

## Effective use of coarse wool

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### Introduction:

Among the natural fibres, wool from sheep is one of the oldest textile fibres used by mankind. Wool is the leader among animal fibres with 1.160 million kg annual production. Apparel, carpet, and coarse grade wool are the three main grades of wool produced around the world, based on the ultimate application. Wools with a diameter of less than 25 microns are classified as clothing wool, wools with a diameter of 25-35 microns are classified as medium or carpet grade



*Coarse wool*

wool, and wools with a diameter of more than 35 microns are defined as coarse wool.

Clothing wool and carpet grade wool is widely used in the textile industry to make clothes, rugs, and carpets. However, a large amount of coarse wool waste is underutilized and discarded into landfills. So there is a need to use and recycle waste materials to produce value added products which is vital for sustainable development and reducing environmental burden.

### Properties of wool:

Wool has the most complex structure. This complex structure has outstanding flexibility, moisture absorption, flame resistance, warmth, coolness, odour absorption, biodegradability, recyclability, breathability, resilience softness, noise absorption, safety, and ease of handling.

### Application of Course wool:

**Dyeing:** The capacity of wool particle-based materials to improve dyeing qualities when used as surface layers, fillers, or dyeing media for natural and synthetic polymers has gotten a lot of attention.



Wool Pellet

**Fertilizer:** The wool waste has been used in agriculture as a source of fertilizer to reduce soil salinity and nitrogen content and to retain soil moisture for a long time. It could be used as a

nutrient source because it has high quantities of nitrogen, sulphur and carbon thus it is rich of nutrient which are necessary for plant growth.

**Cosmetic Industries:** The wool fibre have been used as hair and skin care products due to their properties such as smoothness, elasticity, lusture, softness and protective efficacy.

**Sorbent:** Wool fiber is an excellent sorbent material to remove dye material, toxic gases and heavy metals such as Ag and Cu from industrial stream and purify wastewater supplies due to their high surface activity, large surface area and low density.

**Biomaterials:** The physicochemical and biological features of wool fibre make it perfect for tissue engineering, bio-inks, drug delivery systems, wound dressing, biomedical applications and bioplastics.

**Composite:** Coarse wool are used as reinforcement filler in the composite material can lead to a significant improvement on the thermal insulating properties of the composite materials, while maintaining mechanical properties. Thus, composite materials with wool exhibit low coefficient of thermal conductivity and as a result they could be used as building insulation materials.

**Conclusion:** It may be concluded that coarse wool was used in number of application such as agriculture, medical and industrial applications. Thus, Coarse wool offers a lot of potential for value addition that hasn't been fully realized yet.