

		MANUFACTURER'S NAME & ADDRESS: BHEL PIPING CENTRE CHENNAI / NPCIL APPROVED SUB CONTRACTORS		MANUFACTURING QUALITY PLAN				PROJECT : KUDANKULAM NUCLEAR POWER PROJECT - UNIT 3 & 4 (2x1000Mwe) CUSTOMER : NPCIL MAIN-SUPPLIER: BHEL-PIPING CENTRE BHEL CUSTOMER Nos: 7430, 7431						
				ITEM : PIPING FABRICATION (Carbon Steel) SYSTEM : PEB (SCHEDULE NO : G.1)		QP No:7430:QPC:05 Rev No: 00 Date : 19.10.2020								
S. No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY				REMARKS	
1	2	3	4	5	6	7	8	9	D*	P	R	W	H	10
1.0	RAW MATERIAL: All Raw materials shall be from approved vendors of NPCIL													
1.1	Seamless Steel Pipes: SA106 Gr.B / Spec as per drawing	Material Conformance	Critical	TC review	100%	Specification as per BHEL drawing	TC & Records	✓	3	2,1	—	1		
1.2	Plates* for Plate Formed Pipes: SA516 Gr.70/ Spec as per drawing	Material Conformance	Critical	TC review	100%	Specification as per BHEL drawing	TC & Records	✓	3	2,1	—	1	*100%UT on plates of all thickness as per SA 578. Acceptance Standard: Level – B	
1.3	Forgings, Bars & Rounds: SA105/ Spec as per drawing	Material Conformance	Critical	TC review	100%	Specification as per BHEL drawing	TC & Records	✓	3	2,1	—	1		
1.4	Fittings: SA234WPB/ Spec as per drawing	Material Conformance	Critical	TC review	100%	Specification as per BHEL drawing	TC & Records	✓	3	2,1	—	1		
1.5	Fasteners : ASTM A193 Gr.B7M, ASTM A 194 Gr.2HM / Spec as per drawing	Material Conformance	Critical	TC review	100%	Specification as per BHEL drawing	TC & Records	✓	3	2,1	—	—		
1.6	Gaskets : BSI BS-7531 Grade X/ Spec as per drawing	Material Conformance	Critical	TC review	100%	Specification as per BHEL drawing	TC & Records	✓	3	2,1	—	—		
1.7	Welding Consumable	Chemical & Mechanical property as per ASME Sec II C, Brand approval *	Critical	TC review	100%	Specification as per Approved WPS/ PQR	TC & Records	✓	3	2,1	—	—	*Refer Note 3	
J.NANTHINI, Dy.MGR/ QA MANUFACTURER		D.SANDRA PRIYA, Dy.MGR/ QA MANUFACTURER	K V RAMANI, AGM/ E&Q MANUFACTURER	LEGEND: * Records identified with mark "✓" shall be essentially included by supplier in QA documentation. RT-RADIOGRAPHIC TEST, UT-ULTRASONIC TEST, MT-MAGNETIC TEST, PT-PENETRANT TEST 3: MANUFACTURER; 2:BHEL/ BHEL AIA ; 1: NPCIL. P: PERFORM; W: WITNESS; R: REVIEW; H:HOLD .				FOR NPCIL USE:						
								REVIEWED BY APPROVED BY APPROVAL SEAL						
SIGNATURE														

		MANUFACTURER'S NAME & ADDRESS: BHEL PIPING CENTRE CHENNAI / NPCIL APPROVED SUB CONTRACTORS		MANUFACTURING QUALITY PLAN					PROJECT : KUDANKULAM NUCLEAR POWER PROJECT - UNIT 3 & 4 (2x1000Mwe) CUSTOMER : NPCIL MAIN-SUPPLIER: BHEL-PIPING CENTRE BHEL CUSTOMER Nos: 7430, 7431					
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S. No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY				REMARKS	
									P	R	W	H		
1	2	3	4	5	6	7	8	9	D*	10				11
2.0	INPROCESS:													
2.1	Plate formed Pipes/ Mitre bends/ Tees/ Reducers & Flanges													
2.1.1	Welding Procedure Qualification	Procedure Qualification	Major	Review of Record	100%	ASME Sec IX		WPS, PQR	✓	3	—	2,1	2	Refer Note 3
2.1.2	Welder Performance Qualification	Personnel Qualification	Major	Review of Record	100%	ASME Sec IX		WPQR	✓	3	—	2,1	2	Refer Note 3
2.1.3	Plate cutting layout for Pipe rolling	Rolling direction	Major	Dimension & Orientation	100%	Approved drawings	Approved drawings	HC	—	3	2,1	—	—	
2.1.4	Edge Preparation	Surface defects	Major	PT	100%	ASME Sec V Article 6 / ASME Sec III Div.1 NC5130		NDT Report	✓	3	2,1	—	—	
2.1.5	Fitup	Dimension & fitup	Minor	Visual & Measurement	100%	Approved drawings	Approved drawings	HC	—	3	2	—	—	
2.2	NDE on welds													
2.2.1	Weld Inspection	Weld size, profile & finish*	Major	Visual & Measurement	100%	BHEL Drawing		HC	✓	3	1	2	2	* NOTE 6
2.2.2	Butt Joints (LS & CS) inclusive of Mitre Bends, Plate formed pipes/ tees/ reducers	Weld quality (LS & CS)	Major	RT	100%	ASME Sec V Article 2 / ASME Sec III Div.1 NC5320		NDT Report	✓	3	2,1	—	2	Including all T-Joints
2.2.3	5%of Butt Joints	Weld quality	Major	UT	100%	ASME Sec V Article 4 / ASME Sec III Div.1 NC5330		NDT Report	✓	3	1	2	2	
J.NANTHINI, Dy.MGR/ QA MANUFACTURER		D.SANDRA PRIYA, Dy.MGR/ QA&BE MANUFACTURER	K V RAMANI, AGM/ Q&BE MANUFACTURER	LEGEND: * Records identified with mark "X" shall be essentially included by supplier in QA documentation. RT-RADIOGRAPHIC TEST, UT-ULTRASONIC TEST, MT-MAGNETIC TEST, PT-PENETRANT TEST 3: MANUFACTURER; 2:BHEL/ BHEL AIA ; 1: NPCIL. P: PERFORM; W: WITNESS; R: REVIEW; H:HOLD .				FOR NPCIL USE:						
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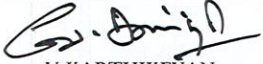
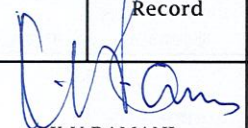
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S. No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY				REMARKS	
									P	R	W	H		
1	2	3	4	5	6	7	8	9	D*	10				11
2.2.4	All butt and pressure boundary welds	Root pass and final pass Weld quality	Major	PT	100%	ASME Sec V Article 6 / ASME Sec III Div.1 NC5350		NDT Report	✓	3	1	2	2	
2.2.5	Other welds : Branch/ Attachment Welds	Weld quality	Major	MT	100%	ASME Sec V Article 7/ ASME Sec III Div.1 NC5340		NDT Report	✓	3	1	2	2	
2.3	Post Weld Heat Treatment	Time/ Temp control	Major	Visual & Measurement	100%	WPS/ ASME Sec.III Div.1 NC		HT Chart	✓	3	2,1	—	—	Refer note 5
2.4	Hydro test	Pressure resistance	Major	Visual	100%	ASME Sec.III Div.1 NC, Approved Drawing		Hydro test Report	✓	3	—	2,1 *	1	*10%Witness by Customer
2.5	Product Testing for Plate formed Pipes (Sample shall be identified from attached coupon plate to pipe per heat/lot)													
	a) Product Analysis (Parent&Weld test coupon)	Chemical Properties	Major	Chemical test	Plate : 1 sample per heat ; Weld : 1 sample per heat per 60 meter.	As per S4 of ASME SA-671		TC	✓	3	—	2,1	1	
	Transverse Tensile test of weld	Tensile strength of weld	Major	Mechanical test	1 sample per heat per 60 meter.	As per ASME SA-671 & ASTM A 370		TC	✓	3	—	2,1	1	
	Transverse Guided Weld Bend test	Weld ductility	Major	Mechanical test	2 sample per heat per 60 meter .	As per ASME SA-671 & ASTM A 370		TC	✓	3	—	2,1	1	
	Charpy V Notch Impact test	Toughness	Major	Mechanical test	1 sample per heat per 60 meter.	As per ASME SA-671, ASTM A 370& SA-20	Test Temp: -50°C Min Avg value=15J. Min Individual value=12J.	TC	✓	3	—	2,1	1	Refer Note 6
J.NANTHINI, Dy.MGR/ QA		D.SANDRA PRIYA, Dy.MGR/ QA&BE		K V RAMANI, AGM/ Q&BE		LEGEND: * Records identified with mark "X" shall be essentially included by supplier in QA documentation. RT-RADIOGRAPHIC TEST, UT-ULTRASONIC TEST, MT-MAGNETIC TEST, PT-PENETRANT TEST 3: MANUFACTURER; 2:BHEL/ BHEL AIA ; 1: NPCIL. P: PERFORM; W: WITNESS; R: REVIEW; H:HOLD .			FOR NPCIL USE:					
MANUFACTURER		MANUFACTURER		MANUFACTURER					REVIEWED BY	APPROVED BY		APPROVAL SEAL		

