52-SM Captive Screws
Miniature series · Surface Mount Technology (SMT) Style

- For installation to PC Board material utilizing surface mount technology
- Smaller footprint for limited space applications
- Heat treated steel screw for optimum strength

Material and Finish
Screw: Hardened carbon steel, zinc plated, chromate, plus sealer
Internal spring: 300 series stainless steel, passivated
Standoff: Steel, Tin plated
Plug: Silicone rubber

Installation Notes
Visit www.southco.com for additional installation guidelines

Part Number
See table

Recess Styles
No. 2 Phillips / Slot Combination
T15 TORX® / Slot Combination

Screw Height and Screw Projection

PC Board Preparation

<table>
<thead>
<tr>
<th>Thread Size</th>
<th>Part Number (Reel package shown)</th>
<th>Part Number (Reel package shown)</th>
<th>Part Number (Reel package shown)</th>
<th>Part Number (Reel package shown)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M3 x 0.5</td>
<td>52-SM-1311-K-R</td>
<td>52-SM-1311-K-R</td>
<td>52-SM-1311-K-R</td>
<td>52-SM-1311-K-R</td>
</tr>
<tr>
<td></td>
<td>52-SM-1411-K-R</td>
<td>52-SM-1411-K-R</td>
<td>52-SM-1411-K-R</td>
<td>52-SM-1411-K-R</td>
</tr>
</tbody>
</table>

*TORX® is a registered trademark of ACUMENT® Intellectual Properties, LLC
Dimensions in millimeters (inch) unless otherwise stated
Southco Surface Mounted Technology (SMT) Captive Screws include installation and packaging features for installation onto PC Boards during the Reflow Process as a surface mounted device (SMD).

### SMT Product Installation

SMT product installation is offered on these Southco Captive Screws for 4-40, 6-32 and M3 thread sizes:
- 47 Styled Knob Series
- 4C Prism Series
- 52 Miniature Series

#### Installation Features

Each Southco SMT style captive screw includes a polyimide patch covering the screw head tool recess allowing for vacuum pick up during placement on the PC Board. The screw threads are protected from excess solder during the reflow process by a plug pre-assembled to the screw by Southco. The patch and plug are then removed after the final cool down phase.

#### Preparing the PC Board to Accept SMT Captive Screws

- See literature for optimum soldering pad surface area for the specific Southco Captive Screw being utilized

#### Packaging Features/Options

- Tray Pack
- Reel Pack

#### Reflow Process

- Reflow of Solder
  - Pre-heat
  - Soak
  - Reflow
  - Cooling
- Cleaning
  - Remove excess solder paste
Captive Screws
Miniature series · Flare-in style

- Smaller footprint for limited space applications
- Heat treated steel screw for optimum strength

Material and Finish
Screw: Hardened carbon steel, zinc plated, chromate, plus sealer
Spring: 300 series stainless steel, passivated
Standoff: Aluminum natural
Installation tool: Hardened carbon steel, zinc plated, chromate, plus sealer

Installation Notes
1. Prepare panel as shown
2. Use light pressure to flare standoff, assuring parallel surfaces on the punch and installation tool

Knob Height and Screw Projection
Unfastened (Total float of screw in standoff)
Fastened

F* - Value represents float in unfastened position
Notes: P-1, P-2 measured from the top side of panel

Thread Size | Panel Thickness | Part Number | Panel Preparation | Tool Part No.
--- | --- | --- | --- | ---
4-40 | 0.8 (.031) 2.4 (.94) | 52-19-11-4 52-17-11-4 52-1A-11-4 52-18-11-4 | 4.75 (.190) 5.4 (.213) 3 (.120) | 47-104
6-32 | 1.5 (.058) 3.2 (.125) | 52-29-21-4 52-27-21-4 52-2A-21-4 52-28-21-4 | 5.4 (.213) 6.76 (.266) 4.2 (.166) | 47-108
M3 x 0.5 | 0.8 (.031) 2.4 (.94) | 52-39-11-4 52-37-11-4 52-3A-11-4 52-38-11-4 | 6.76 (.266) 4.2 (.166) | 47-108
M4 x 0.7 | 1.5 (.058) 3.2 (.125) | 52-49-21-4 52-47-21-4 52-4A-21-4 52-48-21-4 | 6.76 (.266) 4.2 (.166) | 47-108

Panel Preparation
- Phillips / Slot
- Phillips / Slot Recess
- T15 TORX® / Slot
- No. 2 Phillips

Note: Subtract .25 (.01) from Ø B for smooth head style.

