



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:
 - i. Provide overview literature describing the manufacturer's overall scope of products.
 - ii. Provide URL of the manufacturer's website; the 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 the manufacturer.

1.4 Testing Standard References

- A. SS(Singapore Standards) Testing Standards:
 - i. SS485:2011 – Specifications for Slip Resistance classification of public pedestrian surface materials
 - ii. SS245:1995 – Specifications for Water Absorption
- B. Load Testing Standards:
 - i. 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:
 - i. ASTM D543:2014 – Specifications for Chemical Resistance classification



1.5 Sustainability

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

1.6 Delivery, Storage and Handling

- A. Deliver materials to the installation site in manufacturer’s original packaging. Handle products per manufacturer’s instructions. Store in a clean, dry location until installation.

1.7 Warranty

- A. Provide manufacturer’s standard warranty.
 - i. Warranty terms: one year against defects in materials and quality.

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
Website: www.jonite.com

2.2 Trench Grates

- A. General
 - i. Trench Grates shall be MODEL _____
 - ii. Size and dimensions to be as specified in shop drawing attached.

- iii. (Optional) Custom Curve Grates are to match radius and arc segments, as shown on plans provided.
- iv. (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 content 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 will be factory-cut to templates attained from the site by the 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 the sample submitted to the manufacturer.

PART 3 - EXECUTION

3.1 Examination

- A. Do not begin installation until the site is adequately prepared.

3.2 Preparation

- A. Clean the surface thoroughly before installation.



3.3 Installation

- A. Install products following the manufacturer's instructions.
- B. Install grates after danger of damage from construction traffic is passed.

3.4 Cleaning and Protection

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

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



MATERIAL SPECIFICATIONS

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.

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/dm³
- 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®((Leadership in Energy and Environmental Design)

- No heavy metals detected under Heavy Metals Test Analysis – Specifications for testing of hazardous substances
- No toxic materials identified under US EPA 1311 Toxicity Characteristic Leaching Procedure (TCLP) – Specifications for testing of inorganic contaminants

STANDARDS AND LABELS



022-016-0270
Eco-Friendly Building Material



SGBP 2019-2728



Maintenance Accessories

Repair Kit

For small chips or cracks due to mishandling, our handy Repair Kit, a proprietary epoxy putty filler, can help to make needed repairs easily. It comes pre-mixed in standard or custom colours as required.



SealFix™ 103

SealFix™ 103 is a two-part epoxy mortar specially formulated for fixing Jonite components such as L-Trimmers™. It has high strength bonding, impermeable, chemical-resistant and suitable for 'dry-fixing'.



ArmorFix™ 108

All Jonite products are impregnated with a coat of ArmorFix™ 108, a clear stone sealer. It has very high compressive strength, remarkable cohesion, superior hardness and high wear resistance.



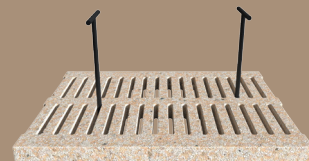
Kleansol™ 511

Kleansol™ 511 is a proprietary algae and stain removal solution specially formulated for Jonite products which might be badly soiled due to mishandling or accidents.



Lifting Hooks

The heaviest Jonite grates are designed to weigh less than 50kg, requiring a maximum of two people to lift. We recommend using these hooks for lifting heavy-duty grates.



Loading Specifications

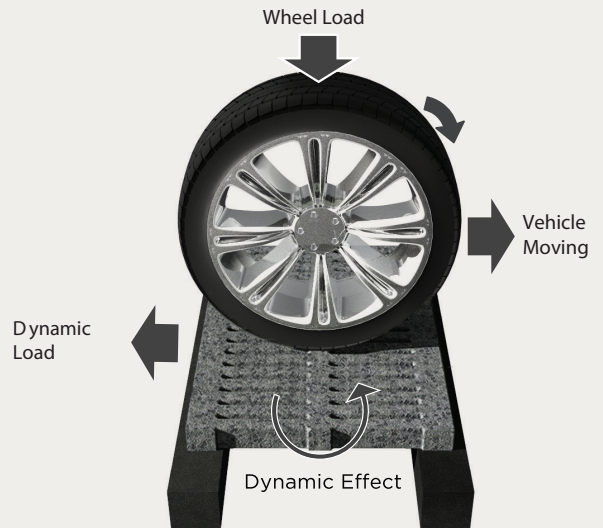
Compliant with BS EN 124:2015

Understanding Loads Affecting Grates:

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

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 01 CLASS A15

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



GROUP 02 CLASS B125

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



GROUP 03 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 04 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.