

## INTRODUCTION

The aim of this book is to supply the most comprehensive and global insight into textile finishing processes. Since the subject is exceptionally extensive and complex, this book may appear limited to the experts working in this sector.

As far as students are concerned, we hope that this book will offer them an essential background, a basis to be extended by further studies.

Textile finishing usually includes treatments such as scouring, bleaching, dyeing and/or printing, the final mechanical or chemical finishing operations, that during this stage are carried out on textile products (staple, sliver or top, yarns or filaments, woven or knitted fabrics) to enhance their basic characteristics like dye penetration, printability, wettability, colour, hand, and appearance.

By textile finishing, we also mean all the processing operations that, though included in the so-called finishing stage, are generally applied to the fabrics to improve their appearance, hand and properties, at times in accordance with their field of application.

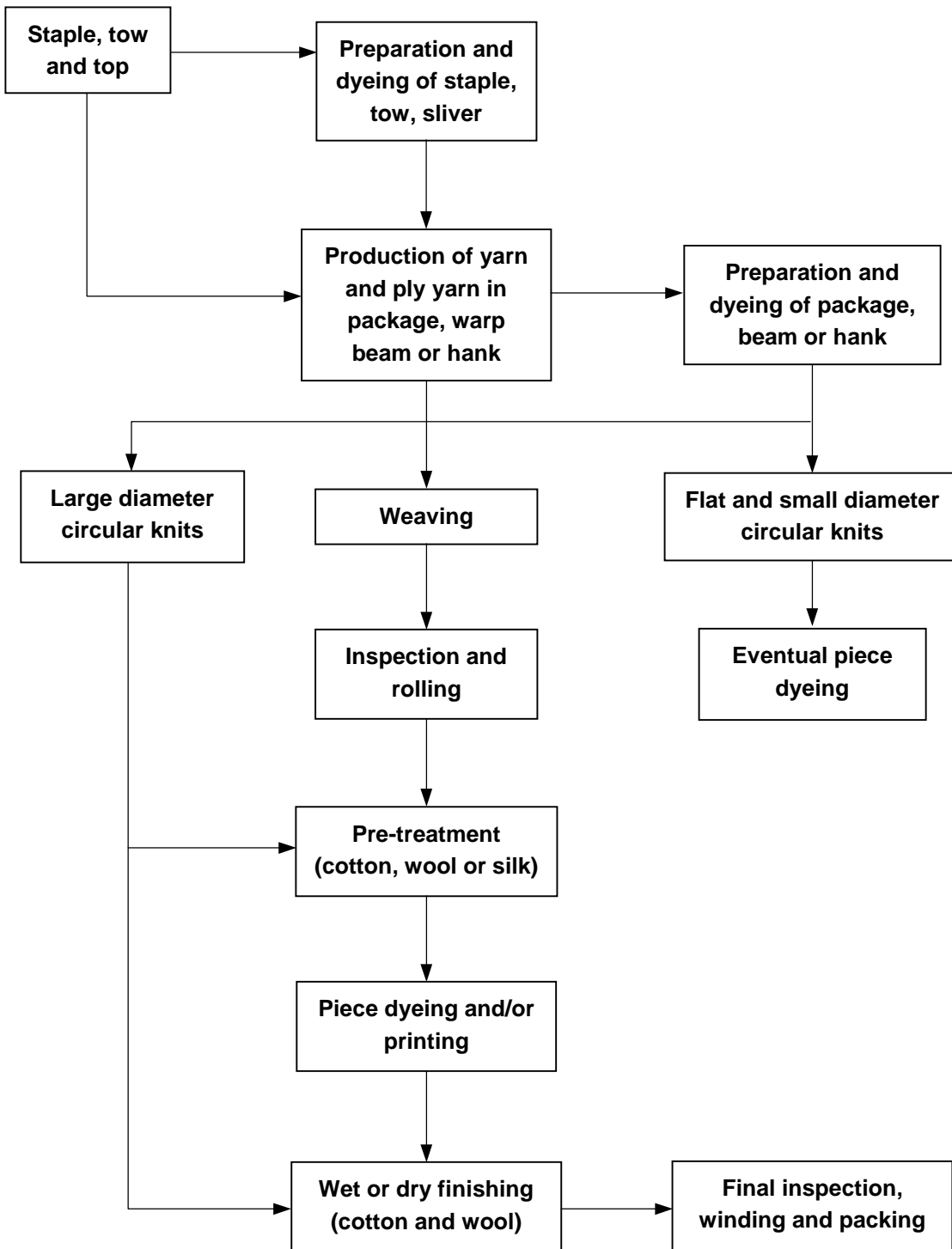
The finishing stage plays a fundamental role in the excellency of the commercial results of textiles, which strictly depend on market requirements that are becoming increasingly stringent and unpredictable, permitting very short response times for textile manufacturers.

