INVICTA CLAMPS

V-BAND CLAMPS

WWW.INVICTAINDIA.COM

ABOUT US:

Invicta India has established a prime position for itself amongst leading manufacturers of Clamps and coupling since the year 1995. Invicta India clamps serve fail-proof joining solutions to various sectors viz. Automotive, Tractors, Diesel Engines, Irrigation, Marine, Chemical, Electrical, Filtration and many others. Since the past five decades, we have been continuously serving reputed OEMs and commercial markets worldwide.
Having rich experience in the industry, Invicta team take pride in providing varied clamping solutions to suit the needs of its clients.

Additionally, our team had various opportunities to develop special designs for Gas Turbine applications and clamps. Certain designs developed by us are *patented*
Our plants are well equipped with advanced machinery for the purposes of development and manufacturing & have its own special processes in-house viz. Trivalent Plating plant & Heat treatment. ETP plant is also in place for waste water recycling. We run our own Design Validation Process (DVP & R) with all necessary testing equipment. It is backed up with skilled employees who take efforts to ensure the quality of the clamps by testing their strength and reliability. Every clamp is passed through several quality checkpoints & is embossed with a batch number for reverse traceability

QUALITY ASSURANCE:

Invicta India has been manufacturing clamps and fastenings for over 26 years Quality is the cornerstone of our philosophy and has been the main contributor to our success and longevity.

Although often a small and relatively inexpensive part of the overall equipment their reliability and functionality are of paramount importance. All materials used by Invicta India are certified and manufacturing quality is closely monitored throughout, using a combination of in process and final inspection testing. Invicta India operates a stringent quality system, from the initial design conception right through the manufacturing process to final packing and indeed dispatch.

AVAILABLE MATERIALS

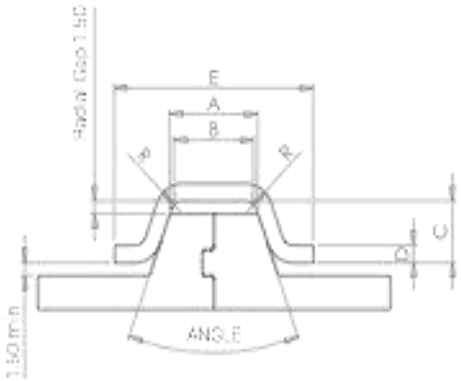
ZINC PLATING ST-37, STAINLESS STEEL 304, STAINLESS STEEL 316, AND STAINLESS STEEL 430

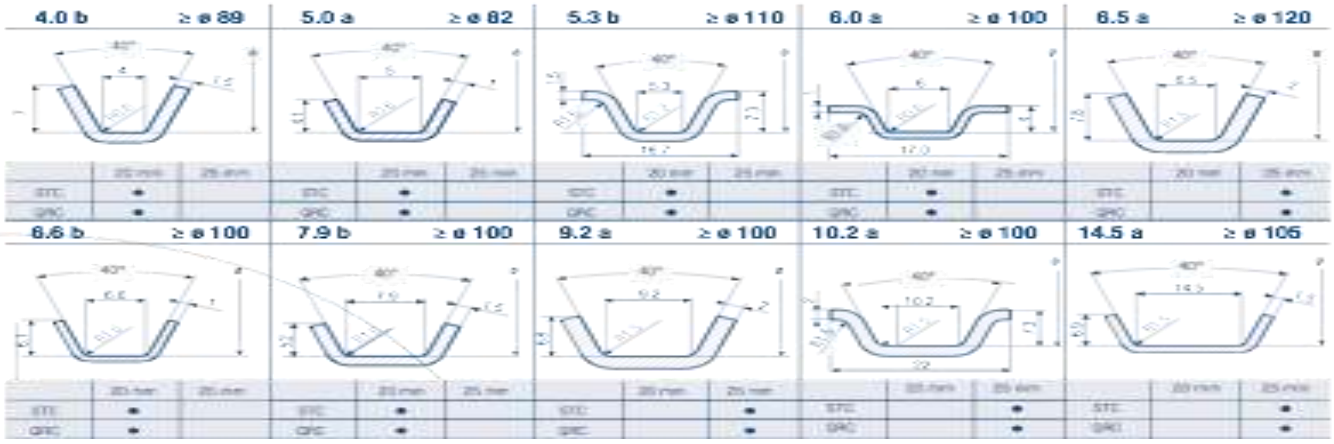
APPLICATIONS

Engines, Aerospace, Turbochargers, Petrochemicals, Exhaust Systems, and Communications V-Band Clamps provide fast and secure coupling for connecting flanged joints.
These V-Band clamps feature high strength and positive sealing integrity.
Custom Sizes available - Please contact our sales team to discuss flange specifications.

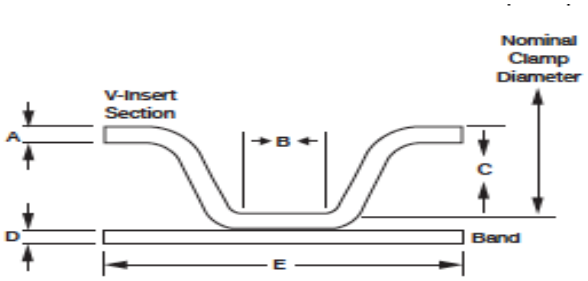
TECHNICAL INFORMATION

Profile Reference	'A' Flange Tip Width mm	'B' Tip Width mm	'C' Retainer Depth mm	'D' Material Thickness mm	'E' Overall Width mm	'R' Radius	Internal Angle
A	6.35	5.26	7.14	1.5	19.05	1.5	40
D	7.4	6.65	3.58	1.22	16.0	0.41	40
E	11.25	10.16	7.14	1.22	25.4	0.8	40
S	11.25	10.16	7.14	2.0	25.4	1.5	40
LL	9.3	8.2	12.5	2.5	30.0	2.5	40
MM	15.1	14.0	20.0	3.0	45.0	3.0	40
AS	8.1	7.0	7.14	2.0	25.4	1.5	40
AX	15.6	14.5	7.0	1.5	22.8	1.5	40
BA	9.0	7.9	5.2	1.5	15.0	1.0	40
BP	10.25	9.14	7.75	2.0	25.5	2.0	40