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Dimensions in millimeters (inch) unless otherwise stated

www.southco.com/52
## 52 Captive Screws
### Miniature series · Press-in style

### Recess Styles
- **Phillips / Slot combination**
- **TORX® / Slot combination**
- **Captive Screws**
  - Miniature series · Press-in style
  - No. 2 Phillips
  - T15 TORX® (M3,4-40,6-32)
  - T25 TORX® (M4)

### Knob Height and Screw Projection
- **Unfastened**
- **Fastened**
  - (Total float of screw in standoff)
  - Do not chamfer
  - Smooth face punch
  - Back-up tool (not supplied)

### Notes:
- **Value represents float in unfastened position**
- **Notes:** P-1, P-2 measured from the top side of panel

### Material and Finish
- **Screw:** Hardened carbon steel, zinc plated, chromate, plus sealer
- **Spring:** 300 series stainless steel, passivated
- **Standoff:** Carbon steel, zinc plated, chromate, plus sealer

### Installation Notes
- For use in most aluminum or in low carbon steels that are 1/4 hard or softer

### Part Number
See table

### See page 543 for additional installation guidelines

---

### Thread Size
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4-40</td>
<td>52-19-51-4</td>
<td>52-17-51-4</td>
<td>52-1A-51-4</td>
<td>52-18-51-4</td>
</tr>
<tr>
<td>52-29-51-4</td>
<td>52-27-51-4</td>
<td>52-2A-51-4</td>
<td>52-28-51-4</td>
<td>52-29-51-4</td>
</tr>
<tr>
<td>52-49-51-4</td>
<td>52-47-51-4</td>
<td>52-4A-51-4</td>
<td>52-48-51-4</td>
<td>52-49-51-4</td>
</tr>
</tbody>
</table>

### Panel Preparation
- **Panel Preparation**
  - **β D**
  - **β Z**

---

TORX® is a registered trademark of ACUMENT® Intellectual Properties, LLC

Dimensions in millimeters (inch) unless otherwise stated

[www.southco.com/52](http://www.southco.com/52)
52 Overmold Captive Screws
Miniature series · Flare-in style

- Smaller footprint for limited space applications
- Heat treated steel screw for optimum strength
- Designate access points with color
- Color match captive screws to your industrial design

Material and Finish
Screw: Hardened carbon steel, zinc plated, chromate, plus sealer
Spring: 300 series stainless steel, passivated
Standoff: Aluminum natural
Knob: PC/ABS
Installation tool: Hardened carbon steel, zinc plated, chromate, plus sealer

Performance Details
Flammability Rating: UL94-VO

Installation Notes
1. Prepare panel as shown
2. Use light pressure to flare standoff, assuring parallel surfaces on the punch and installation tool

Part Number
See table

<table>
<thead>
<tr>
<th>Thread Size</th>
<th>Panel Thickness</th>
<th>Part Number</th>
<th>Knurled Head</th>
<th>Smooth Head</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Min.</td>
<td>Max.</td>
<td>Phillips / Slotted</td>
<td>TORX®/ Slotted</td>
</tr>
<tr>
<td>4-40</td>
<td>0.8</td>
<td>2.4</td>
<td>(.031)</td>
<td>(.094)</td>
</tr>
<tr>
<td>4-40</td>
<td>1.5</td>
<td>3.2</td>
<td>(.058)</td>
<td>(.125)</td>
</tr>
<tr>
<td>4-40</td>
<td>0.8</td>
<td>2.4</td>
<td>(.031)</td>
<td>(.094)</td>
</tr>
<tr>
<td>4-40</td>
<td>1.5</td>
<td>3.2</td>
<td>(.058)</td>
<td>(.125)</td>
</tr>
</tbody>
</table>

