CHAPTER 1
INTRODUCTION AND OBJECTIVES

1.1 Introduction

Texturing in general can be described as a technique by which closely packed parallel arrangements of continuous synthetic filaments are changed into more open, voluminous structures. Most of the texturing methods involve simple mechanical distortion during heat treatment of the thermoplastic yarns. In contrast, the air-jet texturing process is a purely mechanical texturing method that uses a cold air-stream to produce bulked yarns of low extensibility; these yarns more closely resemble spun natural fibre yarns in their appearance and physical characteristics. Since the process does not involve heat as an essential requirement, it is suitable for both thermoplastic and non-thermoplastic yarns. Their resemblance to the conventionally spun yarns is in that the yarn surface is covered with fixed resilient loops, and these serve the same purpose as the protruding hairs in spun yarns by forming an insulating layer of entrapped still air between neighboring garment layers. The increasing consumer demand for the spun yarn look and natural fibre feel, and the increasing use of synthetic and other man-made filament yarns have made the air-jet texturing process extremely important for the textile industry and its share is expected to show a steady increase. The factors contributing to its growing popularity are the unique capability of this process; the desirable characteristics of the resultant yarns; the availability of a wider range of suitable supply yarns and the developments in the jet design resulting in reduced air consumption and better process economics.

Air-jet texturing is by far the most versatile of all the yarn texturing methods in that it can blend filaments together during processing. It was invented in the early 1950s. The commercial success of this process was delayed in the early stages of its introduction because of unfavorable economics and the problems with the quality of the textured yarns. Since late 1970s researchers have attempted to study various aspects of the process. A comprehensive analysis of the process was published in a series of papers in 1986 [1-8]. The limited range of end use of air-jet textured yarns has not facilitated
continued interest in the understanding of the process. Most of the previously reported work on air-jet texturing was mainly done on polyester, polypropylene and nylon yams, and although the texturing of blended yarns is very simple, very little published work [9-17] exists elucidating the various aspects of the process or the final yarn properties in relation to blending in texturing.

Modern day living conditions require clothing that is light weight, comfortable, safe, elegant, easy care and hard wearing. No single textile fibre has all the desirable attributes. Synthetic fibres have better wear and easy care properties but they lack many comfort related properties. Natural and regenerated fibres have better feel and higher moisture absorbency leading to good comfort in wear and low static charges but have poor strength and abrasion resistance. The blended yarns composed of two or more fibre components like polyester/viscose in intimate blend can produce yarns and fabrics with optimum desirable properties.

1.2 Objectives

Two main objectives of this study are:

i. To assess the properties of P/V blended air-jet textured yarns and determine the optimum air-jet texturing process parameters based on instability, physical bulk and tenacity of these yarns.

ii. To assess the properties of P/V blended air-jet textured yarn woven fabrics and compare the properties of these fabrics with corresponding ring-spun yarn fabrics and study the effect of blend proportion on the properties.