

Taper Dowel

An engineered load transfer system for horizontal movement in concrete construction joints

The size and diamond-shape of the Taper Dowel provides concrete joint stability, load transfer and smooth slab-to-slab transition, without restraining floor movement.

The plastic sleeve is nailed to lumber edge forms before concrete placement and the steel plate slides into the sleeve after forms are removed in preparation for the adjoining slab.

The Taper Dowel simplifies dowel installation, eliminates slab edge drilling and reduces labor costs for all types of ground level concrete slabs, including floors, flatwork and pavement.

The plastic sleeve allows movement and the steel plate provides maximum bearing, bending and punching resistance, without the risk of slab interlock common with other methods.

A properly installed Taper Dowel is recommended for joints up to 0.20" wide and is suitable for all types of ground level concrete slabs, such as jointed floors, flatwork and pavement.

A Taper Dowel installation conforms to ACI 302.1R Guide for Concrete Floor and Slab Construction and ACI 360 Design of Slabs-on-Ground.



The dowel sleeve is quickly positioned and attached to edge forms, minimizing the related labor costs.



The steel dowel plate fits snugly into the sleeve, creating the load transfer between adjoining concrete slabs.

Taper Dowel Set (One Sleeve and One Plate)			
Part No.	Description	Slab	Spacing*
SBTD14SL	SB Taper Dowel 1/4" - Sleeve Only (Orange)	5" to 6-1/2"	18"
SBTD14PL	SB Taper Dowel 1/4" - Plate Only 1/4" x 4-1/2" x 4-1/2"		
SBTD38SL	SB Taper Dowel 3/8" - Sleeve Only (Yellow)	7" to 9"	18"
SBTD38PL	SB Taper Dowel 3/8" - Plate Only 3/8" x 4-1/2" x 4-1/2"		
SBTD34SL	SB Taper Dowel 3/4" - Sleeve Only (Green)	9" to 12"	18"
SBTD34PL	SB Taper Dowel 3/4" - Plate Only 3/4" x 4-1/2" x 4-1/2"		

* Spacing shown based on ACI 360 Design of Slabs-on-Ground.

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MADE IN USA

Taper Dowel Specification

The Taper Dowel provides joint stability, load transfer and smooth transition, without restraining concrete floor movement. Material minimizes joint spalling and random cracking for long-lasting quality joints.

A doweling method in accordance with:

- ACI 302 Guide for Concrete floor and slab construction
- ACI 300 Guide for the design and construction of concrete parking lots
- ACI 360 Design of slab on ground
- ACI 360R 2017 Chapter 6.2

Taper Dowel materials:

Plastic void: High-density ABS plastic

Steel plate: ASTM 529, A572 and A36, multi-grade 50 ksi

Corrosion protection: Optional zinc plating (ASTM B633) or stainless steel (ASTM A420)

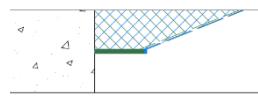
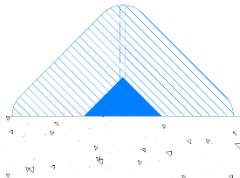
Void Color	Slab Thickness	Plate Dimensions	Dowel Spacing
Orange	5" to 6-1/2"	1/4"x4-1/2"x4-1/2"	18"
Yellow	7" to 9"	3/8"x4-1/2"x4-1/2"	18"
Green	9" to 12"	3/4"x4-1/2"x4-1/2"	18"

Values are based on maximum joint opening of 0.20", A360R table 6.1.

Performance characteristics:

The 4-1/2"x4-1/2" tapered dowel shape provides a large bearing area and creates a larger shear cone to transfer the load between adjoining slabs. The dowel has concrete-to-steel bearing area of 6.39" at the joint. (Significantly more bearing area than a similar square dowel, reducing bearing stresses in the concrete slab.)

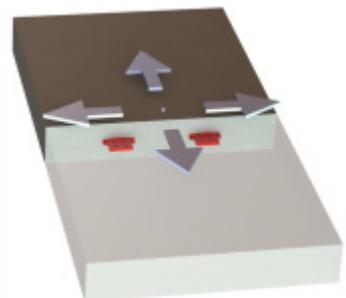
Shear cone:



Design:

The high-density ABS plastic void with collapsible internal walls and grade 50 ksi steel with precise thickness tolerance provides a secure, yet free movement of the dowel plate in all directions.

