V-RETAINER COUPLING

SELECTION GUIDE

CLAMP TECHNOLOGY™
DIVISION OF VOSS INDUSTRIES, INC.

ISO 9001:2000 CERTIFIED
Voss V-Retainer Coupling Profile & Latch Selection

As a sampling of what Voss has to offer, several standard V-retainer Coupling profiles are shown in this guide. The burst pressure charts displayed with the profiles indicate ultimate performances when used on machined flanges with an O-ring seal. Please refer to the notes at the end of this section for a more detailed explanation.

Sufficient data is included with each Voss V-retainer Coupling Series to select a part number for your specific application. A part number code example is shown on p. 4 and includes:

- 2-digit V-retainer Series Number indicating the required profile and metal thickness to satisfy load.
- Number of retainer segments.
- 1- or 2-digit Latch Style Code - see p. 3 for illustrations;
- p. 5 for photos and a detailed explanation.
- Letter indicating T-Bolt material. (length & diameter to be determined)
- Nominal inside diameter of coupling in whole and .010 in.
- Letter indicating nut material and type. (Consult Voss Sales Engineer for recommended combinations of T-bolts and nuts)

A V-retainer coupling exerts compressive force against flanges and can be a continuous, single ring (one-piece) or specified as two or more segments. Segments must be even-numbered for multiple-latch applications (see "Latch Codes").

Single-segment couplings are relatively economical. Due to the stiffness of a continuous ring, single-segment couplings are available only in larger diameters and for infrequent removal. Multi-segment couplings are recommended for most applications because of more uniform clamp loading and their inherent flexibility for ease of installation and removal.

Voss has a wide variety of latch styles for almost any application. Common styles include standard T-bolt, T-bolt quick-release and over-center latches. Several special application latches are available. Large diameter couplings frequently employ two or more latches to provide more uniform loading.

Notes:
1) Profiles: Light Gray = Outer Band; Dark Red = V-Retainer
Profile: Light Red = Mating Flange. Consult the factory for other available profiles, or for specific design and availability of mating flanges.

2) Charts: Red lines = Full Bands; Dotted Black lines = Strap Loops.
See p. 5 for an example and more detailed information.
Latch Code

Latch code numbers shown at the right can be specified by the 4th digit (and when applicable, the 5th digit) in the part number code. These digits define standard latch styles available from stock. For additional latch details, see p. 5, and/or consult your Voss Sales Engineer.

Note: Number of segments to be specified by the customer.
### T-Bolt Nut Code

<table>
<thead>
<tr>
<th>Code Letter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C*</td>
<td>Alloy steel 4037, cadmium plated or zinc plated, 125 KPSI min.</td>
</tr>
<tr>
<td>E*</td>
<td>431 stainless steel, 125 KPSI min.</td>
</tr>
<tr>
<td>H</td>
<td>18-8 stainless steel, 80 KPSI min.</td>
</tr>
<tr>
<td>K</td>
<td>316 stainless steel, 75 KPSI min.</td>
</tr>
</tbody>
</table>
*Heat treated

<table>
<thead>
<tr>
<th>Code Letter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>NASM 21044 nylon insert, self-locking, alloy steel, cadmium plated 250°F.</td>
</tr>
<tr>
<td>SL</td>
<td>18-8 CRES, silver plated self-locking, Nylon insert 250°F.</td>
</tr>
<tr>
<td>L</td>
<td>Plain hex stainless steel, silver plated, 800°F.</td>
</tr>
<tr>
<td>A</td>
<td>A-286 stainless steel, silver plated, self-locking, 1200°F.</td>
</tr>
<tr>
<td>Z</td>
<td>347 stainless steel, silver plated, self-locking, 1200°F.</td>
</tr>
<tr>
<td>ZB</td>
<td>303 stainless steel, silver plated, self-locking, 800°F, castellated or elliptical.</td>
</tr>
</tbody>
</table>

### Part No. Code

**Typical Voss Part No.: 51 3 2 E-450-Z**

V-Retainer, Series No.

Number of Segments (specified by the customer)

Code Number, Latch Style (can be one or two digits)

Bolt Material, Code Letter

Retainer Diameter I.D. in 1/100 Inches*

*Flange O.D. plus twice apex gap.

Nut Code Letter
Voss V-Retainer Coupling Standard Latch Styles

NO. 1 Style - Standard T-Bolt and Trunnion Latch
For applications where infrequent clamp removal is anticipated. May be used with any size coupling and is one of the strongest standard latch styles available. Nut must be removed to open the coupling.

NO. 2 Style - Standard T-Bolt Quick-Release Latch
Useful where frequent coupling removal is necessary. Can be quickly and easily opened by loosening the nut and raising the hinged latch. This design permits T-bolt replacement. Applicable for couplings of many diameters.

NO. 3 Style - Socket Head Cap Screw Latch
For special low profile applications. Features a barrel trunnion and barrel nut.

