

adidas	Division FW	Test Method ID PHM-FW0211 (aka GE-11)	Version 4.1	Page: 1-3
	Fatigue Bending			Effective Date: Nov 22, 2018
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Applicability - Brand: Adidas, Reebok			Division: FW	

Scope

- All bendable polymer materials not harder than Shore A 98
- Foamed materials (e.g.EVA, PUR) when used for mid- /outsole purpose, E-TPU (Boost)

Purpose

- To assess the resistance of a material, to tearing and tear growth, under a dynamic fatigue bending load.

Referenced documents

- **ASTM D 1052 (2005)** - Standard Test Method for Measuring Rubber Deterioration-Cut Growth Using Ross Flexing Apparatus
- **adidas test method PHM-FW0208** - Hydrolysis

Apparatus

Testing device according to ASTM D1052 (Ross Flexing Apparatus) and the ability to perform tests at -10°C.

Test Conditions:

A) Fatigue Bending/23°C:

Temperature 23 ± 2°C; Humidity 50 ± 5%

B) Fatigue Bending/-10°C:

Temperature -10°C

Number and size of Test Pieces

- 2 Test specimens per test.
- Specimen size
 - Plastic materials :
150mm ± 1mm (length) x 20mm ± 1mm (width) x 2mm ± 0,1mm (thickness).
 - Foamed materials (also Boost):
150mm ± 1mm (length) x 20mm ± 1mm (width) x 10mm ± 1mm (thickness).

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General Test Procedure

Note: Deformation Ankle for all kinds of tested items: 60 °

1. Place the material specimens into the clamping device in such a way, that in the forefoot flexing point, the maximum bending stress takes place.
2. Lower the adjustable top rollers until they just touch the specimen and lock in this position by means of the wing nuts, permitting free travel of the test specimen between the rollers, during the bending movement.
3. The specimen undergoes deformation, at a constant stroke value between 95 and 105 strokes/min, until the required bending cycles are reached.
- 4.** When the test machine is stopped overnight leave the specimen in the machine, however ensure that the specimen is not in bending condition but flat.

Additional test procedures

Test at cold temperatures (Plastic materials)

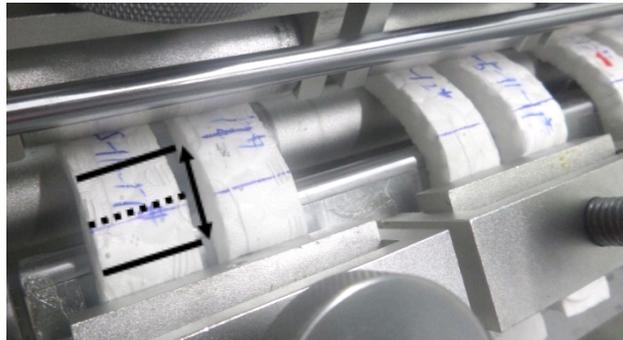
1. Place the specimen plates into the flex machine as described in the general test procedure
2. Let the freezing chamber with the inserted specimens cool down to the required temperature.
3. When the temperature is on the right level, start the test.

Test after hydrolysis (TPU/PU based materials)

1. Perform flex test after hydrolysis as described in the general test procedure after the relevant materials had been reconditioned from the hydrolysis test according to PHM-FW0208

Boost

1. Place the material specimens into the clamping device (avoid filler gate in testing area).
2. Mark the evaluation line in the center of the specimen.



Evaluation

1. The specimen should be checked after the following cycle numbers.
 - 1st check 10,000 cycles
 - 2nd check 20,000 cycles
 - 3rd check 50,000 cycles
 - 4th check etc....every 50,000 cycles until the endpoint (material failure), or required number of cycles (see specifications), is reached.
2. Following the required bending cycles, the specimen must not show any tear or damage. **For Boost, delamination or breakage is not allowed between beads. This applies to both, upper and bottom side.**

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Note for Boost: Delamination between beads is most likely a problem caused by the manufacturing process of the test plate/component

Requirements (*before aTP implementation*)

Test Method Code	Test Method Name	UOM/Report	Requirement
PHM-FW0211FABD PHM-FW0211FABDHY	Fatigue Bending Fatigue Bending a.hydrolysis	cycles	Depending on Material type

Document version history (*before aTP implementation*)

Version	Date	Author	Notes
04	15.11.2018	Harald Schäfer	Evaluation for Boost material changed
4.1	July 2023	Andreas Peter	Make clear that evaluation must done on both sides of the specimen



In all cases, the instruction manual and the operating instructions have to be followed to ensure safety and quality.

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