Knob Height and Screw Projection
Unfastened
Fastened

F* - Value represents float in unfastened position
Notes: P-1, P-2 measured from the top side of panel

Specifying Color: To indicate color, change the last three digits of the part number
Example: 52-11-11-4-000 Black, 52-11-11-4-013 Red

Dimensions in millimeters (inch) unless otherwise stated

TORX® is a registered trademark of ACUMENT Intellectual Properties, LLC

www.southco.com/52
52 Overmold Captive Screws
Miniature series · Press-in style

Recess Styles*

<table>
<thead>
<tr>
<th>Phillips / Slot combination</th>
<th>Phillips / Slot Recess No. 2 Phillips</th>
<th>T15 TORX® (M3,4-40.6-32)</th>
<th>T25 TORX® (M4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø E</td>
<td>52-16-51-4-000*</td>
<td>52-33-51-4-000*</td>
<td>52-46-53-4-000*</td>
</tr>
<tr>
<td>Ø Z</td>
<td>52-15-51-4-000*</td>
<td>52-36-51-4-000*</td>
<td>52-45-51-4-000*</td>
</tr>
<tr>
<td>2.5 (.1)</td>
<td>5.56</td>
<td>5.56</td>
<td>6.35</td>
</tr>
</tbody>
</table>

Knob Height and Screw Projection

Unfastened (Total float of screw in standoff)

Fastened

F* Value represents float in unfastened position
Notes: P-1, P-2 measured from the top side of panel

Notes: Recommended minimum distance from edge of panel to centerline of hole is 1.5 x Ø D for press-in version.

Material and Finish
Screw: Hardened carbon steel, zinc plated, chromate, plus sealer
Spring: 300 series stainless steel, passivated
Standoff: Carbon steel, zinc plated, chromate, plus sealer
Knob: PC/ABS

Performance Details
Flamability Rating: UL94-VO

Installation Notes
For use in most aluminum or in low carbon steels that are 1/4 hard or softer. Visit www.southco.com for more information.

Part Number
See table

Specifying Color: To indicate color, change the last three digits of the part number
Example: 52-11-11-4-000 Black, 52-11-11-4-013 Red

Visit www.southco.com for additional installation guidelines

<table>
<thead>
<tr>
<th>Thread Size</th>
<th>Part Number</th>
<th>Knurled Head</th>
<th>Smooth Head</th>
<th>B Knurled Head</th>
<th>B Smooth Head</th>
<th>C</th>
<th>Ø E</th>
<th>F*</th>
<th>G</th>
<th>H-1</th>
<th>H-2</th>
<th>Ø J</th>
<th>P-1</th>
<th>P-2</th>
<th>Panel Preparation</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-40</td>
<td>52-11-51-4-000*</td>
<td>52-15-51-4-000*</td>
<td>52-16-51-4-000*</td>
<td>52-13-51-4-000*</td>
<td>52-14-51-4-000*</td>
<td>8.1</td>
<td>(.32)</td>
<td>7.8</td>
<td>(.31)</td>
<td>7.9</td>
<td>(.31)</td>
<td>6.4</td>
<td>(.25)</td>
<td>0.5</td>
<td>(.018)</td>
</tr>
<tr>
<td>6-32</td>
<td>52-29-51-4-000</td>
<td>52-27-51-4-000</td>
<td>52-28-51-4-000</td>
<td>52-26-51-4-000</td>
<td>52-25-51-4-000</td>
<td>8.8</td>
<td>(.35)</td>
<td>8.5</td>
<td>(.33)</td>
<td>8.6</td>
<td>(.34)</td>
<td>7</td>
<td>(.28)</td>
<td>0.7</td>
<td>(.028)</td>
</tr>
<tr>
<td>M3 X 0.5</td>
<td>52-31-51-4-000*</td>
<td>52-35-51-4-000*</td>
<td>52-36-51-4-000*</td>
<td>52-33-51-4-000*</td>
<td>52-34-51-4-000*</td>
<td>8.1</td>
<td>(.32)</td>
<td>7.8</td>
<td>(.31)</td>
<td>7.9</td>
<td>(.31)</td>
<td>6.4</td>
<td>(.25)</td>
<td>0.6</td>
<td>(.023)</td>
</tr>
<tr>
<td>M4 X 0.7</td>
<td>52-49-51-4-000</td>
<td>52-45-51-4-000</td>
<td>52-46-51-4-000*</td>
<td>52-44-51-4-000</td>
<td>52-43-51-4-000</td>
<td>10.3</td>
<td>(.41)</td>
<td>10</td>
<td>(.39)</td>
<td>8.6</td>
<td>(.34)</td>
<td>8.7</td>
<td>(.34)</td>
<td>0.7</td>
<td>(.028)</td>
</tr>
</tbody>
</table>

