

## TRENCH GRATES CSI SPECIFICATIONS

### Part 1 GENERAL

#### 1.1 Section Includes:

- A. Trench Grates as shown on drawings and as specified herein.

#### 1.2 Submittals

- A. Submit manufacturer's shop drawings and maintenance instructions.
- B. Manufacturer information:
  - 1. Provide overview literature describing manufacturer's overall scope of products.
  - 2. Provide URL of manufacturer's website; website must provide access to technical data, images and general product information.

#### 1.3 Quality Assurance

- A. Manufacturer Qualifications: Minimum of 20 years of experience in the manufacturing of stone (reinforced) architectural products.
- B. Supporting drawings: Products are supported with complete shop drawings by manufacturer.

#### 1.4 Testing Standard References

- A. SS(Singapore Standards) Testing Standards:
  - 1. SS485:2011 - Specifications for Slip Resistance classification of public pedestrian surface materials
  - 2. SS245:1995 - Specifications for Water Absorption
- B. Load Testing Standards:
  - 1. BS(British Standards) EN124:2015\* & BS EN1433:2002 - Specifications for drainage channels for vehicular and pedestrian areas - Classification, design and testing requirements, marking and evaluation of conformity. *\*selected models only*
- C. ASTM(American Society for Testing and Materials) Testing Standards:
  - 1. ASTM D543:2014 - Specifications for Chemical Resistance classification

#### 1.5 Sustainability

- A. Provide Green Label certifications from:
  - 1. SEC(Singapore Environment Council)
  - 2. SGBC(Singapore Green Building Council) - Product leader in SGBC product directory - <https://web.sgbc.online/public/product>
- B. Heavy Metals Testing Standards:
  - 1. Heavy Metals Test Analysis - Specifications for testing of hazardous substances
- C. Toxicity Testing Standards:
  - 1. US EPA 1311 Toxicity Characteristic Leaching Procedure (TCLP) - Specifications for testing of inorganic contaminants

**1.6 Delivery, Storage and Handling**

- A. Deliver materials to installation site in manufacturer's original packaging. Handle products in accordance with manufacturer's instructions. Store in clean, dry location until installation.

**1.7 Warranty**

- A. Provide manufacturer's standard warranty.
1. Warranty terms: one year against defects in materials and workmanship.

**Part 2 PRODUCT**

**2.1 Manufacturer**

- A. Jonite Private Limited  
5 Upper Aljunied Link  
Quartz Industrial Building #01-01  
Singapore 367903  
Phone: +65 6383-3788  
Fax: +65 6383-3718  
Email: [info@jonite.com](mailto:info@jonite.com)  
Website: [www.jonite.com](http://www.jonite.com)

**2.2 Trench Grates**

- A. General
1. Trench grates shall be MODEL \_\_\_\_\_
  2. Size and dimensions to be as specified in shop drawing attached.
  3. (Optional) Custom Curve Grates are to match radius and arc segments as shown on plans provided.
  4. (Optional) Grates\* to fit channels MANUFACTURER \_\_\_\_\_ and MODEL \_\_\_\_\_ \*selected models only

**2.3 Material**

- A. Trench grate material shall be stone (reinforced) from at least 30% recycled materials. The material is a 95% agglomeration of natural stone substrates & mineral oxides formed under a high-tech vacuum & compression process. It is a proprietary formulated structural polymer hybrid system of a heterogeneous blend.

**2.4 Accessories**

- A. (Optional) L-trimmers- All trench grates to come with supporting L-trimmers of matching material and colours.
- B. (Optional) 90° Corner Grates- All 90° drain corners to come with 90° Corner Grates of matching material and colours.
- C. (Optional) Grate Tiles- All irregular connections in drains to be covered by Grate Tiles. Light duty models will be cut on site by the installer. Heavy duty models to be factory-cut to templates attained from site by installer.

**2.5 Finish**

- A. Trench grates to be supplied in natural stone matte state.
- B. Colour to be \_\_\_\_\_
- C. (Optional) Colour to be customized according to sample submitted to manufacturer.

## Part 3 EXECUTION

### **3.1 Examination**

- A. Do not begin installation until site is properly prepared.

### **3.2 Preparation**

- A. Clean surfaces thoroughly prior to installation.

### **3.3 Installation**

- A. Install in accordance with manufacturer's instructions.
- B. Install grates after danger of damage from construction traffic is past.

### **3.4 Cleaning and Protection**

- A. Clean promptly after installation in accordance with manufacturer's instructions.
- B. Do not use harsh cleaning materials like acid wash that could damage product.
- C. Repair or replace product if damaged by mishandling.

