



Standard Specification for Condition 1 Bicycle Frames¹

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INTRODUCTION

This specification defines a set of requirements for Condition 1 bicycle frames. Condition 1 is a vehicle usage classification defined in Classification F2043 indicating the type of riding and surface condition intended by design. Included are specifications for establishing loads and other criteria to be used with the matching test method.

1. Scope

1.1 This specification establishes testing requirements for the structural performance properties of Condition 1 bicycle frames.

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

1.3 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

F2043 Classification for Bicycle Usage

F2711 Test Methods for Bicycle Frames

3. Terminology

3.1 *Definitions:*

3.1.1 *bicycle frame, n*—structural member that supports the seat with rear connection for the rear wheel, front connection via the head tube for the fork and lower connection for the crank/pedal assembly.

¹ This specification is under the jurisdiction of ASTM Committee F08 on Sports Equipment, Playing Surfaces, and Facilities and is the direct responsibility of Subcommittee F08.10 on Bicycles.

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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.

4. Classification

4.1 *Condition 1 Bicycle Frame*

5. Performance Requirements

5.1 *Performance Requirements for Use Condition 1 Touring, Commuting or Trekking Bicycles*—The bicycle frame shall be tested in accordance with the following tests from Test Methods F2711:

5.1.1 *Horizontal Loading Fatigue Test*—The frame shall be tested and each must complete a minimum 100 000 cycles with a cyclic load of 450 N tensile and 450 N compressive with no cracks or fractures.

5.1.2 *Vertical Loading Fatigue Test*—The frame shall be tested and each must complete a minimum 50 000 cycles with a cyclic load of 1000 N to 120 N load in the compressive direction with no cracks or fractures.

5.1.3 *Falling Mass Test*—The frame shall be tested with a drop height of 180 mm; the frame shall not fracture and the permanent set of the frame and fork shall be less than 40 mm.

5.1.4 *Falling Frame Test*—The frame shall be tested with **Mass1** of 50 kg, **Mass2** of 10 kg, **Mass3** of 30 kg, and a drop height of 200 mm; the frame shall not fracture and the permanent set of the frame and fork shall be less than 40 mm.

5.2 *Performance Requirements for Use Condition 1 Racing Bicycles*—The bicycle frame shall be tested in accordance with the following tests from Test Methods F2711:

5.2.1 *Horizontal Loading Fatigue Test*—The frame shall be tested to 100 000 cycles with a cyclic load of 600 N tensile and 600 N in the compressive direction with no cracks or fractures.

5.2.2 *Vertical Loading Fatigue Test*—The frame shall be tested and each must complete a minimum 50 000 cycles with a cyclic load of 1200 N to 120 N load in the compressive direction with no cracks or fractures.

5.2.3 *Falling Mass Test*—The frame shall be tested with a drop height of 212 mm; the frame shall not fracture and the permanent set of the frame and fork shall be less than 40 mm.