

TECHNICAL SPECIFICATIONS FOR FIREFIGHTING EQUIPMENTS.

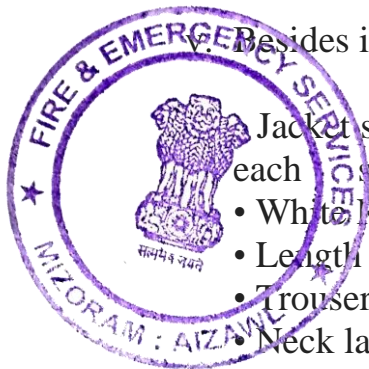
1. SPECIFICATION FOR THE FLAME RETARDANT

The Flame Retardant Material shall be not less than 340 GSM 100% Cotton conforming to EN ISO 11612 of 2015 (Navy Blue Suit with white Reflective Flame Retardant Tapes)

- i. The suit shall come in navy blue trouser jacket type and the fabric shall be treated with fire resistant chemicals.
- ii. The trouser and the jacket shall be provided with a reflective band to increase the visibility of the wearer. The reflective band shall run down the entire length from the left and right shoulder at the back and front meeting the reflective band fitted round the trim of the jacket. Reflective band shall also be provided on the sleeve- halfway between the elbow and the wrist.
- iii. The trouser shall also be fitted with reflective band at the shin level and provided with a Suspender to help keep the trouser from sagging when they become wet. The trouser shall also have a zip opening.
- iv. The jacket shall be provided with straight collar and zip on the entire front which will be covered by a flap supported by a Velcro. Two pockets shall also be provided at appropriate place.

Besides it should also have the following vital Components:

- Jacket should have Shoulder flap of not less than 6(six) inches in length on each shoulder
- White Reflective tape on the Flame Retardant Suit should be of 5 cm width
- Length of Jacket should cover the hip
- Trouser should have elastic straps
- Neck label should mention the size and washing instructions.



2. HEAD LAMP

The head lamp should be simple and compact suitable for practical use in outdoor activities. It should be able to produce 200 lumens brightness and wide beam and provided with adjustable elastic head strap. It should also be compact and light weight having a long burn time and have three lighting modes proximity, distance vision and movement. It should also comes with three AAA / LR03 batteries and should also be compatible with CORE rechargeable battery Ni-MH along with the Ni-MH battery charger and other accessories.

3. MULTIPURPOSE HAND CONTROL NOZZLE

The multipurpose hand control nozzle should be able to produce straight stream and fog facility independently or simultaneously. It should be specially designed to give low back pressure and a provision for automatic kink removal. It should also be able to give straight stream to dense fog and flush without shut off. There should also be ON/OFF ball valve handle and pistol grip. There should also be 63mm male instantaneous coupling and should also be NFPA 1964 compliant.

4. MEGA PHONE

The Megaphone shall have the following features:

- i. Power output ; 16 watt, 20 watt maximum
- ii. Voice range : 0.40 km (1 km in quiet area)
- iii. Power source : 12 volts DC, 8 * UM-2 CELLS
- iv. Microphone : Unidirectional, with volume control & press to talk switch
- v. Dimension : Horn diameter 220 mm, length 370 mm
- vi. Weight : 2 kg (approximate)
- vii. Operation : Dry cell & Car battery operation
- viii. Body : Sturdy & light weight with inbuilt siren
- ix. The megaphone shall be able to withstand the following climatic severities:
 - a. Dry heat : +70C
 - b. Cold heat : - 10C
 - c. Damp heat : 2 cycles
 - d. Weight : No more than 2 kg
 - e. Harmonic distortion : should be less than 10% at 1000Hz
 - f. Frequency response : Overall frequency response shall be within plus minus 3 db from 300 to 3000 Hz



5. REFILLING OF CO₂ FIRE EXTINGUISHER 4.5 LITRES cap (24 nos)

The refilling of 24(twenty four) nos of CO₂ Fire Extinguisher should be done in such a way that the steel cylinder is hydrostatically tested to ensure the strength of the steel container, refill with CO₂ and further carry out servicing of discharge tube, valve connections discharge horn etc. Each cylinder should be tagged with the date of hydro testing, refilling and servicing with complete address of the firm that carry out hydro testing, refilling and servicing. The empty cylinder etc will be sent to the address of the selected firm by the department. After fully testing, refilling and servicing the CO₂ Fire Extinguisher, the selected firm should deliver the items to F & ES Hqrs Mizoram, Aizawl. All the CO₂ Fire Extinguishers must be properly packed so as to avoid damage while transportation.