**NOTE:** Please note that Options are highlighted in red. Select or delete as desired.

**Jonite<sup>®</sup> Stone (reinforced) architectural products are compliant to the general specification & criteria as in accordance:-**

**Core Material**

- A 95% agglomeration of natural stone substrates & mineral oxides formed under a proprietary vacuum & compression process.
- A proprietary formulated structural polymer hybrid system of a heterogeneous blend.

**Material Structural & Mechanical Properties**

- **Tensile Strength:** 8-25 MPa
- **Compression Strength:** 47.8 Mpa
- **Flexural Strength:** 21.1MPa (ASTM D 790-92)
- **Modulus of Elasticity:** 20 - 40 Gpa
- **Standard Density:** 2.0 - 2.4 kg/dm<sup>3</sup>
- **Elongation at Rapture:** 3%
- **Thermal Coefficient of Expansion:** 106C-1

**Physical Properties**

- **Water absorption:** 0.09% (SS245:1995 Appendix F - Water Absorption Test)
- **Slip Resistance:** Achieved Classification V (Very Low notional contribution of the floor surface to the risk of slipping when wet - SS485:2011)
- **Chemical Resistance:** Achieved ASTM D543:2014 - Specifications for Chemical Resistance classification)

**Load Class**

- Compliant with \*BS EN124:2015 - *\*selected products only*
- Compliant with \*BS EN1433:2002 - *\*selected products only*

**Sustainability**

- Singapore Green Label certification- (022-016-0270 Eco-Friendly Building Material) from SEC(Singapore Environment Council)
- Singapore Green Building Product certification- Product Leader (SGBP 2019-2728) from SGBC(Singapore Green Building Council)
- USGBC(United States Green Building Council) member satisfies MR Credit 4: Recycled Content under LEED<sup>®</sup>((Leadership in Energy and Environmental Design)
- No heavy metals detected in accordance to Heavy Metals Test Analysis - Specifications for testing of hazardous substances
- No toxic materials detected in accordance to US EPA 1311 Toxicity Characteristic Leaching Procedure (TCLP) - Specifications for testing of inorganic contaminants

Standards & Labels



022-016-0270  
Eco-Friendly Building Material



SGBP 2019-2728



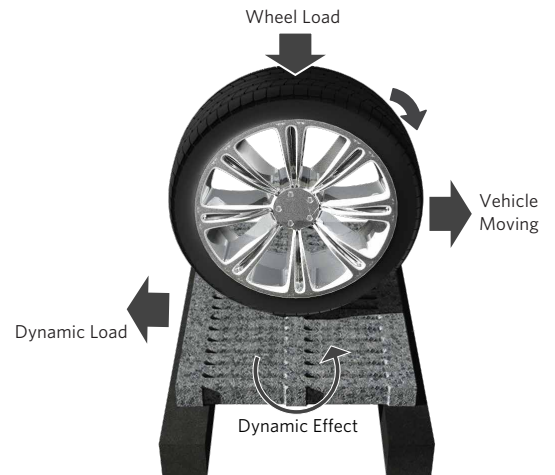
# LOADING SPECIFICATION

Compliant with BS EN 124:2015

## Understanding Loads Affecting Grates:

Static Loads refers to load applied vertically to the grating with no other movement, such as load from a stationary vehicle.

Wheel-loads refer to the weight of the vehicle and its typical load depending on the type of the wheels. Pneumatic tyres spread the load like the test-block in the illustration and solid tyres post a greater point load, which is only recommended for Class E600 and F900. Vehicle movement, speed, braking and traffic frequency are the consolidated consideration of dynamic loads.



## Selection Of Appropriate Load Class According To BS EN 124:2015

### Group 1 - (Class A15)



Areas strictly for pedestrians and pedal cyclists. House drains, pool decks, courtyards, park-walkways and pedestrian compounds within precincts.



### Group 2 - (Class B125)



Public footways and comparable areas, car porches and parks. Generally for slow-moving vehicles not exceeding 3 tonnes in wheel-load.



### Group 3 - (Class C250)



Used as curb-side grates in heavy vehicle parking areas and entrances of small precincts. Generally for slow-moving vehicles not exceeding 5.5 tonnes in wheel-load.



### Group 4 - (Class D400)



Carriageways of roads, hard-standing areas for fire-engine access and parking areas for heavy vehicles. Generally for slow-moving vehicles not exceeding 11.5 tonnes in wheel-load.

