Summary of the most commonly used test methods

Part 5A – Total Hip Replacement

☐ Dynamic compression (D-CO) with (or without) torsion

ISO 7206-4

Implants for surgery -- Partial and total hip joint prostheses -- Part 4: Determination of endurance properties and performance of stemmed femoral components

Scope

Determining the endurance properties of stemmed femoral components of total or partial hip joint prostheses.

☐ Dynamic compression (D-CO) with (or without) torsion

ISO 7206-6

Implants for surgery -- Partial and total hip joint prostheses -- Part 6: Determination of endurance properties of head and neck region of stemmed femoral components

Scope

Determining the endurance properties of the head and neck region of stemmed femoral components of total or partial hip joint prostheses.

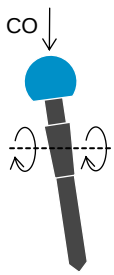
☐ FEA (worst case assessment)

ASTM F2996

Standard Practice for Finite Element Analysis (FEA) of Non-Modular Metallic Orthopaedic Hip Femoral Stems

Scope

Simulation of metallic hip stems using Finite Element Analysis techniques. Can be used for worst case assessment.



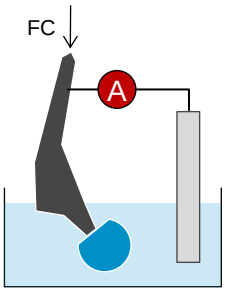
☐ Dynamic compression (D-CO)

ASTM F2580

Standard practice for evaluation of modular connection of proximally fixed femoral hip prosthesis

Scope

Fatigue testing of modular metallic femoral hip prostheses with proximal metaphyseal fixation



☐ Dynamic corrosion (D-FC)

ASTM F1875

Standard Practice for Fretting Corrosion Testing of Modular Implant Interfaces: Hip Femoral Head-Bore and Cone Taper Interface

Scope

Evaluating the mechanical stability of the bore and cone interface of the head and stem junction of modular hip implants.

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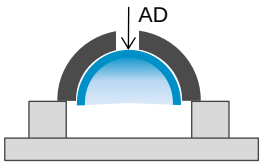
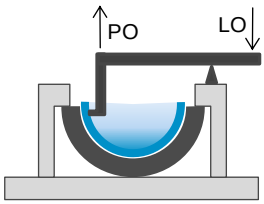
Summary of the most commonly used test methods

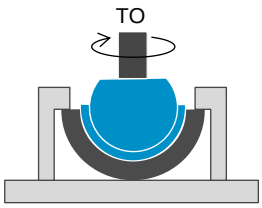
Part 5B - Total Hip Replacement



☐ Static axial disassembling (S-AD)



☐ Static offset pull-out or lever-out disassembly (S-PO or S-LO)



☐ Static torque-out disassembly (S-TO)

ASTM F1820

Standard Test Method for Determining the Forces for Disassembly of Modular Acetabular Devices

Scope

Measuring the attachment strength between the modular acetabular shell and liner.

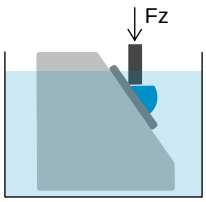
☐ Static compression (S-AD)

ISO 7206-12

Implants for surgery -- Partial and total hip joint prostheses -- Part 12: Deformation test method for acetabular shells

Scope

Determining the short-term deformation of a press-fit acetabular component for total hip joint replacement.



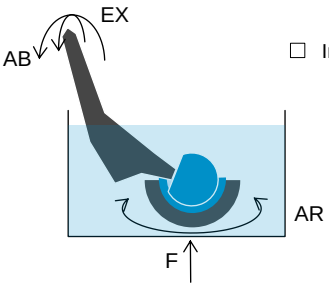
☐ Dynamic-compression fatigue (D-CO)

WK28883 (S11)

Standard Test Method for Fatigue Testing of Acetabular Devices for Total Hip Replacement

Scope

Evaluating the potential for acetabular shells to fracture under repetitive forces.



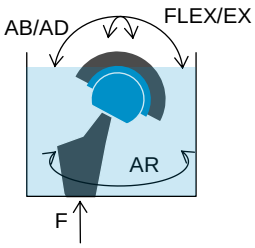
☐ Impingement testing (D-IP)

ASTM F2582

Standard Test Method for Impingement of Acetabular Prostheses

Scope

Evaluation of acetabular component fatigue, deformation, and wear and femoral head assembly dislocation under dynamic impingement conditions.



☐ Wear testing (D-WE)

ISO 14242-1 (ISO 14242-2)

Implants for surgery — Wear of total hip-joint prostheses — Part 1: Loading and displacement parameters for wear-testing machines and corresponding environmental conditions for test

Scope

Specification of the movement and loading patterns, the speed, the duration of testing, the sample configuration, and the test environment for wear testing of total hip-joint prostheses.

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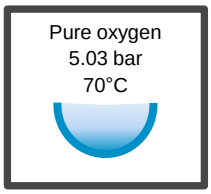
Summary of the most commonly used test methods

Part 5C - Total Hip Replacement



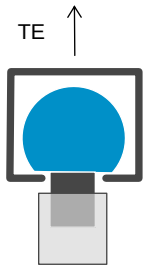
☐ Accelerated ageing

ASTM F2003

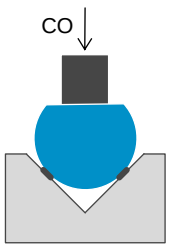
Standard Practice for Accelerated Aging of Ultra-High Molecular Weight Polyethylene after Gamma Irradiation in Air

Scope

Evaluation of the oxidative stability of UHMWPE materials as a function of processing and sterilization method.



☐ Static tension (S-TE)



☐ Static compression (S-CO)

ASTM F2009

Standard Test Method for Determining the Axial Disassembly Force of Taper Connections of Modular Prostheses

Scope

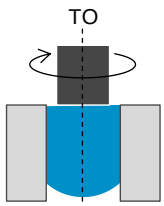
Determining the force required to disassemble tapers of implants.

ISO 7206-10

Implants for surgery — Partial and total hip-joint prostheses — Part 10: Determination of resistance to static load of modular femoral heads

Scope

Determining the compressive (fracture) or the tension (disassembly) loads required, to cause failure of a modular head system



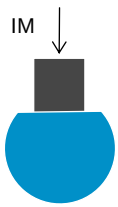
☐ Static torsion (S-TO)

ISO 7206-13

Implants for surgery -- Partial and total hip joint prostheses -- Part 13: Determination of resistance to torque of head fixation of stemmed femoral components

Scope

Determining the torque required to loosen the fixation of the head of hip joint prostheses.



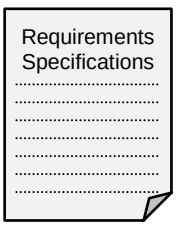
☐ Impaction (IM)

ISO 11491

Implants for surgery — Determination of impact resistance of ceramic femoral heads for hip joint prostheses

Scope

Determining the impact resistance of ceramic femoral heads



ISO 21535

Non-active surgical implants — Joint replacement implants — Specific requirements for hip-joint replacement implants

ASTM F2068

Standard specification for femoral prostheses — metallic implants

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