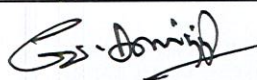
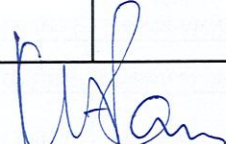
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S. No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY				REMARKS	
									P	R	W	H		
1	2	3	4	5	6	7	8	9	D*	10				11
3.0	FINAL INSPECTION													
3.1	Dimensional Inspection, Surface Condition	Visual, Surface condition, Straightness, End finish, Bevel angle, Root face, Outer diameter, Thickness, Length, Diagonal, Ep, Orientation, Location, Height of attachments etc	Major	Visual, Measurement	100%	Approved Drawing	Report/ HC	✓	3	—	2,1*	1	*10%Witness by Customer	
3.2	Cleaning and Grit blasting, Painting & Color code	Surface Preparation, Paint specification, Appearance & DFT	Minor	Visual, Contamination check & Measurement	100%	If Direct to Site (DTS) : External : Primer of Inorganic Zinc Silicate DFT=70 microns min. If Despatch to BHEL Stores : External : Resin type Rust preventive coating.	HC	✓	3	2,1	—	—	DFT at random location across job	
3.3	Identification, Marking and Protection	WO, Du no, Spec, Grade, Heat no, Qty, Project name, System, KKS Code (as per Engg drawing) etc*	Minor	Visual & Measurement	100%	PO, GMS & BHEL Drawing	HC	✓	3	2,1	—	—	* Refer Note 7&8	
4.0	INSPECTION CLEARANCE													
4.1	Inspection data compilation	History card, Reports, TC	Major	Verification	100%	All documents as per QP	History Docket		3	2,1	—	1	Despatch Clearance	
Note: 1) Heat number transfer to cut piece (raw material) shall be done by Sub Contractor in the presence of BHEL representative. 2) Items shall be manufactured as per Approved BHEL drawing. 3) Incase of Welded pipes, in one random length one welded circumferential seam of same quality as longitudinal weld is permitted. Circumferential weld seam shall be atleast 2.5 m from either end. Longitudinal seams of two portions shall be staggered by 90°. Welded pipes of diameter less than 900NB shall not have more than one longitudinal joint. 4) WPS/ PQR/ WPQR shall be reviewed by BHEL&NPCIL.Only NPCIL approved brand of Welding Consumables shall be used(Annexure 1). Impact test qualified WPS/ PQR shall be used. 5) Non destructive examinations shall be carried out by personnel qualified to Level II of ISNT or ASNT in respective NDT method. 6) PWHT is applicable for weld thickness 32mm and above and CS: Carbon content : max 0.25%.														

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S. No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY				REMARKS	
									P	R	W	H		
1	2	3	4	5	6	7	8	9	D*	10				11
7) Raw material SA 516 Gr 70 plates used for fabrication is exempted from Impact test according to ASME Sec III NF 2019, Clause NF 2311(b)-9. However, Impact test shall be done on the weld metal and welding procedure qualification as per ASME Sec III NF-2300. Impact test shall meet the requirements of ASME Sec III NF-2300. 8) Repair Procedure, if any shall be furnished for NPCIL approval prior to the repair work. All repaired welds shall be re-examined and re-tested as per the requirements of original weld and shall meet the requirements of the same. 9) Marking :- Hard Punching & Paint stencilling at one end: Project name, PO no, W/O DU details, Block number (as per Engg drg). Stencilling & Punching shall be done in such a manner that any pipe may be easily identified without turning or lifting it. Paint or ink for marking shall not contain any harmful metal or metallic salts such as zinc, lead or copper which cause corrosive attack on heating. 10) Packing : End of pipes shall be secured with end caps to avoid storage & transit damages. Bevelled pipe ends shall be closed with a leak tight Steel bevel protector combined with plastic plug. Dessicant material suitable for use in combination with steel (moisture absorbent) shall be placed inside closed pipe to enable corrosion prevention for atleast 2 years. 11) Videography/Digital Photography carried out during manufacture, examination/ testing, loading/unloading, shipment etc shall be made available to Purchaser as and when demanded. Same shall be transferred on CD and submitted to BHEL on completion. 12) Chemical & Mechanical tests shall be performed in laboratories approved by NPCIL. Heat Treatment shall be carried out in furnaces approved by NPCIL. 13) NPCIL approved chemicals for Liquid Penetrant Examination shall be used. 14) All Gauges and measuring Instruments, used shall be with valid calibration.														
J.NANTHINI, Dy.MGR/ QA		D.SANDRA PRIYA, Dy.MGR/ QA&BE		K V RAMANI, AGM/ Q&BE		LEGEND: * Records identified with mark "X" shall be essentially included by supplier in QA documentation. RT-RADIOGRAPHIC TEST, UT-ULTRASONIC TEST, MT-MAGNETIC TEST, PT-PENETRANT TEST 3: MANUFACTURER; 2:BHEL/ BHEL AIA ; 1: NPCIL. P: PERFORM; W: WITNESS; R: REVIEW; H:HOLD .			FOR NPCIL USE:					
MANUFACTURER		MANUFACTURER		MANUFACTURER										
SIGNATURE									REVIEWED BY		APPROVED BY		APPROVAL SEAL	

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				ITEM : FABRICATION OF SUPPORTS (Carbon Steel) SYSTEM : PUQ (SCHEDULE NO : G.2)		QP No:7430:QPC:07 Rev No: 00 Date : 20.10.2020								
S. No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY				REMARKS	
									P	R	W	H		
1	2	3	4	5	6	7	8	9	D*	10			11	
1.0 RAW MATERIAL: All Raw materials shall be from approved vendors of NPCIL.														
1.1	Plates SA516 Gr.70/ Spec as per drawing	Material Conformance	Critical	TC review	100%	Specification as per BHEL drawing & MSS-SP-58	TC & Records	✓	3	2,1	—	—		
1.2	Plates SA240TY316L / Spec as per drawing	Material Conformance	Critical	TC review	100%	Specification as per BHEL drawing & MSS-SP-58	TC & Records	✓	3	2,1	—	—		
1.3	Welding Consumable	Chemical & Mechanical property as per ASME Sec II C, Brand approval	Critical	TC review	100%	Specification as per Approved WPS/ PQR	TC & Records	✓	3	2,1	—	—	Refer Note 3	
2.0 INPROCESS:														
2.1	Welding Procedure Qualification	Procedure Qualification	Major	Review of Record	100%	ASME Sec IX		WPS, PQR	✓	3	—	2,1	2	Refer Note 3
2.2	Welder Performance Qualification	Personnel Qualification	Major	Review of Record	100%	ASME Sec IX		WPQR	✓	3	—	2,1	2	Refer Note 3
2.3	Plate cutting layout for Pipe Support fabrication	Rolling direction	Major	Dimension & Orientation	100%	Approved drawings	Approved drawings	HC	—	3	2,1	—	—	
2.4	Welding	Visual defects, Weld size	Major	Visual & Measuremen	100%	Approved drawings	Approved drawings	HC	✓	3	1	2	—	
		Surface defects	Major	MPI	100%	ASME Sec V Article 7, ASME B 31.1 CI 136.4.3		NDT Report	✓	3	1	2	2	
V.KARTHIKEYAN, Dy. ENGR/ QA		J.NANTHINI, Dy.MGR/ QA		K V RAMANI, AGM/ Q&BE		LEGEND: * Records identified with mark "√" shall be essentially included by supplier in QA documentation. MT-MAGNETIC TEST ; HC - HISTORY CARD 3: MANUFACTURER; 2:BHEL/ BHEL AIA ; 1: NPCIL. P: PERFORM; W: WITNESS; R: REVIEW; H:HOLD .		FOR NPCIL USE:						
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				ITEM : FABRICATION OF SUPPORTS (Carbon Steel) SYSTEM : PUQ (SCHEDULE NO : G.2)		QP No:7430:QPC:07 Rev No: 00 Date : 20.10.2020								
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1	2	3	4	5	6	7	8	9	D*	P	R	W	H	11
3.0	FINAL INSPECTION													
3.1	Dimensional Inspection, Surface Condition	Visual, Surface condition, Straightness, Thickness etc.,	Major	Visual, Measurement	100%	Approved Drawing		Inspection Report / HC	✓	3	—	2,1*	2,1	*10%Witness by Customer
3.2	Cleaning and Grit blasting, Painting & Color code	Surface Preparation, Paint specification, Appearance & DFT	Minor	Visual, Contamination check & Measurement	100%	Grit Blasting - SSPC SP 10 Primer & Finish coat-Refer Note 6 Total DFT = 250 micron min.		Painting report	✓	3	1	2	—	
3.3	Identification, Marking, and Protection	WO, DU no, Spec, Grade, Heat no,Qty, Project name, System & KKS Code (as per Engg drawing) etc*	Minor	Visual & Measurement	100%	PO, Approved Drawing		HC	✓	3	2,1	—	—	* Refer Note 7&8
3.4	Inspection data compilation	History card, Reports, TC	Major	Verification	100%	All documents as per QP		History Docket		3	2,1	—	1	Despatch Clearance
Note: 1) Raw material - Carbon content - 0.25 %max. 2) Items shall be manufactured as per Approved BHEL drawing. 3) WPS/ PQR/ WPQR shall be reviewed by BHEL & NPCIL. Only NPCIL approved brand of Welding Consumables shall be used (Annexure 1). 4) Non destructive examinations shall be carried out by personnel qualified to Level II of ISNT or ASNT in respective NDT method. 5) Repair Procedure, if any shall be furnished for NPCIL approval prior to the repair work. All repaired welds shall be re-examined and re-tested as per the requirements of original weld and shall meet the requirements of the same. 6) Primer or first coat of paint shall be applied within 4 hours of surface preparation. * Primer : Two coats of any one of the following make primer of minimum thickness of 100 microns each. INTERSEAL 670 HS (M/s Akzonobel) / PROTECTOMASTIC (M/s Berger paints) / RUST-O-CAP (M/s Asian Paints) or NPCIL approved equivalents. * Finish : One coat of any one of the following make finish coat of minimum thickness of 50 micron. INTEGRARD 740 (M/s Akzonobel) / EPILUX 155 (or) EPILUX 89 HB (M/s Berger paints) / APCODUR CF 693 LX (M/s Asian Paints) or NPCIL approved equivalents. 7) Paint or ink for marking shall not contain any harmful metal or metallic salts such as zinc, lead or copper which cause corrosive attack on heating. 8) Packing : Pipe supports shall be properly supported & packed to avoid transit damages. Small components, not assembled with equipment, shall be properly packed in totally enclosed boxes & properly marked with equipment & part number for identification. 9) All Gauges and measuring Instruments, used shall be with valid calibration.														
V.KARTHIKEYAN, Dy.ENGR/ QA		J.NANTHINI, Dy.MGR/ QA		K V RAMANI, AGM/ Q&BE		LEGEND: * Records identified with mark "√" shall be essentially included by supplier in QA documentation. MT-MAGNETIC TEST ; HC - HISTORY CARD 3: MANUFACTURER; 2:BHEL/ BHEL AIA ; 1: NPCIL. P: PERFORM; W: WITNESS; R: REVIEW; H:HOLD .		FOR NPCIL USE:						
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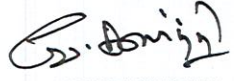
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				ITEM : FABRICATION OF SUPPORTS (Carbon Steel)		QP No: 7430:QPC:06 Rev No: 00 Date : 15.10.2020							
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1.0	RAW MATERIAL: All Raw materials shall be from approved vendors of NPCIL.												
1.1	Plates SA516 Gr.70/ Spec as per drawing	Material Conformance	Critical	TC review	100%	Specification as per BHEL drawing	TC & Records	✓	3	2,1	-	-	
		Product Analysis	Critical	Chemical test	100%	Specification as per BHEL drawing, S2 of SA 516 Gr 70.	TC & Records	✓	3	2,1	-	-	
		Charpy V Notch Impact test (as applicable)	Critical	Mechanical test	One test each plate as heat treated.	ASTM A 20, ASME Sec III Div.1 NF 2300, ASME SA 370	Test Temp: — 3 deg C Min Avg value = 20J. Min Individual value =16J.	TC & Records	✓	3	2,1	-	-
1.2	Fasteners (Stud, Nut, Washer, U bolts) SA193 Gr.B7, SA 194 Gr.2H, ASTM F436 Type I / Spec as per drawing	Material Conformance	Critical	TC review	100%	Specification as per BHEL drawing	TC & Records	✓	3	2,1	-	-	
1.3	Welding Consumable	Chemical & Mechanical property as per ASME Sec IIC, Brand approval	Critical	TC review	100%	Specification as per Approved WPS/PQR	TC & Records	✓	3	2,1	-	-	Refer Note 3
2.0	INPROCESS:												
2.1	Welding Procedure Qualification	Procedure Qualification	Major	Review of Record	100%	ASME Sec IX	WPS, PQR	✓	3	-	2,1	2	Refer Note 4&6
2.2	Welder Performance Qualification	Personnel Qualification	Major	Review of Record	100%	ASME Sec IX	WPQR	✓	3	-	2,1	2	Refer Note 4&6
 V.KARTHIKEYAN, Dy.ENGR/QA		 J.NANTHINI, Dy.MGR/QA	 K V RAMANI, AGM/Q&BE		LEGEND: * Records identified with mark "√" shall be essentially included by supplier in QA RT-RADIOGRAPHIC TEST, UT-ULTRASONIC TEST, MT- 3: MANUFACTURER; 2:BHEL/BHEL AIA ; 1: NPCIL. P: PERFORM; W: WITNESS; R: REVIEW; H:HOLD .			FOR NPCIL USE:					
SIGNATURE				REVIEWED BY				APPROVED BY		APPROVAL SEAL			