6. SUCTION WRENCH :

The Suction Wrench shall be for 100 mm suction hose couplings as per IS: 4643:1984. The overall length shall be not less than 500 mm. Mild steel bars used for making the wrench shall conform to IS: 226-1975. The wrenches shall be free from burs at sharp edges and shall be filed and smoothed and shall properly marry with the lugs in the suction hose couplings. Suction wrenches shall be clearly and permanently marked with the following information:

- a) Manufacturer's name or trade-mark, and
- b) Size and reference of coupling for which it is suitable.
- c) The suction wrenches may also be marked with the I S I Certification Mark.

7. DELIVERY HOSE WASHER :

The delivery hose coupling washer shall be for 63 mm Fire Hose and made of good quality rubber. The shape and sizes of the washer shall be same and identical in all respect and shall be able to prevent leakage of water from the coupling joint.

8. WALKIE TALKIE SET(Two way):

The Walkie Talkie in a set of 4(four) shall be a Trans-Receiver Two way radio UHF hand-held, with capacity of not less than 400-470 MHz, having not less than 10 Channels, , adjustable volume control, PTT and belt clip for carry etc. It may also come with a rechargeable battery of 1500mAh battery at a rated output power of Voltage DC 3.7V and other accessories like charging adaptor etc complete.



9. SELF CONTAINED BREATHING APPARATUS:

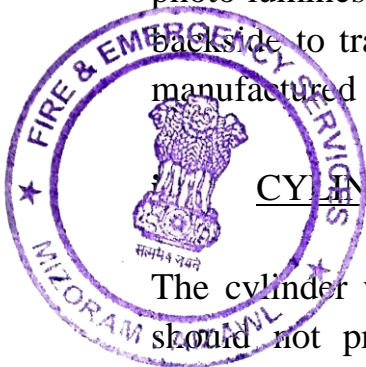
Positive pressure open circuit compressed air self-contained BA set with extra mask (Rescue hood) having safe working duration of at least 35 minutes and 10 minutes safety margin. It should have approval from BS / EN 136, 137, 139/93 and should bear mark of relevant specification. The set should operate efficiently in variety of harsh environment and capable of withstanding rough uses of Fire Brigade i.e. hot, cold, wet, humid, cramped and zero visibility and must be simple to wear. The weight and ergonomics of the set, when fitted with ancillary equipment should be so designed that it is spread over the frame of the human skeleton, and not to cause physical damaged to the wearer and is comfortable. Designed of set should allow for safe accessible stowage in appliance crew caps or lockers. It should as compact as possible with no sharp edges, burrs or protruding parts likely to be caught on projections and narrow passages. The apparatus shall continue to function satisfactorily after being submerged into the water to maximum depth of one metre. The total weight of set with filled cylinder should not exceed 12 kg.

i. BREATHING APPARATUS CYLINDER :

Seamless superlight cylinder of adequate water capacity for 45 minutes duration at filling pressure not exceeding 300bar duly hydro- tested to 1.5 times of filling pressure, (mask bear ISO / BS/DIN/NIOSH/EN mark on body on cylinder). Should have test certificate from authorized test station of the country from where it has been imported / manufactured. It must have approval from CCE , Nagpur and should be painted as per latest cylinder rules. The cylinder should be marked with photo luminescent strip in such a way that when set is assembled it is visible from backside to trace/ follow the BA wearer in smoke filled compartment. Cylinders manufactured for more than one year shall not be acceptable.