The latest machines on the market used for finishing operations generally offer multi-purpose applications; the flexibility and versatility features of these machines are uninterruptedly evolving to grant excellent consistency of the results.

Finishing operations can be carried out by means of discontinuous, continuous and semi-continuous systems.

- *Discontinuous or batch-type systems*: all the operations are carried out on a single machine; it is therefore necessary to load the machine, carry out the treatments following a predetermined cycle, unload the machine and finally wash it thoroughly before starting a new cycle. This working process is extremely flexible and is suitable for processing small lots: for example, it is possible to carry out a scouring treatment on a single machine, then a bleaching one followed by a dyeing process. For the production of large lots, the discontinuous process is labour-intensive, i.e. it requires many operators to load and unload the material; it also entails long processing times and results that can vary from one batch to another.
- *Continuous systems*: the operations are carried out by means of a series of machines; every machine carries out always and solely the same process. Every machine is assembled according to specific production requirements. A system like this entails high start-up costs and a complex setup but once the system has started, it requires a smaller staff and grants excellent repeatability and high output rates; continuous systems are therefore suitable for manufacturing large lots of products with the highest cost-efficiency.
- *Semi-continuous systems*: in these mixed systems several operations are carried out with both continuous and discontinuous machines. For example, a continuous pad-batch machine is used to wet the fabric and a discontinuous system is then used for other treatments. These mixed systems are suitable for processing small and medium lots; they require reasonable start-up costs and grant quite good reproducibility.