TECHNICAL INFORMATION



Part Number	Nominal Diameter	A Insert Thickness	B Apex Width	C Insert Depth	D Band Thickness	E Band Width	Insert angle column degree
Rex-001	44.5	1.27	6.65	3.58	0.63	15.87	45
Rex-002	80	1.27	6.65	3,58	0.88	19.05	45
Rex-003	81.5	1.27	6.65	3.58	0.88	19.05	45
Rex-004	85.9	1.95	5.25	7.13	1.01	22.22	45
Rex-005	97	1.95	5.25	7.13	1.01	22.22	45
Rex-006	97	1.95	5.25	7.13	1.27	22.22	45
Rex-007	98.6	1.27	10.16	7.13	1.01	22.22	45
Rex-008	100.6	1.95	5.25	7.13	1.57	22.22	45
Rex-009	102.6	1.27	6.25	3.58	0.88	19.05	45
Rex-010	108	1.27	10.16	7.13	1.01	22.22	45
Rex-011	109.5	1.95	5.25	7.13	1.01	22.22	45
Rex-012	114.3	1.27	6.65	3.58	0.88	19.05	45
Rex-013	117.1	1.27	3.96	7.13	0.88	19.05	45
Rex-014	120.7	1.27	10.16	7.13	1.01	22.22	45
Rex-015	122.2	1.95	5.25	7.13	1.01	22.22	45
Rex-016	133.4	1.27	6.65	3.58	0.88	19.05	45
Rex-017	147.6	1.27	5.25	7.13	1.57	22.22	45
Rex-018	149.4	1.27	10.16	7.13	1.01	22.22	45
Rex-019	149.9	1.27	6.65	3.58	0.88	19.05	45
Rex-020	152.4	1.27	3.96	7.13	0.88	19.05	45
Rex-021	242.8	1.27	13.46	5.46	0.88	19.05	45
Rex-022	242.8	1.27	13.97	7.13	0.88	19.05	45
Rex-023	271.5	1.27	5.25	7.13	1.57	22.22	45

V-BAND CLAMP (EUROPEAN STYLE)

V-Band clamps provide fast, secure coupling for flanged joints.

V-Band clamps are engineered for long term durability, strength, corrosion resistance, easy usage with the highest quality standarts.

The Advantages

- Compact design
- Space and weight saving design
- Durable and stronger closure system
- Easy handling
- Quick assembly

Outline Specifications

-Diameter range 55mm to 600mm
-High pressure, corrosion resistance and temperature rating up to 900 °C
-Materials:
300 series stainless steel : 304, 301, 316, 316Ti
400 series stainless steel : 430, 409, 430Ti, 441
- Flange width range 4mm to 25mm
- Flange depth range 4mm to 20 mm

It is used in a wide range of applications including exhaust systems, turbochargers, pumps, filters, emission and industrial applications, diesel engines and other flanged joints.

V-Band Klemmen bieten an Flanschverbindungspunkten schnelle, sichere und qualitative Lösungen an. Bei Flanschverbindungen werden unter Berücksichtigung der wichtigsten Faktoren wie Temperatur, Druck und Vibration die am besten geeigneten Materialien und technischen Eigenschaften für die V-Bandklemmen-Herstellung verwendet, die Vibrationsfestigkeit und Abdichtung gewährleisten.

Vorteile

- Kompaktes Design
- Platz- und Gewichtersparnis
- Stabiler und dauerhafter Schließmechanismus
- leichte und schnelle Montage

Allgemeine Techniker Eigenschaften

- Durchmesserbereich 55mm bis 600mm (besondere Durchmesserwünsche werden bewertet.)
- Hohe Druck-, Korrosion- und bis zu 900 °C Temperaturfestigkeit
- verwendete Materialien:
300 Serie Edelstahl : 304, 301, 316, 316Ti
400 Serie Edelstahl : 430, 409, 430Ti, 441
- Flanschbreite 4mm bis 25mm
- Flanschtiefe 4mm bis 20mm

Typische Einsatzgebiete: Emissionen - und industrielle Anwendungen, Turbolader Verbindungen, Abgasanlagen, Dieselmotoren , Pumpen und alle Flanschverbindungen.

NOMINAL DIAMETER	FLANGE O.D.
Ø97	Ø94
Ø103	Ø100
Ø110	Ø107
Ø131	Ø128
Ø243	Ø240
Ø117	Ø114
Ø68	Ø65
Ø197	Ø194
Ø124,4	Ø121,4
Ø76,5	Ø73,5
Ø127	Ø124
Ø115,8	Ø112,8
Ø115,8	Ø112,8
Ø127,4	Ø124,4
Ø127,4	Ø124,4
Ø145,8	Ø142,8
Ø155,8	Ø152,8
Ø145,8	Ø142,8
Ø70	Ø67

Band Wideness (mm)	Band Thickness (mm)	Material	Bolt	
			Metric	Material
20 mm	1 - 1,2 - 1,5 mm	AISI 300 Series SS AISI 400 Series SS	M6 M8 M10	AISI 304 AISI 316
25 mm	1,2 - 1,5 - 2 mm			
30 mm	1,2 - 1,5 - 2 mm			

CLOSURE TYPES

STC – Straight Trunnion Closure

Advantages:

- Low-friction losses
- High-strength precision-machined components
- Manufactured from consistently high-quality materials
- State-of-the-art automated manufacturing
- Competitively priced

QRC – Quick-Release Closure

Advantages:

- All the advantages of STC-type closures
- Rapid closing and opening
- Captive closure components
- Significantly shorter installation times
- Closure bolt secured during tightening

Band widths & closure sizes

V-Band clamps are manufactured in two different band widths and with different closures, depending on the profile type concerned:

Closure type	Cover band 1.0 x 20 mm	Cover band 1.5 x 25 mm
STC	Bolt M 6 x 50	Bolt M 8 x 70
QRC		

	STC	QRC
Single-closure 3 profile segments Dia ≤ 300		
Double-closure 2 profile segments Min dia 200 mm Max dia 500 mm		

DOUBLE HARDWARE T-BOLT V-BAND CLAMP

Dual V-Band clamps provide high tightening torque and secure coupling for critical joints which icludes large diameter applications and high vibration.