CYLINDER VALVE:

The cylinder valve should be both hand operated, perpendicular to cylinder but should not protrude beyond cylinder width, having safety device to prevent accidentally closer of valve. The design of valve should be such that in case of spindle is broken it can be repaired when cylinder is full. Cylinder valve should bear mark of relevant specification and should have approval of BS/EN/DIN/NIOSH. A test certificate from authorized test laboratory. and approval of CCE, Nagpur should also be supplied. The valve assembly must include anti-debris tube for preventing the debris flowing from the Cylinder to air circuit and should also have universal coupling for connecting different types of



sets and air compressor. A blank cap should be provided to protect cylinder valve threads.

iii. PRESSURE REDUCER:

Compact designed should reduced the cylinder pressure unto 7 to 10 bars to meet the design requirement of demand valve and should maintain the same reduced pressure even with decreasing cylinder pressure. It should have built in pressure relief valve, designed to prevent excess pressured in the in the low pressure circuit and also safety device to restrict the flow in high pressure circuit in case of failure/damage of high pressure hose. The pressure reducer also contains the suitable filter for filtering out particles unto size of 20 Microns or greater.

iv. SECOND-MAN ATTACHMENT:

Provision for second man / airline attachment should be provided. The designed should be such that through same connection air from another BA wearer can be fed and also the second face mask could be used. Coupling used should be quick release type.

v. INTEGRATED CONTROL UNIT:

Water proof pressure gauge having luminous dial reading up to 400 bars should be positioned in such a way that it can be read by BA wearer conveniently. It should be mounted in stainless steel case having corrosion resistance and protected by rubber cover. Gauge dial should be photo luminescent and shatter proof polycarbonate glass. It should be mounted on left shoulder. The dial must be marked red to indicate low pressure in the cylinder, in addition to warning whistle set to operate at a pressure when it is left with a 10 minutes air in the cylinder. It should be protected by safety device including restriction valve that will limit the loss of air in event of damaged of pressure gauge to 10 litres/minutes maximum.

The system incorporates a gauge to monitor the following:

- a) Pressure
- b) Temperature
- c) Remaining Service time
- d) Battery capacity
- e) Motion sensor which gives alarm if the user is motion less
- f) Alarm at low cylinder pressure



vi. LOW PRESSURE WARNING WHISTLE:

BA set must be provided with low pressure warning whistle, which shall operate automatically, when cylinder pressure drops to a determined pressure (i.e. air in the cylinder is left for 10 minutes at the rate of 40 litres/minutes) for safety margins. It should not be externally adjustable, and the consumption air by warning whistle

should not exceed 5 litres/minutes. It should be positioned at left shoulder for easy hearing and should not produce sound less than 90 db.

vii. HOSES:

Hoses should be impact resistant and flame resistant stainless steel braided over hydra covered hose and fitted with suitable coupling, or manufactured with suitable material to withstand desired operational objective.

viii. DEMAND VALVE:

The valve should have compact design, low profile, automatic positive pressure, operable with first breath / quick fitting coupling when fixed with supply to wearer on demand to perform various nature of hard/ strenuous job during fire Fighting, rescue etc. in smoke / toxic, hot, humid and hazardous atmosphere. It should be quiet in operation to prevent disturbance during communication between BA wearers. It should also have a provision of by-pass valve to provide extra air in case wearer demands and should be totally independent from demand valve functioning (EN-137). It should continue to function satisfactorily after being submerged in water to a maximum dept of one meter, once worn by BA wearer. The provision of shut off button on demand valve assembly should also be made for stopping air flow in face mask, which should be capable of de-activating on next breath. The coupling should be quick release mechanism type to unplugged demand valve from the mask connector.

ix. The mask must be made from silicon or EP DM – rubber. It should be pan-seal including optically correct and with full view replaceable visor made from poly-carbonate having resistance to chemicals and shock and should be anti scratch. The inner mask should allow the air to pass across the visor to keep it free from condensation and should reduce the dead space within the face mask to prevent accumulation of carbon-di-oxide to uncomfortable level. Speech diaphragm for effective communication should be provided. A safety device should be incorporated in the exhalation valve to release excess pressure in the face mask than the design positive pressure. It should be provided with suitable strap with locking for easy donning the face mask strap made of Fire retardant material should also be provided. It should have double reflex sealing and quick filling plug-in connection for demand valve. This mask should bear mark of relevant specification.