NO. 4 Style - Multi-Latch: One No. 1 Style (T-Bolt & Trunnion) & One No. 2 Style (T-Bolt Quick-Release) Latch with Strap Loops on a Two-Segment Coupling
Provides uniform takeup and load distribution for larger diameter couplings. Useful for lower pressure applications. Requires even number of segments.

NO. 5 Style - Same as No. 4 Style except with Full Circumferential Band & Two or More Segment Couplings
Permits convenient, quick access. Very useful for larger diameter couplings, with higher pressures. Requires even number of segments.

NO. 6 Style - Multi-Latch: Two No. 1 Style Latches with Full Circumferential Band and Two or More Segment Couplings
For larger diameter couplings where a quick disconnect is not required. The full band provides greater clamping force than the No. 4 Style. Most economical of all multi-latch styles. Requires even number of segments.

NO. 7 Style - T-Bolt Over-Center Latch
Applicable where frequent removal of the coupling is required (canisters, filters, etc.). Features over-center handle; requiring no tools to open or close once initial adjustment is made. Nut provides adjustable tension. Self-energizing safety latch reduces accidental opening. Note: Any pressure must be released before opening the latch. Not recommended for applications with internal pressures.

NO. 8 Style - C-30 Formed Clip
A light-duty latch featuring a machine screw with standard hex nut. Lock nut and projection weld nut are optional.

NO. 9 Style - T-Bolt Saddle Latch
An economical quick-release style for light-to-medium-duty applications. Permits quick access where couplings must be periodically removed (canisters, etc.). Style allows for easy field replacement of the T-bolt.

NO. 10 Style - Multi-Latch: Two T-Bolt Latches with Strap Loops
Very similar to No. 6 (full band) Style.

NO. 18 Style - Multi-Latch: Two T-Bolt Saddle Latches with Two-Segment Coupling
For very large diameter, light-to-medium-duty applications. Permits easy access and simple bolt replacement.

NO. 19 Style - Double-Opposed Trunnion Latch
For very large diameter, heavy-duty applications. Features a conventional hex bolt and a hex nut for leveraged torqueing. Both bolt and nut are replaceable.

NOTE: MANY SPECIAL APPLICATION LATCH AND COUPLING PROFILES NOT SHOWN IN THIS SELECTION GUIDE ARE ALSO AVAILABLE AND IN A VARIETY OF MATERIALS. CONSULT YOUR VOSS SALES ENGINEER.

V-Retainer Coupling Burst Pressure Charts

A performance chart showing burst pressures (not operating pressures) relative to coupling diameters accompanies each Vretainer profile on p. 2 to 4. An example is shown below.

The curves are based upon the use of AISI 301 stainless steel at room temperature. Reduce pressure values by 50% for lower strength materials such as AISI 1008-1020 steel. These proof pressure ratings are based upon maximum pressure, which will not cause yielding of the V-retainer, band or latching mechanism.

The red curve covers specified Vretainer T-bolt latch styles employing a full circumferential band. Black, dotted curves represent one or two-segment strap loop couplings without a full band.
Single-Segment Stamped V-Retainers

Voss Clamp Technology offers stamped V-retainer couplings for low to moderately high pressure connections of ducting, tubing, and other joints. These economical, one-bolt, quick-connect couplings are available in 300 Series stainless and carbon steels in nominal diameters (see chart below). The couplings may be plated with zinc, cadmium, or painted to customer specifications. Voss stamped couplings can be used with economical sheet metal or machined flanges, as shown below. Typical applications are rigid exhaust members in truck and stationary engine systems, containers, tanks, reservoirs and pumps or plumbing systems for fluid transfer.

<table>
<thead>
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<tbody>
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<td>SV51X-150X</td>
<td>1.50</td>
<td>2.34</td>
<td>2.22</td>
<td>1/4-20NC x 1-1/2</td>
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<tr>
<td>SV51X-200X</td>
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<td>2.84</td>
<td>2.72</td>
<td>1/4-20NC x 1-1/2</td>
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<td>3.22</td>
<td>5/16-18NC x 1-3/4</td>
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<td>3.72</td>
<td>5/16-18NC x 1-3/4</td>
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<td>SV61X-350X</td>
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<td>5/16-18NC x 1-3/4</td>
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<td>SV61X-500X</td>
<td>5.00</td>
<td>5.84</td>
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<td>5/16-18NC x 1-3/4</td>
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<td>SV61X-600X</td>
<td>6.00</td>
<td>6.84</td>
<td>6.72</td>
<td>5/16-18NC x 1-3/4</td>
</tr>
</tbody>
</table>

Joint Burst Pressure Rating Chart
(for 70°F or 21.1°C)

Since safety factors vary with the operating conditions of each application, typical joint burst pressures —not operating pressures— are shown in the following performance chart. (Consult your Voss Sales Engineer for exact numbers)

Consult Voss Clamp Technology for additional stamped V-retainer sizes, profiles (one-two segment) and materials for your specific requirements. Mated machined and sheet metal flanges are also available in a variety of sizes.

SV-Series Two-View Drawings & Auxiliary Cross-Sectional

NOTE: UNLESS OTHERWISE INDICATED, ALL DIMENSIONS ARE IN INCHES.

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