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FUNCTIONAL REQUIREMENTS FOR WATER TENDER TYPE 'A' FOR FIRE BRIGADE USE

(Second Revision)

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Indian Standard

FUNCTIONAL REQUIREMENTS FOR WATER TENDER TYPE 'A' FOR FIRE BRIGADE USE

(Second Revision)

0. FOREWORD

0.1 This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 15 March 1983, after the draft finalized by the Fire Fighting Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Water tenders type 'A' are used in rural areas. This standard was first published in 1959 and revised in 1970. At that time mostly petrol engine driven chassis was used for this type of vehicle which was having payload of 5 tonnes. Even the diesel trucks were used in the transition period, and payload of these chassis increased from 5 tonnes. Keeping in mind 5 tonnes payload of the chassis, water tank capacity was pegged at 2 700 litres and other parameters like acceleration were set accordingly.

Keeping in mind the latest trend having the fire engine on diesel driven chassis which are having higher payload, the capacity of water tank is being increased to 3 600 litres in this revision. But due to the limited power available from the diesel engine of the chassis, the acceleration figures are being revised.

0.2.1 A list of accessories and equipment which do not form part of this appliance and most of which are normally required to assist in operation of the appliance is given in Appendix A for information and guidance. The appliance shall also conform to statutory rules in regard to height clearance framed by Transport Authority.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in

accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard lays down the requirement regarding material, design and construction, workmanship and finish, accessories and equipment of water tender, type A for fire brigade use.

2. GENERAL REQUIREMENTS

2.1 The appliance shall carry a water tank of 2 7 00 to 3 6 00 litres capacity depending upon the type of chassis used. It shall carry an extension ladder and shall be capable of towing a trailer pump.

2.2 The water tender shall be fabricated in a manner so as to conform to the following characteristics :

a) Gross vehicle mass	Not less than 8 500 kg including crew, water and equipment
b) Maximum speed on level road (fully laden)	72 km/h
c) Acceleration from a standing start through the gears (fully laden)	50 km/h in 45 seconds

d) The appliance shall be capable of being started from rest and move upon a gradient of 1 to 4.

e) When travelling at 48 km/h on a level dry surface the foot brake shall be capable of stopping the vehicle within a distance of 15 m from the point at which the brake is applied. The hand brake shall be capable of holding the fully laden appliances on a dry surface gradient of 1 in 4 when in neutral gear.

f) The appliance shall have the following overall dimensions:

Wheel base	Not more than 4·30 m
Turning circle, diameter	Not more than 20 m
Road clearance	Not less than 23 cm
Overall width	Not more than 2·50 m

*Rules for rounding off numerical values (*revised*).

3. MATERIALS

3.1 The choice of material to be used in the construction of the appliance shall be made with a view to combining lightness with strength and durability.

3.2 All parts which form water-ways or come into contact with water shall be of corrosion resisting material or treated for anti-corrosion. All metal parts exposed to atmosphere shall either be of corrosion-resisting material or treated to resist corrosion.

4. DESIGN AND CONSTRUCTION

4.1 Electrical System

4.1.1 Trickle type battery charger, if required, shall be provided for charging the battery *in situ*. The red pilot lamp indicating when the batteries are being charged from an external supply shall be provided.

4.1.2 All important electrical circuits shall have separate fuses suitable indicated and shall be grouped into a common fuse-box located in an accessible position in driver's cab and fitted with means for carrying spare fuses. The wiring shall be single pole.

4.2 Water Tank — It shall vary from 2 700 to 3 600 litres depending upon the type of chassis used.

4.2.1 A tank of required capacity constructed of mild steel treated for anti-corrosion shall be suitably mounted on the chassis in a manner keeping in view the proper load distribution on the axles. The tank shall be suitably baffled to prevent surge when the vehicle is braking, cornering or accelerating. The baffles shall be arranged in a manner to facilitate the passage of a man throughout the tank for cleaning purposes. The tank shall be mounted on not less than three cross members to counteract stresses caused by chassis flexing and shall be so secured that it can be removed. The tank body and baffles except bottom shall be minimum 3 mm thicksheet which should be of minimum 4 mm thick. There should be minimum 2 baffles for 2700 litres water tank and 3 baffles for higher capacity.