		MANUFACTURER'S NAME & ADDRESS: BHEL PIPING CENTRE CHENNAI / NPCIL APPROVED SUB CONTRACTORS		MANUFACTURING QUALITY PLAN					PROJECT: KUDANKULAM NUCLEAR POWER PORJECT - UNIT 3 & 4 (2x1000Mwe) CUSTOMER : NPCIL MAIN-SUPPLIER: BHEL-PIPING CENTRE BHEL CUSTOMER Nos: 7430, 7431					
				ITEM : FABRICATION OF SUPPORTS (Carbon Steel)			QP No:7430:QPC:06 Rev No: 00 Date : 15.10.2020							
S. No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY				REMARKS	
									P	R	W	H		
1	2	3	4	5	6	7	8	9	D*	10				11
2.3	Plate cutting layout for Pipe Support fabrication	Rolling direction	Major	Dimension & Orientation	100%	Approved drawings	Approved drawings	HC	-	3	2,1	-	-	
2.4	Welding	Visual defects, Weld size	Major	Visual & Measurement	100%	Approved drawings	Approved drawings	HC	✓	3	1	2	-	
		Surface defects	Major	MPI	100%	ASME Sec V Article 7, ASME Sec III Div.1 NF 5340	NDT Report	✓	3	-	2,1*	2		*10% Witness by Customer
2.5	Post Weld Heat Treatment	Time/Temp control	Major	Visual & Measurement	100%	WPS / ASME Sec.III Div.1 NF	HT Chart	✓	3	2,1	-	-		
2.6	Charpy V Notch Impact test	Toughness	Major	Mechanical test	One test each plate as heat treated.	ASTM A 20, ASME Sec III Div.1 NF 2300, ASME SA 370	Test Temp: - 3 deg C Min Avg value = 20J. Min Individual value =16J.	TC	✓	3	-	2,1*	1	Refer Note 6 *10% Witness by Customer
3.0	FINAL INSPECTION													
3.1	Dimensional Inspection, Surface Condition	Visual, Surface condition, Straightness, Thickness etc.,	Major	Visual, Measurement	100%	Aprproved Drawing	Inspecti on Report / HC	✓	3	-	2,1*	2,1		*10% Witness by Customer
3.2	Cleaning and Grit blasting,Painting & Color code	Surface Preparation, Paint specification, Appearance & DFT	Minor	Visual, Contaminatio n check & Measurement	100%	Blast Cleaning SSPC SP-10 Primer : 1 coat of 70-80 µ of Inorganic Zinc Silicate. Intermediate : 1 coat of 100-120 µ of epoxy MIO. Finish : 2 coats of 30 µ of Aliphatic Polyurethane. Total DFT = 230-260 µ min.	Painting report	✓	3	1	2	-		
 V.KARTHIKEYAN, Dy.ENGR/QA				 J.NANTHINI, Dy.MGR/QA		 K V RAMANI, AGM/Q&BE		LEGEND: * Records identified with mark "✓" shall be essentially included by supplier in QA RT-RADIOGRAPHIC TEST, UT-ULTRASONIC TEST, MT-MAGNETIC TEST, PT-PENETRANT TEST 3: MANUFACTURER; 2:BHEL/BHEL AIA ; 1: NPCIL. P: PERFORM; W: WITNESS; R: REVIEW; H:HOLD .		FOR NPCIL USE:				
SIGNATURE								REVIEWED BY		APPROVED BY		APPROVAL SEAL		

		MANUFACTURER'S NAME & ADDRESS: BHEL PIPING CENTRE CHENNAI / NPCIL APPROVED SUB CONTRACTORS		MANUFACTURING QUALITY PLAN				PROJECT: KUDANKULAM NUCLEAR POWER PORJECT - UNIT 3 & 4 (2x1000Mwe) CUSTOMER : NPCIL MAIN-SUPPLIER: BHEL-PIPING CENTRE BHEL CUSTOMER Nos: 7430, 7431						
				ITEM : FABRICATION OF SUPPORTS (Carbon Steel) SYSTEM : PEB (SCHEDULE NO : G.1)		QP No:7430:QPC:06 Rev No: 00 Date : 15.10.2020								
S. No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY				REMARKS	
									P	R	W	H		
1	2	3	4	5	6	7	8	9	D*	10				11
3.3	Identification, Marking, and Protection	WO, DU no, Spec, Grade, Heat no, Qty, Project name, System (as per Engg drawing) etc*	Minor	Visual & Measurement	100%	PO, Approved Drawing		HC	✓	3	2,1	-	-	* Refer Note 8&9
3.4	Inspection data compilation	History card, Reports, TC	Major	Verification	100%	All documents as per QP		History Docket		3	2,1	-	1	Despatch Clearance

Note:

- 1) Raw material - Carbon content - 0.25 % max.
- 2) Heat number transfer to cut piece (raw material) shall be done by Sub Contractor in the presence of BHEL representative.
- 3) Items shall be manufactured as per Approved BHEL drawing.
- 4) WPS/PQR/WPQR shall be reviewed by BHEL&NPCIL. Only NPCIL approved brand of Welding Consumables shall be used (Annexure 1). Impact test qualified WPS/PQR shall be used.
- 5) Non destructive examinations shall be carried out by personnel qualified to Level II of ISNT or ASNT in respective NDT method.
- 6) Raw material SA 516 Gr 70 plates used for fabrication of supports is exempted from Impact test according to ASME Sec III NF 2019, Clause NF 2311(b)-9. However, Impact test shall be done on the weld metal and welding procedure qualification as per ASME Sec III NF-2300. Impact test shall meet the requirements of ASME Sec III NF-2300.
- 7) Repair Procedure, if any shall be furnished for NPCIL approval prior to the repair work. All repaired welds shall be re-examined and re-tested as per the requirements of original weld and shall meet the requirements of the same.
- 8) Paint or ink for marking shall not contain any harmful metal or metallic salts such as zinc, lead or copper which cause corrosive attack on heating.
- 9) Packing : Pipe supports shall be properly supported & packed to avoid transit damages. Small components, not assembled with equipment, shall be properly packed in totally enclosed boxes & properly marked with equipment & part number for identification.
- 10) Videography/Digital Photography carried out during manufacture, examination/testing, loading/unloading, shipment etc shall be made available to Purchaser as and when demanded. Same shall be transferred on CD and submitted to BHEL on completion.
- 11) Chemical & Mechanical tests shall be performed in laboratories approved by NPCIL. Heat Treatment shall be carried out in furnaces approved by NPCIL.
- 12) NPCIL approved chemicals for Liquid Penetrant Examination shall be used.
- 13) All Gauges and measuring Instruments, used shall be with valid calibration.

