

Pre-Qualification requirements for GAS TYPE DIAL THERMOMETER as per specification TG60745

Description:

Gas actuated dial thermometer is used for measuring temperature in primary water and seal oil system of turbo generator. It comprises of bourdon tube, bezel ring, glass, shank and dial. It should be of very reliable and proven design to measure the temperature in all operating conditions.

- 1.0** The vendor should be a regular manufacturer of such dial thermometer with following requirements-

Sr. No.	Parameter	Value
(i)	Dial size (mm)	100 (minimum)
(ii)	Scale	Degree C
(iii)	Range	0 to 50 (minimum)
(iv)	Accuracy	±1 % of Full Scale Deflection

- 2.0** In support of above sl. no. 1, vendor shall furnish technical details in below mentioned format for at least five (5) nos. of dial thermometer for the P.O. executed in past 5 years (from date of enquiry) along with P.O. copies.

S. No.	Brief technical details	Application	Name & address of customer	Date of supply
	<ul style="list-style-type: none"> - Application fluid - Working pressure and temperature - Dial size - Measuring range, scale, accuracy - Material of case/bourdon tube/ bezel ring etc. 	De-mineralized water, oil & gas		

- 3.0** Vendor to furnish the test certificate for accuracy, calibration test and type test as per EN13190 against any one of the P.O. submitted as per clause 2. Test certificates must be clearly correlated with P.O.
- 4.0** Vendor to furnish acceptance certificate from one of the end users of dial thermometer against any one of the P.O. submitted as per clause 2. (Original Certificate or through e-mail directly from the customer). Acceptance certificate should contain information like item details and its application or correlation with P.O.

Note: BHEL reserves the right to verify information submitted by vendor. In case the information is found to be false / incorrect, the offer shall be rejected.

NUCLEAR POWER CORPORATION OF INDIA LTD.

(A Government of India Enterprise)

CHECKLIST & RECOMMENDATION FOR EVALUATION OF VENDORS

Tender No :

Item/Package : TG Island

Name of Main Contractor : BHEL, Haridwar

Address and contact details of Main Contractor : Heavy Electrical Equipment Plant, BHEL
Ranipur, Haridwar, Uttarakhand-249403,
Contact:- 01334-281363

Name of Sub-contractor/Vendor :

Business address of Sub-contractor :

Factory address of Sub-contractor :

Items for which approval is sought :

1.0 General:

- 1.1) Key Personnel contacted :
- a) Senior Management :
- b) Quality Co-ordinator :
- c) Others (Production, Planning etc.) :

FOLLOWING ARE TO BE COMMENTED

- 1.2) Recognition details if any code
Stamps like U1, U2, ASME N,
NPI or certification Like ISO :
9001, 14000 etc. (Verify the
records)
- 1.3) Floor space availability for present
Activities/for future expansion :
- a) Indoor :
- b) Outdoor :

- 1.4) Level of House keeping :
- 1.5) Whether NPC jobs executed earlier :
- Whether BHEL jobs executed earlier for same item :
- Whether BHEL jobs executed earlier for similar item :
- Other than BHEL/NPC experience :
- 1.6) Delivery Performance (Schedule vs Actual) (Verify records) :

2.0 Technical

- 2.1) Quality Control
 - (a) Incoming Material Inspection :
 - (b) Process Inspection :
 - (c) Final Inspection :
 - (d) Manufacturing flow chart in detail along with outsourcing of items/operations :
- 2.2) Plant & Machinery :
 - (a) General condition & Age :
 - (b) Confirms to the details submitted in application :
- 2.3) Calibration facilities :
- 2.4) Calibration records :
- 2.5) NDE Qualification records :
- 2.6) Is there a system of selecting/short listing Sub-vendors? :
- 2.7) Availability of Testing facilities (details to be submitted) :

- 2.8) Whether working of following are satisfactory?
- (a) Production :
- (b) Quality control :
- 2.9) Understanding of scope of work :
- 2.9.1) Understanding of technical requirement of Job :
- 2.10) Availability and understanding of related standards. :
- 2.11) Capacity of the Vendor to fabricate and inspect :
- 2.12) Understanding of special Examination/ Testing (like ultrasonic Examination/ Helium Leak testing, Optical alignment testing etc.) :
- 2.13) Availability of special facilities :
- 2.14) Facilities/Machineries/testing equipment available in the shop floor to meet technical requirement of the job :
- 2.15) Qualified and experience Manpower in the shop floor to execute the specified job :

3.0 Quality System :

- 3.1) If ISO certified, check the availability and accessibility of Quality system manual :
- 3.2) Validity of ISO certification :
- 3.3) Whether Quality Control plan and Procedures are prepared? :
- 3.4) Whether organisation chart is available? :