4.2.2 The tank shall be fitted with a 75 mm bore overflow pipe. A 63 mm instantaneous hydrant connection, incorporating a strainer, shall be provided for filling the tank through 50 mm bore pipe work. An 100 mm bore pipeline shall be taken from the tank for the suction inlet of the pump incorporating an 100 mm quick spherical type valve.

4.2.3 The tank shall be given adequate anti-corrosive treatment from inside after fabrication if it is not galvanized. Inside surface shall be

prepared by sand blasting before painting. Epoxy treatment should be given inside the water tank for corrosion resistance. Epoxy treatment shall consist of one coat of primer with 2 coats of finish. The tank with its fitments shall withstand hydrostatic pressure of 0·3 bar.

4.2.4 Dial gauge water level indicator for the tank shall be provided perferably in the driver's cab or a visual level gauge of glass tube shall be provided at the control panel calibrated 1/4, 1/2, 3/4 and full preferably calibrated in litres also.

4.2.5 The tank shall have a covered manhole of 45 cm dia minimum. A cleaning hole of at least 25 cm dia shall also be provided at the bottom.

4.3 Portable Pump — 275 LPM Portable Pump Set (conforming to IS : 942-1982*) shall be provided for fire fighting purpose. The pump shall be mounted preferably behind the water tank. The frame of the pumping unit shall preferably be provided with two quickly detachable solid tyred road wheels.

4.4 Body Work and Stowage

4.4.1 Enclosed accommodation for six persons shall be provided in the driver's cab-cum-crew compartment including the driver and the incharge of the crew. Two doors on each side shall be provided on the driver-cab cum-crew compartment. The doors shall be hinged opening outwards and shall be hung forward and shall have catch locks and flush type handles.

4.4.2 The cab and lockers should be of all metal construction with sufficient rigidity and reinforcement and shall be kept as light as possible in mass. Pressed sections of sufficient strength shall be used for the superstructure.

4.4.3 Lockers shall be provided to secure stowage of all equipments given in Appendix A except those mentioned at Sl No. 1, 2, 26 and 44 The height of the lockers from the bottom to the top of the opening shall be not less than 600 mm.

4.4.4 All lockers shall be provided with internal automatic lighting arrangement with the meter switch in the cab. The doors of the lockers shall have sufficient means for holding them closed by efficient flush fitting spring loaded lockers. The doors of the side lockers shall not be hinged at the bottom.

*Specification for 275-l/min portable pump set for fire fighting (*second revision*).

4.4.5 Hose tunnels shall be provided to carry four 2·5m lengths of suction hoses in convenient location. The tunnels should be sloped in such a way that these allow the water/contents left in the hose after use to drain out.

4.4.6 *Ladder Gallows* — Gallows shall be provided to carry a 10·5 m aluminium extrasion ladder. The design shall be such that the ladder can be released without difficulty from a reasonably accessible position and shall embody rollers to permit easy withdrawal by one man. Means shall also be provided for locking the ladder when stowed.

4.4.7 *Tool-Kit Container* — A specially fitted recessed tray for the normal kit of tools, carried on the appliance shall be provided.

4.4.8 *Stability* — The stability of the appliance shall be such that when under fully-equipped and loaded condition (but excluding crew), if the surface on which the appliance stand is tilted to either side, the point at which over-turning occurs is not passed at an angle of 30 degrees from the horizontal.

5. WORKMANSHIP AND FINISH

5.1 All parts of the appliance shall be of good workmanship and shall have streamlined finish.

5.2 The appliance shall be painted in fire red colour conforming to shade No. 536 of IS : 5-1978*. The paint shall conform to IS : 2932-1974†.

