



Standard Test Methods for Dynamic Evaluation of Glenoid Loosening or Disassociation¹

This standard is issued under the fixed designation F2028; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 These test methods measure how much a prosthetic anatomic glenoid component rocks or pivots following cyclic displacement of the humeral head to opposing glenoid rims (for example, superior-inferior or anterior-posterior). Motion is quantified by the tensile displacement opposite each loaded rim after dynamic rocking. Similarly, these test methods measure how much a prosthetic reverse glenoid component rocks or pivots following cyclic articulation with a mating humeral liner. Motion is quantified by the magnitude of displacement measured before and after cyclic loading.

1.2 The same setup can be used to test the locking mechanisms of modular glenoid components, for example, disassociation of both anatomic and reverse shoulder components.

1.3 These test methods cover shoulder replacement designs with monolithic or modular glenoid components for cemented fixation as well as reverse glenoid components for uncemented fixation.

1.4 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.5 *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 limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

[E4 Practices for Force Verification of Testing Machines](#)
[F1378 Specification for Shoulder Prostheses](#)

¹ These test methods are under the jurisdiction of ASTM Committee F04 on Medical and Surgical Materials and Devices and are the direct responsibility of Subcommittee F04.22 on Arthroplasty.

Current edition approved March 1, 2014. Published July 2014. Originally approved in 2000. Last previous edition approved in 2012 as F2028 – 08(2012) ^{ϵ 1}. DOI: 10.1520/F2028-14.

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.

[F1839 Specification for Rigid Polyurethane Foam for Use as a Standard Material for Testing Orthopaedic Devices and Instruments](#)

3. Terminology

3.1 Definitions:

3.1.1 *anatomic total shoulder arthroplasty, n*—shoulder implant that has a concave glenoid component and a convex humeral component design.

3.1.1.1 *anatomic glenoid, n*—the concave prosthetic portion that replaces the glenoid fossa of the scapula and articulates with a convex prosthetic replacement of the humeral head in anatomic total shoulder arthroplasty applications. It may consist of one or more components from one or more materials, for example, either all-polyethylene or a metal baseplate with a polymeric insert.

3.1.1.2 *humeral head, n*—the convex prosthetic portion that replaces the proximal humerus or humeral head and articulates with the natural glenoid fossa or an anatomic prosthetic replacement.

3.1.2 *reverse total shoulder arthroplasty, n*—shoulder implants that have a convex glenoid component and a concave humeral component design.

3.1.2.1 *glenoid baseplate, n*—the nonarticular portion of the reverse glenoid component that modularly connects to the glenosphere and is usually fixed to the glenoid fossa of the scapula using bone screws without the use of cement.

3.1.2.2 *glenosphere, n*—the convex prosthetic articular portion of the reverse glenoid component that articulates with the concave prosthetic replacement of the proximal humerus or humeral head (for example, the humeral liner).

3.1.2.3 *glenosphere thickness, n*—the height of the truncated section of the sphere which composes the glenosphere. Note that the difference between the glenosphere articular radius and thickness defines the medial/lateral position of the glenoid center of rotation (see [Fig. 1](#)). The glenosphere thickness could also be affected by the geometric relation between the glenosphere and the glenoid baseplate.

3.1.2.4 *humeral liner, n*—the concave prosthetic portion of the reverse humeral component that replaces the proximal