- 3.5) What is the level of Quality Control in the organisation? :
- 3.6) Whether working of following are Satisfactory?
- (a) Document control :
- (b) Process Control :
- (c) Non-conformances control :
- 3.7) Whether Internal Quality Audits are carried out? :
- 3.8) Whether non-conformities during Internal Audits are recorded and disposed off following laid down procedure? :
- 4.0 Financial Details (Previous three years) :

5.0 Assessment

5.1 Understanding and interpretation by vendor

Sl No	Area of Assessment	Observation	Remark
1	Scope of work		
2	Related standard		
3	Construction features		
4	Functional Requirement		

5.2 Capability of Vendor

Sl No	Area of Assessment	Observation	Remark
1	To design/develop		
2	To fabricate		
3	To inspect		
4	Specify remark on the capability of vendor to execute the job		

5.3 Comments if any w.r.t. delivery schedules: NA

5.4 Comments if any on quality of product: NA

6.0 Conclusion: Vendor is capable for meeting the requirement, hence acceptable to BHEL.

Signatures of BHEL evaluation Team Members

Sl No	Name (Mr.)	Designation	Signature & Date
1			
2			
3			

GENERAL QUALITY REQUIREMENTS FOR NPCIL GHAVP & KAIGA PROJECT

Vendors to confirm the followings points for enquired items/materials pertaining to NPCIL project.

S. No.	Clause	Descriptions	Vendor's response (Yes/No/Not applicable)
1	5.1	All material shall be procured from the manufacturer and not from Trader.	
2	5.1	All material used or supplied under this contract shall carry suitable identification marks.	
3	5.2	All fabrication processes are controlled and accomplished by qualified personnel using BHEL/NPCIL approved qualified procedures.	
4	5.2	Supplier to maintain a weld book for all welding related activities for records.	
5	5.2	WPS/PQR/WPQ shall be verified/approved by BHEL & NPCIL before start of the welding activity.	
6	5.4	Record of stage wise inspection record (surface preparation, primer application, each coat of paint) shall be maintained. Paint thickness shall be within 10% of the dry film thickness specified.	
7	5.7	WPS/WPQR/Welder qualification/NDE procedure/Heat Treatment/Hydrostatic pressure test/Vacuum Test/Painting/Special process/Test procedure (if any) shall be verified/approved by BHEL & NPCIL (if required) before start of activity.	
8	6.0	Chemicals used for LPT shall be from NPCIL approved brands only (attached).	
9	6.0	Welding consumables shall be from NPCIL approved brand list (attached). However, lot testing of each batch of welding consumables shall have to be carried out separately before use in the job for meeting the requirements of respective specification and code. Vendor to provide TC for the same.	
10	6.0	Brazer and Brazing procedure qualification shall be BHEL and NPCIL verified/approved (if applicable).	
11	6.0	Casting shall be procured from NPCIL/BHEL approved foundries (if applicable).	

In case vendor gives response as "No", vendor to provide reason/justification of same for BHEL review. If above activity/clause is not relevant to any item/product, vendor to provide response as "Not applicable". In case of ambiguity, vendor to comment and take clarification from BHEL during offer evaluation.



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-400094
Corporate Identification No. U40104MH1987GOI149458



थॉमस मैथ्यू Thomas Mathew

उत्कृष्ट वैज्ञानिक Outstanding Scientist

अधिकासी निदेशक (गुणवत्ता आश्वासन) Executive Director (QA)

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संख्या /No. NPCIL/ED (QA)/2023/M/152

तिथि: 12th July, 2023

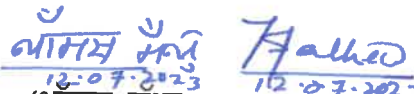
Sub: Updated List of approved brands of welding consumables

The lists of approved brands of welding consumables for use on NPCIL jobs as on 12.07.2023 are enclosed herewith:

- 1) List of approved Carbon steel & Low Alloy Steel Welding Electrodes (2 sheets)
- 2) List of approved Stainless Steel & other Ni Alloy electrodes (2 Sheets)
- 3) List of Approved Brands of Wire and Wire flux combination (2 Sheets)

The approvals are granted in conformance to the requirements stipulated in procedure for approval of Welding Consumables (QAD/Proc/Welding Consumables/002 Rev2) 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.

For use in nuclear application, welding consumable manufacturing requirement shall be as per lot class C3 /S2 as per ASME Section II Part C and any other specific requirements mentioned in purchase document.


(थॉमस मैथ्यू Thomas Mathew)
Executive Director (QA)

1). LIST OF APPROVED CARBON STEEL AND LOW ALLOY STEEL ELECTRODES AS ON 03-07-2023



SR. NO	MANUFACTURERS	BRAND NAME	AWS NO.	VALID UP TO
1.	ADOR WELDING LIMITED, SILVASSA	MOLYTEN	E7018-A1	July 2026
2.	ADOR WELDING LIMITED, SILVASSA	CROMOTEN	E 8018 B2	July 2026
3.	ADOR WELDING LIMITED, SILVASSA	CROMOTEN C	E 9018 B3	July 2026
4.	ADOR WELDING LIMITED, SILVASSA	TENALLOY Z PLUS	E7018-1	Jul 2027
5.	ADOR WELDING LIMITED, SILVASSA	SUPABASE X PLUS	E7018	Feb 2024
6.	ADOR FONTECH LIMITED, BENGALURU	LH511	E NiCu7	Dec 2025
7.	ADOR FONTECH LIMITED, BENGALURU	LH-521	NiCrFe3	Dec 2025
8.	SUPERON SCHWEISSTECHNIK INDIA LTD, DELHI	SUPERON 7018S (SUPERCITO)	E7018-1	Jun 2026
9.	SUPERON SCHWEISSTECHNIK INDIA LTD, DELHI	SUPERON 7018 (SUPERCITO)	E7018	Jun 2026
10.	SUPERON SCHWEISSTECHNIK INDIA LTD, DELHI	SUPERON 6013S (OVERCORD S)	E6013	Jun 2026
11.	HONAVAR ELECTRODES PVT. LTD, THANE	Ultimate-18SPL	E 7018-1	Sep 2025
12.	HONAVAR ELECTRODES PVT. LTD, THANE	Ultimate-18	E 7018	Sep 2025
13.	HONAVAR ELECTRODES PVT. LTD	Regular S	E 6013	Sep 2025
14.	ROYAL ARC ELECTRODES LTD, VASAI	ROYAL THERM SPL.	E 7018-1	Mar 2027
15.	RAAJARATNA ELECTRODES PVT. LTD, AHMEDABAD	RATNA 7018 SPL E 7018-1	E 7018-1	Feb 2025
16.	RAJRATNA ELECTRODES PVT LTD , AHMEDABAD	RATNA 7018	E7018	NOV 2023
17.	MAILAM INDIA LTD, PUDUCHERRY	MAILARC-1 CR	E 8018-B2	Jun 2024
18.	MAILAM INDIA LTD, PUDUCHERRY	MAILARC-18 PLUS	E-7018-1	May 2026
19.	MAILAM INDIA LTD, PUDUCHERRY	MAILARC-2 CR	E 9018-B3	Jun 2024
20.	D&H SCHERON ELECTRODE Pvt. Ltd, Indore	SUPERTHERME(SPL)	E7018-1	NOV 2023
21.	D&H SCHERON ELECTRODE Pvt. Ltd, Indore	EXOBEL	E6013	May 2026
22.	D&H SCHERON ELECTRODE Pvt. Ltd, Indore	MEDIO	E6013	May 2026
23.	D&H SCHERON ELECTRODE Pvt. Ltd, Indore	SUPRATHERME	E7018	May 2026
24.	D&H SCHERON ELECTRODE Pvt. Ltd, Indore	MOLYTHERME	E7018-A1	May 2026
25.	Weld fast Electrodes Pvt Ltd, Nagpur	WELDFAST LH-18	E7018	August 2026
26.	Weld fast Electrodes Pvt Ltd, Nagpur	WELDFAST LH-18-1	E7018-1	August 2026

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Part C. However, batch qualification wherever called for in specific cases, will have to be carried out separately.

For use in nuclear application the welding consumable manufacturing requirement shall be as per lot class C3 as per ASME Section II Part C.



 
12.07.2023
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Executive Director (QA)