The tapered dowel will deliver acceptable joint stability per industry guides of less than 0.01" (0.25mm). (Allowable deflection for truck wheel traffic per ACI 360R-28.) It is critical to use internal vibration to consolidate concrete around all plate dowels.



Packaging:

Plastic void: 100 pieces per box, 1,000 pieces per pallet

Steel plates: 500 pieces per crate

Aligner Template for Taper Dowel Sleeves® Installation Manual

This device's function is to facilitate and speed up the correct fixing of the Taper Dowel Sleeves into the wooden forms, so that they can be drowned in between sections or floor stones in the concrete pavements and concrete slabs, and afterwards insert on them sections of rhombus-shaped steel plates in the construction joints.

Procedure:

The device for fixing the Sleeves is made up of two pieces: the Aligner or Arch in which the Template is fixated on. On both sides of the Aligner are located many fixing holes that match the heights marked in inches, and on the Template's ends we can find buttons that should be inserted into the holes to assemble into the Aligner, considering the height at which you have specified the placement of the steel plates on the concrete slab (consult the table of heights and thicknesses of slabs).

Figure 1

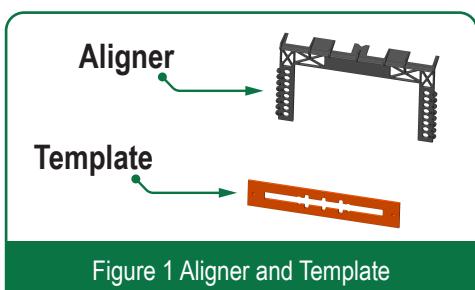


Figure 1 Aligner and Template

In order to illustrate this manual, we have placed the Template in 4", which corresponds to a 8" slab thickness, placing the iron plate at the center. **Figure 2**

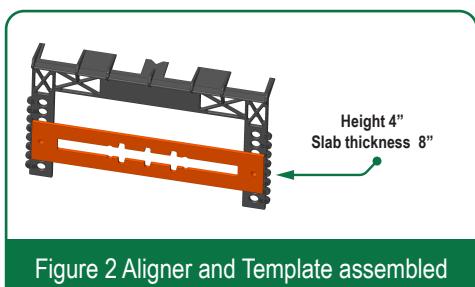


Figure 2 Aligner and Template assembled

- Once the Template is assembled to the Aligner at the chosen height, and the Sleeve is inserted inside the Template, the device is ready for alignment and to be nailed on the wooden form. **Figures 3 & 4**

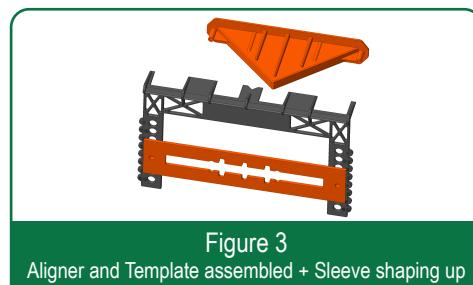


Figure 3
Aligner and Template assembled + Sleeve shaping up

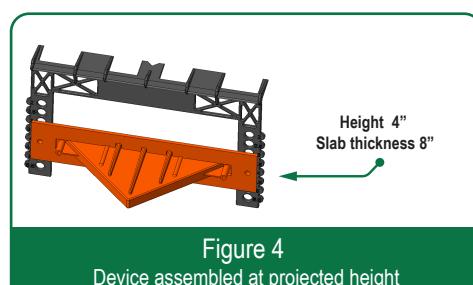


Figure 4
Device assembled at projected height

- The correct procedure considers one step before, which consists of marking the top edge of the wooden form that will be containing the poured concrete, the projected distance between the centers of each steel plate, so that those lines can be used as a reference for the fixing of the Sleeves. **Figure 5**

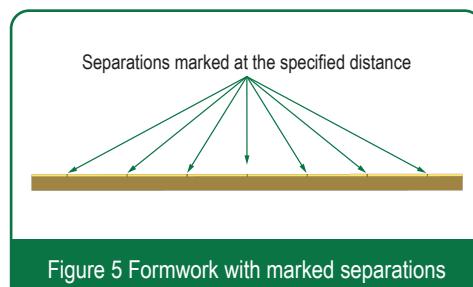


Figure 5 Formwork with marked separations

- At the top of the Aligner, you should be able to observe the slit which marks the center that should be aligned to the marks on the wooden form before nailing it down.