6. INSTRUCTION BOOK, ACCESSORIES AND EQUIPMENT

6.1 Instruction Book or Books — Instruction book(s) for the guidance of the user(s) including both operating and normal maintenance procedure shall be supplied. The book (s) shall include an itemized and illustrated spare-parts list giving reference numbers of all the wearing parts.

6.2 Accessories

6.2.1 The following accessories shall be provided in addition to those normally fitted on modern commercial vehicles.

a) *Fire Bell* — 250 mm diameter fire bell shall be mounted externally and shall be capable of being operated from within the driving compartment. The bell shall be of the hand-operated type.

*Colours for ready mixed paints and enamels (*third revision*).

†Specification for enamel, synthetic, exterior (a) undercoating, (b) finishing (*first revision*).

b) *Head Lamps* — two

c) *Fog Lamps* — two

d) *Reversing Light* — a lamp suitably situated to assist reversing.

e) *Ambar Blinker Lights* — situated on the head of the driving compartment.

f) *Traffic ators* — Illuminated with indicating light on instrument panel or in any other prominent position in driving compartment.

g) *Wind Screen Wippers*

h) *Tools* — All tools required for normal routine maintenance of the appliance which are not included in the kit for the chassis.

j) *Siren* — Battery operated

k) *Search Light* — adjustable to given flood or beam light, mounted in a convenient position but capable of being readily disconnected and mounted on a tripod away from the appliance, complete with tripod and with not less than 30 m of TRS cable on a reel mounted on the appliance.

m) *Spot Light* — adjustable, mounted in a convenient position on the rear side of the driving compartment.

n) *Inspection Lamp* — protected type on wander lead with plug. A socket shall be provided in the control panel in the driver's cab for plugging in the lamp.

p) *Tail Lamps* — two of combined stop and tail.

q) *Rear Reflectors*

r) *Cab, Instrument Panel and Locker, Light*

s) *Public Address System* (if required) — battery operated system with mike in the driver's cab and speaker on the top of the vehicle shall be provided.

7. MARKING

7.1 Each appliance shall be clearly and permanently marked with the following information:

a) Manufacturer's name or trade-mark, if any;

b) Capacity of the water tank in litres; and

c) Year of manufacture.

APPENDIX A

(*Clause* 0.2.1)

SCHEDULE OF EQUIPMENT TO BE STOWED IN THE APPLIANCE

Sl No.	*Items*	*Quantity*
1.	Extension ladder 10·5 m (*see* IS : 4571-1977[1] or IS : 930-1977[2])	1
2.	Suction hose of rubber of 75 mm internal diameter in 2·5 m lengths (*see* IS : 2410-1963[3])	7·5 m
3. a)	Rubber lined delivery hose (*see* Type II of IS : 636-1979[4]) in 22·5 m or 15 m lengths fitted with 63 mm delivery hose couplings (*see* IS : 903-1975[5])	90
b)	Unlined flax canvas hose (*see* IS : 4927-1968[6]) in 30 m lengths fitted with delivery hose couplings (*see* IS : 903-1975[5])	90
	or	
	Controlled percolating hose (*see* IS : 8423-1977[7]) in 30 m lengths fitted with delivery hose couplings (*see* IS : 903-1975[5])	
4. a)	Hose-clamps [*see* IS : 5612 (Part I)-1977[8]]	6
b)	Hose-bandages [*see* IS : 5612 (Part II)-1977[9])	6
c)	Hose-straps	12

1. Specification for aluminium extension ladders for fire brigade use (*first revision*).
2. Specification for wooden extension ladder for fire brigade use (*first revision*).
3. Specification for suction hose of rubber for fire services.
4. Specification for fire fighting hose (rubber lined or rubberized fabric lined, woven-jacketed) (*second revision*).
5. Specification for fire hose delivery couplings branch pipe, nozzles and nozzle spanner (*second revision*).
6. Specification for inlined flax canvas hose for fire fighting.
7. Specification for controlled percolating hose for fire fighting.
8. Specification for hose-clamps and hose-bandages for fire brigade use : Part I Hose-clamps (*first revision*).
9. Specification for hose-clamps and hose-bandages for fire brigade use : Part II Hose-bandages (*first revision*).