2). LIST OF APPROVED STAINLESS-STEEL & OTHER ALLOY ELECTRODES AS ON 03-07-2023


SR. NO	MANUFACTURER	BRAND NAME	AWS No.	VALID UP TO
1.	ADOR WELDING LIMITED, SILVASSA	BETANOX-DL	E309L-16	July 2026
2.	ADOR WELDING LIMITED, SILVASSA	SUPERINOX-2C	E316L-16	July 2026
3.	ADOR WELDING LIMITED, SILVASSA	SUPERINOX-1C	E308L-16	July 2026
4.	SUPERON SCHWEISSTECHNIK INDIA LTD, DELHI	SUPER OPTIMAL 309 MOL	E309 MoL-16	Feb 2025
5.	SUPERON SCHWEISSTECHNIK INDIA LTD, DELHI	SUPER OPTIMAL 308 L	E308L-16	Feb 2025
6.	SUPERON SCHWEISSTECHNIK INDIA LTD, DELHI	SUPER OPTIMAL 309 L	E309L-16	Feb 2025
7.	SUPERON SCHWEISSTECHNIK INDIA LTD, DELHI	SUPER STAINLESS 347 L	E347L-16	Feb 2025
8.	SUPERON SCHWEISSTECHNIK INDIA LTD, DELHI	SUPER OPTIMAL 316 L	E316L-16	Feb 2025
9.	HONAVAR ELECTRODES PVT. LTD, THANE	SILVER SHINE 308L-15	E308L-15	Feb 2024
10.	HONAVAR ELECTRODES PVT. LTD, THANE	SILVER SHINE 316L	E316L-16	Nov 2023
11.	RAAJARATNA ELECTRODES, AHMEDABAD	RATNA 308L	E 308L-16	Feb 2025
12.	RAAJARATNA ELECTRODES, AHMEDABAD	RATNA 316L	E 316L-16	Feb 2025
13.	MAILAM INDIA LTD, PUDUCHERRY	MAILEX-A	E 308-16	Jun 2024
14.	MAILAM INDIA LTD, PUDUCHERRY	MAILEX-AL	E 308L-16	Jun 2024
15.	MAILAM INDIA LTD, PUDUCHERRY	MAILEX-AL-15	E 308L-15	Jun 2024
16.	MAILAM INDIA LTD, PUDUCHERRY	MAILEX-25/12	E 309-16	Jun 2024
17.	MAILAM INDIA LTD, PUDUCHERRY	MAILEX-25/12L	E 309L-16	Jun 2024
18.	MAILAM INDIA LTD, PUDUCHERRY	MAILEX-25/12-MO	E 309 Mo-16	Jun 2024
19.	MAILAM INDIA LTD, PUDUCHERRY	MAILEX MO	E 316-16	Jun 2024
20.	MAILAM INDIA LTD, PUDUCHERRY	MAILEX MOL	E 316L-16	Jun 2024
21.	D&H SECHERON, INDORE	D&H 309L	E309L-16	NOV 2023
22.	D&H SECHERON, INDORE	RUTOX-A	E308-16	NOV 2023
23.	D&H SECHERON, INDORE	RUTOX-A ST	E347-16	NOV 2023
24.	D&H SECHERON, INDORE	RUTOX-MO	E316-16	NOV 2023
25.	ROYAL ARC ELECTRODES, VASAI	ROYAL 1C	E308L-16	OCT 2024
26.	ROYAL ARC ELECTRODES, VASAI	ROYAL 2C	E316L-16	OCT 2024
27.	ROYAL ARC ELECTRODES, VASAI	ROYAL D2L	E309L-16	OCT 2024
28.	D&H SECHERON ELECTRODE Pvt. Ltd, Indore.	RUTOX-D	E316L-16	May 2026
29.	D&H SECHERON ELECTRODE Pvt. Ltd, Indore.	RUTOX-B	E308L-16	May 2026
30.	D&H SECHERON ELECTRODE Pvt. Ltd, Indore.	Cronitherme-25/12	E309-16	May 2026

31.	D&H SECHERON ELECTRODE Pvt. Ltd, Indore.	BATOX B	E308L-15	May 2026
32.	D&H SECHERON ELECTRODE Pvt. Ltd, Indore.	D&H-1212 (NS)	ENiCrFe-3	May 2026
33.	D&H SECHERON ELECTRODE Pvt. Ltd, Indore.	D&H-1250	ENiCu-7	May 2026
34.	Weld fast Electrodes Pvt Ltd, Nagpur	WELDFAST 308L	E 308L-16	August 2026
35.	Weld fast Electrodes Pvt Ltd, Nagpur	WELDFAST 316L	E 316L-16	August 2026
36.	Weld fast Electrodes Pvt Ltd, Nagpur	WELDFAST 309L	E 309L-16	August 2026
37.	Weld fast Electrodes Pvt Ltd, Nagpur	WELDFAST 309 MoL	E 309 L-Mo-16	August 2026

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For use in nuclear application the welding consumable manufacturing requirement shall be as per lot class C3 as per ASME Section II Part C




 (थॉमस मैथ्यू Thomas Mathew)
 Executive Director (QA)