- High tigtening torque and accurate sealing with double latch
- High resistance to pressure and vibration
- Long term durability, strenght and corrosion resistance
- Space and weight saving compact design
- Easy handling
- Quick assembly

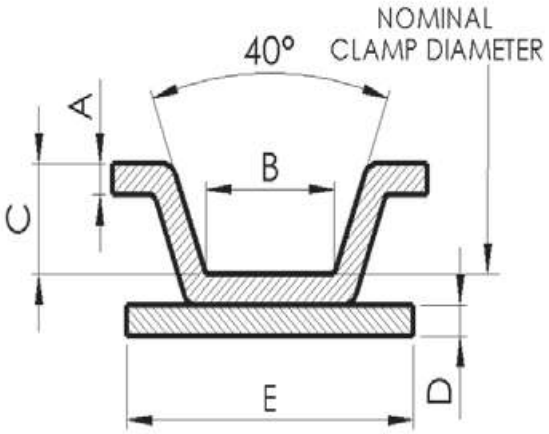
It is used in a wide range of applications including exhaust connections, pumps, ship exhaust systems and other flanged joints.

Doppel-V-Bandklemmen sind dafür konzipiert, dass sie vor allem bei großem Durchmesser und Vibrationen an kritischen Verbindungspunkten für hohen Drehmoment und eine vollständige Abdichtung sorgen.

- Mit doppeltem Schließmechanismus hoher Drehmoment und vollständige Abdichtung
- Hohe Beständigkeit gegen Druck und Vibration
- Langlebige hohe Korrosionsfestigkeit
- Platz- und Gewichtersparendes Design
- leichte und schnelle Montage-Möglichkeit

Typische Einsatzgebiete: Schifffahrt, Schiffsabgassysteme, industrielle Anwendungen, Pumpen und alle Flanschverbindungen.

NOMINAL DIAMETER	FLANGE O.D.
Ø300	Ø279
Ø193	Ø190
Ø211	Ø208
Ø373	Ø370



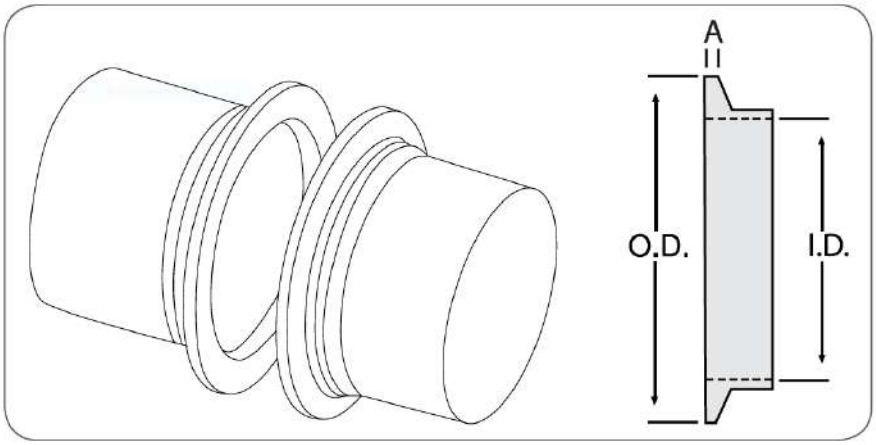
Band Wideness (mm)	Band Thickness (mm)	Material	Bolt		Material
			inch.	Metric	
19 mm	1 - 1,2 - 1,5 mm	AISI 300 Series SS AISI 400 Series SS	1/4 inc. 5/16 inc. 3/8 inc.	M6 M8 M10	AISI 410 AISI 304 Steel 8.8 (Geomet Plated)
22,2 mm	1 - 1,2 - 1,5 - 2 mm				
25 mm	1,2 - 1,5 - 2 mm				
31,8 mm	1,5 - 2 mm				

V-CLAMP FLANGE.

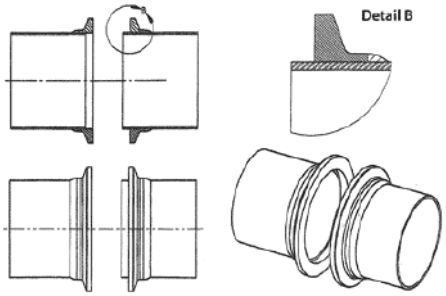
V-Band Flange Kit provide fast, secure coupling for tube connections. It is a perfect solution for easy installation and disassemble of tube connections.
It is used in a wide range of applications including turbo charges, tube fixing, pumps, high pressure air and water systems.

V-Band Flansch-Kit bietet für Rohre schnelle, sichere und hochwertige Verbindungen.
Typische Einsatzgebiete: Turbolader Verbindungen, modifizierte Abgasverbindungen, Filter und bietet an allen Rohrverbindungen praktische Montagemöglichkeiten.

