

WOODHEAD PUBLISHING SERIES IN TEXTILES



Advances in knitting technology

Edited by K. F. Au



The Textile Institute

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PUBLISHING

Published by Woodhead Publishing Limited in association with The Textile Institute
Woodhead Publishing Limited,
80 High Street, Sawston, Cambridge CB22 3HJ, UK
www.woodheadpublishing.com

Woodhead Publishing, 1518 Walnut Street, Suite 1100, Philadelphia,
PA 19102-3406, USA

Woodhead Publishing India Private Limited, G-2, Vardaan House,
7/28 Ansari Road, Daryaganj, New Delhi – 110002, India
www.woodheadpublishingindia.com

First published 2011, Woodhead Publishing Limited
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British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library.

ISBN 978-1-84569-372-5 (print)
ISBN 978-0-85709-062-1 (online)
ISSN 2042-0803 Woodhead Publishing in Textiles (print)
ISSN 2042-0811 Woodhead Publishing in Textiles (online)

The publisher's policy is to use permanent paper from mills that operate a sustainable forestry policy, and which has been manufactured from pulp which is processed using acid-free and elemental chlorine-free practices. Furthermore, the publisher ensures that the text paper and cover board used have met acceptable environmental accreditation standards.

Typeset by RefineCatch Limited, Bungay, Suffolk, UK
Printed by TJI Digital, Padstow, Cornwall, UK

Types and suitability of yarns for knitting

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Abstract: The chapter introduces the basic definition and information on types of yarns and their classifications. It also provides information concerning the types of bobbins used for stapled and/or filament yarns. The processes of winding yarns and some of their modifications are described, and a classification of the knitting yarns is presented. The reader can find a brief description and photograph of common defects occurring during the knitting process, their names and methods of eliminating them. The chapter also describes progress in synthetic yarn production depending on design process, with some examples.

Key words: yarn, natural fibers, synthetic yarns, winding, defects, properties.

1.1 Introduction

Today, textile products are expected to comply with an increasing number of requirements. The most important of these are how comfortable the product is to use, the look of the product and its hygiene features. In order to fulfill these requirements, the ready textile product has to be eye-catching. It must possess an interesting color and design, and also be pleasant to handle, giving a sensation of smoothness, softness and elasticity. The product must provide heat insulation, but still remain permeable to air and moisture. It is also important that it maintains its shape and color stability, even after regular washing.

It is possible to fulfill these requirements by selecting the proper raw material and structure for the knitted fabric, and applying a suitable finishing process. The proper selection of the raw material seems to be the most important factor. Yarns vary greatly in terms of their physical and mechanical properties (in other words, the properties that dictate the future usage and features of the fabrics).

In recent years, researchers have combined improvements in the properties of natural and chemical fibers. Thus, the chemical fibers in a manufactured product can possess the same properties as a natural fiber. Many researchers are also concerned with the task of developing new fiber assortments, as well as improving the existing ones.

1.1.1 Types and definition of knitting yarns

In view of the general property profile, there are specific kinds of yarns for weaving, knitting and other special purposes. The properties of knitting yarns are determined by the specific requirements of both knitted goods and the knitting

process itself. There are several different kinds of yarns recognized, defined on the basis of their final product application and the kind of knitting machine on which the knitting process is run. These include: tricot, hosiery, yarn for brushing, wadding yarn, yarn for elastic goods, and for other special fabrics.

Additionally, as in the classification of other yarns, there are recognized types such as single, double or multi-throw yarns. Classifications that depend on the processing of the yarn include:

- conventional yarn, traditional (staple, filament and cord);
- modified, textured.

The spinning system is used in the production of the following conventional staple yarns:

- comb yarn
- card yarn
- waste yarn

and also in the production of the following textured yarns: elastic yarn and fluffy yarn, where the elastic yarn is characterized by a very good resiliency, and fluffy yarn by bulk. A staple yarn can be made using a cotton spinning system or a wool spinning system.

We can also classify staple yarns on the basis of their raw material composition, for example:

- 100% natural fibers (e.g. cotton, wool, linen, silk);
- natural fibers blended with chemical or synthetic yarns.

The knitting yarns in the groups mentioned above are recognized as single and twisted. Filament yarn can be classified as:

- non-textured
- textured
- high elastic
- bulk.

In contrast with all the groups mentioned above, knitting yarns can also be classified according to finishing process:

- raw yarn
- bleached yarn
- colored or multi-colored, both in the yarn or in fiber mass.

1.1.2 Qualitative factors of knitting yarns

In order to make the right qualitative estimation, it is essential to underline several very basic aspects of quality, which can be found in many definitions: