

# CONCRETE ACCESSORIES JOINT DOWELING SYSTEMS

BUILDING TRUST  
CONSTRUIRE LA CONFIANCE





# TABLE OF CONTENTS

**04** Speed Dowel®

---

**05** Speed Dowel® for Construction Joints

---

**06** Speed Dowel® for Round and Square Dowels

---

**08** Speed Load™

---

**09** Speed Plate®

---

**11** G-Seal™ and Sika® Greenstreak® Expansion Boards

---

# Speed Dowel®

Patented Concrete Doweling System For Slabs-On-Ground



Speed Dowel® is the pioneering slip dowel installation system that ensures proper dowel alignment for positive load transfer in slab-on-ground concrete joints.

Speed Dowel® has revolutionized how the concrete industry designs and constructs joints for superior performance, while slashing the time and cost required for conventional slip dowel installations

Field-tested for over 20 years,  
Speed Dowel® is the choice for  
round and square dowel installations,  
such as:

- Warehouse / Distribution Centers
- Big Box Stores
- Manufacturing Facilities
- Commercial / Industrial Complexes
- Entertainment Centers
- Recreational Complexes
- Parking Facilities
- Airports



# Speed Dowel® FOR CONSTRUCTION JOINTS

Speed Dowel® provides a practical dowel alignment method for transferring loads across, and managing stresses within, concrete slab-on-ground joints, while facilitating the following recommendations of the American Concrete Institute:



“In areas subjected to wheeled traffic, heavy loads, or both, joints with load transfer devices are recommended. When positive load transfer is required, provisions should be made along the bulkhead to ensure proper alignment of the load-transfer device during construction and finishing operations.”

**ACI 360R-10 6.1.2**

“For dowels to be effective, they should be smooth, aligned, and supported so they will remain parallel in both the horizontal and the vertical planes during the placing and finishing operation. All dowels should be sawn and not sheared. Properly aligned, smooth dowels allow the joint to open as concrete shrinks.”

**ACI 302.1R-04 3.2.7**

“Dowels across pavement joints can provide load transfer while permitting the joints to move. When dowels are used, their correct alignment and lubrication is essential for proper joint function.”

**ACI 330R-08 3.8.2**

“The dowels should be centered on the joint. To permit horizontal movement, the dowels must not bond to the concrete on at least one side of the joint.”

**ACI 224.3R-95 (Reapproved 2008) 5.2.4.3**



## SIMPLE 3-STEP Speed Dowel® INSTALLATION METHOD



1 Attach base to edge form and tap on Speed Dowel® sleeve



2 Make first placement of concrete



3 Strip form and insert ungreased dowel into Speed Dowel® sleeve

### Trumps Conventional Methods Every Time!

- Drill dowel holes in lumber (edge form)
- Insert dowel into edge form
- Grease half of dowel
- Make first placement of concrete
- Hand align and position dowel



- Rotate dowel to loosen bond
- Remove dowel
- Strip edge form
- Reinsert dowel into oversized cavity
- Align and position dowel as needed

# Speed Dowel® FOR ROUND AND SQUARE DOWELS

| SLEEVE PRODUCT CODE | ROUND DOWEL SIZE                 | SLEEVE LENGTH | BASE PRODUCT CODE |
|---------------------|----------------------------------|---------------|-------------------|
| PSD09/#4TX          | 5/8" Smooth or #4 Rebar X 18"    | 9"            | PSD/#4BX          |
| PSD12/#4TX          | 5/8" Smooth or #4 Rebar X 24"    | 12"           |                   |
| PSD09/#5TX          | 3/4" Smooth or #5 Rebar X 18"    | 9"            | PSD/#5BX          |
| PSD12/#5TX          | 3/4" Smooth or #5 Rebar X 24"    | 12"           |                   |
| PSD09/#6TX          | 7/8" Smooth or #6 Rebar X 18"    | 9"            | PSD/#6BX          |
| PSD12/#6TX          | 7/8" Smooth or #6 Rebar X 24"    | 12"           |                   |
| PSD09/#7TX          | 1" Smooth or #7 Rebar X 18"      | 9"            | PSD/#7BX          |
| PSD12/#7TX          | 1" Smooth or #7 Rebar X 24"      | 12"           |                   |
| PSD09/#9TX          | 1 1/4" Smooth or #9 Rebar X 18"  | 9"            | PSD/#9BX          |
| PSD12/#9TX          | 1 1/4" Smooth or #9 Rebar X 24"  | 12"           |                   |
| PSDEPX09/#9TX*      | 1 1/4" Smooth or #9 Rebar X 18"  | 9"            | PSDEPX/#9BX       |
| PSDEPX12/#9TX*      | 1 1/4" Smooth or #9 Rebar X 24"  | 12"           |                   |
| PSD10/#11TX         | 1 1/2" Smooth or #11 Rebar X 20" | 10"           | PSD/#11BX         |
| PSD230x20TL*        | 20 mm X 460 mm Round Dowel       | 230 mm        | PSD20BL           |
| PSD305x20TL*        | 20 mm X 610 mm Round Dowel       | 305 mm        |                   |

\*Sika Canada offers Speed Dowel® sleeves sized to suit epoxy coated dowels. Consult a Sika Canada Technical Sales Representative for your specific project needs or if using with epoxy coated dowels.



Sleeves and bases are sold separately. Bases are reusable, which should be considered when determining requirements.



| SLEEVE PRODUCT CODE | SQUARE DOWEL SIZE           | SLEEVE LENGTH | BASE PRODUCT CODE |
|---------------------|-----------------------------|---------------|-------------------|
| PSDQ09X3/4TX        | 3/4" X 18" Square Dowel     | 9"            | PSDQ3/4BX         |
| PSDQ12X3/4TX        | 3/4" X 24" Square Dowel     | 12"           |                   |
| PSDQ230X20TL        | 20 mm X 460 mm Square Dowel | 230 mm        | PSDQ20BL          |
| PSDQ305X20TL        | 20 mm X 610 mm Square Dowel | 305 mm        |                   |

Sleeves and bases are sold separately. Bases are reusable, which should be considered when determining requirements.

## PHYSICAL PROPERTIES, CHARACTERISTICS, AND SPECIFICATIONS

|                           |                    |
|---------------------------|--------------------|
| Material Composition      | 100% polypropylene |
| Compressibility ASTM D695 | 5500-8000 psi      |
| Thickness (Nominal)       |                    |
| Speed Dowel Sleeve        | 0.125"             |
| Speed Load Sleeve†        | 0.075"             |
| Density                   | 0.88-0.92 g/cc     |
| Fatigue Resistance        | Excellent          |
| Impact/Stiffness Balance  | Excellent          |

### SUGGESTED PROPRIETARY SHORT FORM GUIDE SPECIFICATION SECTION 03252

Provide Speed Dowel® System, to accept \_\_\_\_ diameter X \_\_\_\_ long slip dowels (fill in appropriate slip dowel dimensions) by Sika Canada Inc., 601 Delmar Avenue, Pointe-Claire, Quebec H9R 4A9, Phone: 1-800-933-7452 or 514-697-2610

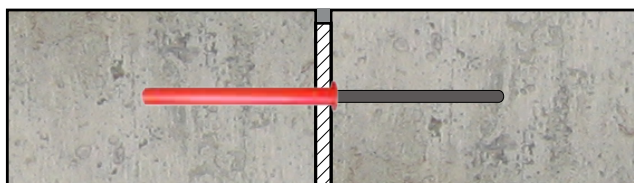
CSI Format, Three Part Specifications and technical assistance is available at the numbers above.

†Speed Load™ for Expansion Joints is featured on the page 8.

# Speed Load™ FOR EXPANSION JOINTS



Speed Load™ is a single component dowel sleeve for use in expansion joints. Speed Load™ passes through pre-drilled expansion boards and has a self-locking design to securely position and align round dowels for positive load transfer. Speed Load™ is featured above with our Polypropylene Expansion Board.



Speed Load™  
U.S. Patent D419,700

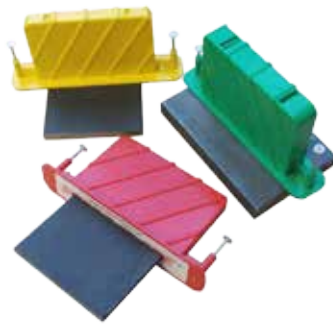
| PRODUCT CODE | ROUND DOWEL SIZE          | SLEEVE LENGTH |
|--------------|---------------------------|---------------|
| PSD1/2X5LT   | 1/2" X 10" Smooth Dowel   | 5"            |
| PSD1/2X9LT   | 1/2" X 18" Smooth Dowel   | 9"            |
| PSD3/4X5LT   | 3/4" X 10" Smooth Dowel   | 5"            |
| PSD3/4X9LT   | 3/4" X 18" Smooth Dowel   | 9"            |
| PSD3/4X12LT  | 3/4" X 24" Smooth Dowel   | 12"           |
| PSD1X9LT     | 1" X 18" Smooth Dowel     | 9"            |
| PSD125X9LT   | 1 1/4" X 18" Smooth Dowel | 9"            |