 V.KARTHIKEYAN, Dy.ENGR/QA		 J.NANTHINI, Dy.MGR/QA		 K V RAMANI, AGM/Q&BE		LEGEND: * Records identified with mark "✓" shall be essentially included by supplier in QA RT-RADIOGRAPHIC TEST, UT-ULTRASONIC TEST, MT-MAGNETIC TEST, PT-PENETRANT TEST 3: MANUFACTURER; 2:BHEL/BHEL AIA ; 1: NPCIL. P: PERFORM; W: WITNESS; R: REVIEW; H:HOLD .	FOR NPCIL USE:		
MANUFACTURER SIGNATURE							REVIEWED BY	APPROVED BY	APPROVAL SEAL

15/10/2020



न्यूक्लियर पावर कॉर्पोरेशन ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
NUCLEAR POWER CORPORATION OF INDIA LTD.

(A Government of India Enterprise)

गुणवत्ता आश्वासन निदेशालय

Directorate of Quality Assurance

नाभिकीय ऊर्जा भवन, अणुशक्तिनगर, मुंबई-400 094

Nabhikiya Urja Bhavan, Anushaktinagar, Mumbai - 400 094.

Corporate Identification No. U40104MH1987GOI149458



आर.के. गुप्ता R.K. Gupta

अधिशाली निदेशक (गु.आ.) Executive Director (QA)

Phone: 022- 25995030/25558487

Fax.No.: 022-25565354

e-mail: rk_gupta@npcil.co.in

सं.No. एनपीसीआईएलNPCIL/02500/क्यूएडी QAD/एमएम/2019/1181

दिनांक Date: December 17, 2019

विषय : वेल्डिंग कंज्यूमेबल्स के अनुमोदित ब्रांड की सूची।

Sub: List of approved brands of welding consumables

17/12/2019 की स्थिति में एनपीसीआईएल कार्यों के उपयोग हेतु वेल्डिंग कंज्यूमेबल्स के अनुमोदित ब्रांडों की सूची इसके साथ संलग्न है:

The lists of approved brands of welding consumables for use on NPCIL jobs as on 17/12/2019 are enclosed herewith.

- 1) अनुमोदित कार्बन स्टील एवं निम्न एलॉय स्टील वेल्डिंग इलेक्ट्रोड्स की सूची (2 शीट)
List of Approved Carbon Steel & Low Alloy Steel Welding Electrodes (2 Sheets).
- 2) अनुमोदित स्टेनलेस स्टील एवं अन्य निकिल एलॉय इलेक्ट्रोड्स की सूची (2 शीट)
List of Approved Stainless Steel & other Ni Alloy Electrodes (2 Sheets).
- 3) वायर के अनुमोदित ब्रांड एवं वायर फ्लक्स संयोजन की सूची (1 शीट)
List of Approved Brands of Wire and Wire Flux Combination (1 Sheet).

वेल्डिंग कंज्यूमेबल्स (क्यूएडी/प्रापण/वेल्डिंग कंज्यूमेबल्स/002 संशो.: 2) के अनुमोदन के लिए प्रक्रिया में एवं एसएमई खंड II भाग C के अद्यतन संस्करण में निर्धारित आवश्यकताओं के अनुसार अनुमोदन प्रदान किया जाता है। तथापि, विशेष मामलों में जहाँ कहीं भी बैच क्वालिफिकेशन अपेक्षित होगा, अलग से निष्पादित किया जाएगा।

The approvals are granted in conformance to the requirements stipulated in Procedure for approval of Welding Consumables (QAD/Proc/Welding Consumables/002 Rev:2) and latest edition of ASME Section II Part C. However, batch qualification wherever called for in specific cases, will have to be carried out separately.

(आर.के. गुप्ता R.K. Gupta) 17.12.19

अधिशाली निदेशक (गु.आ.) Executive Director (QA)



न्यूक्लियर पावर कॉर्पोरेशन ऑफ इंडिया लिमिटेड

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Nabhikiya Urja Bhavan, Anushaktinagar, Mumbai - 400 094.



1) LIST OF APPROVED CARBON STEEL & LOW ALLOY STEEL WELDING ELECTRODES

(2 pages)

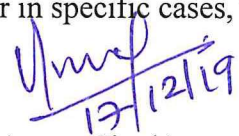
As on 17-12-2019

Sr. No.	Manufacturers	Brand name	AWS No.	Valid up to
1.	ADOR WELDING LTD., SILVASSA	SUPABASE X PLUS	E7018	FEB2024
2.	ADOR WELDING LTD., SILVASSA	MOLYTEN	E7018-A1	APR2020
3.	ADOR WELDING LTD., SILVASSA	CHROMOTEN	E8018 B2	APR2020
4.	ADOR WELDING LTD., SILVASSA	CHROMOTEN-C	E9018 B3	APR2020
5.	ADOR WELDING LTD., SILVASSA	TENALLOY Z PLUS	E7018-1	JUN2022
6.	D&H INDIA LTD., INDORE	SUPER -CR-1	E8018 B2	DEC2020
7.	D&H INDIA LTD., INDORE	SUPER -CR-2	E9018 B3	DEC2020
8.	D&H INDIA LTD., INDORE	SUPER -LH (SPL)	E7018-1 (DCEP Only)	FEB2021
9.	D&H INDIA LTD., INDORE	STANDARD	E6013	FEB2021
10.	D&H INDIA LTD., INDORE	SUPER LH	E7018 (DCEP Only)	FEB2021
11.	D&H SECHERON, INDORE	MEDIO	E6013	JUN2020
12.	D&H SECHERON, INDORE	EXOBEL	E6013	JUN2020
13.	D&H SECHERON, INDORE	SUPERTHERME	E7018	JUN2020
14.	D&H SECHERON, INDORE	MOLYTHERME	E7018-A1	JUN2022
15.	D&H SECHERON, INDORE	SUPERTHERME(SPL)	E7018-1	NOV2023
16.	HONAVAR ELECTRODES, THANE	REGULAR S	E6013	JAN2020
17.	HONAVAR ELECTRODES, THANE	ULTIMATE - 18	E7018	JAN2020
18.	HONAVAR ELECTRODES, THANE	ULTIMATE - 18 SPL	E7018-1	JAN2020
19.	MAILAM INDIA LTD., PUDUCHERRY	MAILARC -13R	E6013	SEP2020
20.	MAILAM INDIA LTD., PUDUCHERRY	MAILARC -18	E7018	SEP2020
21.	MAILAM INDIA LTD., PUDUCHERRY	MAILARC -18 PLUS	E7018-1	SEP2020
22.	MAILAM INDIA LTD., PUDUCHERRY	MAILARC -1 CR	E8018-B2	JUN2024
23.	MAILAM INDIA LTD., PUDUCHERRY	MAILARC -2 CR	E9018-B3	JUN2024
24.	RAJ KESARI ELECTRODES, UDAIPUR	SUPERLET 18	E7018	AUG2022
25.	RAJ KESARI ELECTRODES, UDAIPUR	SUPERLET 18 (SPL.)	E7018-1	AUG2022
26.	RAJ KESARI ELECTRODES, UDAIPUR	RAJCORD 13S	E6013	AUG2022
27.	RAJRATNA ELECTRODES, AHMEDABAD	RATNA 7018 SPL.	E7018-1	MAR2020
28.	RAJRATNA ELECTRODES, AHMEDABAD	RATNA 7018	E7018	NOV2023
29.	ROYAL ARC ELECTRODES LTD, VASAI	ROYAL THERM SPL.	E7018-1	SEP2021
30.	ROYAL ARC ELECTRODES LTD, VASAI	ROYAL CHROM 1	E8018-B2	FEB2023
31.	ROYAL ARC ELECTRODES LTD, VASAI	ROYAL CHROM 2	E9018-B3	FEB2023
32.	ROYAL ARC ELECTRODES LTD, VASAI	ROYAL THERM MOLY	E7018-A1	MAR2023
33.	ROYAL ARC ELECTRODES LTD, VASAI	ROYAL THERM	E7018	DEC2023
34.	ROYAL ARC ELECTRODES LTD, VASAI	ROYAL S	E6013	DEC2023
35.	SUPERON SCHWEISSTECHNIK INDIA LTD. DELHI	GARANT MO	E7018-A1	SEP2020
36.	SUPERON SCHWEISSTECHNIK INDIA LTD., DELHI	SUPER CROMO 1B	E8018-B2	DEC2020

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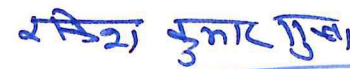
Sr. No.	Manufacturers	Brand name	AWS No.	Valid up to
37.	SUPERON SCHWEISSTECHNIK INDIA LTD., DELHI	SUPER CROMO 2B	E9018-B3	DEC2020
38.	VIJEY ELECTRODES & WIRES PVT. LTD., CHENNAI	VJ 6013 X	E6013	SEP2020
39.	VIJEY ELECTRODES & WIRES PVT. LTD., CHENNAI	VJ 7018	E7018	SEP2020
40.	VIJEY ELECTRODES & WIRES PVT. LTD., CHENNAI	VJ 7018 - 1	E7018-1	SEP2020
41.	WELD FAST ELECTRODES, NAGPUR	WELDFAST LH 18	E-7018	MAR2020
42.	WELD FAST ELECTRODES, NAGPUR	WELDFAST LH-18-1	E-7018-1	MAR2020
43.	WELD FAST ELECTRODES, NAGPUR	WELDFAST CROMO 0500	E7018-A1	FEB2023
44.	WELD FAST ELECTRODES, NAGPUR	WELDFAST CROMO 1500	E8018-B2	FEB2023
45.	WELD FAST ELECTRODES, NAGPUR	WELDFAST CROMO 2251	E9018-B3	FEB2023

The approvals are granted in conformance to the requirements stipulated in latest edition of ASME Section II Part C. However, batch qualification wherever called for in specific cases, will have to be carried out separately.


