

AGGREGATE PHYSICAL PROPERTIES

Buildex Expanded Shale Lightweight Aggregate New Market Missouri Plant

Our New Market plant is located one mile south of the town of New Market, Missouri on State Highway 371. This plant is located near a large deposit of Weston shale that is used in production.

TABLE 1
Typical Physical Properties of Production Sizes
Buildex New Market MO Plant

| Production Size | Specific Gravity (a) | Density, lb/cu ft (b) | Percent Absorption (c) |
|------------------------|-----------------------------|------------------------------|-------------------------------|
| 5/8" X 3/8" | 1.10 | 38 | 18 |
| 3/8" X 1/4" | 1.15 | 42 | 15 |
| 1/4" X 1/8" | 1.20 | 44 | 12 |
| 1/8" X 0 | 1.80 | 58 | 8 |

(a) ASTM C 127 / C 128, bulk specific gravity.

(b) ASTM C 29, loose unit weight (density).

(c) ASTM C 127 / C 128, 24 hour absorption.

TABLE 2
Typical Gradation of Production Sizes
Buildex New Market MO Plant

Cumulative Percent Retained

| Sieve | 5/8" x 3/8" | 3/8" x 1/4" | 1/4"x1/8" | 1/8" x 0 |
|-------|-------------|-------------|-----------|----------|
| 3/4" | 0 | | | |
| 1/2" | 22 | 0 | | |
| 3/8" | 82 | 3 | 0 | |
| No 4 | 98 | 95 | 22 | 0 |
| No 8 | 99 | 99 | 96 | 12 |
| No 16 | | | 99 | 43 |
| No 30 | | | | 67 |
| No 50 | | | | 80 |
| No100 | | | | 86 |

These production sizes can be sold "as is," but more often are blended before loading to meet appropriate industry specifications.

For producing pumpable structural lightweight concrete, the coarse blends like 1/2" x No. 4 and 3/8" x No. 8 are vacuum saturated at our plant prior to shipment. The fines (3/8" x 0 and 1/4" x 0) are pre-wetted while stockpiled at the concrete producers' plant.

TABLE 3
Typical Physical Properties of ASTM Blends
Buildex New Market MO Plant

| ASTM Blend | Specific Gravity (a) | Density, lb/cu ft (b) | Percent Absorption (c) | Saturated Density, lb/cu ft |
|--------------|----------------------|-----------------------|------------------------|-----------------------------|
| 3/4 " x No 4 | 1.15 | 43 | 30 | 54 (d) (e) |
| 1/2 " x No 4 | 1.15 | 43 | 25 | 54 (d) |
| 3/8 " x No 8 | 1.3 | 44 | 20 | 54 (d) (e) |
| 3/8 " x 0 | 1.45 | 54 | 10 | 65 (f) |
| 1/4 " x 0 | 1.45 | 54 | 10 | 65(f) |

- a) ASTM C 127 / C 128, bulk specific gravity.
- b) ASTM C 29, loose unit weight (density)@ normal 6% shipping moisture content.
- c) ASTM C127 / C 128, 24 hour water absorption at ambient pressure. Please note that the 24 hour absorption figure is not appropriate for use in determining moisture content of Buildex used in pumped concrete.
- d) Unit Weight (density) when vacuum saturated at Buildex plant for concrete pump placement.
- e) 3/4" x No. 4 and 3/8" x No. 8 are available vacuum saturated by advance special order only.
- f) The 3/8" x 0 and 1/4" x 0 fines are not available vacuum saturated; values for stockpile ambient saturated density are shown for these materials.

TABLE 4
Typical Blended Aggregate Gradation
Lightweight Structural Aggregates for Structural Concrete ASTM C 330- 3/4 " x No 4
Buildex New Market MO Plant

| Sieve | Percent Retained | | Percent Passing | |
|-------|-------------------|----------------------------|-------------------|----------------------------|
| | Typical Gradation | 3/4" x No 4 Specification* | Typical Gradation | 3/4" x No 4 Specification* |
| 1" | | | 100 | 100 |
| 3/4 " | | 0-10 | 100 | 90-100 |
| 1/2 " | 17 | | 83 | |
| 3/8" | 60 | 50-90 | 40 | 10-50 |
| No 4 | 97 | 85-100 | 3 | 0-15 |
| No 8 | 99 | | 1 | |

(a) ASTM C330 "Standard Specification for Lightweight Aggregates for Structural Concrete"

