



Standard Guide for Characterization and Testing of Hyaluronan as Starting Materials Intended for Use in Biomedical and Tissue Engineered Medical Product Applications¹

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INTRODUCTION

Hyaluronan, which in this guide will encompass hyaluronic acid, hyaluronate, and its salt forms, is the simplest of the glycosaminoglycans. Hyaluronan is soluble in water and forms highly viscous solutions. Hyaluronan is found in ubiquitously in the body as part of the extracellular matrix of tissues, with high concentrations in the synovial fluid, vitreous humor, and skin, as well as in cartilage. Hyaluronan has found uses in a variety of products ranging from viscosupplements (treatment of osteoarthritis), adhesion prevention (prevention of post-surgical adhesions), viscoelastics (ocular protection), and dermal implants (lip augmentation and wrinkle removal). New applications, such as scaffolds for tissue engineering, are emerging. The aim of this guide is to identify key parameters relevant to the characterization of hyaluronan for the development of new commercial applications of hyaluronan for the biomedical and pharmaceutical industries.

1. Scope

1.1 This guide covers the evaluation of hyaluronan suitable for use in biomedical or pharmaceutical applications, or both, including, but not limited to, Tissue Engineered Medical Products (TEMPs).

1.2 This guide addresses key parameters relevant to the characterization and purity of hyaluronan.

1.3 As with any material, some characteristics of hyaluronan may be altered by processing techniques, such as cross-linking and sterilization, required for the production of a specific formulation or device. Therefore, properties of fabricated forms of this polymer should be evaluated using test methods that are appropriate to ensure safety and efficacy and are not addressed in this guide.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory requirements prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

- D 2196 Test Methods for Rheological Properties of Non-Newtonian Materials by Rotational (Brookfield) Viscometer
- F 619 Practice for Extraction of Medical Plastics
- F 748 Practice for Selecting Generic Biological Test Methods for Materials and Devices
- F 749 Practice for Evaluating Material Extracts by Intracutaneous Injection in the Rabbit
- F 756 Practice for Assessment of Hemolytic Properties of Materials
- F 763 Practice for Short-Term Screening of Implant Materials
- F 813 Practice for Direct Contact Cell Culture Evaluation of Materials for Medical Devices
- F 895 Test Method for Agar Diffusion Cell Culture Screening for Cytotoxicity

¹ This guide is under the jurisdiction of ASTM Committee F04 on Medical and Surgical Materials and Devices and is the direct responsibility of Subcommittee F04.42 on Biomaterials and Biomolecules for TEMP.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.