(Anoop Singh)
ACE & Head QA (M-6)

Through: Shri A.K. Singh, AD (QA- Opns. & Group-1)

Executive Director (QA)


17.12.19

न्यूक्लियर पावर कॉर्पोरेशन ऑफ इंडिया लिमिटेड

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Nabhikiya Urja Bhavan, Anushaktinagar, Mumbai - 400 094.



2) LIST OF APPROVED STAINLESS STEEL & OTHER NI ALLOY ELECTRODES

(2 Pages)

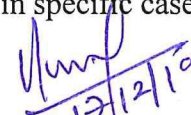
As on 17-12-2019

Sr. No.	MANUFACTURERS	BRAND NAME	AWS No.	VALID UPTO
1.	ADOR WELDING LTD., SILVASSA	BETANOX-DL	E 309L-16	SEP2020
2.	ADOR WELDING LTD., SILVASSA	SUPERINOX-2C	E 316L-16	SEP2020
3.	ADOR WELDING LTD., SILVASSA	SUPERINOX-1C	E 308L-16	SEP2020
4.	D&H INDIA LTD., INDORE	SV-308L	E 308L-15	DEC2022
5.	D&H INDIA LTD., INDORE	SV-309L	E 309L-15	DEC2022
6.	D&H INDIA LTD., INDORE	CROMALLOY-B	E 308L-16	DEC2022
7.	D&H INDIA LTD., INDORE	CROMALLOY 309L	E 309L-16	DEC2020
8.	ADOR FONTECH, BENGALURU	LH 511	E Ni Cu7	OCT2020
9.	ADOR FONTECH, BENGALURU	LH 521	E Ni Cr Fe 3	OCT2020
10.	D&H SECHERON, INDORE	CRONITHERME 25/12	E 309-16	JUN2022
11.	D&H SECHERON, INDORE	RUTOX-D	E 316L-16	JUN2022
12.	D&H SECHERON, INDORE	BATOX-B	E 308L-15	JUN2020
13.	D&H SECHERON, INDORE	RUTOX-B	E 308L-16	JUN2020
14.	D&H SECHERON, INDORE	D&H 309L	E 309L-16	NOV2023
15.	D&H SECHERON, INDORE	D&H 1250	E NiCu-7	JAN2021
16.	D&H SECHERON, INDORE	D&H 1212NS	E NiCr Fe-3	JAN2021
17.	D&H SECHERON, INDORE	RUTOX-A	E 308-16	NOV2023
18.	D&H SECHERON, INDORE	RUTOX-A St	E 347-16	NOV2023
19.	D&H SECHERON, INDORE	RUTOX-Mo	E 316-16	NOV2023
20.	HONAVAR ELECTRODES, THANE	SILVER SHINE 308L-15	E 308L-15	FEB2024
21.	HONAVAR ELECTRODES, THANE	SILVER SHINE 316L	E 316L-16	FEB2024
22.	RAJRATNA ELECTRODES, AHMEDABAD	RATNA 308L	E 308L-16	MAR2020
23.	RAJRATNA ELECTRODES, AHMEDABAD	RATNA 316 L	E 316L-16	MAR2020
24.	MAILAM INDIA LTD., PUDUCHERRY	MAILEX-A	E 308-16	JUN2024
25.	MAILAM INDIA LTD., PUDUCHERRY	MAILEX-AL	E 308L-16	JUN2024
26.	MAILAM INDIA LTD., PUDUCHERRY	MAILEX-AL-15	E 308L-15	JUN2024
27.	MAILAM INDIA LTD., PUDUCHERRY	MAILEX-25/12	E 309-16	JUN2024
28.	MAILAM INDIA LTD., PUDUCHERRY	MAILEX-25/12-L	E 309L-16	JUN2024
29.	MAILAM INDIA LTD., PUDUCHERRY	MAILEX-25/12-Mo	E 309 Mo-16	JUN2024
30.	MAILAM INDIA LTD., PUDUCHERRY	MAILEX Mo	E 316-16	JUN2024
31.	MAILAM INDIA LTD., PUDUCHERRY	MAILEX MoL	E 316L-16	JUN2024
32.	ROYAL ARC ELECTRODES, VASAI,	ROYAL 1C	E 308L-16	OCT2024
33.	ROYAL ARC ELECTRODES, VASAI,	ROYAL 2C	E 316L-16	OCT2024

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Sr. No.	MANUFACTURERS	BRAND NAME	AWS No.	VALID UPTO
34.	ROYAL ARC ELECTRODES, VASAI,	ROYAL-D2L	E 309L-16	OCT2024
35.	WELD FAST ELECTRODES, NAGPUR	WELDFAST 308L	E 308L-16	JAN2021
36.	WELD FAST ELECTRODES, NAGPUR	WELDFAST 316L	E 316L-16	JAN2021
37.	WELD FAST ELECTRODES, NAGPUR	WELDFAST 309L	E 309L-16	JAN2021
38.	WELD FAST ELECTRODES, NAGPUR	WELDFAST 309MoL	E 309LMo-16	JAN2021

The approvals are granted in conformance to the requirements stipulated in latest edition of ASME Section II Part C. However, batch qualification wherever called for in specific cases, will have to be carried out separately.


 (Anoop Singh)
 ACE & Head QA (M-6)

Through: Shri A.K. Singh, AD (QA- Opns. & Group-1)


 17/12/19


 17/12/19

Executive Director (QA)


 17-12-19



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Nabhikiya Urja Bhavan, Anushaktinagar, Mumbai - 400 094.



3) LIST OF APPROVED BRANDS OF WIRE AND WIRE FLUX COMBINATION

(1 Page)

As on 17-12-2019

Sr. No.	MANUFACTURERS	BRAND NAME	AWS No.	VALID UPTO
1.	ADOR FONTECH, BENGALURU	TIG 120	ER 308L	OCT2024
2.	ADOR FONTECH, BENGALURU	TIG 121	ER 316L	OCT2024
3.	ADOR FONTECH, BENGALURU	TIG 123	ER 309L	OCT2024
4.	ADOR FONTECH, BENGALURU	TIG 120S	ER 347	OCT2024
5.	ADOR FONTECH, BENGALURU	TIG 521	ER NiCr3	OCT2024
6.	ADOR WELDING LTD., SILVASSA	TIGFIL 70S-2	ER 70S-2	FEB2022
7.	ADOR WELDING LTD., SILVASSA	TIGINOX-308L	ER 308L	SEP2020
8.	ADOR WELDING LTD., SILVASSA	TIGINOX-309L	ER309L	SEP2020
9.	ADOR WELDING LTD., SILVASSA	AUTOMIG 70-S6	ER 70S-6	DEC2023
10.	ADOR WELDING LTD., SILVASSA	AUTOMELT-B71 AUTOMELT-EH 14 WIRE	F7A2-EH14	FEB2024
11.	D&H INDIA LTD., INDORE	SUPER TIG 308L	ER 308L	DEC2020
12.	D&H INDIA LTD., INDORE	SUPER TIG 309L	ER 309L	DEC2020
13.	D&H SECHERON, INDORE	FILLER WIRE FW 308L	ER 308L	FEB2021
14.	D&H SECHERON, INDORE	FILLER WIRE FW 309L	ER 309L	FEB2021
15.	D&H SECHERON, INDORE	F 70 S2	ER 70S-2	JUN2022
16.	RAJRATNA ELECTRODES, AHMEDABAD	RAAJTIG ER 308L	ER 308L	MAR2020
17.	RAJRATNA ELECTRODES, AHMEDABAD	RAAJTIG ER 316L	ER 316L	MAR2020
18.	VENUS WIRES, KHOPOLI	VENUS 308L	ER 308L	SEP2021
19.	VENUS WIRES, KHOPOLI	VENUS 316L	ER 309L	SEP2021
20.	VENUS WIRES, KHOPOLI	VENUS 309L	ER 316L	SEP2021
21.	VENUS WIRES, KHOPOLI	VENUS 347	ER 347	SEP2021
22.	WELD FAST ELECTRODES, NAGPUR	TIG FAST-3	ER 70S-2	JAN2021
23.	WELD FAST ELECTRODES, NAGPUR	MIG FAST-1	ER 70S-6	JAN2021

The approvals are granted in conformance to the requirements stipulated in latest edition of ASME Section II Part C. However, batch qualification wherever called for in specific cases, will have to be carried out separately.

(Anoop Singh)

ACE & Head QA (M-6)

Through: Shri A.K. Singh, AD (QA- Opns. & Group-1)

Executive Director (QA)

रविशंकर गुजाल 13-12-19

कमलेश्वर गुजाल 17/12/19

श्रीराम 17/12/19

NPCIL approved Chemical & Mechanical testing labs

Annexure- I

Sr. No.	QA unit	Test Lab.	Suitable for material testing		
			Physical	Chemical	Micro
1	Noida	M/s R.K. Inspection & Testing Services C-42, Manak Vihar Ext.(Tihar), Subhash Nagar, New Delhi-110018. Phone no. 011 -28122201 Fax No. 011-25122517 E mail-info@rkits.co.in	1. 0 Physical Testing 1.1 Tensile testing at room temp. with extensometer 1.2 Impact testing as per ASTM E-23 standard 1.3 Hardness test (Brinell, Vickess, Rockwell, Microhardness up to 1000 grams) 1.4 Bend test, Flattening, Flaring, Proof load, Pull out load, Fillet test.	2.0 Chemical Testing - *2.1 Spectrometer analysis	3.0 Corrosion Test & Micro Examination 3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth measurement.
2	Noida	M/s SPECTRO E-41, Okhla Indl. Area, Phase-II, New Delhi-110020 Phone no. 011 -40522000 Fax No. 011-40503150 E mail-kd@spectro.in	1. 0 Physical Testing 1.1 Tensile testing at room temp. 1.2 Tensile testing at elevated temp. subject to availability of extensometer for 0.2% yield stress measurement. 1.3 Impact testing testing as per ASTM E-23 standard 1.4 Hardness test (Brinell, Vickess, Rockwell, Microhardness up to 1000 grams) 1.5 Bend test, Flattening, Flaring, Proof load, Pull out load, Fillet test.	2.0 Chemical Testing 2.1 Wet Analysis 2.2 Spectrometer analysis	3.0 Corrosion Test & Micro Examination 3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth measurement. 3.2 Mass of zinc coating 3.3 Paint thickness measurement

3	Noida	M/s IRC Engg. Services.India (P) Ltd. A-53,Sector-63, Noida, District : G.B.Nagar Phone no. 0120 -3352706 Fax No. 0120-4227940 E mail-	1. 0 Physical Testing *1.1 Tensile testing at room & elevated temp subject to availability of extensometer for 0.2% yield stress measurement. 1.2 Impact testing as per ASTM-E-23 standard 1.3 Hardness test (Brinell, Vickess, Rockwell, Microhardness up to 1000 grams) 1.4 Bend test, Flattening, Flaring, Proof load, Creep test, Stress rupture test, Pull out load, Fillet test.	2.0 Chemical Testing - ** 2.1 Spectrometer analysis	3.0 Corrosion Test & Micro Examination 3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth measurement.
4	Noida	M/s Inspection & Testing Engg., D-155,Sector-49. Noida, District :G.B.Nagar (UP), Pin-201 307 Phone no. 0120 -2500065 Fax No. 0120-4310675 E mail-	1. 0 Physical Testing 1.1 Hardness test (Brinell, Vickess, Rockwell, Microhardness up to 1000 grams) 1.2 Bend test, Flattening	2.0 Chemical Testing * 2.1 Spectrometer analysis	3.0 Corrosion Test & Micro Examination - Nil

5	Kolkata	M/s Metals& Minerals Testing Laboratories 30/A, Naraasingha Dutta Road, Howrah-711101 Kolkata-26 Phone no. 033 26673185 Fax No. 033 26779422 E mail-	1.0 Physical Testing 1.1 Tensile testing at room temp with extensometer. 1.2 Hardness test (Brinell, Vickess, Rockwell, Microhardness) 1.3 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt & Fillet test.	2.0 Chemical Testing * 2.1 Spectrometer analysis	3.0 Corrosion Test & Micro Examination 3.1 IGC practice A , Micro, Macro, Inclusion rating, Case depth measurement. 3.2 Mass of zinc coating 3.3 Paint thickness measurement
6	Kolkata	M/s Aglow Quality Control Laboratories Pvt.Ltd. P 47,Kasba Industrial Estate,Kolkatta-107 Phone no. 033 40089633 Fax No. 033 40625177 E mail-	1.0 Physical Testing 1.1 For Rubber Testing : Tensile, Hardness, elongation, adhesion, Tension & compression, abrasion, flexing, load deflection, hydro testing, aging.	2.0 Chemical Testing 2.1 For Rubber Testing: Rubber polymer content, hydrocarbon Content, neoprene rubber, identification of rubber, resistance to oil, density, analysis of ash. 2.2 Painting related tests(Abrasion, cohesion , adhesion , impact resistance, % elongation, etc.)	3.0 Corrosion Test & Micro Examination 3.1 Not Application

7	Kolkata	M/s ID & RL Pvt. Ltd. 33/2A,atish Mukherjee Road, Kolkatta-26 Phone no. 033 24644527 Fax No. 033 24644812 E mail-	1.0 Physical Testing 1.1 Tensile testing at room temp with extensometer. 1.2 Hardness test (Brinell, Vickess, Rockwell, Microhardness up to 1000 grams) 1.3 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt & Fillet test.	2.0 Chemical Testing 2.1 Wet Analysis * 2.2 Spectrometer analysis	3.0 Corrosion Test & Micro Examination 3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth measurement. 3.2 Mass of zinc coating 3.3 Paint thickness measurement
8	Kolkata	M/s Inspection Survey & Surveillance (India) Pvt. Ltd. 26D/27,Park Lane, Kolkatta-16 Phone no. 033 65454984 Fax No. 033 22297658 E mail- insurveylab@yahoo.com	1.0 Physical Testing 1.1 Tensile testing at room temp with extensometer. 1.2 Hardness test (Brinell, Vickess, Rockwell, Microhardness up to 1000 grams) 1.3 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld Fillet test.,	2.0 Chemical Testing * 2.1 Spectrometer analysis	3.0 Corrosion Test & Micro Examination 3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth measurement. 3.2 Mass of zinc coating 3.3 Paint thickness measurement
9	Kolkata	M/s TREATS, 14,Ramnath Pal Road, Kidderpore Kolkata-23 Phone no. 033 24584142 Fax No. 033 2495818 E mail-	1.0 Physical Testing 1.1 Tensile testing at room temp with extensometer. 1.2 Hardness test (Brinell, Rockwell, Microhardness up to 1000 grams)	2.0 Chemical Testing 2.1 Wet analysis * 2.2 Spectrometer analysis.	3.0 Corrosion Test & Micro Examination 3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth measurement.

			1.3 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld Fillet test.		3.2 Mass of zinc coating 3.3 Paint thickness measurement
10	Mumbai	M/s. TCR Engg. Services Pvt.Ltd., EL-182,TTC Ind.Area,Mahape, Vashi, Navi-Mumbai - 400 705, (India). Phone no- 27610921/22/23 Fax no.- 2761 2044 Email- sales@tceng.com	1.0 Physical Testing 1.1 Tensile testing at room temp with extensometer. 1.2 Impact test as per ASTM E-23 Standard. 1.3 Hardness test (Brinell, Vickess, Rockwell, Microhardness upto 1000 grams. 1.4 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld ,Fillet test, Reverse bend test	2.0 Chemical Testing 2.1 Wet analysis * 2.2 Spectrometer analysis	3.0 Corrosion Test & Micro Examination 3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth Measurement, ferrite content measurement 3.2 Mass of zinc coating
11	Mumbai	M/s. Subodh Technologiists R-874, M.I.D.C.,Rabale , Navi Mumbai - 400 701. Phone no- 27690817 Fax no.- 27690817 Email- sudhakar@subodhlabs.com	1.0 Physical Testing 1.1 Tensile testing at room temp with extensometer. 1.2 Hardness test (Brinell, Vickess, Rockwell, Microhardness up to 1000 grams 1.3 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld Fillet test.	2.0 Chemical Testing * 2.1 Spectrometer analysis	3.0 Corrosion Test & Micro Examination 3.1 IGC practice A &E, Micro, Macro, Inclusion rating, 3.2 Mass of zinc coating
12	Mumbai	M/s Geo Chem Laboratories Pvt Ltd., (Mumbai) 36, Raja Industrial Estate, Purushottam Kheraj Marg, Mulund (W), Mumbai 400 080. Phone no- 67974999 Fax no.- 67974616 Email-	1.0 Physical Testing 1.1 Tensile testing at room temp with extensometer. 1.2 Hardness test (Brinell, Vickess, Rockwell) 1.3 Bend Test, Flattening, Flarring,	2.0 Chemical Testing 2.1 Wet analysis * 2.2 Spectrometer analysis	3.0 Corrosion Test & Micro Examination 3.1 IGC practice A &E, Case depth Measurement, Micro, Macro 3.2 Mass of zinc coating

		laboratory@geochemgroup.com	Proof Load for nuts		
13	Mumbai	M/s. Jewel Metallochem Laboratory Pvt. Ltd., A-12, Ghatkopar Indl. Estate, Ghatkopar (W), Mumbai 400 086. Phone no. 25007745 Fax No. 25001263 E mail- info@jewelmetalchem.com jewelmetal@rediffmail.com www.jewelmetalchem.com	1.0 Physical Testing 1.1 Tensile testing at room temp with extensometer. 1.2 Impact test as per ASTM E-23 Standard. 1.3 Hardness test (Brinell, Vickers, Rockwell, Microhardness 50 to 1000 grams. 1.4 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld Fillet test, Reverse bend test	2.0 Chemical Testing 2.1 Wet analysis * 2.2 Spectrometer analysis	3.0 Corrosion Test & Micro Examination 3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth measurement. 3.2 Mass of zinc coating
14	Mumbai	M/s. Metallurgical Services, Mehta House, Ashok Silk Mills Lane, L.B.S. Marg, Ghatkopar (W), Mumbai 400 086. Phone no. 25000240 Fax No. 25001740 E mail- info@metallurgicallab.com metallurgicalservices@gmail.com www.metallurgicallab.com	1.0 Physical Testing 1.1 Tensile testing at room & elevated temp with extensometer. 1.2 Impact test as per ASTM E-23 Standard. 1.3 Hardness test (Brinell, Vickers, Rockwell, Microhardness 50 to 1000 gm 1.4 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld Fillet test, Creep test, Fracture toughness and stress rupture test, Reverse bend test , Fatigue test	2.0 Chemical Testing 2.1 Wet analysis * 2.2 Spectrometer analysis	3.0 Corrosion Test & Micro Examination 3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth measurement, ferrite content measurement 3.2 Mass of zinc coating

