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Sub: Issue of Specification MDTS 46430 rev 00 for Schedule of Technical Requirements for Composite Fire Extinguisher with Anti-Theft Mechanism.

Please find enclosed copy of Specification No. MDTS 46430 rev 00 for Schedule of Technical Requirements for Composite Fire Extinguisher with Anti-Theft Mechanism for information and necessary action please.

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Schedule of Technical Requirements for Composite Fire Extinguisher with Anti-Theft Mechanism

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Schedule of Technical Requirements for Composite Fire Extinguisher with Anti-Theft Mechanism

1. **General:**
   a) This specification covers the general & technical requirements for Composite dry chemical powder type fire extinguisher with anti-theft mechanism.
   b) While quoting, the supplier shall submit the following details:
      - The details of M&P and testing equipment's, mentioning - make, year and capacity (against clause 8.1).
      - Clause wise compliance on the specification. Deviation statement with respect to specification, if any.
      - Technical data sheet of the offered product.
      - Credentials and performance of the original supplier i.e. OEM.
      - In case of an authorized dealer of OEM, tender specific letter of authorization from the OEM.
      - Test certificates from NABL certified Labs OR from the OEM Test Lab (NABL accredited Lab) indicating compliance to all the test parameters as per Clause 7.1 or mentioned anywhere else.

2. **Description:**
   The system shall consist of ABC type dry chemical powder composite body (composite material in 3 parts: inner liner + aramid yarn winding + outer body/jacket)fire Extinguisher as per clause 9.2.8 of IS:15683:2018 (with latest amendment applicable) with anti-theft mechanism. The anti-theft mechanism shall be electro-mechanical device to prevent misuse/theft of the fire extinguisher system from its mounting location. The Extinguisher should have a controllable discharge mechanism to provide flexibility of releasing extinguishing agent on targeted fire location.

3. **Description of fire extinguisher:**
   The fire extinguisher should be ABC dry chemical powder composite body with stored pressure. The details requirements should be as per Table -1:

Table-1

S.No	Description	Parameters of fire Extinguisher
1	Type of Fire Extinguisher	Stored pressure DCP-ABC type (Mono Ammonium Phosphate based dry powder 90% conforming to IS:4308-2019)
2	Capacity	As per IS:15683-2018 with latest amendment applicable.
3	Standard code	IS:15683-2018 with latest amendment applicable
4	Fire rating	3A:89B or higher

5	Gross weight	10 Kgs. (Max.)
6	Diameter of cylinder	180 mm(max).
7	Overall height of extinguisher	585mm (Max.)
8	Cylinder material	Composite
9	Working pressure	12-15Bar
10	Temperature range	-30°C to +60°C
11	Propellant	High grade dry Nitrogen (IS:1747-2023, N 5.0 Grade)
12	Minimum effective discharge time	13 Seconds (Min.)
13	Throw distance	2 Meters (Min)
14	Shelf Life	10 Years
15	Pressure gauge & handle	To be provided as per IS 15683 with latest amendment applicable
16	Hose	Braided PVC/Flexi PVC/EPDM (As per clause 9.8.4 of IS 15683:2018 with latest amendment) (Burst pressure-50 Bar) as per IS 15683:2018with latest amendment applicable
17	The fire extinguisher shall be ISI marked	
18	Surface painting/labelling as per IS 15683:2018with latest amendment.	

Extinguishing Medium: The powder shall conform to the requirements of IS:4308-2019. Dry chemical powder used as extinguisher agent should be Mono Ammonium Phosphate with 90% concentration conforming to IS:4308-2019. Powder should be ISI marked. It shall be water repellent.

4. **Description of Anti-Theft Mechanism:**

i. The anti-theft mechanism should be an electro-mechanical device to prevent misuse/theft of fire extinguisher. The complete mechanism should be a wall mounted with a stainless-steel cable/wire/chain, one end of which is attached to an alarm device and the other end is attached securely with the extinguisher. On removal of the extinguisher from its mounting, for any reason, the steel cable should get pulled out from the device and thereby activating an alarm.

ii. The steel cable attaching the alarm and the extinguisher should be more than 3.5 mm diameter and should have a protective layer to prevent rusting during the normal life span of the product.

iii. The activated alarm should have audibility of not less than 80 decibels (dB) at 1 meter. The alarm should remain activated for at least 5 minutes.

iv. The device should also have a reset mechanism that in case the cable is reinserted, the alarm would be deactivated.

v. It should be self-powered with suitable 9 Volts long life batteries (of reputed make like Duracell/Panasonic/Eveready or equivalent) to provide a standby battery life of at least 12 months.

vi. Weight & size of the device should not be more than purchaser requirements. Approval of purchaser shall be taken for it.

vii. The mechanism should have tamper proof sturdy design and should be made from long-life rust-free material such as an engineering plastic.