Figures 6 to 9

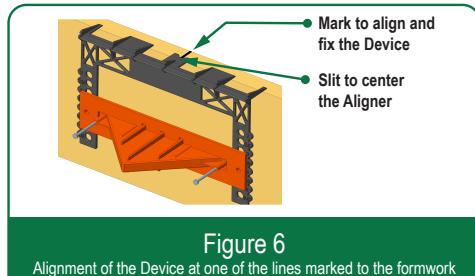


Figure 6

Alignment of the Device at one of the lines marked to the formwork

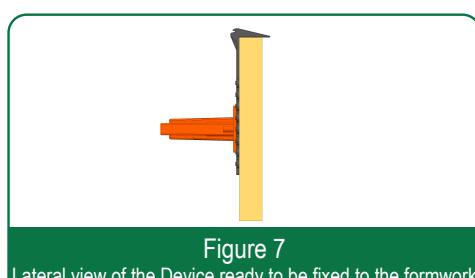


Figure 7

Lateral view of the Device ready to be fixed to the formwork

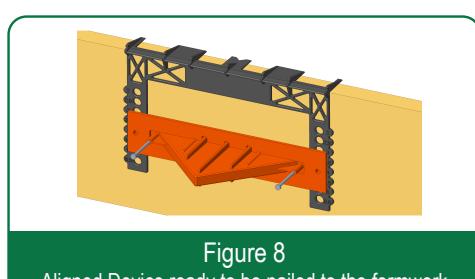


Figure 8

Aligned Device ready to be nailed to the formwork

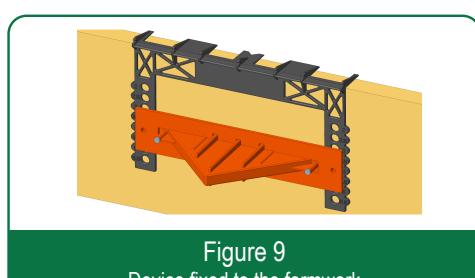


Figure 9

Device fixed to the formwork

Taper Dowel Aligner & Templates

Part No.	Description
SBTDAS	Taper Dowel Aligner Short
SBTDAL	Taper Dowel Aligner Large
SBTD14T	Aligner Template for 1/4" Taper Dowel
SBTD38T	Aligner Template for 3/8" Taper Dowel
SBTD34T	Aligner Template for 3/4" Taper Dowel

- Once the Sleeve is fixed to the wooden form, the device is removed and can be reused to align and fix as many Sleeves as needed. **Figure 10 to 12**

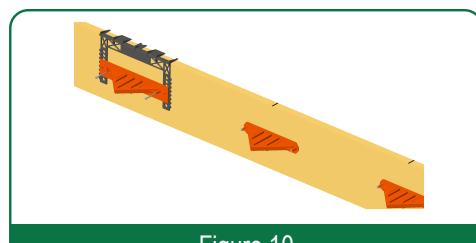


Figure 10

Perspective of the Sleeves fixed to the formwork

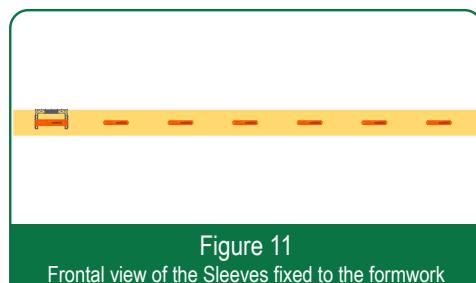


Figure 11

Frontal view of the Sleeves fixed to the formwork

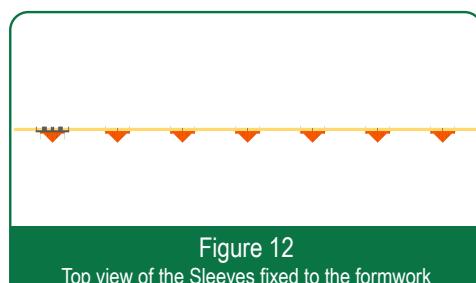


Figure 12

Top view of the Sleeves fixed to the formwork

Template heights & Slab thickness

Template Heights Inches	Slab thickness Inches
2	4
2.5	5
3	6
3.5	7
4	8
4.5	9
5	10
5.5	11 / 12

*Patent Pending

Template Alineador para Fundas Taper Dowel® Manual de Instalación

La función de este Dispositivo es facilitar y agilizar la correcta fijación de las Fundas Taper Dowel a las cimbras de Madera, para ser ahogadas entre secciones o piedras de pisos en los pavimentos y losas de concreto, y en un paso posterior, insertarles secciones de placas de acero con forma de rombos, en las juntas constructivas.

