

ZEN COMPOSITES

Bicycle Frame Testing
AFNOR NF EN 14781 Standard
(simplified version)

Version 1.0
December 9, 2008

Introduction

The following document is an abridged version of the AFNOR NF EN 14781 test standard. This shortened version gives an overview of only the frame testing portions of the standard. This document should be used as a guideline only. This is not an official document issued by AFNOR.

For a complete version of this test standard, please contact:

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Test Description – Part 1

Stiffness Tests (Cycling Forces)

- Load applied in a 12 second ramp form 0 N to 1200 N following the load direction and boundary conditions described in section 4.8.4.3 of the AFNOR standard.

Fatigue Test (Cycling Forces)

- Alternating push force on cylinders following a sinusoidal load pattern for 100,000 cycles and having amplitude of 1100 N. Load direction follows the description in section 4.8.4.3 of the AFNOR standard.
 - Requirements: no visible cracks and the final cylinder displacement must be within 20% of the initial cylinder displacement.

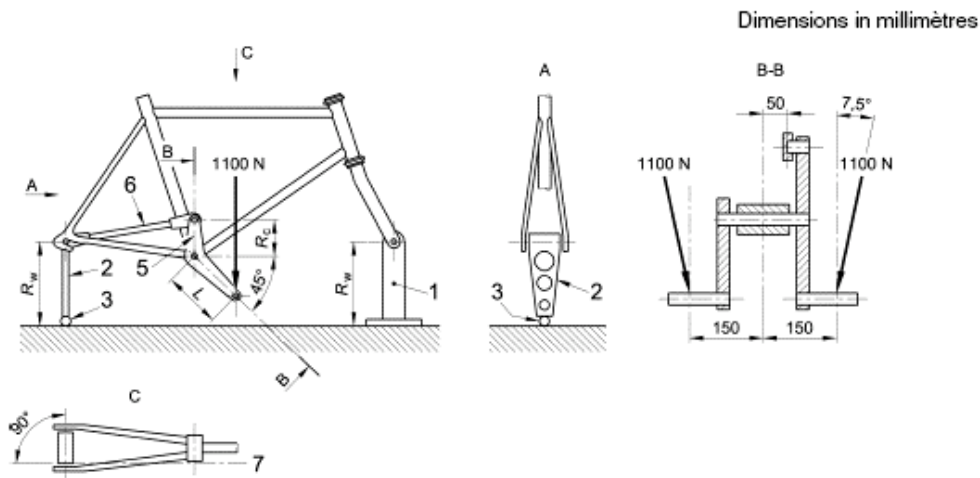


Figure 1: AFNOR NF EN 14781 Cycling Force Test Setup Diagram