5. **Warranty:**

i. The fire extinguishers are expected to be fit and forget type with inspection intervals matching the maintenance schedule of rolling stock on which it is installed.

ii. The supplier shall provide a warranty for all supplied items for a period of 6 (Six) years from the date of fitment or 7 (Seven) years from the date of supply whichever is earlier.

iii. The fire extinguisher should be tested at an interval of 3 years for its functioning and suitability. HPT testing of fire extinguisher shall be carried out as per IS 2190:2024 & IS 15683: 2018 with latest amendments applicable. Maintenance activities & refilling to be carried out only by certified agencies & quality control to be ensured during it.

iv. All information required for filing a warranty claim shall be provided in a warranty certificate and on a QR code (engraved/embossed/itched etc. or with any related process with suitable technology, which makes the QR code undetachable from surface throughout its working) on the item provided.

6. **Prototype approval:**

The firm who has not got their prototype sample approved earlier, shall submit following documents for prototype from CDE/RCF before bulk supply:

- Mounting details & dimensions
- Technical and safety datasheet of the offered product
- Test certificates from NABL certified Labs for tests OR from the OEM Test Lab (NABL accredited lab) (latest test report or within last one year) indicating compliance to all the test parameters.
- Tender specific letter of authorization from the OEM (in case of an authorized dealer of OEM).
- BIS license number should be mentioned on composite body.

The prototype and drawings shall be examined from all viewpoints and supplier shall incorporate modifications suggested by RCF based on this review of prototype and drawings. Only after

getting approval of drawings and prototype from CDE/RCF, the firm can undertake manufacture of bulk supply.

7. Test sampling plan, stage inspection, final inspection:

7.1. Tests

The following table summarizes the tests sampling plan, must be conducted by the inspecting agency, for portable fire extinguishers as per IS 15683:2018 with latest amendment applicable.

S. No.	Test Name	Clause Number	Sampling
1	Hydrostatic Pressure Test at 35 Bar	6.1 of IS 15683 with latest amendment applicable	100% by firm (records to be shown to inspecting agency) and1 in 100 nos by inspecting agency
2	Leakage Test	7.4.2 of IS 15683 with latest amendment applicable	
3	Pressure Cycling Test	9.2.4 of IS 15683 with latest amendment applicable	1 in 500 nos by inspecting agency
4	Burst test at minimum55 Bar	As per clause 9.2.2 of IS 15683:2018 with latest amendment applicable.	
5	Crushing Test	9.2.3 of IS 15683 with latest amendment applicable	
6	Vibration Resistance Test	7.5.2 of IS 15683 with latest amendment applicable	
7	Impact resistance Test	7.5.1 of IS 15683 with latest amendment applicable	
8	Tapping Test	7.7 of IS 15683 with latest amendment applicable	
9	Resistance to Temperature Changes	7.3 of IS 15683 with latest amendment applicable	

10	Method of operation	9.9 of IS 15683 with latest amendment applicable	1 in 500 by inspecting agency
11	Safety-Locking Devices	9.10 of IS 15683 with latest amendment applicable	
12	Minimum Effective Discharge Time and Bulk Range of Discharge	7.2 of IS 15683with latest amendment applicable	
13	Retention of Charge	7.4 of IS 15683with latest amendment applicable	
14	Intermittent Discharge Test	7.8 of IS 15683with latest amendment applicable	
15	Determination of maximum service pressure (P_{max})	9.2.1.8 of IS 15683 with latest amendment applicable	
16	Visual & Dimensional inspection	IS: 2500 Pt. I/2000 GIL-II AQL-2.5 (Wall thickness shall be checked in fire extinguishers used in destructive testing)	
17	Checking of labelling, serial numbering, and marking as per IS:15683-2018 with latest amendment applicable.		

