



**CONSTRUCTION SPECIFICATION FOR  
SEALING OR RESEALING OF JOINTS AND CRACKS  
IN CONCRETE PAVEMENT AND CONCRETE BASE**

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**369.01 SCOPE**

This specification covers the requirements for sealing ~~or~~ resealing of joints and cracks up to 25 mm in width in concrete pavement and concrete base.

**369.02 REFERENCES**

This specification refers to the following standards, specifications, or publications:

**Ontario Provincial Standard Specifications, Construction**

OPSS 350 Concrete Pavement and Concrete Base  
OPSS 366 Repairing Concrete Pavement and Concrete Base  
OPSS 929 Abrasive Blast Cleaning - Concrete Construction

**Ontario Provincial Standard Specifications, Material**

OPSS 1212 Hot Poured Rubberized Asphalt Joint Sealing Compound

**ASTM International**

~~D-2628-91(2005) — Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements~~

## [CSA Standards](#)

[A23.2-14C](#) [Obtaining and Testing Drilled Cores for Compressive Strength Testing\\*](#)  
\*[\[Part of A23.1-19/A23.2-19 - Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete\]](#)

### **369.03** [DEFINITIONS](#)

For the purpose of this specification, the following definitions shall apply:

**Backer Rod** means a compressible material inserted into the [joint](#) reservoir to achieve the required shape factor for the [sealant](#)[joint sealing compound](#) and prevent loss of [sealant](#)[joint sealing compound](#).

**Concrete Base** means as defined in [OPSS 350](#).

**Concrete Pavement** means as defined in [OPSS 350](#).

**Effluent** means as defined in [OPSS 350](#).

**Reservoir** means a saw cut cavity [used in some existing concrete pavement longitudinal and transverse joints](#) of specific dimensions designed to receive ~~the~~ [backer rod](#) and ~~sealant or seal~~[joint sealing compound](#).

**Shape Factor** means the ratio of width to depth of a field poured liquid sealant within the reservoir.

### **369.04** [DESIGN AND SUBMISSION REQUIREMENTS](#)

#### **369.04.01** [Submission Requirements](#)

##### **369.04.01.01** [Joint Sealing Compound](#)

[The following joint sealing compound product information shall be submitted to the Contract Administrator prior to the joint sealing operations:](#)

- [a\) Product name and manufacturer;](#)
- [b\) The manufacturer's batch or lot number or designation;](#)
- [c\) The manufacturer's recommended heating time and heating temperature range; and](#)
- [d\) The manufacturer's installation procedures.](#)

### **369.05** [MATERIALS](#)

#### **369.05.01** [Sealants](#)

~~Hot poured rubberized asphalt joint sealing compound shall be according to OPSS 1212.~~  
~~Silicone sealant shall be as specified in the Contract Documents.~~

#### **369.05.02** [Seals](#)

~~Preformed compression seals shall meet the manufacturer's requirements according to ASTM D 2628.~~

#### **369.05.03** [Backer Rods](#)

Backer rods shall be made of polyethylene foam, cross-linked polyethylene foam, or polyurethane foam.

### 369.05.02                      Joint Sealing Compound

Hot poured rubberized asphalt joint sealing compound shall be according to OPSS 1212 and shall be on the MTO DSM list designated for use with the joint design specified in the Contract Documents.

## **369.06**                      **EQUIPMENT**

### **369.06.01**                      Air Compressor

The air compressor used to supply the hot-compressed air lance shall be equipped with oil and moisture filters and provide a minimum pressure of 700 kPa at a minimum air volume of 4.25 cubic metres per minute (150 cfm).

### 369.06.02                      Heating and Mixing Kettle for Joint Sealing Compound

The heating and mixing kettle shall be used for the hot poured rubberized asphalt joint sealing compound.

The kettles shall be of the double boiler oil heat transfer type with a built-in agitator and equipped with two functional permanently installed dial type thermometers. The thermometers shall measure the temperature of the melted compound and the oil to an accuracy of  $\pm 2$  °C. Heating shall be controlled by an automatic thermostat to maintain the temperature of the product used within the range required by the manufacturer. Infrared or direct heat kettles shall not be used.

Certificates of calibration from an organization accredited by the Standards Council of Canada shall be available for review when requested by the Contract Administrator for each gauge certifying that the thermometers can measure the temperature within a tolerance of  $\pm 2$  °C.

### 369.06.03                      Hot Compressed Air Lance

The hot compressed air lance shall have an oil free discharge of air at a temperature greater than ~~Saw Cutting~~200 °C and less than 500 °C, and an air velocity greater than 1,000 m per second.

### 369.06.04                      Sawcutting Equipment

~~Saw cutting~~The sawcutting equipment shall be self-propelled, guided, and capable of sawcutting the joints to the dimensions specified in the Contract Documents. The sawcutting equipment shall be capable of sawcutting the joints without causing spalling or damage to the adjacent concrete.

