



## Designation: F851 – 87 (Reapproved 2020)

# Standard Test Method for Self-Rising Seat Mechanisms<sup>1</sup>

This standard is issued under the fixed designation F851; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This test method evaluates the performance of self-rising or automatic-lifting seat mechanisms of chairs in places of assembly.

1.2 This test method addresses only the raising of the seat. It does not address the load that may be placed on that seat. Committee F15 is considering a standard addressing this load.

1.3 The values as stated in inch-pound units are to be regarded as the standard. The values in parentheses are provided for information only.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *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. Summary of Test Method

2.1 The principle of the test method is to test the reliability of the seat-lifting mechanism.

2.2 This test method consists of using hard rubber rollers attached dually to the end of an actuating bar to lower the seat. The seat is then released and allowed to lift automatically to the “at-rest” or “raised” position. The test method requires the seat to be cycled at a specified rate, and allows for the number of cycles completed, without failure, to be measured.

2.3 The “at-rest” position for an auditorium chair is the “raised” position. The seat is lowered to allow the occupant to be seated. When released, the seat is automatically returned to the “raised” position by use of a spring return mechanism or counter-weight for gravity lift (see Figs. 1 and 2).

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee F15 on Consumer Products and is the direct responsibility of Subcommittee F15.23 on Auditorium Seating.

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## 3. Significance and Use

3.1 This test method provides the criteria for a practical, reproducible test for assuring the proper life-cycle of self-rising or automatic-lifting seat mechanisms of chairs.

3.2 This test method should be considered suitable for the testing required for design purposes, manufacturing control, service evaluation, specification acceptance, and regulatory statutes.

## 4. Apparatus

4.1 A representative apparatus capable of performing this test is shown in Figs. 1 and 2. This unit consists of a motor-powered rotating arm with adjustable length and two 3½-in. (88.9 mm) roller wheels fastened to the end of the arm.

4.2 Other suitable apparatus may be used.

## 5. Sampling

5.1 *Test Specimen*—Each test specimen shall consist of a self-rising seat mechanism contained in a single chair.

5.2 *Sample Size*—The sample size shall consist of three test specimens selected at random from a standard production run (see Appendix X1.1). All components of the test specimens must be manufactured using that manufacturer’s standard materials, methods, and design.

## 6. Specimen Preparation

6.1 Assemble and mount the test specimen to simulate installation conditions, following manufacturer’s assembly instructions. Record dimensional position of seat in “raised” position relative to the back of the chair (see Fig. 3).

## 7. Procedure

7.1 Design the apparatus to lower the seat to its complete “down” position.

7.2 The apparatus then releases the seat. This allows the seat-lifting mechanism to function, returning the seat to the “at-rest” or “raised” position, completing one cycle.

7.3 Continue for 100 000 cycles to be completed within a period not to exceed 14 calendar days (see Appendix X1.2).

7.4 The seat-lifting mechanism passes the test if the three specimens meet the following conditions:

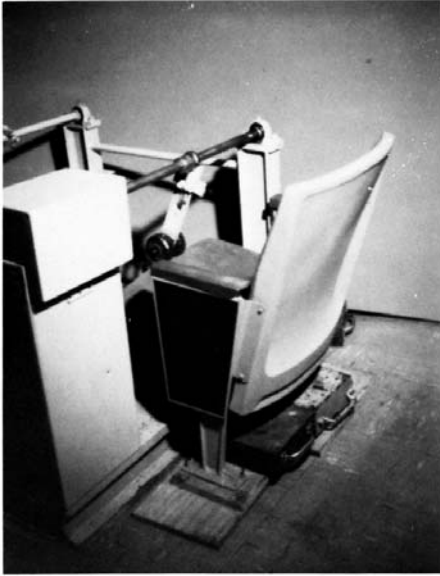


FIG. 1 Self-Rising Seat Mechanism Apparatus (Down Position)

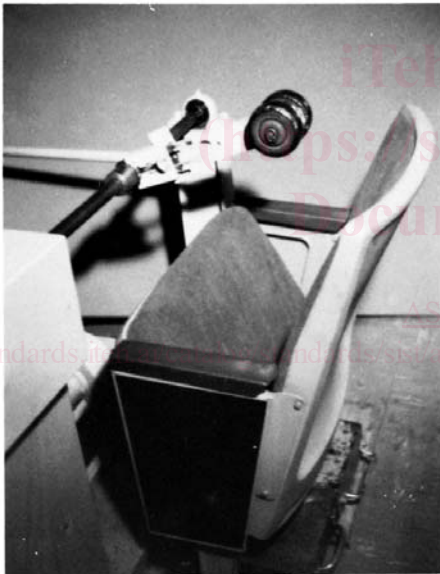


FIG. 2 Self-Rising Seat Mechanism Apparatus (Raised Position)

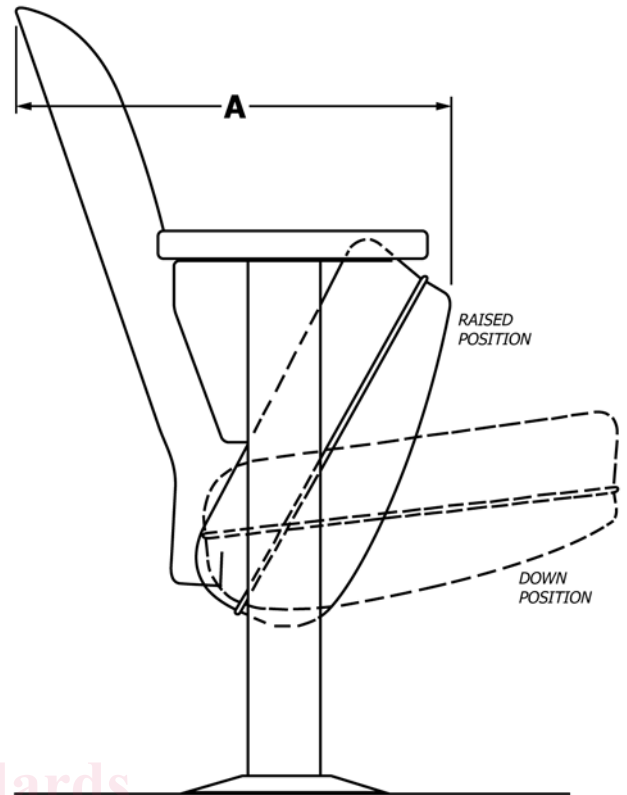


FIG. 3 Diagram of Self-Rising Seat Mechanism

## 8. Report

8.1 At completion of test the report should include the following information:

- 8.1.1 Chair manufacturer's name,
- 8.1.2 Chair model or series number or name, or both,
- 8.1.3 Dates of testing,
- 8.1.4 Brief description of testing apparatus and method,
- 8.1.5 Brief description of chair assembly tested, and
- 8.1.6 Number of cycles, rate of cycles and elapsed time of testing.

8.2 Report any dimensional deviations of the seat position as compared to original "at-rest" or "raised" position.

8.3 Report if the seat-lifting mechanism passes the test (see 7.4).

## 9. Precision and Bias

9.1 No justifiable statements can be made either on the precision or bias of this test method, since the test result merely states whether there is conformance to the criteria specified in the report (see Section 8).

7.4.1 Completion of 100 000 cycles without failure. To return to raised position see Appendix X1.3.

7.4.2 Dimensional deviation of front of seat shall not exceed 1½ in. (38.1 mm).