- Performance Requirements for Test Fires (clause 8 of IS:15683 with latest amendment applicable) is a type test and certificate (NABL certified) to be produced to inspecting agency. Test to be conducted every year.
- The current and valid BIS certification of IS:15683-2018 with latest amendments needs to be submitted by the vendor.
- Extinguishing Medium (Dry Powder) MAP content test reports as per IS 4308 to be provided. Chemical testing & fluidity testing of MAP content of one fire extinguisher to be tested inhouse by inspection agency.
- Valid BIS license for ISI marking for Extinguisher confirming to IS 15683:2018 with latest amendment applicable, shall be shown at time of inspection. Any other additional test requirement shall also be performed by the firm.
- Firm shall demonstrate extinguishing of indicative fire with the help of Fire Extinguisher.

7.2. Firm shall provide following type test reports of accessories of Fire extinguisher:

i. As per clause 9.5.5 of IS 15683 with latest amendment, cap, valves or closure shall withstand the burst test pressure specified for the cylinder for 1min without rupture.

ii. As per clause 9.7 of IS 15683 with latest amendment, Plastic components. Shall be tested for Air-Oven Ageing, Impact Resistance, Exposure to Extinguishing medium.

iii. As per clause 9.8.4 of IS 15683 with latest amendment, the hydrostatic pressure test of hose assembly shall be carried out.

iv. As per clause 9.11.2 of IS 15683 with latest amendment, Calibration Test of Gauges and Indicators from a NABL accredited laboratory or OEM.

v. As per clause 9.11.3 of IS 15683 with latest amendment, Burst Strength Test of Gauges and Indicators shall be carried out

vi. As per clause 9.11.4 of IS 15683 with latest amendment, Water Resistance Test of Gauges and Indicators to be carried out.

vii. Material safety data sheet of the DCP powder being used needs to be provided.

viii. The extinguishers pressurized with using high grade dry Nitrogen (propellant) as per IS:1747-2023, N 5.0 Grade. OEM declaration should be submitted for it.

8. M&P and Testing requirements:

a) Manufacturing Capability:

i. Fibre Filament winding machine: The manufacturer shall possess in-house of continuous fibres (aramid) filament winding over non-metallic liner (HDPE inner liner) machine as per Cl 9.2.8 OF IS 15683:2018 and assembly facilities.

ii. Non-metallic inner Liner Neck trimming machine

iii. Winded Inner Liner Air Pressure testing machine

iv. Printing and Printing Curing machine

v. Assembly machine for outer body, bottom base with inner fibre filament winded liner.

vi. Head Valve with handle Riveting machine

vii. Powder filling machine

viii. Foam filling machine

ix. Calibrated Weighing machine

x. Head valve fixing machine with Torque wrench

xi. Propellant Filling Machine

xii. Laser marking machine for Batch code and serial number marking.

xiii. Hose assembly and Fitment fixtures

xiv. Utility machines- Air Compressor

b) Testing facilities:

i. Hydrostatic Pressure Testing (HPT) machine up to 35 Bar
ii. Fatigue test500 cycles
iii. Burst Test setup
iv. Crushing test
v. Water tightness test
vi. Water Immersion Test
vii. Impact test for handle
viii. Vibration Test setup
ix. Tapping Test setup
x. Temperature Cycling Chamber (-30^0 C to $+60^0$ C)
xi. Salt spray test
xii. Minimum Effective Discharge Time and Bulk Range of Discharge test set up
xiii. Resistance to Temperature Changes test set up
xiv. MAP content chemical testing facility & fluidity testing facility

9. Quality Assurance Plan:

Each manufacturer shall prepare a detailed Quality Assurance Plan (QAP) describing very stage of manufacture, inspection and testing of fire extinguishers. QAP must be submitted by the vendor to the nominated vendor approving agency at the time of registration. The QAP shall be approved by the nominated vendor approving agency prior to approval of the vendor.

The QAP may include:

i. Process flow chart covering material receipt to manufacturing of the final product.
ii. Inspection and testing plan.
iii. List of measuring and testing equipment (with calibration details).
iv. Specification of raw material (Composite, ABC powder MAP 90 etc.)

10. Up-Gradation of Design:

Suppliers may offer alternate design of anti-theft mechanism for all the above or any of the above clauses with a view to upgrade design/concept. Clause wise justification shall be given by the supplier in such case. Specification details for the subject item may be deviated from those specified above, if sufficient technical justification is provided. However, RCF's decision on all such matters shall be final and bindings.

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