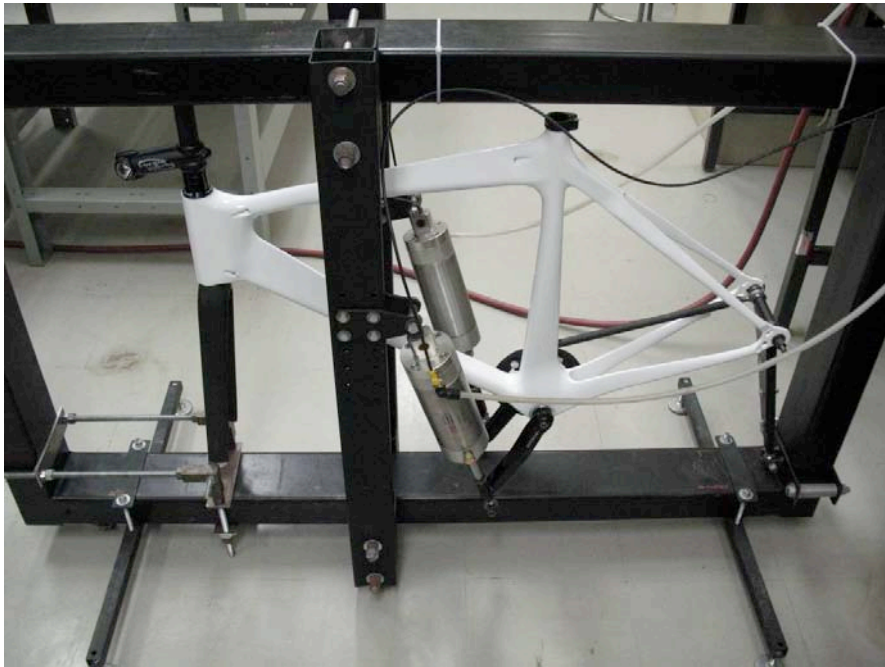


Figure 2: Cycling Forces Test Setup

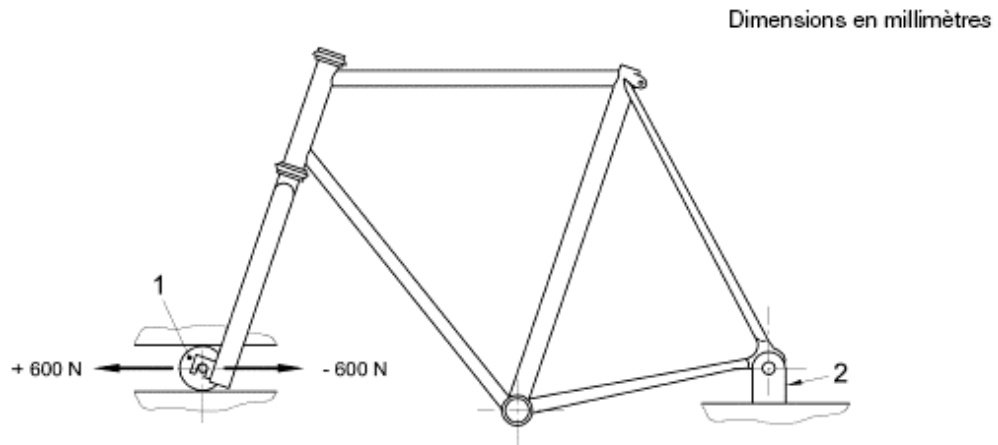
Test Description – Part 2

Stiffness Test (Horizontal Forces)

- Load applied in a 12 second ramp from 0 N to 600 N following the load direction and boundary conditions describe in section 4.8.5.3 of the AFNOR standard.

Fatigue Test (Horizontal Forces)

- Alternating push force on cylinders following a sinusoidal load pattern for 100,000 cycles and having amplitude of 600 N. Load direction follows the description in section 4.8.5.3 of the AFNOR standard.
 - Requirements: no visible crack and the final cylinder displacement must be within 20% of the initial cylinder displacement.



Légende

- 1 Rouleau guidé pouvant tourner librement
- 2 Monture rigide pivotante pour le point de fixation de l'axe arrière

Figure 3: AFNOR NF EN 14781 Horizontal Force Test Setup Diagram



Figure 4: Horizontal Force Test Setup

Test Description – Part 3

Impact Test (Mass Drop)

- A mass of 22.5 kg is dropped on the assembly frame/fork from a height of 212 mm. For more information, see section 4.8.2 of the AFNOR standard
 - Requirements: no visible crack and the permanent deformation between the two axes must be below 90 mm.