Turbo Size / O.D.	Part No V-Bant Kit	ID mm	OD	A dia mm
2,00"	VBK200	50,8 (+0,75)	70,55	4,08
2,50"	VBK250	63,5 (+0,75)	83,25	4,08
3,00"	VBK300	76,2 (+0,75)	95,95	4,08
3,50"	VBK350	88,9 (+0,75)	111	4,08
4,00"	VBK400	101,6 (+0,75)	124	4,08
4,50"	VBK450	114,3 (+0,75)	137,5	4,08
5,00"	VBK500	127 (+0,75)	149,5	4,08



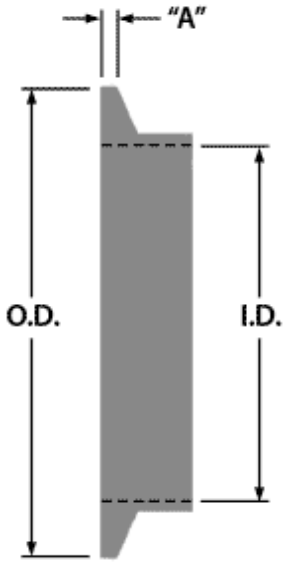
To complement the V-Clamps which we manufacture we also offer machined flanges and seals as part of a kit.
Our flanges can be machined to work with flat gaskets, O-Ring gaskets or supplied without a gasket. The gaskets are available in Graphite, NBR, Viton, Silicone, EPDM, PTFE & Chloroprene. The flanges themselves can be machined in AISI304 & AISI316 stainless steels. As standard we produce flanges to suit 2",2.5",3",3.5" & 4" tube OD's in many of our V-Profiles.



V-Band clamps have been around for ages. Sometimes called "Marmon clamps", they are used in a variety of commercial, industrial, and racing applications. In many cases the end of a tube/pipe is pressed to form the flange. We have designed a line weld on flanges that can be used to replace the old 3 bolt flange or slip and clamp connections. The precision CNC machined surface provides a gasket less seal. The T-bolt style latch allows the clamp to be installed quickly without removing the nut.

INVICTA INDIA V-Bands are designed for use with INVICTA INDIA Sealing Flanges. The advertised size refers to the outside diameter of the tubing that will slide through the inside diameter of the sealing flange.Our V-Band clamps and sealing flanges are not designed specifically to be compatible with other manufactures flanges, such as turbine outlets. See the diagram and chart *(right)* for compatibility.

Flange P/N #	I.D.	O.D.	A dia.
150	1.50"	2.24"	.150"
175	1.75"	2.49"	.150"
200	2.00"	2.69"	.150"
225	2.25"	2.99"	.150"
250	2.50"	3.22"	.150"
275	2.75"	3.49"	.150"
300	3.00"	3.69"	.150"
350	3.50"	4.22"	.150"
400	4.00"	4.69"	.150"
450	4.50"	5.10"	.150"
500	5.00"	5.59"	0.15



V-BAND CLAMP (T-BOLT)		DOUBLE HARDWARE T-BOLT V-BAND CLAMP	
ROLL FORMED T-BOLT V-BAND CLAMP		Worm Drive V-Band Clamp • Light Duty - Designed for Low Pressure Applications • Hardware - ⅝" slotted hex-screw • Sizes: 1.75" – 7" (2" – 5.50") • 3 V-inserts	
Quick Release V-Band Clamp		Spring Loaded V-Band Clamp (Turbocharger Applications)	
Thumb-Turn V-Band Clamp • Light Duty - Designed for Low Pressure Applications • Thumb Screw for Hand Tightening. • Sizes: 1.75" – 7" (2" – 5.50") • 3 V-inserts			

SERIES - 1

Invicta V-Profile Clamps use an optimized design that reduces weight and maximizes space. The result is improved fuel consumption and a more flexible use of space around the application.

The advantages at a glance

- Quick assembly
- Compact design
- Lightweight
- Easy handling
- Wide range of existing profiles

Why choose a V-Profile Clamp?

- Easy to handle and provide ease of assembly.
- Compact design requires minimal space
- Quick to assemble – only one bolt to tighten to produce a secure joint
- Lightweight, reducing the total weight of the system

Methods of Operation

- The profile clamp's method of operation is based on the principle of an inclined plane.
- When the closure bolt is tightened, this exerts circumferential force on the profile segments.
- The two halves of the flange are pressed together by means of the profile.
- The circumferential force that is exerted is translated into considerably higher axial force.

Applications

- Exhaust gas systems
- Exhaust gas recirculation (EGR)
- Charged air applications
- Cooling systems
- Filter systems
- Selective catalytic reduction (SCR)
- Turbocharger manifold connections

SERIES – 2

The Series-2 is a stamped V-Clamp that is a low-cost and economical continuously formed metal band with a flexible hinge point. The spot-weld-free construction enhances corrosion resistance.

Applications

- Air connections
- Exhaust connections
- Materials: Corrosion- and heat-resistant steel (Cold-rolled steel and stainless steel)
- **Sizes:** 2-1/8" – 7" (178 mm) or 1.75" (44.5 mm) to 7" (178 mm)
- **Fasteners:** 1/4" and 5/16"

SERIES – 3

The Series-3 V-Clamp is a cost-effective continuously formed metal band having two 180° V-Retainer zones and an added hinge point for flexibility with a general purpose style closure.

Applications

- Light-duty Turbocharger connections
- Turbo exhaust outlet
- Diesel exhaust connections
- **Materials:** Corrosion-resistant and specialty steels 301SS, 304SS, 316SS
- **Sizes:** 4" (102 mm) to 9" (229 mm) diameter (limited dimensions)
- **Fasteners:** 1/4"

SERIES – 4

Series-4 V-Clamp Halves feature two separate V-retainers with two bolts. This creates a more uniform clamping load than a single bolt clamp. The spot-weld-free construction enhances the corrosion resistance. Available options include carriage, hex head or special bolts, captivated nuts.