15-A	Mumbai	M/s Elca Laboratories Plot No.A-444, Road No.37, (Off Road No.28) Near Rubber Products, Wagle Estate, Thane – 400 094. Phone no. 25824499 Fax No. 25825394 E mail- info@elcalabs.com www.elcalabs.com	1.0 Physical Testing 1.1 Tensile testing at room temp with extensometer. 1.2 Hardness test (Brinell, Vickess, Rockwell, Microhardness 50 to 1000 grams. 1.3 Bend test, Flattening, Flaring, Proof load for nuts, Pull out load, Fillet test.	2.0 Chemical Testing 2.1 Wet analysis * 2.2 Spectrometer analysis	3.0 Corrosion Test & Micro Examination 3.1 IGC practice A & E, Micro, Macro 3.2 Mass of zinc coating
15-B	Mumbai	Elca Laboratories, Unit-II, W-361, TTC Industrial Area, MIDC, Rabale, Navi Mumbai- 400701 25824499 25822047 25823142 25833410 Fax No. 25825394 E mail- rabale@elcalabs.com	1.0 Physical Testing 1.1 Tensile testing at room temp with extensometer 1.2 Impact testing 1.3 Hardness test (Brinell, Vickess, Rockwell, Microhardness. 1.4 Bend test, Flattening, Flaring, Proof load for nuts, Pull out load, Fillet test.	2.0 Chemical Testing 2.1 Spectrometer analysis	3.0 Corrosion Test & Micro Examination 3.1 IGC practice A
16	Mumbai	M/s Metal Analysis & Services Pvt.Ltd., 219, Bussa Udyog Bhavan, Tokersey Jivraj Road, Sewree (W), Mumbai 400 015. Phone no. 24131160 Fax No. 66624514 E mail- hmj@bom7.vsnl.net.in	1.0 Physical Testing 1.1 Tensile testing at room temp with extensometer. 1.2 Hardness test (Brinell, Vickess, Rockwell, Microhardness upto 1000 grams. 1.3 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld Fillet test, Reverse bend test	2.0 Chemical Testing 2.1 Wet analysis * 2.2 Spectrometer analysis	3.0 Corrosion Test & Micro Examination 3.1 IGC practice A &E, Micro, Macro 3.2 Mass of zinc coating
17	Mumbai	M/s Offshore Testing &	1.0 Physical Testing	2.0 Chemical Testing	3.0 Corrosion Test & Micro

		Inspection Services (India) Pvt .Ltd., W-147, M.I.D.C., Pawane, Thane Belapur Road, Navi-Mumbai 400 710. Tel. 022 4144414 /15/16/17 Fax : 022 27633982 /25560401	1.1 Tensile testing at room temp with extensometer. 1.2 Impact test as per ASTM E-23 Standard. 1.3 Hardness test (Brinell, Vickess, Rockwell) 1.4 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld Fillet test	2.1 Wet analysis * 2.2 Spectrometer analysis	Examination 3.1 IGC practice A & E
18	Mumbai	M/s Reliable Testing Services, Unit Number 59, 2nd floor, Bindal Industrial Estate, Kurla Andheri Road, Sakinaka, Mumbai 400 072. Phone no. 28516406 Fax No. 42154942 E mail- reliable1983@rediffmail.com www.reliabletestingservices.com	1.0 Physical Testing 1.1 Tensile testing at room temp with extensometer.	2.0 Chemical Testing 2.1 Spectrometer analysis	3.0 Corrosion Test & Micro Examination 3.1 Mass of zinc coating 3.2 IGC practice A & E

19	Mumbai	M/s. Soham Analytical Services, A-121/101, B33/35, Amargian Industrial Estate, Pokhran Road No.1, Khopoli, Thane (W), Maharashtra. Tel. 022-25471297/93/94 Fax : 022 25471295 Email : lab_support@sohmanalytical.com	1.0 Physical Testing 1.1 Tensile testing at room temp with extensometer. 1.2 Impact test as per ASTM E-23 Standard. 1.3 Hardness test (Brinell, Vickers, Rockwell, Microhardness) 1.4 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld, Fillet test, Reverse bend test, Through thickness tensile test, Nick break test (pipes), Compression test	2.0 Chemical Testing 2.1 Wet analysis 2.2 Spectrometer analysis	3.0 Corrosion Test & Micro Examination 3.1 IGC practice A & E, Micro, Macro, Inclusion rating, Case depth Measurement, Ferrite content 3.2 Mass of zinc coating 3.3 Hydrogen Induced corrosion test, Ferrite Chloride pitting & crevice corrosion test
20	Chennai	M/s Chennai Mettlex Lab P.Ltd. Jyothi Complex, No.83, M .K.N.Road, Guindy , Chennai – 600 032 Ph. 044-22323163, 42179490/91 Fax :044-43534270 email address test@mettlexlab.com	1.0 Physical Testing 1.1 Tensile testing at room temp with and without extensometer. ** 1.2 Impact test as per ASTM E-23 Standard. 1.3 Hardness test (Brinell, Vickers, Rockwell) and Microhardness 1.4 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld Fillet test, Reverse bend test 1.5 Tensile testing of rubber material	2.0 Chemical Testing * 2.1 Spectrometer analysis 2.2 Polymer identification (rubber)	3.0 Corrosion Test & Micro Examination 3.1 Micro, Macro, Inclusion rating, Case depth measurement. 3.2 Mass of zinc coating

21	Chennai	M/s Micro Lab, SP.101, 2 nd Main Road , Ambattur Industrial Estate, Chennai – 600 058 Ph. 044-26242525, Fax :044-26244872 E mail: cre@micrilabchennai.com	1.0 Physical Testing 1.1 Tensile testing at room temp with and without extensometer. 1.2 Tensile testing at elevated temp with and without extensometer. 1.3 Impact test as per ASTM E-23 Standard. 1.4 Hardness test (Brinell, Vickess, Rockwell) and Microhardness 1.5 Bend test, Flattening, Flaring, Proof load, Pull out load, Reverse bend test	2.0 Chemical Testing 2.1 Spectrometer analysis (OES)	3.0 Corrosion Test & Micro Examination 3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth measurement. 3.2 Mass of zinc coating
22	Chennai	M/s. Commando Lab No. 3A 5 th South Street, Avarampalayam, Coimbatore 641 006 Phone : 0422 2560907	1.0 Physical Testing 1.1 Tensile testing at room temp with extensometer as applicable. 1.2 Hardness test (Brinell, Vickers, Rockwell) 1.3 Bend test, Reverse bend test, Flattening test, Flaring test, Proof load test, Pull out load test.		

23	Bangaluru	M/s Geological and Metallurgical Laboratories (GML) 105X, 3rd Main, 3rd Cross, II Stage, Yeshwanthpur Indl. Suburb, Goraguntepalya, BANGALORE - 560 022 Ph. 2347 1065 , 2347 2020 Fax 2347 1011	1.0 Physical Testing 1.1 Tensile testing at room temp with extensometer. 1.2 Hardness test (Brinell, Vickess, Rockwell, Microhardness upto 1000 grams. 1.3 Bend test, Flattening, Flaring , Proof load, Pull out load, Butt weld Fillet test, Reverse bend test	2.0 Chemical Testing 2.1 Wet analysis * 2.2 Spectrometer analysis.	3.0 Corrosion Test & Micro Examination 3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth measurement. 3.2 Mass of zinc coating 3.3 Paint thickness measurement
24	Baroda	M/s Met Heat Engineers Pvt. Ltd, Vadodara 857/2,G.I.D.C. Industrial Estate, Makarpura , Vadodara -390 010 Ph. (0265)2643655, 3046493, 6548715-16 Fax email address: info@metheat.com	1.0 Physical Testing 1.1 Tensile testing at room temp with extensometer. 1.2 Impact test as per ASTM E-23 Standard. 1.3 Hardness test (Brinell, Vickess, Rockwell, Microhardness upto 1000 grams. 1.4 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld Fillet test, Reverse bend test	2.0 Chemical Testing 2.1 Wet analysis * 2.2 Spectrometer analysis	3.0 Corrosion Test & Micro Examination 3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth measurement. 3.2 Mass of zinc coating 3.3 Paint thickness measurement

25	Baroda	M/s TCR Advanced Engineering Pvt. Ltd. , 36/2/9, First Floor, Abhishek Complex, GIDC Estate, Makarpura, Vadodara-390 010 Ph. 0265 2657233, 2634375 Fax 0265 2643024 email address	1.0 Physical Testing 1.1 Tensile testing at room temp with extensometer. 1.2 Impact test as per ASTM E-23 Standard. 1.3 Hardness test (Brinell, Vickess, Rockwell, Microhardness upto 1000 grams. 1.4 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld Fillet test, Reverse bend test	2.0 Chemical Testing 2.1 Wet analysis * 2.2 Spectrometer analysis	3.0 Corrosion Test & Micro Examination 3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth measurement. 3.2 Mass of zinc coating 3.3 Paint thickness measurement
26	Pune	M/s Elca Quality Systems & Calibration Pvt.Ltd. S.Np. 232/2, Pune Nasik Road, Bhosari, Pune 411 039. Phone no.-020 27129194, 27125024 e-mail- qc@elcalabs.com	1.0 Physical Testing 1.1 Cold/Hot tensile 1.2 Impact test as per ASTM E-23 Standard. 1.3 Hardness/Bend/Flattening etc.	2.0 Chemical Testing 2.1 Spectro 2.2 Wet	3.0 Corrosion Test & Micro Examination 3.1 IGC 3.2 Micro/Macro 3.3 Coating thickness etc.
27	Pune	M/s Perfect Laboratory Services, 58,59/13,14/Unit 2 DII Block, MIDC, Chinchwad, Pune 411 019. Phone no.-020 27458150, 27454716 e-mail- trust_perfectlab@yahoo.com	1.0 Physical Testing 1.1 Room temperature Tensile testing 1.2 Impact test as per ASTM E-23 Standard. 1.3 Hardness/Bend/Flattening etc.	2.0 Chemical Testing 2.1 Spectro 2.2 Wet	3.0 Corrosion Test & Micro Examination 3.1 IGC 3.2 Micro/Macro 3.3 Coating thickness etc.

28	Hyderabad	M/s. Jyothi Spectro Analysis (P) Ltd., A-30, APIE, Balanagar, Hyderabad 500 037. Tel. No. 040- 23771193 23771194 23773676 23778042 E-mail : sdsingh@jyothispectro.com	1.0 Physical Testing : 1.1 Hardness test (Brinell, Vickers, Rockwell) 1.2 Bend test, Flattening, Flaring, Pull out load, Proof load test and Fillet test.	2.0 Chemical testing 2.1 Spectrometer analysis for low carbon, alloy steels, ASS and aluminium bronze.	3.0 Corrosion Test & Micro Examination 3.1 IGC Practice A&E, Micro, macro, Inclusion rating. 3.2 Mass of zinc coating.
29	Hyderabad	M/s. Lucid Laboratories (P) Ltd., B-1/A, TIE, Phase II, Balanagar, Hyderabad 500 037. Te. No. 040-23720678 23720680 23720681 23720406 E-mail : info@lucidlabsindia.com lucidlabs@rediffmail.com	1.0 Physical Testing : 1.1 Hardness test (Vickers, Rockwell) 1.2 Bend test, Flattening and Fillet test.	2.0 Chemical testing 2.1 Spectrometer analysis for low carbon, alloy steels and ASS	3.0 Corrosion Test & Micro Examination 3.1 Mass of zinc coating.



