



Designation: F 732 – 9800

Standard Test Method for Pin-on-Flat Wear Test for Wear Testing of Polymeric Materials Used in Total Joint Prostheses which Experience Linear Reciprocating Wear Motion¹

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1. Scope

1.1 This test method ~~covers~~ describes a laboratory method for evaluating the ~~friction and wear properties of combinations of materials that are being considered for use as the bearing surfaces of human total joint replacement prostheses that experience only linear reciprocating motion.~~ The body of this standard contains general methods which apply to all types of prosthesis wear motion. Such applications include hinged knees, other hinged joints, trunnion bearings, and any other application in which the while individual annexes describe specific wear path at any given contact point reciprocates along a fixed line. Applications that ~~are not relevant to this test method include head/socket articulation in hips methods and shoulders, liner/shell relative motion in hips, all patello-femoral and femoro-tibial articulation in knees where internal-external rotation may occur, and tibial insert/tibial tray relative motion in knees.~~ clinical validation criteria tailored to each distinct wear application (for example, linear reciprocating motion, ball-cup (“hip-type”) wear, delamination wear, etc.). It is the intent of this test method to rank ~~the materials with regard to friction levels and materials, within each wear application, for polymer wear rates under simulated physiological conditions.~~ However, it ~~It~~ must be recognized that, since any one design of joint replacement, even with this restricted scope, performs under unique conditions of load, motion, and recognized, however, that contact geometry, there can be no single, universally applicable geometries and wear screening test. motions are simplified using such methods. This test method, therefore, represents only the first state an initial stage in the full wear characterization of a candidate material.

1.2 All candidate materials should be tested in an appropriate joint simulator apparatus using prototype prostheses before being used in clinical trials in patients. The ~~pin-on-disk test tests~~ described in this test method ~~is~~ are used to quickly and reliably ~~identify those low-friction, low-wear materials~~ screen material combinations for wear performance in different orthopaedic wear applications prior to committing them to more expensive and time-consuming joint simulator testing is justified. testing. In addition, ~~the pin-on-disk test these simplified tests can be used to relate wear to material parameters such as polymer molecular weight or counterface material, surface finish, or other parameters to wear behavior on a more practical basis than is possible in joint simulator tests.~~

2. Referenced Documents

2.1 ASTM Standards:

F 75 ~~Specification for Cobalt 28 Chromium — 6 Molybdenum Casting Alloy and Cast Products for Surgical Implantss (UNS R30075)~~

¹ This test method is under the jurisdiction of ASTM Committee ~~F-4~~ F04 on Medical and Surgical Materials and Devices and is the direct responsibility of Subcommittee F04.15 on Materials Test Methods.

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