3) List of Approved Brands of wire and wire flux combination as on 03-07-2023



SR NO	MANUFACTURERS	BRAND NAME	AWS NO.	VALID UPTO
1	ADOR FONTECH LIMITED, BENGALURU	TIG 120	ER 308L	OCT 2024
2	ADOR FONTECH LIMITED, BENGALURU	TIG 121	ER 316L	OCT 2024
3	ADOR FONTECH LIMITED, BENGALURU	TIG 123	ER 309L	OCT 2024
4	ADOR FONTECH LIMITED, BENGALURU	TIG 120S	ER 347	OCT 2024
5	ADOR FONTECH LIMITED, BENGALURU	TIG 521	ER NICR3	OCT 2024
6	ADOR WELDING LIMITED, SILVASSA	TIGINOX-308L	ER 308L	JUL 2026
7	ADOR WELDING LIMITED, SILVASSA	TIGINOX-309L	ER 309L	JUL 2026
8	VENUS WIRE INDUSTRIES PVT. LTD, KHOPOLI	VENUS 308L	ER 308L	NOV 2026
9	VENUS WIRE INDUSTRIES PVT. LTD, KHOPOLI	VENUS 316L	ER 316L	NOV 2026
10	VENUS WIRE INDUSTRIES PVT. LTD, KHOPOLI	VENUS 309L	ER 309L	NOV 2026
11	VENUS WIRE INDUSTRIES PVT. LTD, KHOPOLI	VENUS 347	ER 347	NOV 2026
12	RAAJARATNA ELECTRODES PVT. LTD, AHMEDABAD	RAAJTIG ER 308L	ER 308L	FEB 2025
13	RAAJARATNA ELECTRODES PVT. LTD, AHMEDABAD	RAAJTIG ER 316L	ER 316L	FEB 2025
14	ADOR WELDING LIMITED, SILVASSA	TIGFIL 90S-B3	ER 90S-B3	JAN 2026
15	ADOR WELDING LIMITED, SILVASSA	TIGFIL 70S-2	ER70S-2	JUL 2027
16	ADOR WELDING LIMITED, SILVASSA	AUTOMIG 70S-6	ER 70S-6	DEC 2023
17	ADOR WELDING LIMITED, SILVASSA	AUTOMELT B71+ AUTOMELT EH14	F7A2- EH14	FEB 2024
18	D&H SECHERON ELECTRODE Pvt. Ltd, Indore	F70S-2	ER70S-2	May 2026
19	D&H SECHERON ELECTRODE Pvt. Ltd, Indore	FW-309L	ER309L	May 2026
20	D&H SECHERON ELECTRODE Pvt. Ltd, Indore	FW-308L	ER308L	May 2026
21	Weld fast Electrodes Pvt Ltd, Nagpur	MIG FAST-1	ER70S-6	August 2026
22	Weld fast Electrodes Pvt Ltd, Nagpur	TIGFAST-3	ER70S-2	August 2026



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For use in nuclear application the welding consumable manufacturing requirement shall be as per lot class C3 as per ASME Section II Part C



 
12.07.2023
(थॉमस मैथ्यू Thomas Mathew)
Executive Director (QA)

LIST OF APPROVED PENETRANT TESTING MATERIALS

(As on 28-06-2022)

Sr. No.	Manufacturers	Brand name	Description	Valid up to
1.	ORIENTAL CHEMICAL WORKS (P) LTD.KOLKATA	Orion 119 P	Red Dye Penetrant	FEB-2026
2.	ORIENTAL CHEMICAL WORKS (P) LTD.KOLKATA	Orion 119 PR	Penetrant Remover	FEB-2026
3.	ORIENTAL CHEMICAL WORKS (P) LTD.KOLKATA	Orion 119 D	Developer (Non-Aqueous)	FEB-2026
4.	MAGNAFLUX ITW INDIA PVT.LTD.SECUNDERABAD	SKL-SP 1	Red Coloured Solvent Removable Penetrant	July2024
5.	MAGNAFLUX ITW INDIA PVT.LTD.SECUNDERABAD	SKC-1	Solvent Cleaner	July2024
6.	MAGNAFLUX ITW INDIA PVT.LTD.SECUNDERABAD	SKD-S2	Solvent Base Developer	July2024
7.	MAGNAFLUX ITW INDIA PVT.LTD.SECUNDERABAD	SKL-WP2	Red Coloured Water Washable Penetrant	July2024
8.	MAGNAFLUX ITW INDIA PVT.LTD.SECUNDERABAD	SKL-SP2	Red Coloured Solvent Removable Penetrant.	July2024
9.	PRADEEP METAL TREATMENT CHEMICALS PVT. LTD., THANE	Flaw Guide Penetrant (NP Grade)	Red Coloured Solvent Removable Penetrant.	Oct2024
10	PRADEEP METAL TREATMENT CHEMICALS PVT. LTD., THANE	Flaw Guide Cleaner (NP Grade)	Solvent Cleaner	Oct2024
11	PRADEEP METAL TREATMENT CHEMICALS PVT. LTD., THANE	Flaw Guide Developer (NP Grade)	Solvent Base Developer	Oct2024
12	PRADEEP METAL TREATMENT CHEMICALS PVT. LTD., THANE	Flaw Guide Red Dye Penetrant-W	Water Washable Dye Penetrant	Oct2024
13	3AK Chemie India Pvt.Ltd. (Formerly known as MR Chemie India Pvt. Ltd.),Hyderabad	MR ^(R) 62	Solvent Removable Penetrant–Red	Dec2026
14	3AK Chemie India Pvt.Ltd. (Formerly known as MR Chemie India Pvt. Ltd.), Hyderabad	MR ^(R) 68 NF	Solvent Removable and Water Washable Penetrant–Red	Dec2026
15	3AK Chemie India Pvt. Ltd. (Formerly known as MR Chemie India Pvt. Ltd.), Hyderabad	MR ^(R) 67	Solvent Removable and Water Washable Penetrant–Red	Dec2026
16	3AK Chemie India Pvt. Ltd. (Formerly known as MR Chemie India Pvt. Ltd.), Hyderabad	MR ^(R) 672 F	Solvent Removable and Water Washable Penetrant–Fluorescent	Dec2026
17	3AK Chemie India Pvt. Ltd. (Formerly known as 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.	Dec2026
18	3AK Chemie India Pvt. Ltd. (Formerly known as 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	Dec2026