Applications

- Air brakes, exhaust connections
- Diaphragm pumps
- **Materials:** Steel, plated steel, corrosion- and heat-resistant steels
- **Fasteners:** #10, 1/4", 5/16"
- **Sizes:** 2" (51 mm) to 14" (356 mm) diameter
- **Tooling**: Application specific
- **Options:** Carriage, hex head or special bolts, captivated nuts

SERIES – 5

The series-5 profile clamps are reliable and time-efficient connection elements.

Applications

- Turbocharger
- Hot end and cold end joints
- EGR, SCR injector and sensor joints
- **Internal profile diameters available:** Diameter 20 –180 mm (other diameters upon request)

SERIES – 6

The series -6 V-Coupling is designed for limited space applications and has two retainers connected with a hinge for ease of installation. The spot-weld-free construction provides enhanced corrosion resistance.

Applications

- Small turbochargers
- Turbocharger turbine housing
- EGR systems
- Exhaust connections
- **Materials:** Corrosion- and heat-resistant steels
- **Sizes:** Diameter range 2" – 7"
- **Fasteners:** M6

SERIES – 7

The Series-7 clamps offer a connection solution to applications exposed to high temperatures. A typical application is gasoline turbocharger connections.

Applications

- Turbo gasoline engine manifold, turbocharger and catalyst joints
- High temperature diesel engine manifold and turbocharger joints
- Internal profile diameters available: Diameter 69–138 mm (other diameters upon request)

SERIES – 8

The Series-8 two-piece profile clamps enable fast and easy pre-assembly by using only two fingers. The special design is based on a spring element and a hook in the bottom of the clamp, in combination with a pre-assembled bolt.

Applications

- Turbocharger
- Hot end and cold end joints
- EGR, SCR injector and sensor joints
- Internal profile diameters available: Diameter 31 mm and 98 mm (other diameters upon request)

SERIES – 9

The Series-9 compact profile clamps are reliable and time-efficient connection elements.

Applications

- Turbocharger
- Hot end and cold end joints
- EGR, SCR injector and sensor joints
- **Internal profile diameters available:** Diameter 50–98 mm (other diameters upon request)

ROLL FORMED T-BOLT V-BAND CLAMP / V-BAND CLAMPS - VTB

V-Band clamps provide fast, secure coupling for flanged joints. V-Band clamps are easy usage with the highest quality standarts.
- Engineered for long term durability, strength, corrrosion resistance
- Space and weight saving compact design
- Durable and stronger closure system
- Temparature rating up to 900 °C
- Easy handling
- Quick assembly

Outline Specification Options
- Diameter range 55mm to 600mm
- Materials:
300 series stainless steel: 304, 301, 316, 316Ti
400 series stainless steel: 430, 409, 430Ti, 441
- Flange width range 4mm to 25mm
- Flange depth range 4mm to 20 mm

It is used in a wide range of applications including exhaust systems, turbochargers, pumps, filters, emission and industrial applications, diesel engines and other flanged joints.

V-Band Klemmen bieten an Flanschverbindungspunkten schnelle, sichere und qualitative Lösungen an.
- An Flanschkombinationen hohe Haftefestigkeit
- vollständige Abdichtung
- hohe Temperatur- (bis 900°C), Druck-, Vibration- und Korrosionsfestigkeit
- kompakte Bauweise bietet Platz- und Gewichtsersparnis
- Leichte und schnelle Montage

Produktionsoptionen
- Durchmesserbereich 55mm bis 600mm
- verwendete Materialien:
300 Serie Edelstahl: 304, 301, 316, 316Ti
400 Serie Edelstahl: 430, 409, 430Ti, 441
- Flanschbreite 4mm bis 25mm
- Flanschtiefe 4mm bis 20mm

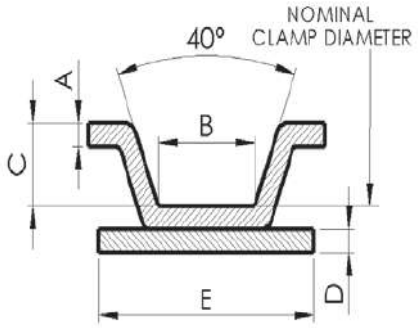
Sonderanfertigungen

Typische Einsatzbereiche

Emissionen- und industrielle Anwendungen, Turbolader Verbindungen, Abgasanlagen, Dieselmotoren, Pumpen und alle Flanschverbindungen.

NOMINAL DIAMETER	FLANGE O.D.
Ø98,5	Ø95,5
Ø119	Ø116
Ø81,50	Ø78,5
Ø73,55	Ø70,55
Ø86,25	Ø83,25
Ø98,95	Ø95,95
Ø114	Ø98,12
Ø127	Ø124
Ø140,5	Ø137,5
Ø152,5	Ø149,5
Ø184,28	Ø181,28
Ø88,9	Ø85,9
Ø129,5	Ø126,5
Ø103	Ø100
Ø121	Ø118
Ø129,5	Ø126,5
Ø206,2	Ø203,2
Ø288,75	Ø285,75
Ø75	Ø72
Ø89	Ø86
Ø109,5	Ø106,5
Ø109	Ø106
Ø137,5	Ø134,7
Ø98	Ø95
Ø91,8	Ø88,8

NOMINAL DIAMETER	FLANGE O.D.
Ø160	Ø157
Ø98	Ø95
Ø124	Ø121
Ø76,2	Ø73,2
Ø117	Ø114
Ø104,1	Ø101,1
Ø93	Ø90
Ø152,5	Ø149,5
Ø183	Ø180
Ø118	Ø115
Ø150	Ø147
Ø205	Ø202
Ø115	Ø112
Ø213	Ø210
Ø65	Ø62
Ø110,2	Ø107,2
Ø104	Ø101
Ø163	Ø160
Ø162	Ø159
Ø155	Ø152
Ø127	Ø124
Ø152,4	Ø149,4
Ø203,4	Ø204,4
Ø130	Ø127