Sl No.	Items	Quantity
5.	2-Way suction collecting head 75 mm size (*see* IS : 904-1983[10])	1
6.	Dividing breeching with control instantaneous pattern 63 mm (*see* IS : 5131-1969[11A])	1
7.	Collecting breeching instantaneous pattern 63 mm (*see* IS: 903-1975[5])	1
8.	Branch pipe (*see* IS : 903-1975[5])	2
9.	Nozzle of sizes 12 mm, 15 mm, 20 mm (two each) (*see* IS: 903-1975[5])	6
10.	a) Adaptor for 75 mm suction female screw coupling and 63 mm male instantaneous.	1
	b) Adaptor double female instantaneous pattern 63 mm	4
11.	Nozzle spanners (*see* IS : 903-1975[5])	1
12.	Portable electric box lamp with rechargeable accumulator	1
13.	Hand lamp (torch — 4 cells)	2
14.	Flameproof lamp (usable in presence of inflammable gases or vapours)	2
15.	Portable chemical fire extinguisher dry powder type 2 kg (*see* IS : 2171-1976[11B])	1
16.	Portable chemical fire extinguisher, foam type 9 litres capacity (*see* IS : 933-1976[12])	1
17.	Lowering line — 50 mm hemp or terylene, 40 m long, having two ends spliced and one end with a running noose (*see* IS : 1084-1969[13])	1
18.	Long line — 50 mm manila, 30 m long (*see* IS : 1084-1969[13])	1
19.	Short Line — 50 mm manila, 15m long (*see* IS : 1084-1969[13])	1

10. Specification for 2-way and 3-way suction collecting heads for fire fighting purposes (*second revision*).

11A Specification for dividing breeching with control, for fire brigade use.

11B Specification for portable fire extinguisher, dry powder type (*second revision*).

12. Specification for portable chemical fire extinguisher, foam type (*second revision*).

13. Specification for manila ropes (*second revision*).

Sl No.	*Items*	*Quantity*
20.	Canvas buckets	2
21.	First-aid box for 10 persons	1
22.	Rubber gloves (in case) (*see* IS : 4770-1968[14])	1 pair
23.	Asbestos guantlets (in case)	1 pair
24.	Axe, large (*see* IS : 703-1966[15])	1
25.	Spade	
26.	Pick axe (*see* IS : 273-1973[16])	1
27.	Crow-bar (*see* IS : 704-1968[17])	1
28.	Sledge hammer, 6·5 kg (*see* IS : 841-1968[18])	1
29.	Carpenter's saw, 60 cm (*see* 5098-1969[19])	1
30.	Spanner adjustable, 30 cm long handle (*see* IS : 6149-1971[20])	1
31.	Door breaker	1
32.	Hydraulic jack 7·5 tonnes	1
33.	Fire hook (*see* IS : 927-1981[21])	1
34.	Tool kit	1
35.	Grease gun	1
36.	Oil feader	1
37.	Can for oil — 2 litres capacity	1
38.	Funnel for oil or fuel filling	1

14. Specification for rubber gloves for electrical purposes.
15. Specification for axes (*revised*).
16. Specification for picks and beaters (*second revision*).
17. Specification for crow-bars and claw-bars (*first revision*).
18. Specification for hand hammers (*first revision*).
19. Specification for cross-cut and rip saws.
20. Specification for single ended open-jaw adjustable wrenches.
21. Specification for fire hooks (*second revision*)

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