# Speed Plate<sup>®</sup> FOR FLAT PLATE DOWEL SYSTEMS

## SUPERIOR PERFORMANCE, LOWER COST

- Larger steel plates provide greater overall surface area to reduce bearing stresses on concrete
- Non-Tapered plate profile ensures consistent bearing stresses at joint face and full depth of dowel
- Engineered to provide optimal use of steel
- Integral, patented sleeve insert eliminates lateral restraint between concrete sections
- A doweling method in accordance with
  - ACI 302 Guide for Concrete Floor and Slab Construction
  - ACI 330 Guide for the Design & Construction of Concrete Parking Lots
  - ACI 360 Design of Slabs-on-Ground
- One-Piece Design with alignment marks and preinstalled nails makes installation quick and easy
- Ensures proper dowel alignment at a construction joint
- Save labour
  - No form drilling required
  - No greasing, spinning, removing, or replacing of dowels



Steel Plates Included



Sika's Speed Plate<sup>®</sup> reduces the number of dowels required when compared with conventional doweling systems. Speed Plate<sup>®</sup> allows the installer to increase the center distance between dowels, further reducing labour and material costs. The spacing chart below is conservative and is based on spacing recommendations in accordance with ACI 360R-10.

| SLEEVE COLOUR | SLAB DEPTH | Speed Plate <sup>®</sup> DOWEL DIMENSIONS | PLATE DOWEL ON CENTER SPACING |
|---------------|------------|---|-------------------------------|
| Red           | 5" - 6"    | 1/4" thick X 4" width X 6" long           | 18"                           |
| Yellow        | 7" - 8"    | 3/8" thick X 4" width X 6" long           | 18"                           |
| Green         | 9" - 11"   | 3/4" thick X 4" width X 6" long           | 18"                           |

Note: Values are based on a maximum joint opening of 0.20"

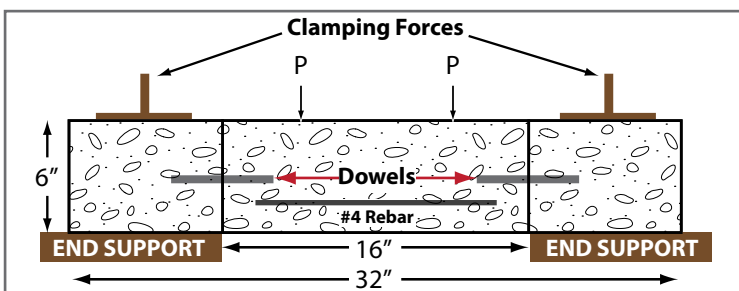
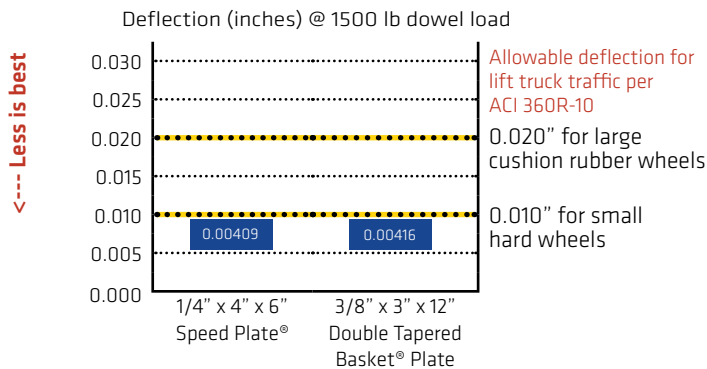
## TESTING AND RESEARCH

Sika's Technical Engineering Department has dedicated countless laboratory hours and research funds to investigate load transfer systems. Independent tests were conducted to provide an unbiased evaluation of the current doweling methods available, including round, flat plate, square, and tapered plate. The test procedure utilized a modified version of the AASHTO T253 test for load transfer devices and was designed to determine the following:

- Total joint deflection under load
- Bearing stresses imparted to the concrete at the joint face
- Failure mode of each doweling system



Typical "pop-out" failure of tested dowel system



**Consult a Sika Canada Technical Sales Representative to review your specific parameters for design and spacing recommendations, additional product information, documentation for LEED compliance purposes, or warranty information.**

## CONCLUSIONS

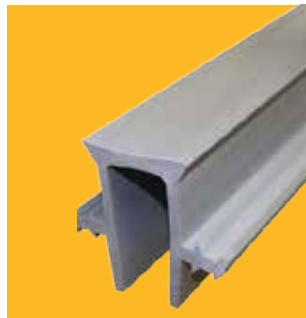
- Tests of ALL DOWEL SYSTEMS resulted in a tensile "pop-out" failure of the concrete.
- All dowel types provided deflections well less than the typically accepted value of 0.010" when loaded to 1500 lb per dowel (typical load for 10 000 lb axle load on a 6" slab with dowel spacing at 24" on center). Deflections greater than 0.010" can lead to joint failure due to impacts from wheeled traffic. MINIMIZING DEFLECTIONS is key to insuring the durability of the joint.
- Dowels with rectangular cross sections and larger widths are effective in reducing bearing stresses on concrete. Adding sleeves to dowels of all types also reduces the bearing stress on the surrounding concrete. Speed Plate® provides the lowest stress on the surrounding concrete of all Sika® Greenstreak® Dowel Systems. Bearing stress alone, however, does not predict ultimate dowel loads. All dowel systems tested failed at a wide range of bearing stress but at similar applied loads.
- Flat plates, or square dowels with sleeves that allow movement in the direction of the joint, are effective in eliminating lateral restraint between concrete sections. The Speed Plate® sleeve incorporates an integral, custom insert that provides lateral movement capability between concrete sections.
- It is critical to use internal vibration to consolidate the concrete around ALL plate dowel systems.