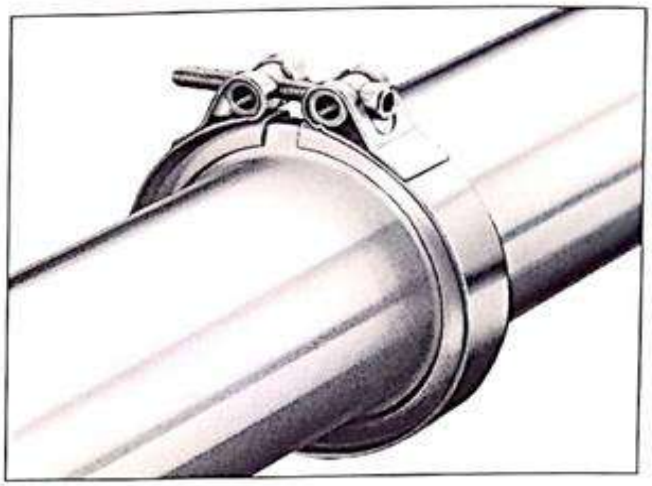
Band Wideness (mm)	Band Thickness (mm)	Material	Bolt inch.	Material
19 mm	1 - 1,2 - 1,5 mm	AISI 300 Series SS AISI 400 Series SS	1/4 inc.	AISI 410 AISI 304 Steel 8.8 (Geomet Plated)
22,2 mm	1 - 1,2 - 1,5 - 2 mm		1/4 - 5/16 inc.	
25 - 25,4 mm	1,2 - 1,5 - 2 mm		5/16 inc.	
31,8 - 32 mm	1,5 - 2 mm		3/8 inc.	

APPLICATION RANGE

Invictaindia profile clamps are quick-release connecting elements for all flange and cover joints. They also present an economical alternative to conventional bolted flange joints.

are therefore the ideal clamps for containers as used in water treatment, filter construction, inlet and exhaust systems as well as for connecting suction and hydraulic lines or supply line systems in climatic, coolant or lubricant applications.

InvictaIndia offers the best solution for any application.



PRODUCT • ADVANTAGES

The comprehensive range of profile clamps offers you

- 39 different profiles
- 3 bandwidths
- 4 closure types
- single-part and two-part clamp design
- 2 materials

In addition, the single-part clamps are available in either 2 or 3 segmented design. While the 2-segment clamp is higher in strength, the 3-segment clamp is recommended if maximum flexibility of the clamp is the key requirement.

The tables on the inside give an overview of the standard range. All profile clamp designs highlighted in blue are quickly available.

MATERIALS

profile clamps are available in 2 material qualities :

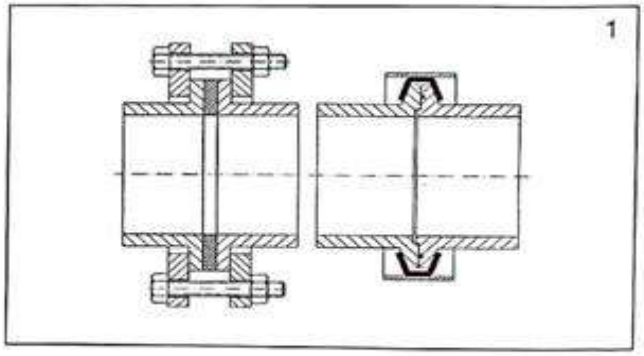
Code	Closure	Profile segments/ clampband
W2	zinc plated mild steel	1.4301
W4	1.4301	

Material cross reference table

DIN	AISI/AS	BS	AFNOR
1.4301	304	304 S 31	Z6 CN 18-09

All Invictaindia profile clamps offer a variety of benefits, such as

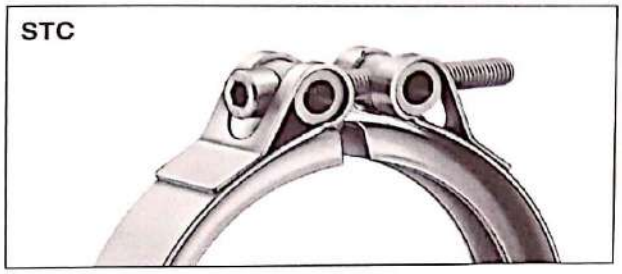
- **Easy handling**
  Profile clamps are easy to handle and can be assembled with conventional tooling.
- **Time effective assembly**
  Due to its handling properties and its quick-release feature, profile clamps are quickly assembled. With the single-part design, only one bolt has to be tightened to produce a secure joint.



- **Compact design** (see fig. 1)
  As the clamp requires only minimal space in contrast to conventional flanges, it can also be used in critical fitting situations.
- **Light weight**
  In comparison to flanges, profile clamps are extremely light-weight. This helps to reduce the total weight of complex systems to a considerable extent.

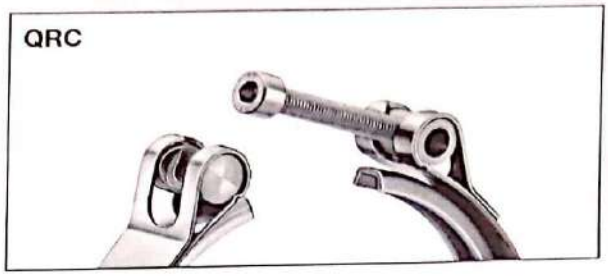
CLOSURE TYPES

STC



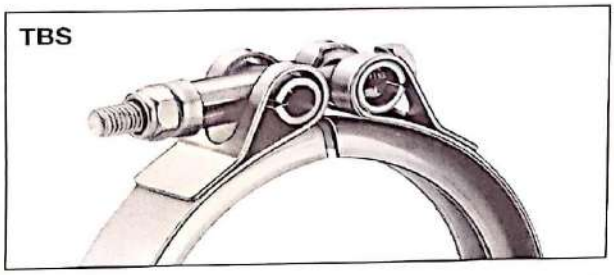
The STC closure type with its practical socket head cap screw is a modification of the common TBS type.