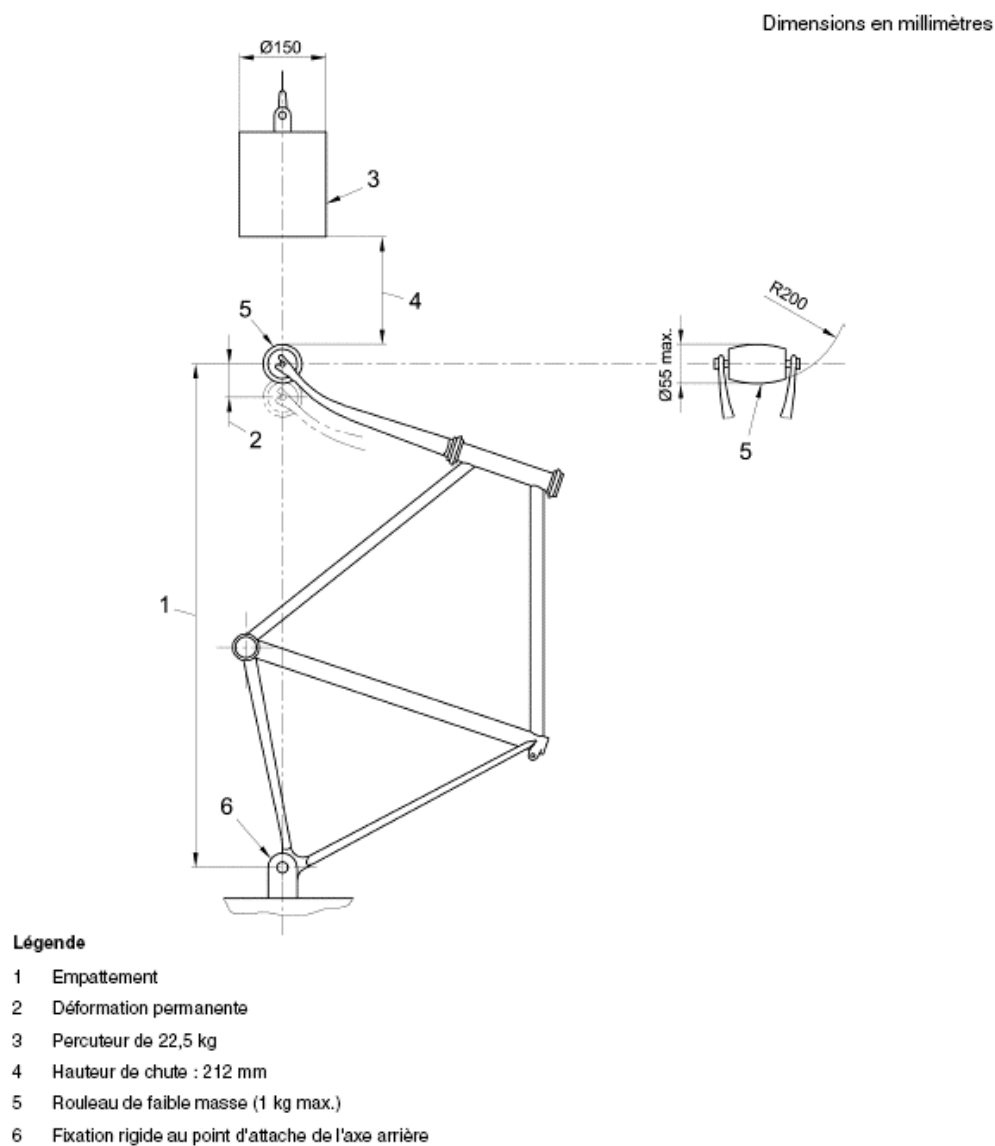


Figure 5: AFNOR NF EN 14781 Mass Drop Impact Test Setup Diagram



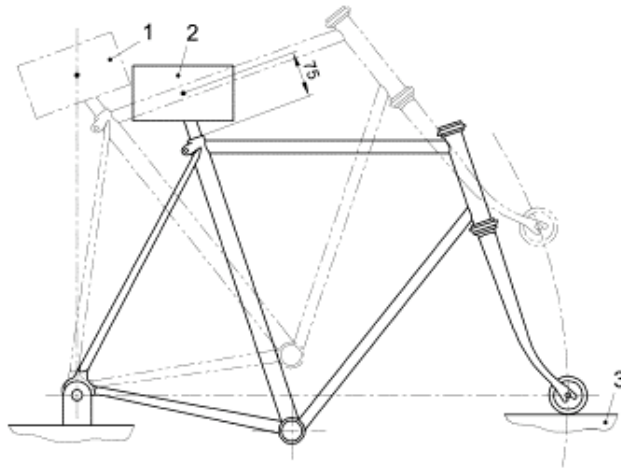
Figure 6: Mass Drop Impact Test Setup

Test Description – Part 4

Impact Test (Frame Drop)

- A mass of 70 kg is placed on the seat post having its center of gravity 75 mm away from the extremity of the frame seat tube end. Then rotating with respect to the rear axis the frame is raised and held in equilibrium then drop on an anvil. For more information, see section 4.8.2 of the AFNOR standard
 - Requirements: no visible crack and the permanent deformation between the two axes must be below 15 mm.

Dimensions en millimètres



Légende

- 1 Masse placée verticalement au-dessus de l'axe arrière
- 2 Masse 70 kg
- 3 Enclume en acier

Figure 7: AFNOR NF EN 14781 Frame Drop Impact Test Setup Diagram



Figure 8: Frame Drop Impact Test Setup