS 3	0.0  Soundne. 1E381  In C2,R1, nsional rance	0.5	Ph St	ysical rep Dov Test IS 4075 attisfactor	Prope	Surfa	, Non lacc Inspector IS 1335.	Destruection 2	uctive Magn	Test netic Poinspect is 1013 OK	& Otl article in 8	UI ASTN	trasonic 11 A388 / 100% Tas And Test n N <sub>2</sub> (pp	alysis Ronethod-Lo	eport	Upsettin Test IS 11165	te gg
Sp Achi Aran Sp Achi	neters  pec. pec. pec. pec. pec. pec. pec. pec	Internal S ASTM  Better tha	0.0  Soundne. 1E381  In C2,R1, nsional rance	0.5	Ph St	ysical rep Dov Test IS 4075	Prope	Surfa	, Non	Destruection 2	uctive Magn	Test netic Po nspect IS 1013	& Otl article in 8	UI ASTN	1 A388 / 1 A388 / 100% Tas And Test n	alysis Ronethod-Lo	eport	Upsettin Test IS 1116	te
Sp Achi Paran Sp Achi	neters  pec. pec. pec. pec. pec. pec. pec. pec	Internal S ASTM  Better tha  Dimen Toler IS 3	0.0  Goundne. 1E381  - Inn C2,R1, Insional rance 1739 - 739 Grac	0.5	Ph St	ysical rep Dov Test IS 4075 attisfactor	Prope	Surfa	, Non lacc Inspector IS 1335.	Destruection 2	uctive Magn	Test netic Poinspect is 1013 OK	& Otl article in 8	UI ASTN	trasonic 11 A388 / 100% Tas And Test n N <sub>2</sub> (pp	alysis Ronethod-Lo	eport	Upsettin Test IS 11165	te
Paran Sp Achi Paran Sp Achi Reman	neters  pec. pec. pec. pec. pec. pec. pec. pec	Internal S ASTM  Better tha  Dimen Toler IS 3	0.0  Goundne. 1E381  - Inn C2,R1, Insional rance 1739 - 739 Grac	0.5	Ph St	ysical rep Dov Test IS 4075 attisfactor	Prope	Surfa	, Non lacc Inspector IS 1335.	Destruection 2	uctive Magn	Test netic Poinspect is 1013 OK	& Otl article in 8	UI ASTN	trasonic 11 A388 / 100% Tas And Test n N <sub>2</sub> (pp	alysis Renethod-Lem)	eport	Upsettin Test IS 11165	te gg
Paran Achi Paran Sp Achi Reman	neters  pec. pec. pec. pec. pec. pec. pec. pec	Internal S ASTM  Better tha  Dimen Toler IS 3	0.0  Soundne. 1E381  In C2,R1, Insional Irance 1739  Grace 1739 Grace	0.5	Ph St	ysical rep Dov Test IS 4075 attisfactor	Prope	Surfa	, Non lacc Inspector IS 1335.	Destruection 2	uctive Magn	Test netic Poinspect is 1013 OK	& Otl article in 8	UI ASTN	trasonic 11 A388 / 100% Tas And Test n N <sub>2</sub> (pp	alysis Renethod-Lem)	eport	Upsettin Test IS 11165	te gg
Paran Sp Achi Paran Sp Achi Reman	neters  pec. pec. pec. pec. pec. pec. pec. pec	Internal S ASTM  Better tha  Dimen Toler IS 3  As per IS 37	o.o  Soundne. 1E381  In C2,R1, Insional Irance 1739 Grace Active Co	0.5	Ph St	ysical rep Dov Test IS 4075 attisfactor	Prope	Surfa	, Non lacc Inspector IS 1335.	Destruection 2	uctive Magn	Test netic Poinspect is 1013 OK	& Otl article in 8	UI ASTN	trasonic 11 A388 / 100% Tas And Test n N <sub>2</sub> (pp	alysis Renethod-Lem)	eport	Upsettin Test IS 11165	te gg
Sp Achi Sp Achi Sp	neters  pec. pec. pec. pec. pec. pec. pec. pec	Internal S ASTM  Better tha  Dimen Toler IS 3  As per IS 37  om Radioa	o.o  Soundne. 1E381  In C2,R1, Insional Irance 1739 Grace Active Co	0.5	Ph St	ysical rep Dov Test IS 4075 attisfactor	Prope	Surfa	, Non lacc Inspector IS 1335.	Destruection 2	uctive Magn	Test netic Poinspect is 1013 OK	& Otl article in 8	UI ASTN	trasonic 11 A388 / 100% Tas And Test n N <sub>2</sub> (pp	alysis Renethod-Lem)	eport	Upsettin Test IS 11165	g 9