

## **Ergonomically Designed Backpack (70 Lt )**

### **Background**

Military operations in Indian scenario are always critical and challenging considering various terrains like high altitudes, desert, jungle etc. Most of the occasions carrying heavy load is an integral part which sometimes involves a load magnitude of 30kg and above. At the same time proper fitting of load carriage ensembles during carrying heavy loads is a critical issue where Indian soldier's represent a broad range of anthropometric variability i.e., 95<sup>th</sup> percentile tallest (Sikh) to 5<sup>th</sup> percentile shortest (Gorkha). On the other hand issues of mobility, comfortably and safety is also a concern.

Apart from the above, the scaffolding external frame in existing backpacks is shorter in size, thus incompatible with most of the soldier population, leading to discomfort and pain. The existing backpacks also do not have adequate cushioning on pressure points at shoulders, back and waist region; and no integrated facility for carrying rifle and hydration pack. In this regard, DIPAS, DRDO has developed an ergonomically designed backpack (70 Lt ) with an aim to provide a well designed backpack for soldier's as well as civilian to enhance their load carrying capacity as well as comfort.

### **Novel features of the Backpack and their Potential benefits:**

- ✓ Ergonomically designed using indigenous anthropometric data, enhancing compatibility with user population.
- ✓ Made up of 6.6 Nylon that is sturdy and water resistant.
- ✓ Hook-on Hydration Pack (1 litre) with antimicrobial feature helps in rehydrating individual during load carriage.
- ✓ Provision of detachable haversack.
- ✓ Outer surface is provided with the facility of pouch attachment ladder (PAL) system to attach optional/additional load.
- ✓ Well cushioned padding at shoulder strap, waist strap, and throughout the length of spinal column causing increased comfort by distributing pressure equally to shoulders, back and waist regions.
- ✓ Adjustable shoulder strap is the unique design feature that allows the adjustability of the back support for different size populations and optimizes users' upright posture for better stability.
- ✓ Removable internal Aluminium plate at the back portion of backpack for better support.
- ✓ Integrated rifle carrying facility on both sides of the backpack allows normal swing of the arms resulting in better balance and stability during load carriage.
- ✓ Provision for neck and hand rest for comfort and reduction in muscular fatigue.
- ✓ Option of carabiner for carrying / holding climbing equipment.
- ✓ Facility to hold skis on both side of backpack.
- ✓ Options for carrying climbing shoes.
- ✓ Facility to cover whole backpack during rain, snow, sandstorm etc.

### **Scope of Usage**

This backpack will be immensely useful to carry military loads during marching, training and military exercises and different civilian applications like trekking and mountaineering, sports and travelling.