न्यूक्लियर पावर कॉर्पोरेशन ऑफ इंडिया लिमिटेड

(भारत सरकार का उद्यम)

NUCLEAR POWER CORPORATION OF INDIA LTD.

(A Government of India Enterprise)

गुणवत्ता आश्वासन निदेशालय

Directorate of Quality Assurance

नाभिकीय ऊर्जा भवन, अणुशक्तिनगर, मुंबई-400 094

Nabhikiya Urja Bhavan, Anushaktinagar, Mumbai - 400 094.

Corporate Identification No. U40104MH1987GOI149458



आर.के. गुप्ता R.K. Gupta

अधिशाली निदेशक (गु.आ.) Executive Director (QA)

Phone: 022- 25995030/25558487

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सं. No. एनपीसीआईएलNPCIL/02500/क्यूएडीQAD/ईडीED(क्यूएQA)/एमएम/2019/1160

December 17, 2019

विषय : वेधी पदार्थों के अनुमोदित ब्रांड की सूची।

Sub: List of approved brands of penetrant materials

17-12-2019 की स्थिति में एनपीसीआईएल के उपयोग हेतु वेधी पदार्थों के अनुमोदित ब्रांड की सूची इसके साथ संलग्न है। यह अनुमोदन हमारी प्रक्रिया संख्या QAD/NDT-PROC-PT-05 (तरल वेधी परीक्षण के लिए उपयोग में आने वाले रसायन परिवार के अनुमोदन हेतु प्रक्रिया) के अनुसार आवश्यकताओं के अनुरूप प्रदान किया जाता है।

The list of approved brands of penetrant materials for use on NPCIL jobs as on 17-12-2019 is enclosed herewith. The approvals are granted in conformance to the requirements as per our procedure no. QAD/NDT-PROC-PT-05 (Procedure for approval of Family of Chemicals used for Liquid Penetrant Examination).



(आर.के. गुप्ता R. K. Gupta)

अधिशाली निदेशक (गु.आ.) Executive Director (QA)



न्यूक्लियर पावर कॉर्पोरेशन ऑफ इंडिया लिमिटेड

(भारत सरकार का उद्यम)

NUCLEAR POWER CORPORATION OF INDIA LTD.

(A Government of India Enterprise)

गुणवत्ता आश्वासन निदेशालय

Directorate of Quality Assurance

नाभिकीय ऊर्जा भवन, अणुशक्तिनगर, मुंबई-400 094

Nabhikiya Urja Bhavan, Anushaktinagar, Mumbai - 400 094.



LIST OF APPROVED PENETRANT TESTING MATERIAL

(As on 17-12-2019)

Sr. No.	Manufacturers	Brand name	Description	Valid up to
1.	DYEGLO PVT. LTD, PUNE	RP-81	Red Coloured Solvent Removable Penetrant	DEC2023
2.	DYEGLO PVT. LTD, PUNE	RP-90	Red Coloured Water Washable Penetrant	DEC2023
3.	DYEGLO PVT. LTD, PUNE	CL-01	Solvent Cleaner	DEC2023
4.	DYEGLO PVT. LTD, PUNE	RD-01	Solvent Base Developer suitable for RP-81 & RP-90	DEC2023
5.	DYEGLO PVT. LTD, PUNE	FP-01	Fluorescent Solvent Removable Penetrant	DEC2023
6.	DYEGLO PVT. LTD, PUNE	WD-01	Solvent Base Developer suitable for FP-01.	DEC2023
7.	FERROCHEM NDT SYSTEM PVT. LTD. PUNE	FC-911, FC-811 FC-711	Solvent Removable (Visible)	FEB2022
8.	FERROCHEM NDT SYSTEM PVT. LTD. PUNE	FC-931, FC-811	Water Washable (Visible)	FEB2022
9.	FERROCHEM NDT SYSTEM PVT. LTD. PUNE	FC-941, FC-821	Water washable (Fluorescent)	FEB2022
10.	FERROCHEM NDT SYSTEM PVT. LTD. PUNE	FC-921, FC-821, FC-721	Solvent removable (Fluorescent)	FEB2022
11.	MAGNAFLUX ITW INDIA PVT.LTD.SECUNDERABAD	SKL-SP 1	Red Coloured Solvent Removable Penetrant	JUL2024
12.	MAGNAFLUX ITW INDIA PVT.LTD.SECUNDERABAD	SKC-1	Solvent Cleaner	JUL2024
13.	MAGNAFLUX ITW INDIA PVT.LTD.SECUNDERABAD	SKD-S2	Solvent Base Developer	JUL2024
14.	MAGNAFLUX ITW INDIA PVT.LTD.SECUNDERABAD	SKL-WP2	Red Coloured Water Washable Penetrant	JUL2024
15.	MAGNAFLUX ITW INDIA PVT.LTD.SECUNDERABAD	SKL-SP2	Red Coloured Solvent Removable Penetrant.	JUL2024
16.	MR CHEMIE INDIA PVT. LTD., HYDERABAD.	MR ^(R) 62	Solvent Removable Penetrant-Red	JAN2021
17.	MR CHEMIE INDIA PVT. LTD., HYDERABAD.	MR ^(R) 68 NF	Solvent Removable and Water Washable Penetrant-Red	JAN2021
18.	MR CHEMIE INDIA PVT. LTD., HYDERABAD.	MR ^(R) 67	Solvent Removable and Water Washable Penetrant-Red	JAN2021
19.	MR CHEMIE INDIA PVT. LTD., HYDERABAD.	MR ^(R) 672 F	Solvent Removable and Water Washable Penetrant-Fluorescent	JAN2021
20.	MR CHEMIE INDIA PVT. LTD., HYDERABAD.	MR ^(R) 85	Solvent Remover suitable for MR ^(R) 68NF, MR ^(R) 67, MR ^(R) 672F and MR ^(R) 62.	JAN2021
21.	MR CHEMIE INDIA PVT. LTD., HYDERABAD.	MR ^(R) 70	Non-Aqueous Developer suitable for MR ^(R) 68 NF, MR ^(R) 67 and MR ^(R) 672F	JAN2021

Sr. No.	Manufacturers	Brand name	Description	Valid up to
22.	MR CHEMIE INDIA PVT. LTD., HYDERABAD.	MR ^(R) 70 I	Non-Aqueous Developer suitable for MR ^(R) 62.	JAN2021
23.	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PP-15/PP-15B	Red Coloured Solvent Removable Penetrant	SEPT2021
24.	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PP-19/PP-19B	Red Coloured Water Washable Penetrant	SEPT2021
25.	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PC-21/PC-21B	Solvent Cleaner	SEPT2021
26.	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PD-31/PD-31B	Solvent Base Developer	SEPT2021
27.	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PP-110/ PP110B	Red Coloured Solvent Removable Penetrant	SEPT2021
28.	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PC 120/ PC-120B	Solvent Cleaner	SEPT2021
29.	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PD 130 /PD-130B	Solvent Base Developer	SEPT2021
30.	P-MET HIGH TECH CO. PVT. LTD., VADODARA	FPS46/FPS46B	Solvent Removable Fluorescent Penetrant	SEPT2021
31.	P-MET HIGH TECH CO. PVT. LTD., VADODARA	FPS49/FPS49B	Water Washable Fluorescent Penetrant	SEPT2021
32.	PRADEEP METAL TREATMENT CHEMICALS PVT. LTD., THANE	Flaw Guide Penetrant (NP Grade)	Red Coloured Solvent Removable Penetrant.	OCT2024
33.	PRADEEP METAL TREATMENT CHEMICALS PVT. LTD., THANE	Flaw Guide Cleaner (NP Grade)	Solvent Cleaner	OCT2024
34.	PRADEEP METAL TREATMENT CHEMICALS PVT. LTD., THANE	Flaw Guide Developer (NP Grade)	Solvent Base Developer	OCT2024
35.	PRADEEP METAL TREATMENT CHEMICALS PVT. LTD., THANE	Flaw Guide Red Dye Penetrant-W	Water Washable Dye Penetrant	OCT2024

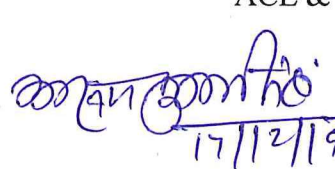
Note:-

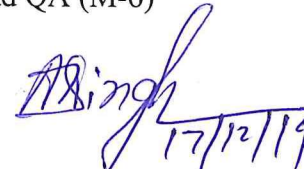
1. Halogen content in Penetrant, Cleaner and Developer is 25ppm (max) and Sulphur content is 500ppm (max). However when using penetrant materials for Austenitic Stainless Steel, Titanium, Nickel base or other high temperature alloys, Halogen and Sulphur content shall not exceed 25ppm. Manufacture has to mention for each batch, the Sulphur and Halogen content in the label of each container for selection of Penetrant materials for the stated application.
2. Developer is to be used in Aerosol can to get the best results.


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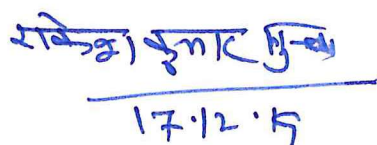
(Anoop Singh)
ACE & Head QA (M-6)

Through: Shri A.K. Singh, AD (QA- Opns. & Group-1)


17/12/19


17/12/19

Executive Director (QA)


17.12.19