Note:*Part Numbers not available with combination head styles; Phillips or TORX® only

TORX® is a registered trademark of ACUMENT™ Intellectual Properties, LLC

Dimensions in millimeters (inch) unless otherwise stated

www.southco.com/52
52 Captive Screws
Miniature low profile series · Press-in style

- Low profile for limited space application
- Heat treated steel screw for optimum strength
- Designate access points with color
- Color match captive screws to your industrial design

Material and Finish
Screw: Hardened carbon steel, zinc plated, chromate, plus sealer
Spring: 300 series stainless steel, passivated
Standoff: Carbon steel, zinc plated, chromate, plus sealer
Prism: PC/ABS

Performance Details
Flamability Rating: UL94-VO

Installation Notes
For use in most aluminum or low carbon steels that are 1/4 hard or softer. Visit www.southco.com for more information.

Part Number
See table

Specifying Color: To indicate color, change the last three digits of the part number
Example: 52-A11-51-4-000 Black, 52-A11-51-4-013 Red

Visit www.southco.com for additional installation guidelines

### Color/ Appearance

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Thread Size</th>
<th>Knurled Head</th>
<th>Smooth Head</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-1</td>
<td>H-2</td>
<td>P-1</td>
<td>P-2</td>
</tr>
<tr>
<td>H-1</td>
<td>H-2</td>
<td>P-1</td>
<td>P-2</td>
</tr>
</tbody>
</table>

### Color/ Appearance

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Thread Size</th>
<th>Knurled Head</th>
<th>Smooth Head</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-1</td>
<td>H-2</td>
<td>P-1</td>
<td>P-2</td>
</tr>
<tr>
<td>H-1</td>
<td>H-2</td>
<td>P-1</td>
<td>P-2</td>
</tr>
</tbody>
</table>

**Dimensions in millimeters (inch) unless otherwise stated**
## 52 Captive Screws

Miniature low profile series · Surface Mount Technology (SMT) Style

### Recess Styles

<table>
<thead>
<tr>
<th>Bright</th>
<th>Prism</th>
</tr>
</thead>
</table>

- **No. 2 Phillips/Slot combination**
- **T15 TORX®/Slot combination**

### Knob Height and Screw Projection

#### Unfastened

- **F** Value represents float in unfastened position
- Notes: P-1, P-2 measured from the top side of panel

#### Fastened

- **H-1**
- **H-2**

### PC Board Preparation

- **Soldering pad surface area**
- **Ø 8.6** (.34)
- **Ø 5.6** (.22)

### Specify Package · SMT Style

- Indicate package option with last digit of the part number
- **Example**: 52-SM-A1111-K000-R, 52-SM-A1111-K013-R