**The textile finishing stage:**

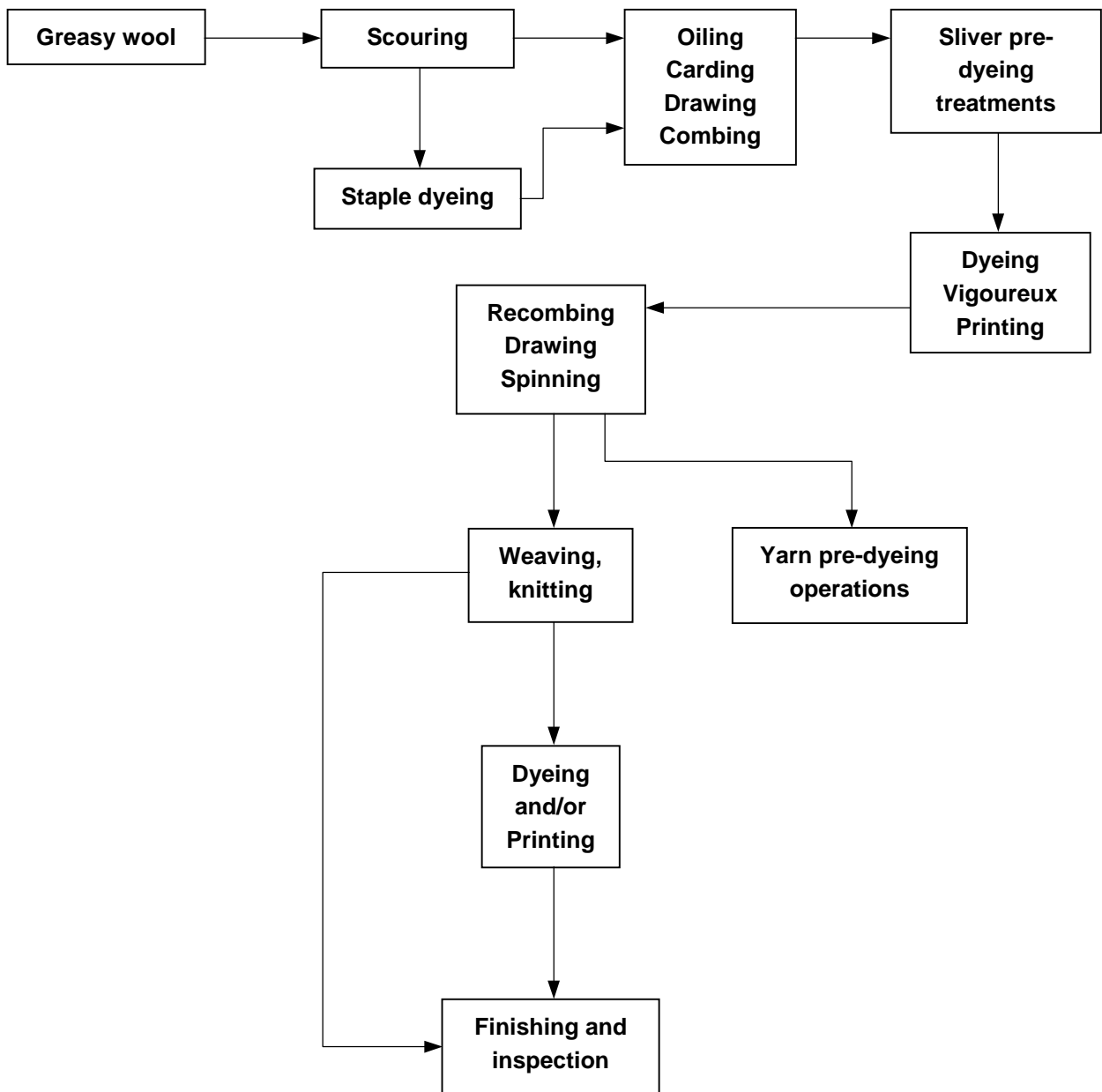


## Wool Finishing Processes

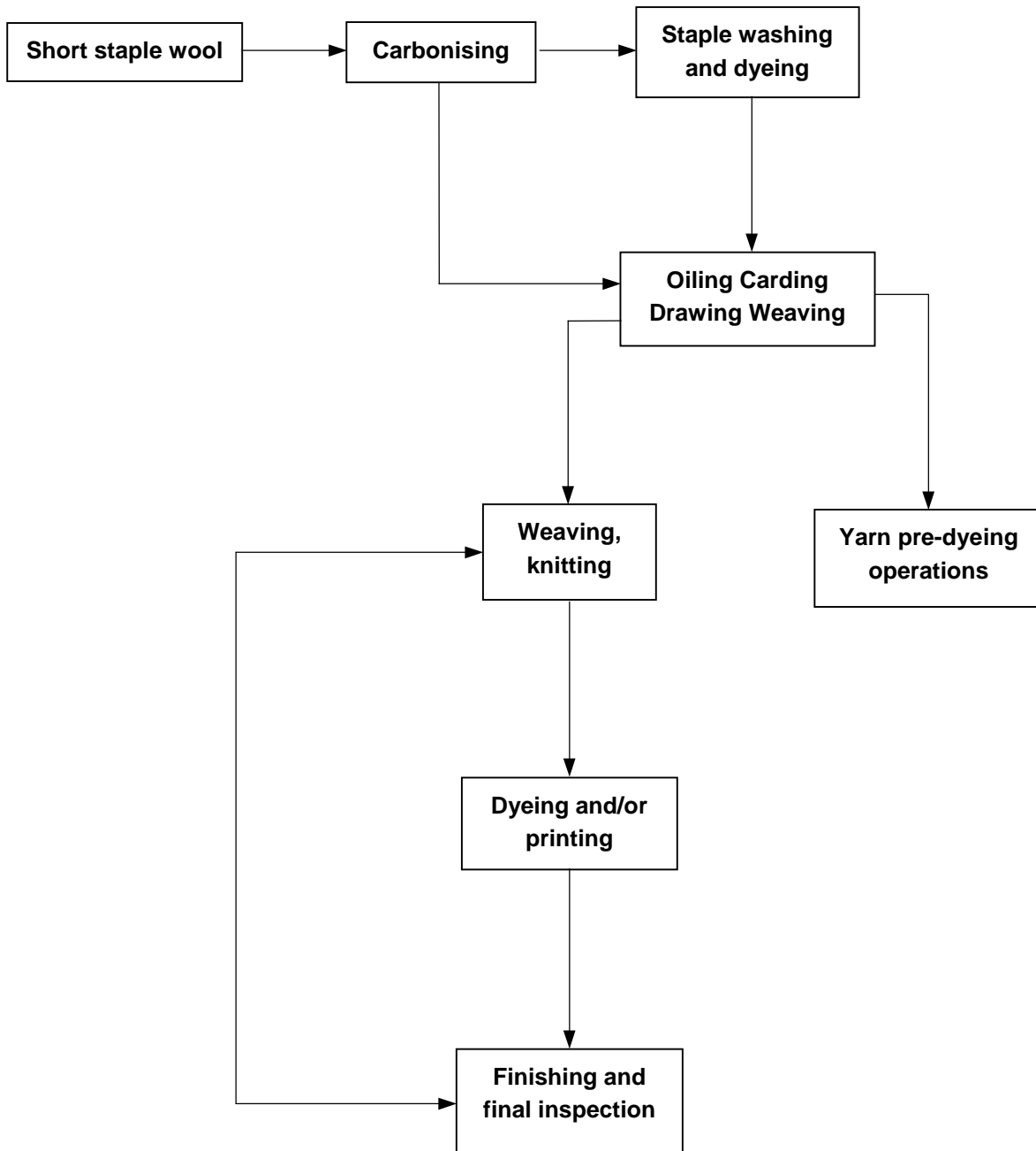
The sequence of the treatments undergone by wool fibres in various forms (staple, sliver, yarn, woven and knitted fabric) varies according to the modification process of the fibre structure, according to the type of processing system used and according to the experience of the operator (these criteria are valid for all fibres).