For resealing cracks with an existing reservoir, sawcutting equipment shall be capable of following the path of random cracks to create a ~~sealant~~ reservoir to the dimensions specified in the Contract Documents, without causing spalling or damage to the adjacent concrete.

The saw shall be ~~power driven and~~ equipped with a diamond blade ~~having a diameter of 200 mm or less.~~

### 369.06.02                      Heating Kettle05                      Thermometer

When required, the heating kettle shall be designed and operated to ensure uniform heat and to agitate and prevent overheating of the sealant.

### ~~369.06.03~~                      ~~Hot Compressed Air Lance~~

~~The hot compressed air lance shall have an oil free discharge of air at a temperature greater than 1,000 °C and an air velocity greater than 1,000 m per second.~~

A separate calibrated thermometer with an accuracy of  $\pm 2$  °C for verification of the joint sealing compound temperature shall be available on the job site.

## 369.07 CONSTRUCTION

### 369.07.01 General

Joints ~~and cracks identified specified to be sealed as specified~~ in the Contract Documents ~~and in the field by the Contract Administrator~~ shall be ~~filled sealed~~ with hot poured rubberized asphalt joint sealing compound. ~~Preformed compression seals or silicone sealant shall be used when~~

Cracks identified to be repaired as specified in the Contract Documents, and in the field by the Contract Administrator shall be sealed with hot poured rubberized asphalt joint sealing compound.

The maximum width of repair shall be 25 mm for both transverse and longitudinal joints or cracks ~~and joints. Cracks and joints. Joints or cracks~~ exceeding the maximum repair width shall be repaired as directed by the Contract Administrator.

### 369.07.02 Operational Constraints

~~Grinding and Joints may be sealed prior to or after grinding, milling, or grooving operations. Cracks shall be sealed after grinding, milling or grooving operations are completed prior to sealant installation.~~

~~Sealant or seals~~ Joint sealing compound shall not be placed until new concrete has cured for a minimum period of 7 Days.

Joint sealing compound shall not be placed when the ambient air or concrete pavement surface temperatures are less than 5 °C.

Joints and cracks shall be sealed between 24 and 48 hours after completion of the water flushing.

Cracks and joints shall be kept in a dry condition for a minimum period of 24 hours prior to ~~sealant or seal installation~~ joint sealing compound installation. This time period shall be extended only if necessary to ensure the joint or crack is dry.

~~Sealant~~ For newly constructed joints, joints shall not be placed when sealed within the ambient air same calendar year in which they are constructed. For crack and pavement surface temperatures are less than 5 °C. Seals joint resealing, cracks and joints shall be placed according to sealed within the manufacturer's recommendations same calendar year in which the existing sealant is removed.

### 369.07.03 Removal of Existing Sealant and Seals

All existing sealant, seals, bond breaker tapes, and seals backer rod shall be removed without damaging the adjacent joint or crack faces.

### 369.07.04 Sawcutting

#### 369.07.04.01 Reservoir

~~Saw cutting~~ For resealing joints with a reservoir cut or cracks with a reservoir cut, sawcutting equipment shall be used to create a reservoir with the dimensions specified in the Contract Documents. ~~Router~~ shall not be used for creating the reservoir.

The shape factor ~~shall be 1H:1V for hot poured rubberized sealant and 2H:1V for silicone sealant.~~ joint sealing compound shall be 1H:1V.

When resealing joints and cracks ~~or joints~~, if the existing reservoir is determined by the Contract Administrator to be in an acceptable condition with minimal spalling ~~and, with no joint sealant adhered to have the side of the joint and with~~ proper dimensions, saw cuttings ~~sawcutting~~ shall not be required, ~~but cleaning. The existing reservoir shall be required cleaned according to the Joint or Crack Cleaning clause.~~

When sawcutting existing joints, the least amount of concrete shall be removed to meet the specified requirements.

#### **369.07.04.02                    New Longitudinal and Transverse Joints**

New longitudinal and transverse joints, in newly constructed and repair areas of concrete pavement and concrete base shall be sawcut to the dimensions specified in the Contract Documents.

Sawcutting equipment shall be used to create the joints. Routers should not be used for creating the joints.

The initial sawcut for longitudinal and transverse joints shall be carried out as soon as the joint can be sawcut without ravelling the joint or damaging the concrete surface, and prior to any cracks developing.

Longitudinal and transverse sawcutting operations shall be carried out concurrently. Sawcutting of the joints to the specified dimensions may be done with the initial sawcut or in two parts with an initial sawcut and a final sawcut. The initial sawcut, and final sawcut, if applicable, shall be a minimum of one third the depth of the concrete slab and shall not be so deep as to cut the tie bars or dowel bars.