Dept.	Document No.	Type	Rev/Released	Lang.	Status
4555	GHP/12S/.....100--GS501EC	MA	2022-10-19	EN	Approved

Sr. No.	Manufacturers	Brand name	Description	Valid up to
19	3AK Chemie India Pvt. Ltd. (Formerly known as MR Chemie India Pvt. Ltd.), Hyderabad	MR ^(R) 70 I	Non-Aqueous Developer suitable for MR ^(R) 62.	Dec2026
20	3AK Chemie India Pvt. Ltd. (Formerly known as MR Chemie India Pvt. Ltd.), Hyderabad	SP-10,SC-20, SD30	Solvent Removable Penetrant, Solvent Remover, Non - Aqueous Developer	April2027
21	3AK Chemie India Pvt. Ltd. (Formerly known as MR Chemie India Pvt. Ltd.), Hyderabad	WP-15, SC20, SD30	Water Washable Penetrant, Solvent Remover, Non - Aqueous Developer	April2027
22	3AK Chemie India Pvt. Ltd. (Formerly known as MR Chemie India Pvt. Ltd.), Hyderabad	MR311-R, MR85,MR70I	Water Washable & Solvent Removable Penetrant, Solvent Remover, Non - Aqueous Developer	April2027
23	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PP-15/PP-15B	Red Coloured Solvent Removable Penetrant	AUG2026
24	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PP-19/PP-19B	Red Coloured Water Washable Penetrant	AUG2026
25	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PC-21/PC-21B	Solvent Cleaner	AUG2026
26	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PD-31/PD-31B	Solvent Base Developer	AUG2026
27	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PP-110/ PP110B	Red Coloured Solvent Removable Penetrant	AUG2026
28	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PC 120/ PC-120B	Solvent Cleaner	AUG2026
29	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PD 130 /PD-130B	Solvent Base Developer	AUG2026
30	P-MET HIGH TECH CO. PVT. LTD., VADODARA	FPS46/FPS46B	Solvent Removable Fluorescent Penetrant	AUG2026
31	P-MET HIGH TECH CO. PVT. LTD., VADODARA	FPS49/FPS49B	Water Washable Fluorescent Penetrant	AUG2026
32	FERROCHEM NDT SYSTEM PVT. LTD. PUNE	FC-911, FC-811 FC-711	Solvent Removable (Visible)	JAN2027
33	FERROCHEM NDT SYSTEM PVT. LTD. PUNE	FC-931, FC-811	Water Washable (Visible)	JAN2027
34	FERROCHEM NDT SYSTEM PVT. LTD. PUNE	FC-941, FC-821	Water washable (Fluorescent)	JAN2027
35	FERROCHEM NDT SYSTEM PVT. LTD. PUNE	FC-921, FC-821, FC-721	Solvent removable (Fluorescent)	JAN2027
36	DYEGLO PVT. LTD, PUNE	RP-81	Red Coloured Solvent Removable Penetrant	DEC2023
37	DYEGLO PVT. LTD, PUNE	RP-90	Red Coloured Water Washable Penetrant	DEC2023
38	DYEGLO PVT. LTD, PUNE	CL-01	Solvent Cleaner	DEC2023
39	DYEGLO PVT. LTD, PUNE	RD-01	Solvent Base Developer suitable for RP-81 & RP-90	DEC2023
40	DYEGLO PVT. LTD, PUNE	FP-01	Fluorescent Solvent Removable Penetrant	DEC2023
41	DYEGLO PVT. LTD, PUNE	WD-01	Solvent Base Developer suitable for FP-01.	DEC2023

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 Cane to get the best results.

Anoop Singh
28/06/2022

(Anoop Singh)
Head QA (Baroda & Dehej)

Through: ~~Shri Sundar Singh, AD (QA, M-1 &4)~~

Sundar Singh
28.06.2022

→ ~~Shri A.K. Deshmukh, AD (QA Group-2)~~

A.K. Deshmukh
28.6.2022

→ ~~Executive Director (QA)~~

T. G. Pathan
28.06.2022

Dept.	Document No.	Type	Rev./Released	Eng.	Status
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NUCLEARPOWERCORPORATIONOFINDIALIMITED		
GORAKHPUR HARYANA ANU VIDYUT PARIYOJANA-1,2		
GHAVP-1,2/40000/ PROCUREMENT SPECIFICATION-MS-1	VOLUME-II- Section-C PART-2 C-2: SPECIFIC TECHNICAL REQUIREMENTS	SECTION-C-2-4-9-46
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SAMPLE QUALITY ASSURANCE PLAN

Sl. No.	Component/ Operation	CHARACTERISTIC	TYPE OF CHECK	CLASS IFICAT ION	QUNATUM OF CHECK	REF. DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY (P)(W)(V)	REMARKS
1.0	RAW MATERIAL/ BOUGHT OUT COMPONEN TS									
1.1	SS 316 CAPILLARY	Dimensions	Vernier, Dial Gauge, Micrometer etc.	MA	100%	Relevant ASTM standard	Relevant ASTM standard	IQC Records	3 2 1	
		Chemical Composition	Chemical Analysis	MA	One sample from a lot	Relevant ASTM standard	Relevant ASTM standard	Test report of approved lab	3 2 1	
1.2	Case & Bezel	Visual dimensions	Vernier, Dial Gauge, Micrometer etc.	MA	100%	As per approved drawings	Visual finish & dimensions as per approved drawings	IQC Records	3 2 1	
1.3	SS Bulb	Visual dimensions	Vernier, Dial Gauge, Micrometer etc.	MA	100%	As per approved drawings	Relevant ASTM Standard	IQC Records	3 2 1	
		Chemical Composition	Chemical Analysis	MA	One sample from a lot	Relevant ASTM standard	Relevant ASTM standard	Test report of approved lab	3 2 1	
1.4	Bourdon Tube SS 316	Dimensions	Measurement	Critical	100%	As per IS-3624	Visual finish	IQC Records	3 2 1	
		Chemical Composition	Chemical Analysis	MA	One sample from a lot	Relevant ASTM standard	Relevant ASTM standard	Test report of approved lab	3 2 1	
1.5	Socket SS 316	Dimensions,	Vernier, Plug gauge	MA	100%	As per approved drawings	As per approved drawings	IQC Records	3 2 1	
		Thread Connection	by Go-NO-GO check	MA	100%	As per approved drawings	As per approved drawings	IQC Records	3 2 1	
		Chemical Composition	Chemical Analysis	MA	One sample from a lot	Relevant ASTM standard	Relevant ASTM standard	Test report of approved lab	3 2 1	