QRC



The QRC closure type can be opened very quickly and conveniently; at the same time, it eliminates the risk of accidental opening.

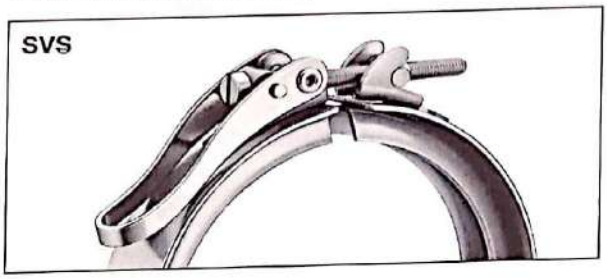
TBS



The TBS closure type is fitted with a strong T-bolt. This closure has been developed for high pressure tapered flange applications.

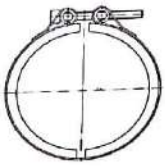
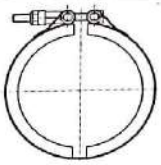
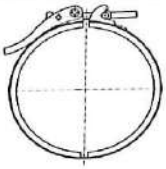
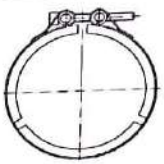
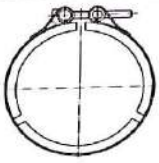
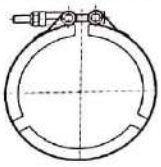
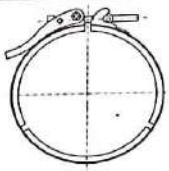
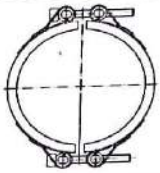
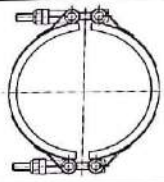
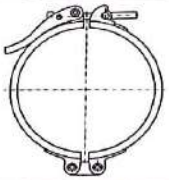
Note: Available only for existing business and not for new design concepts.

SVS



SVS is an elbow lever-type closure, which can be opened and closed without tooling. It is recommended for applications which require frequent release of the joint, e.g. in filter constructions.

THE WHOLE RANGE AT A GLANCE

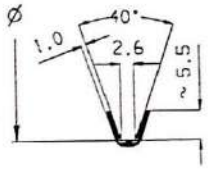
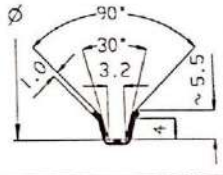
	STC	QRC	TBS*	SVS
Single-part 2 segments				
Single-part 3 segments				
Two-part 2 segments		not part of the standard range		

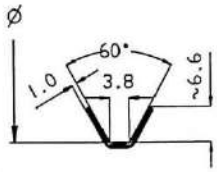
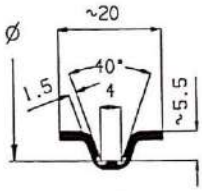
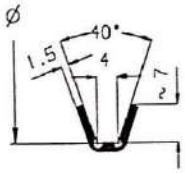
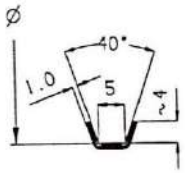
* Available only for existing business and not for new design concepts.

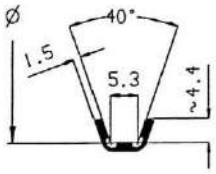
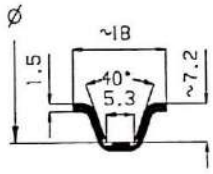
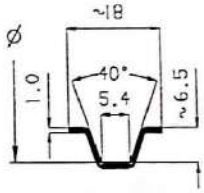
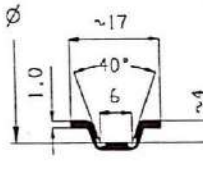
ALL PROFILES AT A GLANCE

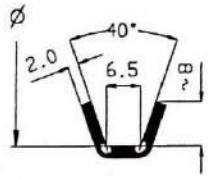
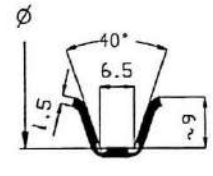
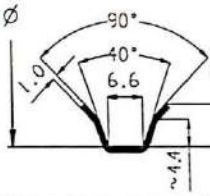
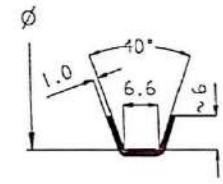
Pages 4 and 9 show all 39 profiles of the **Invicta India V-Clamp** standard range. The respective inner profile diameter can be freely chosen in milimeter steps with consideration to the limits of minimum and maximum diameter.

For any special application, please ask for further profile types in our **Invicta India V-clamp** special range or special pressed profiles.

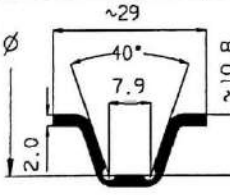
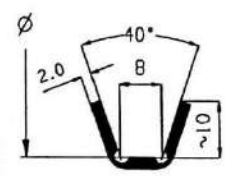
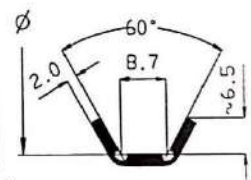
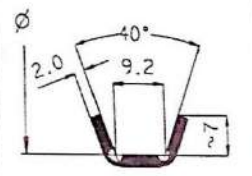
2,6a	01	3,2a	02
			

