CHAPTER I
INTRODUCTION

Dyeing and printing are fabric beautification techniques that employ colouration processes. When dyeing and printing become complex processes to be studied these are called techniques. These are the textile arts which need high technical skills. These skills have always been a part of culture in India. These are also contributing to the prosperity of our country. These arts have taken form of industries and are source of earning foreign exchange for the country (Gurjar, 2003).

Resist dyeing is one of the oldest techniques of colouring and embellishing fabrics and is used around the world using a variety of processes, tools and materials with varied results. Resists dyeing decorates fabrics by controlling the flow or placement of dye or paint. It helps in the creation of imagery, intricate patterning and interesting dye effects. There are many resist types and techniques, some as old as dyeing itself and some brand new with undiscovered potential.

Resist dyeing is a technique of patterning in which a part of fabric surface is covered or reserved prior to dyeing. This may be achieved by covering the areas with the dye resisting substances, such as wax or rice paste or by stitching and tying either the finished cloth or the yarns from which it is to be woven (ikat) (Anonymous, 2001b).

A resist may be anything that blocks the application of another medium. It may be a string, wax, stencil or a chemical (Marshall, 2007). All types of resist dyeing techniques can be classified into Chemical and Mechanical Techniques. In the chemical method, the resist material renders dye fixation difficult by chemical means. In the mechanical process, the penetration of dye is restricted by preventing the dye liquor from wetting the fabric by purely mechanical means.

A resist may be a physical manipulation of the cloth as in the case of tie-dye where methods of tying, stitching, folding and clamping the cloth secure the inner areas and leave it unaffected by dye. Or it may be a liquid substance that once applied to the cloth dries or solidifies on the fibres creating a barrier. This barrier prevents dye from reaching the areas underneath.
These mechanical resist dyeing techniques are classified mainly in two categories—batik techniques and tie and dye techniques. Batik technique is further divided into two types—wax and non-wax batik.

Batik is a traditional Javanese resist style and it is practiced in many cultures, including Indonesia, Malaysia, Africa, China, Australia (Anonymous 2001b) and Japan (Anonymous 2006b), where the design is drawn onto the cloth with wax or a wax mixture. Although this is often molten wax, it may also be any other dye proof substance like starch or clay paste. These resists may be water based or solvent based. These may be man-made or natural products. When applied substance hardens it resists dyes and when it is removed by boiling, melting or scrapping, the design of the reserved area remains un-dyed, showing a light pattern against the dyed background. The resistance substances are applied by brush, kalam, block, or hand. Resist application is repeated as many times as the number of colours in the pattern, in order to produce very rich and striking effects. This art offers a unique and personal aesthetic charm of hand work unlike the mass produced fabrics. With careful thought and considerations, it is possible to produce imitations; which are usually very inferior both in design and in finish. This is not due to the difficulty of imitating the patterns but because of problem in duplicating the effect that is created per chance. The accidental effect is what has always endeared these to the craftsmen.

Now-a-days resist dyeing has captured the interest of artists and consumers and is been rediscovered by designers. The art of batik is becoming popular worldwide and has attained prominence in the world of fashion. It has reached fantastic heights of virtuosity. Lots of people are earning their livelihood by practicing this art. Artists use these techniques to translate their own idea into patterns, designed for dress materials or decorative articles. The interest for batik of the general public and artisans is growing constantly as it is an individualistic means of expression with unlimited means of expression with unlimited scope. It is a craft which is within the capabilities of even the non-specialist.

Earlier, the batik process was employed almost exclusively in making dress material. But today many eminent artists have begun to experiment with batik. Batik takes many forms, ideas, discoveries, styles and completely new methods of working with textiles. The modern batiks are livelier and brighter. It is worked on textiles, decorative panels, interior blinds, murals, paintings, screen etc. (Anonymous, 2001a).
Indians were familiar with batik as early as first century A.D. A large part of population in India earns its livelihood by producing handicraft items including batik textiles. Traditional resist printing is prevalent at many places especially in Rajasthan (Anonymous, 2007). It is the state in India, where four pastes are used as resist called Daabu in local language. Wax is used in Sanganer and Jaisalmer; while clay, wheat starch and guar gum are used in Bagru. This art can be exploited to its fullest extent for the benefit of craftsmen with a little more imagination and experimentation. Combining this traditional art with new techniques will give a lift to this art.

