



# Standard Specification for Condition 1 Bicycle Forks<sup>1</sup>

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## 1. Scope

1.1 This standard establishes testing requirements for qualifying designs using production forks intended for use in Condition 1 per Classification **F2043**.

## 2. Referenced Documents

2.1 *ASTM Standards*:<sup>2</sup>

**F2043** Classification for Bicycle Usage

**F2273** Test Methods for Bicycle Forks

## 3. Classification

3.1 Condition 1 per Classification **F2043**.

## 4. Sampling and Test Specimens

4.1 *Selection and Preparation of Specimens*:

4.1.1 Three forks shall be randomly selected from the first production lot for the fatigue plus impact test per this test method.

4.1.2 One fork shall be randomly selected for the impact test per this test method.

4.1.3 One fork shall be randomly selected for both the compression and bending tests per this test method.

## 5. Performance Requirements

5.1 Bicycle forks intended by the manufacturer to be used according to Condition 1 shall be tested per Test Methods **F2273**.

5.1.1 *Compression Load Test (Suspension Forks)*:

5.1.1.1 The fork shall withstand a compression load of 2800 N without any component failure, fracture or permanent deformation.

5.1.1.2 Under the application of the compression load of 2800 N, the minimum clearance from the maximum tire profile

intended for use by the manufacturer to the nearest surface of the crown shall be at least 3 mm.

5.1.2 *Bending Load Test*:

5.1.2.1 The fork shall withstand a maximum bending load of 1200 N (100 N initial load plus an additional 1100 N).

5.1.2.2 The permanent deflection of a rigid fork shall not exceed 5 mm and the permanent deflection of a suspension fork shall not exceed 10 mm.

5.1.3 *Impact Resistance Test*:

5.1.3.1 For each fork, permanent deflection shall be less than 45 mm following impact of a 22.5 kg mass dropped from a height such that the velocity at impact shall be at least 3.54 m/s.

NOTE 1—In a frictionless system, this velocity would be achieved for a drop height of 640 mm.

5.1.3.2 For Condition 1 forks, a second drop test and steerer torsional assessment are not required in this impact resistance test.

5.1.4 *Fatigue Plus Impact Test*:

5.1.4.1 Each fork shall withstand a fully reversed sinusoidal load of 620 N for at least 100 000 cycles without structural cracks or fractures and without exceeding the displacement limits described in Test Methods **F2273**.

5.1.4.2 If the fork withstands 100 000 cycles, it shall be subjected to an impact of a 22.5 kg mass dropped from a height such that the velocity at impact shall be at least 2.66 m/s.

NOTE 2—In a frictionless system, this velocity would be achieved for a height of 360 mm.

5.1.4.3 Following this impact test the permanent deflection shall not exceed 45 mm.

## 6. Rejection and Rehearing

6.1 If any sample fails to meet all the requirements of this specification, the fork models shall be rejected.

## 7. Certification

7.1 When specified in the purchase order or contract, a report of the test results shall be furnished pursuant to the report as described in Test Methods **F2273**.

## 8. Keywords

8.1 bending; bicycle; compression; condition 1; fatigue; fork; impact; structural test

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.