#### **369.07.05                    Joint or Crack Cleaning**

Immediately after the sawing operation, reservoirs shall be flushed. Cleaning of joints or cracks shall remove all sawcut slurry, grinding and grooving effluent, if applicable, and any other debris from the joint or crack. Cleaning of joints or cracks shall consist of flushing the joints or cracks with water in one direction to remove the slurry, slurry, effluent and debris. Additional methods of cleaning the joints or cracks may be required and shall be approved by the Contract Administrator.

Cracks shall be cleaned at a minimum at between 24 and 48 hours before sealing. Joints shall be cleaned at a minimum at each of the following times:

- a) Immediately after each sawcutting operation.
- b) Immediately after final texturing for unsealed joints.
- c) Between 24 and 48 hours before sealing.

Immediately prior to sealing operations, all new or existing joint and crack faces shall be abrasive blast cleaned according to OPSS 929. ~~The reservoir~~

The new or existing joint or crack and adjacent concrete pavement surface shall then be blown clean and dried, using a hot compressed air lance.

When resealing joints and cracks, cleaning shall remove all existing joint sealing compound.

#### **369.07.06                    Backer Rod Installation**

Backer rod installation is required when a reservoir cut is used.

Backer rods shall have a minimum diameter of 25% greater than the reservoir width. -They shall be installed immediately after cleaning and drying and of the joints before sealant joint sealing compound installation.- Backer rods shall be inserted uniformly to the required depth to achieve the required shape factor.

Backer rods shall be inserted using a double wheel steel roller and shall not be punctured or stretched during the installation process.

#### **369.07.07                    Sealant and Seal Joint Sealing Compound Installation**

##### **369.07.07.01                    General**

Prepared transverse Transverse joints and cracks shall be filled prior to longitudinal joints and cracks.

~~Sealant and seals~~Joint sealing compound shall be installed according to the manufacturer's recommendations and as specified in the Contract Documents.

### **369.07.07.02** Hot Poured Rubberized ~~\_\_\_\_\_~~ Joint Sealing Compound Preparation and Installation

The ~~sealant~~joint sealing compound shall be slowly melted with constant agitation until it is in a lump-free, free-flowing state, within the application temperature range recommended by the manufacturer for application.

The Contract Administrator shall be informed at least 24 hours prior to the initial charging of the empty kettle with joint sealing compound. The initial charge of material shall be placed in an empty kettle. The Contract Administrator shall be granted access to witness the empty kettle and initial charge of joint sealing compound upon request.

Joints and cracks shall be clean and dry when the joint sealing compound is placed.

The joint sealing compound shall be placed by a manual pouring cone or hose and wand fitted with a ~~proper sized~~ tip from a low pressure pump connected to the heating kettle. The tip shall be small enough to fit inside the joint or crack and extend to the bottom of the sawcut or, when specified, to the top of the backer rod.

~~The~~When filling joints or cracks with a reservoir, the tip of the cone or wand shall be placed to the top of the backer rod to ensure uniform application.

~~The~~When filling joints without reservoir, the tip of the cone or wand shall be placed at the bottom of the sawcut to ensure uniform application.

Joints and cracks shall be filled with ~~sealant~~joint sealing compound so that upon cooling, the ~~sealant~~joint sealing compound is recessed 3 to 6 mm below the adjacent concrete pavement surface. If the initial placement of material subsides below the required recess depths, additional ~~sealant~~joint sealing compound shall be placed within 8 hours of the original placement.

~~Sealant~~Joint sealing compound shall be fully adhered to the concrete on both sides of the joint or crack.

Joint sealing compound damaged by construction traffic or by the Contractor's operations shall be removed and replaced.

Any spilled material or excess material in the joints or cracks shall be removed immediately and the concrete pavement surface cleaned.

### **369.07.07.03** Compression Seal

The material heated shall be placed on the same Day. Excess heated material shall be disposed of and shall not be used on subsequent Days.

### **369.07.08** Material Sampling and Testing

~~After final cleaning of the reservoir, the lubricant adhesive shall be applied to the seal and the seal shall be installed according to the manufacturer's specifications. During installation, twisting, nicking, or other damage to the seal shall be avoided.~~

### **369.07.07.04** Silicone Sealant

~~Installation~~08.01 Sampling of silicone sealant shall be as specified in the Contract Documents and according to manufacturer's recommendations.Hot Poured Rubberized Joint Sealing Compound

During the installation of the joint sealing compound, a 4-litre sample of the joint sealing compound shall be submitted to the Contract Administrator, upon request, for testing by the Owner. The joint sealing compound shall be sampled from the heating kettle.

All containers used for sampling shall be metal, with double tight lids. The Contract Administrator shall be allowed to examine the sample containers prior to sampling to ensure they are clean and free of debris.

