	Standard No.: **MEB-P056**
Transportation and Infrastructure **Highway Design**	Effective Date Current: **August 2024** Previous: **None**
	Page 1 of 2

Standard Test Method: **Lightweight Particles (LWP) in Aggregate**

1.0   SCOPE

This test method covers the determination of lightweight particles in aggregates by means of sink-float separation in a solution of Zinc Chloride in water.

2.0   REFERENCE STANDARDS

ASTM Standards
   C123   Lightweight Particles in Aggregate
   C702   Reducing Samples of Aggregates to testing size

AASHTO Standards
   T113   Lightweight Particles in Aggregate

MEB Standards
   P054   Preparation of Bituminous Aggregates for the Determination of Physical Properties

3.0   DEFINITION

Blended aggregates: As-received aggregate samples combined as per the bituminous mix design.

Coarse Aggregate: Coarse aggregate is all material retained on the 4.75 mm sieve. This includes material retained on the 4.75 mm sieve contained in the fine aggregates.

Fine Aggregate: Fine aggregate is all material passing the 4.75 mm sieve. This includes material passing the 4.75 mm sieve contained in the coarse aggregates.

4.0   PROCEDURE

Follow ASTM C123 except as noted in 4.1, 4.2 and 4.3.

4.1   For concrete and bituminous aggregates, combine as-received aggregates in accordance with *MEB-P054 Preparation of Bituminous Aggregates for the Determination of Physical Properties*

4.2   Split blended aggregates on the 4.75 mm sieve and separate portion retained on the 4.75 mm sieve (coarse aggregate) and the portion passing the 4.75 mm sieve and retained on 300 µm (#50) Sieve (fine aggregate) for testing.

4.3 Conduct the test on dry aggregate without bringing the material to a saturated surface-dry condition as specified in ASTM C123.

Manitoba Transportation and Infrastructure Highway Design	Standard No.: **MEB-P056**
	Effective Date Current: **August 2024** Previous: **None**
	Page 2 of 2

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5.0 CALCULATION

5.1 Calculation for Light Weight Particles content, coarse aggregates

$$LWP_{Coarse} = \frac{W_1}{W_2} * 100$$

Where,
W_1 = Dry mass of Lightweight Particles in the Coarse Aggregate portion, g
W_2 = Dry mass of aggregates retained on the 4.75 mm sieve

5.2 Calculation for Light Weight Particles content, Fine aggregates

$$LWP_{Fine} = \frac{W_3}{W_4} * 100$$

Where,
W_3 = Dry mass of Lightweight Particles in the Fine Aggregate portion, g
W_4 = Dry mass of aggregates passing the 4.75 mm and retained on the 300 μm (#50) sieve, g

5.3 Calculation for Total Light Weight Particles content (%)

$$LWP_{total} = \frac{\left[(P_{coarse} * LWP_{coarse}) + (P_{fine} * LWP_{fine})\right]}{100}$$

Where,
P_{coarse} = Adjusted portion of aggregates retained on the 4.75 mm sieve, %
P_{fine} = Adjusted portion of aggregates passing the 4.75 mm sieve, and retained on 300 μm (#50) Sieve, %
LWP_{coarse} = Lightweight Particles content of the Coarse Aggregate portion, %
LWP_{fine} = Lightweight Particles content of Fine Aggregate portion, %

Note: *Adjusted Portion of Aggregates shall be calculated based on the results from gradation test (i.e. material retained on 300-μm (#50) Sieve. See below example for details.*

Material size Fraction (mm)	Original Sieved individual %retained	Original Sieved % retained on tested portion	**Adjusted % for weighted average	Test results per size fraction	Weighted average %
≥4.75	60	60	60/90 x 100=66.7	5	66.7x5/100=3.3
<4.75 to 0.3	30	30	30/90 x 100=33.3	8	33.3x8/100=2.6
<0.3	10	Not Tested	Not tested	Not tested	Not tested
Total	100	90	100	**W.AV. LWP (%)**	**5.9**

	Standard No.: **MEB-P056**
Manitoba 🦬 **Transportation and Infrastructure** **Highway Design**	Effective Date Current: **August 2024** Previous: **None**
	Page 3 of 2

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6.0   REPORT

Report Lightweight Particle content of Coarse, Fine and total aggregates to the nearest whole number as a percentage.