Therefore the wool processing cycle can vary accordingly: an example is shown in the following.

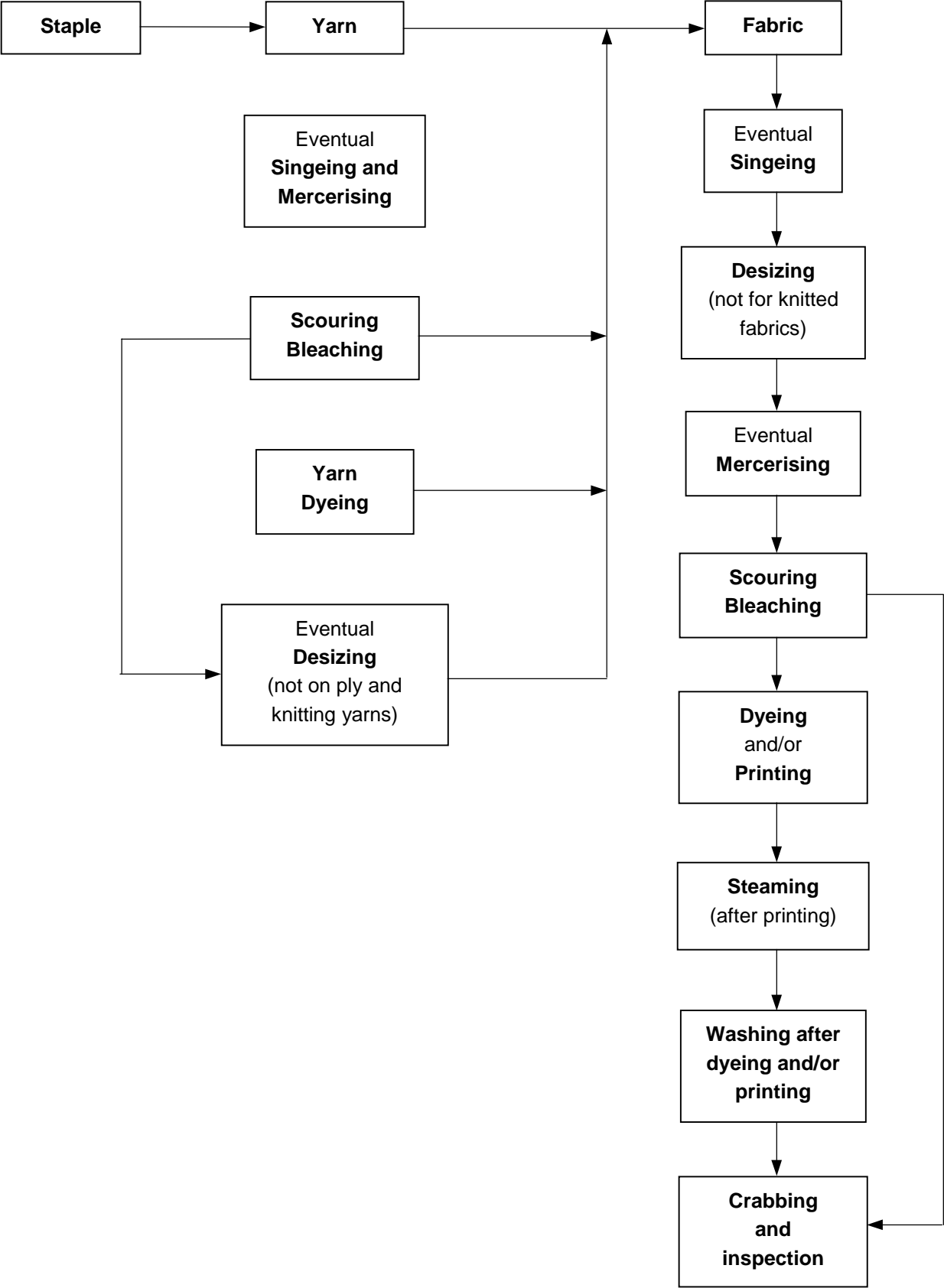
### Worsted cycle:



