

**Title** Pneumatic conveying characteristics of cotton seeds  
**Author** A. Kılıçkan and M. Güner  
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### Abstract

The pneumatic conveying characteristics of delinted and fuzzy cotton seeds (*Gossypium hisutum* L.) of *Gülerbey* and *Nazilli 84 S* varieties were determined. The length, width, thickness, arithmetic mean diameter, geometric mean diameter, sphericity, volume, 1000 seed mass, bulk density, true density, porosity, projected area, terminal velocity, drag coefficient, pressure drop, power consumption, and seed damage, namely mechanical damage, germination test, and seed vigour were investigated experimentally. The positive low-pressure system was used for conveying of cotton seeds. The length, width, thickness, arithmetic mean diameter, geometric mean diameter, sphericity, volume, 1000 seed mass, bulk density, true density, porosity, projected area, terminal velocity, and drag coefficient ranged from 9.06 to 10.89 mm, 4.73 to 5.88 mm, 4.23 to 5.15 mm, 5.74 to 7.31 mm, 5.82 to 6.89 mm, 61.37 to 64.03%, 95.11 to 121.40 mm<sup>3</sup>, 106.50 to 126.50 g, 296 to 632.10 kg m<sup>-3</sup>, 1000 to 1075 kg m<sup>-3</sup>, 41.20% to 71.59%, 31.90 to 52.70 mm<sup>2</sup>, 8.12 to 11.31 m s<sup>-1</sup>, and 0.462 to 0.684, respectively. The power requirement and pressure drop increased with increase in air velocity and decreased with increase in pipe diameter. As the conveying capacity increased, the power requirement and pressure drop increased. The highest pressure drop and power requirement were obtained for *Gülerbey* (delinted) and *Nazilli 84 S* (delinted) varieties, while the lowest pressure drop was found for *Nazilli 84 S* (fuzzy) and *Gülerbey* (fuzzy). The mechanical damage to the cotton seed for all varieties increased as the air velocity increased. The average values of germination and vigour index for all varieties at the inside pipe diameters of 43.1 mm and 70.3 mm decreased after pneumatic conveying. After conveying the germination and vigour index of *Nazilli 84 S* (delinted) decreased from 92% and 2.32 cm to 28% and 1.10 cm for 44.43 m s<sup>-1</sup> at the inside pipe diameters of 43.1 mm.