The resist substance used in this technique requires to be converted to the paste form so that it can be applied in the form of pattern on the cloth using a block, brush, stencil or any other method of application. These resist substances may be gums, mud/clay, starch or wax.

The most widely used resist material in batik is wax, but it has some disadvantages too. Use of wax in batik has many times led to accidents. It is quite costly. Its application and removal are difficult and lengthy. It also causes air pollution as fumes are released during heating (Flowers, 1986 and Reed, 2002).

The wax is removed by boiling. Sometimes the process must be repeated several times. If the hot waxy water is thrown down a sink, the solution on cooling may bring plumbing disasters. Wax is difficult to remove completely without employing aggressive solvents. Colour of many cold dyes is compromised when wax is removed by boiling. Hot dyeing adversely affects wax patterning so wax cannot be used with hot dyes (Flint, 2008).

Various types of non wax resist pastes have been tried from time to time in different cultures. A paste of okra vegetable is used in West Africa particularly in the hand printed adinkra cloths of Ghana (Polakoff, 1982). The Soninke people of Senegal use as resist a tough rice paste. In Batavia, a paste of groundnuts, lime and water is used. The peasant population in Chinese mainland used a mixture of soya bean, cheese and lime (Robinson, 1969). The Yoruba people of Niger area West Africa use starch resist paste make from cassava tubers (Proud, 1965; Jameson 1973; Flower, 1986 and Anonymous, 2005). The solvent based Gutta (resist, works like wax but is liquid), water based Gutta (applied straight from a tube), potato dextrin paste resist (not for immersion dye baths), corn dextrin resist (not suited for immersion dye baths) are also available in market (Anonymous, 2001c).

Recent studies carried out on non wax batik included the use of various starches, gums, clays, fevicol, etc. (Gogoi et.al., 1998; Boobyer, 2001; Reed, 2002 and Shahidulla et.al., 1994). The
The challenge in finding out a new resist material is that the substance must be permanent enough that it performs the task of resisting dye while still being impermanent enough to be removed later. The substance should also be strong to withstand the dyeing process. Plaster of Paris fits best in these requirements. Plaster of Paris was first studied as resist material by Parul (2002). She found that plaster of Paris was the best among non-wax resist materials. It gave perfect white resist, it did not need reapplication, no cooking was required so it took minimum time, was cheaper, gave finest crack effect, and produced greatest aesthetic appeal and sharpness of outline.

Chauhan (2004) conducted further experiments with plaster of Paris as a resist material. Experiments were done to see the performance of plaster of Paris on different cotton fabrics with azoic dye. Experiments were also carried out by varying the consistency, thickness of layer, application techniques, single/double side application, crack level and immersion time.

Chauhan’s one of the experiments involved the comparison of plaster of Paris’ performance with azoic, direct and reactive dye in which it was found that the paste could resist azoic and direct dyes satisfactorily but not the reactive dye. It not only implies that the performance of plaster of Paris is different with different types of dyes but also that it can be as effective with hot bath dyes as with the cold bath dyes. It means that it does not have the limitation of wax of just being suitable with cold bath dyes. It further suggests that there is a lot of scope of using plaster of Paris with different types of dyes on different types of fabrics like silk, cotton, wool, polyester, nylon and acrylic.

Variety of methods has been suggested by various researchers for application of different resist pastes like combs, sticks, brushes, blocks, screens, stencil, feathers and so on. Those methods can be tried with Plaster of Paris to obtain variety of patterns and interesting effects.

The foresaid efforts will be helpful in producing novel looks and adding a new dimension to the batik industry. This will open new avenues of income generation for the artisans and craftsmen. Therefore, the present study has been planned to explore the potential of plaster of Paris as a resist material with different dyes.

OBJECTIVES
1. To study the compatibility of Plaster of Paris resist paste with different hot bath dyes on different fabrics.

2. To compare the efficacy of different brands of Plaster of Paris as resist material.

3. To investigate the effect of Plaster of Paris resist paste on physical properties of the fabrics.

4. To explore the various application techniques for Plaster of Paris resist paste.

DELIMITATION

1. Only six types of fabrics will be used in the study.

2. Only ten types of dyes will be selected for the study.

3. Only five brands of Plaster of Paris will be compared.