# OTHER PRODUCTS FOR DOWEL SYSTEMS

## G-Seal™ PAVING CAP SEAL

G-Seal™ is a durable, modified PVC cap placed over expansion board materials to provide a long lasting, maintenance free joint seal. Unlike traditional sealants, G-Seal™ is installed prior to concrete placement and forms a mechanical bond once the concrete is finished.

Profiles are also available for retrofit applications.

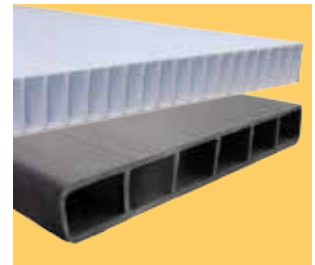


## Sika® Greenstreak® POLYPROPYLENE AND HIGH DENSITY POLYETHYLENE EXPANSION BOARDS

G-SEAL, installed with Sika® Greenstreak®'s Speed Load and Plastic Expansion Board combine to create highly effective, long lasting expansion joints. This system provides an efficient method for installing and aligning round dowels in expansion joints that are critical to the quality of the slab.

Sika offers two varieties of expansion board materials.

- White Polypropylene Expansion Board is available in 1/2" or 3/4" sheets which can be cut to varying depths.
- Black High Density Polyethylene Expansion Board is available in 3/4" X 10' lengths for either 6" or 8" depth slabs.



Both materials are highly durable and exceptional for use with G-Seal. Consult a Sika Canada engineer for more information on this and other joint systems for concrete slabs.

**Contact Sika Canada for additional information or to learn more about other Dowel Products and Systems.**

# SIKA SOLUTIONS FROM ROOF TO FOUNDATIONS

## Roofing Systems



Sarnafil®  
Sikaplan®  
Sikalastic®

## Concrete Production



Sika® ViscoCrete®  
Sika® Retarder®  
Sika® AER<sup>CA</sup>

## Joint Sealing



Sikaflex®  
Sikasil®  
Sikadur® Combiflex

## Grouting and Anchoring



SikaGrout®  
Sikadur®  
Sika AnchorFix®

## Concrete Repair & Protection



Sika® MonoTop®  
SikaTop®, SikaRepair®  
Sikagard®

## Structural Strengthening



Sikadur®, Sika® CarboDur®  
SikaWrap®  
Sika® CarboShear

## Floor & Wall Systems



Sikafloor®  
Sikagard®  
Sikagard® Duroplast

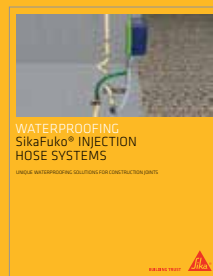
## Waterproofing Systems



SikaProof®, SikaFuko®  
Sika® Greenstreak®  
SikaSwell®, SikaFix®

Sika Canada Inc., a member of the Sika Group, is a leader in the field of speciality chemicals for construction and manufacturing industries. Our product lines feature high quality roofing systems, concrete admixtures, mortars and resins, sealants and adhesives, structural strengthening components, industrial and decorative flooring, as well as protective coatings and waterproofing systems. Our expertise is borne out of a global presence and served by strong, local support. Sika has earned the trust of our customers for over 100 years, by delivering the highest standards of commitment and partnership.

## Also Available:



The information, and in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions, within their shelf life. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any recommendations, or from any other advice offered. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users should always refer to the most recent issue of the Product Data Sheet for the product concerned, copies of which will be supplied on request or can be accessed in the Internet under [www.sika.ca](http://www.sika.ca).

### SIKA CANADA INC.

**Head Office**  
601, avenue Delmar  
Pointe-Claire, Quebec  
H9R 4A9

### Other locations

Toronto  
Edmonton  
Vancouver

1-800-933-SIKA  
[www.sika.ca](http://www.sika.ca)

An ISO 9001 certified company  
Pointe-Claire: ISO 14001 certified EMS

**BUILDING TRUST  
CONSTRUIRE LA CONFIANCE**