Procedimiento:

- El Dispositivo para fijar las Fundas se compone de 2 piezas: El Alineador o Arco en el que se fija el Template o Plantilla. El Alineador en sus 2 costados tiene varios huecos o cavidades de fijación correspondientes con las alturas señaladas en pulgadas, y el Template en sus extremos contiene 2 puntos o botones que se deben insertar en los huecos para ensamblarse al Alineador, considerando la altura a la que tienen especificada la colocación de las placas de acero en la losa de concreto (consulta la tabla de alturas y espesores de losas). **Figura 1**

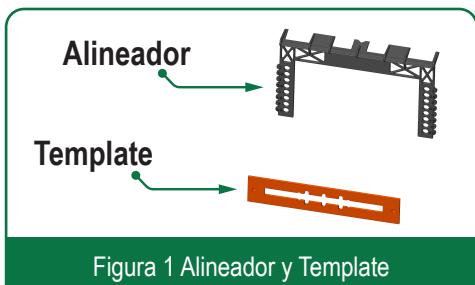


Figura 1 Alineador y Template

- Una vez que se ensambla el Template con el Alineador en la altura deseada y se inserta la Funda dentro del Template, el Dispositivo está listo para alinearla y clavarlo en la cimbra. **Figuras 3 y 4**

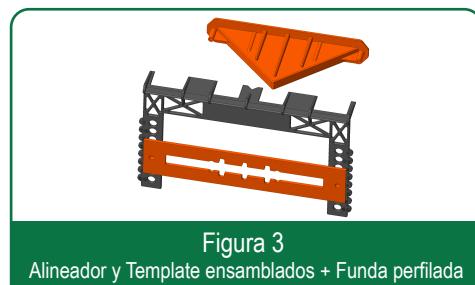


Figura 3
Alineador y Template ensamblados + Funda perfilada

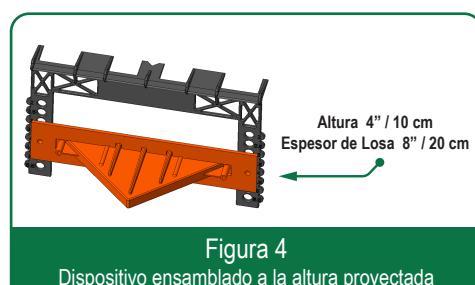


Figura 4
Dispositivo ensamblado a la altura proyectada

- El procedimiento correcto considera un paso antes, marcar en el borde superior de la cimbra que va a contener el vaciado de concreto, la distancia proyectada entre los centros de cada placa de acero, de tal manera que esas líneas sirvan como referencia para la colocación de las Fundas. **Figura 5**

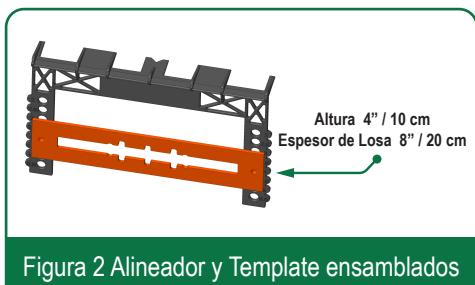


Figura 2 Alineador y Template ensamblados

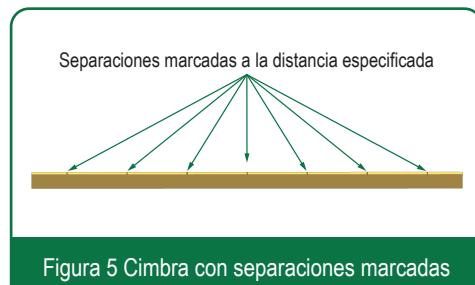


Figura 5 Cimbra con separaciones marcadas

- En la parte superior del Alineador, observarán la hendidura que señala el centro que debe ser alineado con las marcas en la Cimbra antes de clavarse. **Figuras 6 a 9**

