

**Standard Test Method of Resistance of FA to Degradation by Abrasion in the Micro Deval Apparatus  
ASTM D7428 - 15**

**APPARATUS / SECTION 6**

1. Micro Deval Abrasion Machine: A jar rolling mill operating at  $100 \pm 5$  rpm? ..... \_\_\_\_\_
2. Micro Deval Abrasion Jars (Stainless Steel):
  - 5 L capacity with locking cover and water-tight gasket? ..... \_\_\_\_\_
  - External diameter shall be 194 mm to 202 mm? ..... \_\_\_\_\_
  - Internal height shall be 194 mm to 202 mm? ..... \_\_\_\_\_
  - Outside and inside surfaces to be smooth with no significant ridges or indentations? ..... \_\_\_\_\_
3. Abrasive Charge (Magnetic Steel Balls):
  - Diameter  $9.5 \pm 0.5$  mm? ..... \_\_\_\_\_
  - $1250 \pm 5$  g of steel balls required for each jar? ..... \_\_\_\_\_
4. Sieves: With square openings and conforming to ASTM E11 specifications? ..... \_\_\_\_\_

As per ASTM D7428 / Clause 6.4

6.7 or 6.3 mm	600 $\mu$ m
4.75 mm	300 $\mu$ m
2.36 mm	150 $\mu$ m
1.18 mm	75 $\mu$ m

5. Oven: Capable of maintaining a uniform temperature of  $110 \pm 5^\circ\text{C}$ ? ..... \_\_\_\_\_
6. Balance: Accurate to 0.1 g? ..... \_\_\_\_\_

**TEST SAMPLE / SECTION 8**

1. Test sample washed over a 75  $\mu$ m sieve according to ASTM C117 and oven dried at  $110 \pm 5^\circ\text{C}$  to a constant mass? ..... \_\_\_\_\_
2. Wash and dried test sample and separated into individual size fractions in accordance with ASTM C136? ..... \_\_\_\_\_
3. Individual fractions recombined to meet the following gradation? ..... \_\_\_\_\_

P/4.75 mm / Fineness Modulus of 2.8

Passing	Retained	Mass
4.75 mm	2.36 mm	50 g
2.36 mm	1.18 mm	125 g
1.18 mm	600 $\mu$ m	125 g
600 $\mu$ m	300 $\mu$ m	100 g
300 $\mu$ m	150 $\mu$ m	75 g
150 $\mu$ m	75 $\mu$ m	25 g
	Total	$500 \pm 5$ g

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**TEST PROCEDURE / SECTION 8**

- a. Prepared a representative test sample (500 ± 5 g) – record mass to the nearest 0.1 g **(A)**? .....
- b. Placed test sample in Micro-Deval jar with 1250 ± 5 g steel balls – add 750 ml ± 50 ml of tap water at 20 ± 5°C and let soak for a minimum of 1 h? .....
- c. Set cover on securely and place Micro-Deval jar on the machine? .....
- d. Run machine at 100 ± 5 rpm for 15 min ± 5 s? .....
- e. Poured test sample and steel balls over a 6.7 or 6.3 mm sieve into a suitable container? .....
- f. Carefully washed steel balls retained on sieve sieve? .....
- g. Removed steel balls from sieve? .....
- h. Washed FA material recovered in container in accordance with ASTM C117? .....
- i. Sample oven dried to 110 ± 5°C? .....
- J. Determine to the nearest 0.1 g and record mass **(B)**? .....

**Note:** A control sample (Calibration Aggregate) It is mandatory for the purpose of calibrating the test method – Refer to ASTM D7428 / Clause 7.1 and Section 11 for details in establishing a supply of this material for use in calibration and procedural requirements.

Control or Reference Aggregate Prepared as Follows:

Passing	Retained	Mass
4.75 mm	2.36 mm	40 g
2.36 mm	1.18 mm	115 g
1.18 mm	600 µm	180 g
600 µm	300 µm	120 g
300 µm	150 µm	38 g
150 µm	75 µm	7 g
Total		500 ± 5 g

**CALCULATION / SECTION 10**

- a. Abrasion loss calculated as follows to the nearest 0.1 %? .....

Percent Loss = (A – B) / A x 100

Where: A = Initial Mass (before prepared test sample placed in Micro Deval)  
B = Final Mass (washed and dried after completion of test procedure)

**COMMENTS**

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