Samples shall be accompanied by a sample data sheet and WHMIS label. Samples shall be delivered with a transmittal form identifying the following information:

- a) Contract number.
- b) Name of Contractor and a contact person's name and telephone number.
- c) Contract Administrator's name and telephone number.
- d) Quantity, type of sample, and product name.
- e) Date sampled (yyyy-mm-dd).
- f) Temperature of the joint sealing compound in the heating kettle at the time of sampling.
- g) Date shipped.
- h) Sample location.

#### **369.07.08.02 Coring for Cleaning and Sealing Inspection**

After sealing operations are complete, the Contract Administrator may require that cores be taken at joint or crack locations to evaluate the acceptability of the joint or crack cleaning and sealing.

Coring shall be carried out according to CSA A23.2-14C. The cores shall be 100 mm in diameter and shall be drilled through the full depth of concrete pavement or concrete base, perpendicular to the surface of the concrete pavement or concrete base. No core shall be taken within 250 mm of any joint or edge of slab.

If the samples show that the joint or crack cleaning and sealing are not according to this specification, additional cores may be required at no additional cost to the Owner to determine the extent and locations of the improperly cleaned or improperly sealed joints.

Core holes shall be repaired according to OPSS 1350.

#### **369.07.09 Management of Excess Material**

Management of excess material shall be according to the Contract Documents.

#### **369.08 QUALITY ASSURANCE**

~~During the process of sealant or seal installation, upon request, the Contractor shall provide a sample of the seal or seal for testing to the Contract Administrator.~~

~~Sealant samples shall be stored in triple-tight epoxy-lined pails or suitable leak-proof plastic containers.~~

~~Seal samples shall be a minimum 1 m in length.~~ **369.08.01 Acceptance of Hot Poured Rubberized Joint Sealing Compound**

When hot poured rubberized joint sealing compound is tested, acceptance shall be according to OPSS 1212. Unacceptable hot poured rubberized joint sealing compound shall be removed and replaced.

#### **369.08.02 Acceptance of Cleaning and Sealing**



During and after sealing operations, the Contract Administrator will inspect the joints and cracks including any cores taken at joint or crack locations to evaluate the acceptability of the joint cleaning and sealing. The Contract Administrator will reject all or a portion of the work if the inspection shows that the joint or crack cleaning and sealing is not according to this specification. Rejected portions of the work shall be removed and replaced.

~~All samples shall be accompanied by a sample data sheet and any additional documents as specified in the Contract Documents. When not specified or not included on the sample data sheet, samples shall be delivered with a transmittal form identifying the following information:~~

- ~~a) Contract number.~~
- ~~b) Name of Contractor and a contact person's name and telephone numbers.~~
- ~~c) Contract Administrator's name and telephone numbers.~~
- ~~d) Quantity and type of sample. When a sample consists of more than one item, each item shall be individually identified.~~
- ~~e) Date sampled (i.e., yyyy-mm-dd).f) Date shipped.~~
- ~~g) Sample location.~~

### **369.09 MEASUREMENT FOR PAYMENT**

#### **369.09.01 Actual Measurement**

##### **369.09.01.01 Resealing of Joints and Sealing or Resealing of Cracks in Concrete Pavement and Concrete Base**

Measurement of ~~resealing of joints and sealing or resealing~~ of cracks in existing concrete pavement or concrete base shall be by length in metres measured along the centreline of the crack ~~or joint~~.

##### **369.09.01.02 Resealing of Joints and Cracks**

Measurement of resealing of joints and cracks in existing concrete pavement or concrete base shall be by length in metres measured along the centreline of the joint or crack.

#### **369.09.02 Plan Quantity Measurement**

When measurement is by Plan Quantity, such measurement shall be based on the units shown in the clause under Actual Measurement.

### **369.10 BASIS OF PAYMENT**

#### **369.10.01 Resealing of Joints and Sealing or Resealing of Cracks in Concrete Pavement and Concrete Base - Item Resealing of Joints and Cracks - Item**

Payment at the Contract price for the above tender ~~item~~items shall be full compensation for all labour, Equipment, and Material required to do the work.

~~Sealant or seals damaged by construction traffic or by the Contractor's operations shall be replaced at no extra cost to the Owner.~~

~~Removal of excess or spilled sealant shall be at no extra cost to the Owner.~~



Payment for the Sawcutting, cleaning and sealing of joints in new concrete pavement shall be paid under the Concrete Pavement item according to OPSS 350.

Sawcutting and cleaning of joints in new concrete base shall be paid under the Concrete Base item according to OPSS 350.

Sawcutting, cleaning and sealing of joints for concrete pavement repairs and the sawcutting and cleaning of joints for concrete base repairs shall be paid under the appropriate tender items according to OPSS 366.

When the maximum width of repair is greater than 25 mm for both transverse and longitudinal cracks and joints, the work directed by the Contract Administrator shall be administered as a Change in the Work.

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