### Installation Notes

- Visit www.southco.com for additional installation guidelines

### Part Number

- **See table**

---

<table>
<thead>
<tr>
<th>Color/ Appearance</th>
<th>Thread Size</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bright</td>
<td>4-40</td>
<td>52-SM-A1311-K-R</td>
</tr>
<tr>
<td></td>
<td>M3 x 0.5</td>
<td>52-SM-A3311-K-R</td>
</tr>
<tr>
<td>Bright</td>
<td>7</td>
<td>52-SM-A1311-N-R</td>
</tr>
<tr>
<td></td>
<td>(.28)</td>
<td>52-SM-A3311-N-R</td>
</tr>
<tr>
<td>Prism (black shown)</td>
<td>4-40</td>
<td>52-SM-A1211-K000-R</td>
</tr>
<tr>
<td></td>
<td>M3 x 0.5</td>
<td>52-SM-A3211-K000-R</td>
</tr>
</tbody>
</table>

**Note**: For installation to PC Board material utilizing surface mount technology

- **Heat treated steel screw for optimum strength**
- **Designate access points with color**
- **Color match captive screws to your industrial design**

### Material and Finish

- **Screw**: Hardened carbon steel, zinc plated, chromate, plus sealer
- **Spring**: 300 series stainless steel, passivated
- **Standoff**: Carbon steel, tin plated, chromate, plus sealer
- **Prism**: High heat resistant plastic

### Performance Details

- **Flammability Rating**: UL94-VO

---

**TORX® is a registered trademark of ACUMENT® Intellectual Properties, LLC**

**Dimensions in millimeters (inch) unless otherwise stated**
Installation Guidelines

for SOUTHCO® Self-Clinching products

Self-clinching product installation is offered on these SOUTHCO® products, making them easy-to-use captive panel fasteners:

- Captive Screws
- Receptacles for Quarter-turn Fasteners
- Receptacles for Fast-lead Thread Screws

When pressed into a properly prepared hole, self-clinching captive fasteners cold-flow (move) the panel material into the retaining groove of the fastener. This material then retains the fastener in the panel.

Successful press-in installations depend on:

Material:
The hardness of the panel material must not exceed SOUTHCO® recommendations. If the panel is too hard, the fastener will not install correctly.

Installation Holes:
Mounting holes may be drilled, punched, or cast.

- Hole edge: the top hole edge must be sharp but with no broken edges.
- Punched holes: use a punch and die with a small clearance to minimize the rollover and fracture angle.
- Hole diameter: measure the hole diameter at the panel surface on the side on which the fastener will be installed. The diameter must be within SOUTHCO® specifications for that product.
  - If the hole is too large, not enough material will flow into the retaining groove and the fastener may not be retained adequately.
  - If the hole is too small, the fastener will not fit and installation may become difficult and unsafe.
- Hole distance from the edge of panel: the minimum recommended distance is 1.5 x the diameter of the mounting hole, unless otherwise indicated.

- Spring-loaded Plungers
- Captive Nuts
- Threaded Inserts

- Installing too close to the edge will cause the material to flow in the opposite direction, deforming the edge of the panel. To install closer to the edge, you may need to restrain the panel edge.

Panel Thickness:
The thickness of the panel at the mounting hole location must meet or exceed Southco’s stated minimum recommendations.
If the material is too thin, panel deformation and/or damage to the fastener may result.

Installation is fast and easy if you follow these tips:

How to install: Use the recommended force where noted and a proper back-up tool.

- use any parallel-acting press
- use a punch whose diameter is larger than the head of the fastener

Installation Force: Proper installation requires an even distribution of adequate force. It does not depend on the distance the fastener is pressed into the panel.

- Southco does not recommend using a hammer. The impact force does not provide an even distribution of force to allow the panel material to completely flow into the fastener’s retaining groove.
- Installation force varies from application to application, depending on the criteria noted above.
- On parts without a collar to provide a hard stop, press-in until the edge of the knurl is just barely visible.

When to Install:
Installation is recommended after plating or finishing has been applied to the panel.
The hole diameter must meet specifications before finish or plating is applied.
- Do not over-install parts. This interrupts the material and will reduce the retention strength.