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***Procurement Technical Specification***  
*of*  
***Multi-Spectral Camouflage Net***  
***(MSCN)***  
*for*  
***Pinaka 5<sup>th</sup> – 10<sup>th</sup> regiments***



**BEML LTD**

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**Note:**

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## 1. INTRODUCTION:

This document provides the technical specifications required for procurement of multi spectral camouflage net (MSCN) for Replenishment vehicle (RV) and Loader Cum Replenishment vehicle (LCR) for Pinaka 5<sup>th</sup> to 10<sup>th</sup> regiments.

Pinaka is a Multiple Launcher Rocket System which consists of four vehicles viz. Launching vehicle, Loader Cum Replenishment (LCR) Vehicle, Replenishment Vehicle (RV) and Command post Vehicle.

The function of LCR is for transportation and handling of rocket pods and the function of RV is to carry four nos. of rocket pods. BEML 8x8 trucks is the base vehicle for both LCR and RV.

## 2. NECESSITY OF MSCN:

MSCN is used to prevent detection of the vehicles by enemy surveillance and detection by devices working in different ranges of the electromagnetic spectrum.

## 3. SPECIFICATIONS OF MSCN:

### i) Ranges of Spectrum:

MSCN screens shall be designed to prevent detection by enemy surveillance and detection by devices working in different ranges of the electromagnetic spectrum as specified below:

#### a) Visual: (380 – 710 nanometers)

In range of 320 – 710 nanometers wavelength using binoculars, telescopes and aerial photography, etc. it is important to have the color distribution, which blends the object to be camouflaged well with the background. MSCN in requisite colors shall be made available. These nets shall be effective against ground and aerial observations.

**b) Near Infra Red:** (710 – 1500 nanometers)

Detection by NIR devices, both active and passive in the range of 680 – 1500 nanometers wavelength shall be reduced by having correct near infra red reflectance for the colors incorporated in the MSCN screens.

**c) Thermal Infra Red:** (3-5 micrometers & 8-14 micrometers)

The thermal properties shall be effective in the wavelength bands of 3-5 micrometers and 8-14 micrometers.

**d) Radar:** (cm & mm wavelengths)

The radar properties shall be effective in cm & mm wavelength bands.

**ii) Adaptability to specified type of terrain:**

MSCN nets shall be designed and manufactured to adapt and to perform well in specified terrain (Plains / Desert / Semi Desert & Mountains).

**iii) Temperature range:** (-30 °C to +60 °C)

MSCN nets shall be designed to perform in a wide range of temperatures. These shall safely provide sustained performance in ambient temperature range of -30 °C to +60 °C.

Cold resistance: No cracking at -30 °C (Test method - ISO: 4675)

Heat resistance: 7 days at + 70 °C – No changes (Test method – ISO: 1419/B)

**iv) Detection Ranges:**

Naked eye in day – 500 to 1000 m, TI – 800 to 1200 m.

**v) Weight:** Less than 300 gm/sq. m

MSCN nets shall be well within specified 300 gm/sq. m approximately.

**vi) Water absorption:** weight should not exceed 10%

MSCN nets shall be manufactured from synthetic woven and rugged yarn. These shall not retain water. After 30 minutes of becoming wet, the weight shall not exceed 10% of the net in dry condition.

There shall be no change in shape or size of the net during use.

**vii) Resistance to fire:**

MSCN nets shall be fire resistant & self-extinguishing.

**viii) Resistance to Termites / Insects:**

MSCN nets shall be resistant to termites & insects.

**ix) Material: Tensile strength**

MSCN nets shall be made of robust and non-snagging material of synthetic yarn.

Nets shall be non-sticking during normal storage.

Fabric: Tensile strength:  $\geq 30$  kg

Tie, Loop and Edge cord: Tensile strength:  $\geq 200$  kg

**x) Should provide for joining 2 or more nets:**

The joining of two or more nets to make larger sizes shall be easy and quick.

Similarly, disjoining of nets.

**xi) Size of MSCN:**

Size of MSCN nets shall be sufficient enough to cover the entire vehicle with dimensions as overall length of the vehicle -  $11000 \pm 50$  mm, overall width of the vehicle -  $3200 \pm 50$  mm and overall height of the vehicle -  $3400 \pm 50$  mm.

**Other points:**

a. Poles of suitable sizes shall be provided for deploying the MSCN. Long poles of lengths more than 2 meters shall be telescopic in construction to facilitate easy stowage. The nets when deployed should withstand steady wind speed up to 15 m/s.

- b. Strong and sturdy ground pegs (Anchor pins) shall be provided. The ground pegs shall be of quality suitable for use in different terrains.

#### **4. SCOPE OF SUPPLY & DELIVERABLES:**

On receipt of PO, vendor has to acknowledge and provide the product within the timelines.

Along with the product vendor has to provide the following deliverables:

- i) Reports of the Factory Acceptance test, Test certificates meeting all the requirements as specified in clause 3 specifications of MSCN above, Material certificates.
- ii) Necessary manuals such as User, Maintenance & Service manuals and list of spares as applicable.
- iii) The vendor should have supplied similar product to MoD/ Armed Forces and should submit documents in support of the same.

#### **5. PACKAGING:**

- i) Deliverables of MSCN should be packed suitably to prevent transit damages.
- ii) The vendor shall provide all packing, crating and markings in accordance with the requirements while handing over the complete set, the spare parts, tools etc.
- iii) The vendor shall provide the instruction for proper storage, handling and logistic functions of components supplied by the vendor.
- iv) All items shall be labeled with maker's name, the type & form of the piece or item, discrete serial number & rating, and the data of manufacture of the particular piece of item.

#### **6. OTHER TERMS AND CONDITIONS:**

##### **6.1 Warranty**

Notwithstanding inspection & acceptance of deliverables by BEML, vendor shall provide warranty for a period of 24 months. The vendor shall be responsible for any defect or failure of parts supplied due to defective design, material or workmanship.

The repair and/or replacement of failed components and installation of repaired/replaced components shall be taken by the vendor on his own charge at the Site.

The vendor shall bear custom duty, freight charges and all other expenses involved in collection of defective components and equipment from the Site, and transportation to the manufacturer's works in India and its return to Site after repairs.

Further, vendor should do any design modification required to any components or equipment as a consequence of failure analysis and modification shall be carried out for free of charge. The vendor shall carry out all replacement and repairs under the warranty promptly and satisfactorily on notification of the defect by BEML immediately.

## **6.2 Materials and Workmanship**

All materials and workmanship shall be in every respect in accordance with the proven up-to-date best practice. vendor shall provide necessary material certificate to this effect.

100% visual inspection of all components shall be carried out and the components/assemblies shall be free from any defect. Stage inspection to be carried out. Any threaded fasteners should turn freely without jamming and to be lubricated wherever called for.

## **6.3 Product Support**

The vendor shall be required to confirm that he is in a position to provide product support in terms of maintenance, material and spares for a period of minimum 10 years.

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