For preventing the deterioration of face-mask from the effect of ultra violet light and also from dust etc., a suitable black bag shall be provided with each face mask.



x. EXTRA MASK:

Extra Mask (Rescue hood) should be made of flame retardant material ideally suited for rescue work. The hood places over the head of the person to be rescued. There should be facility to supply the air by the second connection to the rescue worker self contained breathing apparatus. There should be a constant airflow of about 50 litres per minute is provided with a medium pressure of 7 bar from the feed line.

xi. HARNESS:

The harness should be fine resistance, should not deteriorate or shrink in contact with water/moisture/water miscible substances or on contact with oil grease etc., and also provide resistance to chemicals; it should not build up static electricity nor should retain static charge. It should be fully adjustable to be worn by a fireman having variation in height and waist size. The design should be such that wearer could don the apparatus quickly without the aid of another person including the chest strap, if provided should be easily distinguishable by touch. The method of fastening should be of similar and also the adjustment. The buckles provided should be quick release type. The light weight webbing harness optimal load distribution, balance, comfort and reduced wearer fatigue.

xii. BACK PLATE:

Adjustable back plate with an innovative foldable protective foot made of composite material/light weight carbon fibre, ergonomically and ribbed covered with flame retardant anti-slip neoprene to prevent the possibility of incurring radiant heat burn through the direct contact with metal and should give maximum and safety to the wearer in all the difficult situations such as, rough working conditions during fire fighting operations, cold, hot, wet/ humid and cramped atmosphere. The back plate should be designed to carry the different diameters of BA cylinders. The strap should have quick release coupling for changing cylinder. Back plate also includes strong carrying handle.

xiii. CARRYING CASE:

(a). A strong carrying case to store complete assembled BA set along with BA cylinder should be provided. It should be designed in such a way that all parts of the assembled set could be placed in its proper position.

(b). A black colour plastic bag to avoid deterioration due to the effect of ultra violet light and also to prevent mask being contaminated by oil, fuel, dust etc. it will be used to cover the face mask and then store it in the carrying case.



xiv. TEST CLAUSES:

Type of test:

Any set of breathing apparatus offered in fulfillment of this specification should pass satisfactorily the following test as are relevant to the class of apparatus offered. It is intended that this tests should be made at the manufacturers'/suppliers works or fire brigade or elsewhere, to arranged by manufacturer / suppliers at their own cost.

TEST DETAILS:

(i) Performance:-

Two test with each of two identical sets to ensure that the apparatus causes no undue discomfort to the wearer for full period of 30 minutes. Each test should be carried-out by a different wearer. For these tests each wearer will walk at a regular rate of 6.4 kms/ hour on level ground and also at higher speed to check the performance of demand valve.

(ii) Low cylinder pressure Warning device:-

Tests to check that the warning device complies with the requirements laid down in EN specifications.

(iii) Demand Valve:-

Tests to check fulfillment of the requirement laid down in the EN specifications.

(iv) Approval:-

The approval from any of the approved tests houses like DIN/BS/NIOSH/EN-shall/will be essential.

(v) CO₂ Test:-

To check that CO₂ proportion of inspired air does not exceed 2%. Samples to be taken as near to the mouth as possible at 10 minutes interval during the performance test as laid down in EN specification.

(vi) Temperature:-

Test to check that during the performance test, the temperature of the inspired air does not exceed 20⁰C above the ambient temperature of the atmosphere in which the apparatus is worn and reading to be taken at the 10 minutes intervals.

(vii) Tests of Acceptance:-

(a) Acceptance test should include a performance test, leakage test, flow test, safety devices functional test, low pressure warning test.

(b) The apparatus shall continue to function satisfactorily after being submerged in water to a maximum depth of one meter.



xv. WORKMANSHIP AND FINISH:

It is essential that the standard of workmanship and finish of all parts is such that replacements parts can be supplied and that they will fit correctly and without difficulty. Exposed metal parts would have a finish which can be kept up without the use of metal polish or any other special preparation.

xvi. TOOLS:

Tools necessary for routine testing and servicing must be provided with each set along with one kit of consumable spares.

xvii. INSTRUCTION BOOKS:

An instruction book in English, for the guidance of the user including both operating and normal maintenance procedure must be supplied. The book must include an itemized and illustrated spare parts list, giving reference numbers to all parts.

xviii. TRAINING:

The supplier shall provide training free of cost to selected staff/ Officer for operation and maintenance of BA set.

xix. SPARES:

Supplier shall ensure availability and supply at fast moving spares at short notice for at least five years. The suppliers shall provide a price list of such spares along with commercial bid.