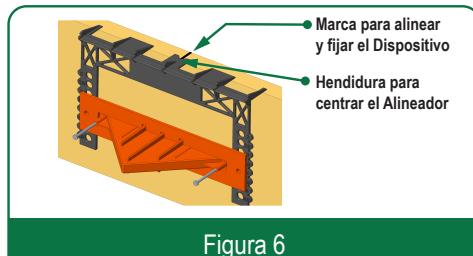


Figura 6
Alineación del Dispositivo en una de las líneas marcadas a la Cimbra

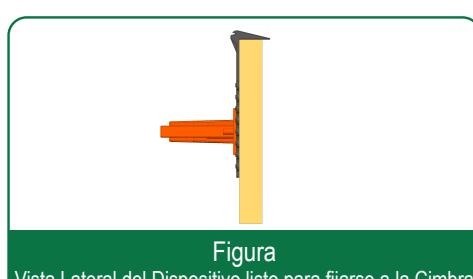


Figura
Vista Lateral del Dispositivo listo para fijarse a la Cimbra

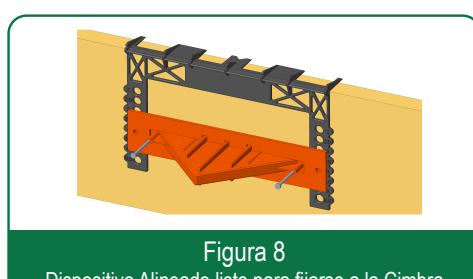


Figura 8
Dispositivo Alineado listo para fijarse a la Cimbra

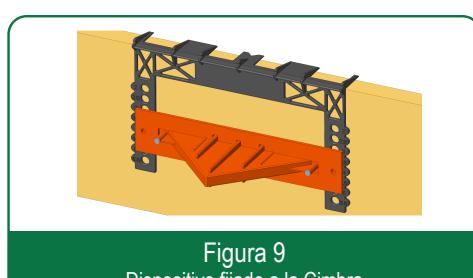


Figura 9
Dispositivo fijado a la Cimbra

Taper Dowel Aligner & Templates	
Part No.	Descripción
SBTDAS	Taper Dowel Aligner Short
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SBTD34T	Aligner Template for 3/4" Taper Dowel

- Una vez que la Funda quede fija a la Cimbra, se retira el Dispositivo y se reutiliza para alinear y fijar las siguientes Fundas que se requieran. **Figuras 10 a 12.**

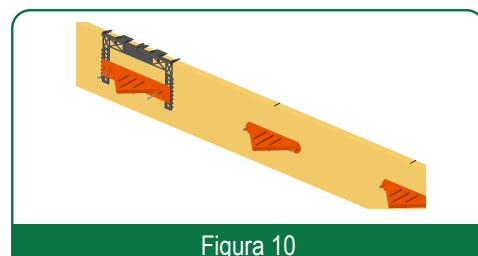


Figura 10
Perspectiva de las Fundas fijadas a la Cimbra

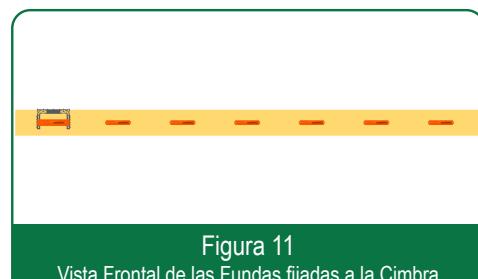


Figura 11
Vista Frontal de las Fundas fijadas a la Cimbra

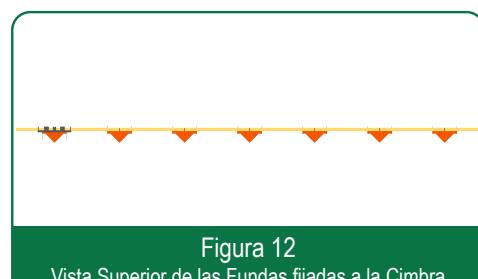


Figura 12
Vista Superior de las Fundas fijadas a la Cimbra

Tabla de Alturas y Espesores de Losas

Alturas Alineador	Espesores Losas	
	Pulgadas	Centímetros
2	4	10
2.5	5	12.5
3	6	15
3.5	7	17.5
4	8	20
4.5	9	22.5
5	10	25
5.5	11 / 12	27.5 / 30

*Patent Pending