TABLE 5

**Typical Blended Aggregate Gradation
 Lightweight Structural Aggregates for Structural Concrete ASTM C 330- 1/2 " x No 4
 Buildex New Market MO Plant**

| Sieve | Percent Retained | | Percent Passing | |
|-------|-------------------|-----------------------------|-------------------|----------------------------|
| | Typical Gradation | 1/2 " x No 4 Specification* | Typical Gradation | 1/2" x No 4 Specification* |
| 3/4 " | | | 100 | 100 |
| 1/2 " | 9 | 0-10 | 91 | 90-100 |
| 3/8" | 35 | 20-60 | 65 | 40-80 |
| No 4 | 96 | 80-100 | 4 | 0-20 |
| No 8 | 99 | 90-100 | 1 | 0-10 |

(a) ASTM C330 "Standard Specification for Lightweight Aggregates for Structural Concrete"

TABLE 6

**Typical Blended Aggregate Gradation
 Lightweight Aggregates for Structural Concrete ASTM C 330- 3/8 " x No 8
 Buildex New Market MO Plant**

| Sieve | Percent Retained | | Percent Passing | |
|-------|-------------------|----------------------------|-------------------|----------------------------|
| | Typical Gradation | 3/8" x No 8 Specification* | Typical Gradation | 3/8" x No 8 Specification* |
| 1/2" | 0 | 0 | 100 | 100 |
| 3/8" | 3 | 0-20 | 97 | 80-100 |
| No 4 | 85 | 60-95 | 15 | 5-40 |
| No 8 | 99 | 80-100 | 1 | 0-20 |
| No 16 | 99 | 90-100 | 1 | 0-10 |

(b) ASTM C330 "Standard Specification for Lightweight Aggregates for Structural Concrete"

TABLE 7
Typical Blended Aggregate Gradation
Lightweight Aggregates for Structural Concrete ASTM C 330- 3/8 " x 0
Buildex New Market MO Plant

| Sieve | Percent Retained | | Percent Passing | |
|--------|-------------------|-------------------------|-------------------|-------------------------|
| | Typical Gradation | 3/8" x 0 Specification* | Typical Gradation | 3/8" x 0 Specification* |
| 1/2" | 0 | 0 | 100 | 100 |
| 3/8" | 0 | 0-10 | 100 | 90-100 |
| No 4 | 12 | 10-35 | 88 | 65-90 |
| No 8 | 45 | 35-65 | 55 | 35-65 |
| No 16 | 65 | | 35 | |
| No 30 | 80 | | 20 | |
| No 50 | 88 | 75-90 | 12 | 10-25 |
| No 100 | 92 | 85-95 | 8 | 5-15 |

(a) ASTM C330 "Standard Specification for Lightweight Aggregates for Structural Concrete"

Buildex aggregate is produced to meet or exceed applicable industry standards, including ASTM C330 "Standard Specification for Lightweight Aggregates for Structural Concrete" and ASTM C331 "Standard Specification for Lightweight Aggregates for Concrete Masonry Units."

TABLE 8

**Typical Blended Aggregate Gradation
 Lightweight Aggregates for Structural Concrete ASTM C 330- 1/4 " x 0
 Buildex New Market MO Plant**

| Sieve | Percent Retained | | Percent Passing | |
|--------|-------------------|-------------------------|-------------------|-------------------------|
| | Typical Gradation | 1/4" x 0 Specification* | Typical Gradation | 1/4" x 0 Specification* |
| 3/8" | | | 100 | 100 |
| No 4 | 5 | 0-15 | 95 | 85-100 |
| No 8 | 30 | | 70 | |
| No 16 | 55 | 20-60 | 45 | 40-80 |
| No 30 | 74 | | 26 | |
| No 50 | 84 | 65-90 | 16 | 10-35 |
| No 100 | 89 | 75-95 | 11 | 5-25 |

(a) ASTM C330 "Standard Specification for Lightweight Aggregates for Structural Concrete"

TABLE 9

**Typical Blended Aggregate Gradation
 Lightweight Aggregates for Structural Concrete ASTM C 331- 1/4 " x 0
 Buildex New Market MO Plant**

| Sieve | Typical Cumulative Grading | Typical Individual Grading | Suggested Individual Grading* |
|---------|----------------------------|----------------------------|-------------------------------|
| 3/8" | 0 | 0 | 0-2 |
| No. 4 | 5 | 5 | 0-10 |
| No.8 | 30 | 25 | 15-35 |
| No. 16 | 55 | 25 | 15-35 |
| No. 30 | 74 | 19 | 5-20 |
| No. 50 | 84 | 10 | 5-15 |
| No. 100 | 89 | 5 | 5-15 |
| Pan | 100 | 11 | 8-20 |

(a) ASTM C331 "Standard Specification for Lightweight Aggregates for Structural Concrete"