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Sl. No.	Component/ Operation	CHARACTERISTIC	TYPE OF CHECK	CLASS IFICATION	QUANTITY OF CHECK	REF. DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY (P)(W)(V)	REMARKS
1.6	Movement SS 304	Visual dimensions	Vernier, Suitable gauge	Critical	100%	As per approved drawings	As per approved drawings	IQC Records	3 2 1	
		Chemical Composition	Chemical Analysis	MA	One sample from a lot	Relevant ASTM standard	Relevant ASTM standard	Test report of approved lab	3 2 1	
1.7	Aluminum (Powder coated) Dial	Visual dimensions	Vernier, Suitable gauge	MA	Random	As per approved drawings	As per approved drawings	IQC Records	3 2 1	
1.8	Thermowell Single piece solid Hexagonal bar stock	a) Internal flaws	Ultrasonic Test	MA	100%	Relevant standard	As per Relevant Standard	Test report of approved lab	3 2 1	
		b) Material Composition	Chemical Analysis	MA	One sample from a lot	Relevant standard	As per Relevant Standard	Test report of approved lab	3 2 1	
		c) Physical Properties	Tensile Strength	MA	One sample from a lot	Relevant standard	As per Relevant Standard	Test report of approved lab	3 2 1	
1.9	Aluminum Pointer	Visual dimensions	Vernier, Suitable gauge	MA	Random	As per approved drawings	As per approved drawings	IQC Records	3 2 1	
1.10	Front Glass Window (Toughened glass)	Visual dimensions	Vernier, Suitable gauge	MA	Random	As per approved drawings/relevant code/standard	As per approved drawings/relevant code/standard	IQC Records	3 2 1	
1.11	Rubber Parts/ 'O'ring	Dimensions	Dimensions	MA	Random	As per approved drawings	As per approved drawings	IQC Records	3 2 1	
2.0	STAGE INSPECTION									
2.1	Socket SS	Thread/ Dimensions	Vernier/ Thread gauge	MA	100%	As per approved drawings	As per approved drawings	IQC Records	3 2 1	
2.2	Case & Bezel	Thread/ Dimensions	Thread/ Dimensions	MA	100%	As per approved drawings	As per approved drawings	IQC Records	3 2 1	
2.3	Silver Brazing/ Welding of Tube and Socket	Brazing and Welding	i) Leak Test	Critical	100%	Test Procedure	No leakage	IQC Records	3 2 1	5% Random check by NPC QA
2.4	Dial Test	Printing	Visual	MA	100%	----	Good painting & neat	IQC Records	3 2 1	

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Sl. No.	Component/ Operation	CHARACTERISTIC	TYPE OF CHECK	CLASS IFICAT ION	QUNATUM OF CHECK	REF. DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY (P)(W)(V)	REMARKS
							printing			
2.5	Assembly & Calibration	Appearance & Accuracy	Clean & dust free, proper pointer motion and Accuracy	MA	100%	PC-E-614	Accuracy as per requirement	Calibration Report	3 2 1	
3.0	TESTING OF FINISHED PRODUCT									
	ROUTINE TESTS									
3.1	Pneumatic Test	Air leak test at 7kg/cm ² or Full Scale Range (FSR) whichever is less	Air leak test with soap solution	Critical	100%	Approved test procedure/relevant ASME standard	No leakage	IQC Records	3/2 1 1	
3.2	Over- Range/Hydrosta tic test	Hydrostatic pressure test for pressure holding time of 10 min	Hydrostatic pressure test at 150% FSR	Critical	100%	As per Approved test procedure/relevant ASME standard	Calibration within accuracy limits	Test Reports	3/2 1 1	
3.3	Calibration repeatability and Accuracy checks	5 point calibration (before and after over-range test)	Calibration test as per approved procedure	Critical	100%	As per Approved test procedure/relevant ASME standard	As per Approved test procedure	Test Reports	3/2 1 1	
3.4	Helium Leak Test	Helium leak test at 1kg/cm ² or Ma. Working Pressure whichever is less	Helium Leak Test with Spectrometer	Critical	100%	Approved test procedure/relevant ASME standard	As per Approved test procedure	IQC Records	3/2 1 1	5% Random check by NPC QA
	TYPE TESTS									
3.5	IP Rating Test	Enclosure Class	Enclosure Protection	Critical	One sample of each type	Test Procedure & IS- 12063/IEC 60529	Test Procedure & IS- 12063/IEC 60529	Test Reports	3/2 1 1	One sample basis (1 instrument per lot)
3.6	Pressure Cycling test	Mechanical properties		Critical	Random	Test Procedure and relevant ASME/ANSI standard	Test Procedure and relevant ASME/ANSI standard	Test Reports	3/2 1 1	One sample basis (1 instrument per lot)
3.7	Seismic test	Seismic acceleration sustainability	Seismic withstand capability	Critical	One no. of each type	Approved test procedure & PB-P- 1819	Approved test procedure & PB-P-541	Test Reports	3/2 1 1	One sample basis (1 instrument per lot)

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LEGENDS:

P	Performed by	1.	NPCIL
W	Witnessed by	2.	Prime Supplier
V	Verified by	3.	Sub-Vendor/External Laboratory
MA	Major		
MI	Minor		

NOTES:

- 1 Test reports on the bought out components for all the NPCIL specified tests shall be obtained from the manufacturers and submitted for the verification of NPCIL.
- 2 The purpose of QAP is to streamline NPCIL Quality Surveillance activities and identifying CHP on un-ambiguous terms.
- 3 All test reports, the certificates and inspection reports shall be reviewed by Prime Supplier/Sub-Vendor/Manufacturer, before submitting the same to verification by purchaser.