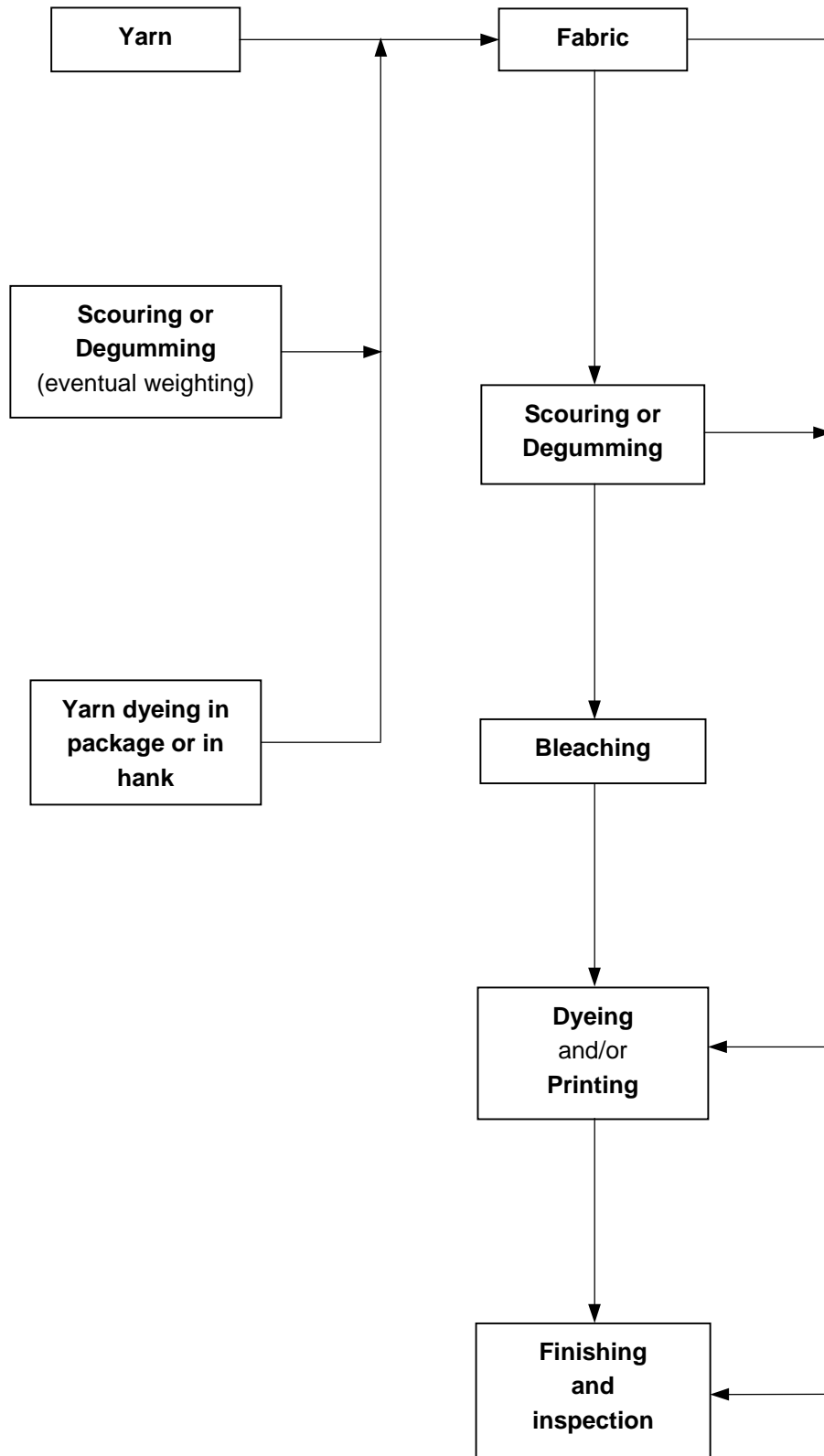
**Woollen cycle:**



# Cotton Finishing Processes



# Silk Finishing Processes



**Synthetic Fibres Finishing Processes**