3,8a	03	4,0a	04	4,0b	05	5,0a	06
							

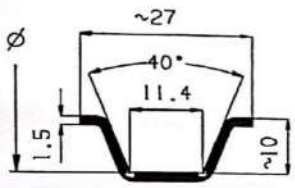
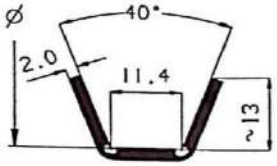
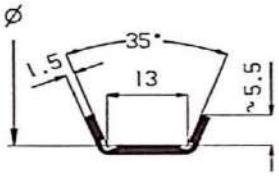
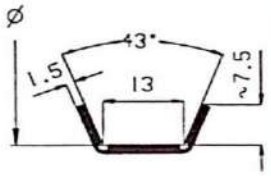
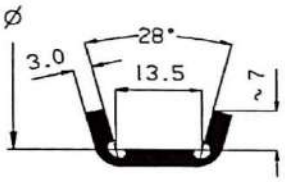
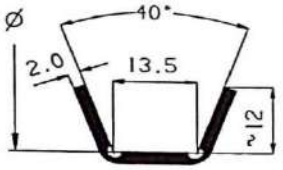
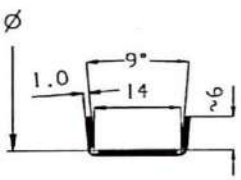
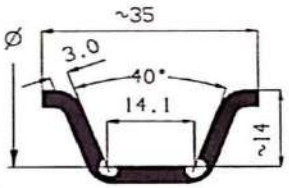
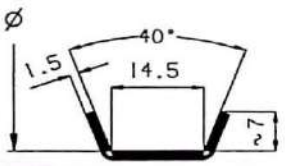
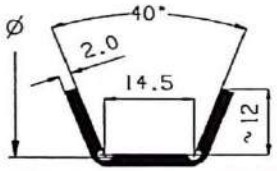
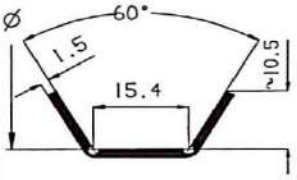
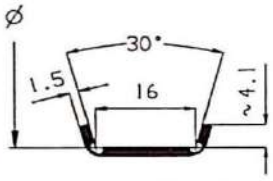
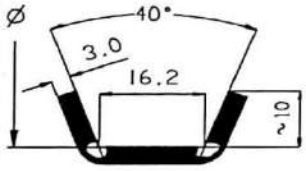
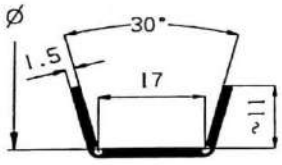
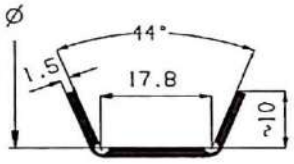
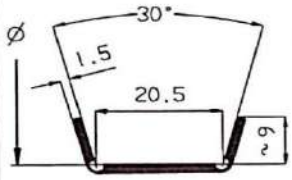
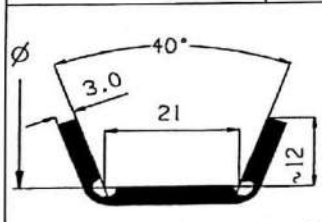
5,3a	07	5,3b	08	5,4a	09	6,0a	10
							

6,5a	11	6,5b	12	6,6a	13	6,6b	14
							

7,9b	15	8,0a	16	8,7a	17	9,2a	18

9,2b	19	10,0a	20	10,2a	21	11,2a	22
							

ALL PROFILES AT A GLANCE

11,4a	23	11,4b	24	13,0a	25	13.0b	26
							
13,5a	27	13,5b	28	14,0a	29	14,1a	30
							
14,5a	31	14,5b	32	15,4a	33	16,0a	34
							
16,2a	35	17,0a	36	17,8a	37	20,5a	38
							
21,0a	39						
							

= with STC and QRC closures these profiles have a reduced lead time

TECHNICAL INFORMATION

How to choose the right profile clamp design

1. Determine the operating or test pressure for your application.
2. Calculate the required inside diameter of the profile using the formula:
   outer flange diameter **+ 3 mm**
3. Use the formula of approximation (1) to check whether the thickness of profile you have chosen is sufficient:

Formula of approximation (1) for the allowable bending stress on the profile ring:

$$\sigma_{b\,allow} \approx \frac{d \cdot p \cdot 0.225\ mm}{s^2} \qquad (1)$$

with
d = inside diameter of the profile (mm)
p = static operating pressure (bar)
s = thickness of the profile (mm)
$\sigma_{b\,allow.}$ = 250 N/mm²

Note: Please put in the operating/test pressure into the formula in (bar)

Example:

inside diameter of the profile	100 mm
operating pressure	10 bar
thickness of profile	2 mm

$$\sigma_b \approx \frac{100\ (mm) \cdot 10\ (bar) \cdot 0.225\ (mm)}{2\ (mm) \cdot 2\ (mm)} = 56.25\ \left(\frac{N}{mm^2}\right)$$

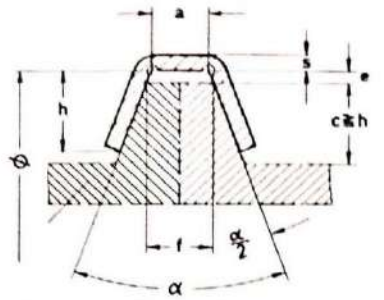
The allowable bending stress $\sigma_{b\,allow}$ must not be exceeded with the wall thickness you have chosen. Please note that the result only gives a first approximate value.

It can be influenced by furhter factors, such as

- seal shape and material
- roughness of the flange surface
- operating temperatures
- bending loads
- pressure peaks
- required operating safety factors

It may be necessary to increase the thickness of the profile.

4. Take equation (2) in order to calculate the inner width of the profile and select the appropriate profile from the profile table (p. 4 and 9).
   Note: For high pressure and bending loads, please select a profile with small inner width.
5. Standard profile clamps with an inside diameter of the profile up to 300 mm are exclusively manufactured in single-part design (1 closure). For standard applications, choose the design with 2 profile segments, or for unfavourable assembly situations, the design with 3 segments.



a = inside width of the profile
c = height of flange
e = 1.5 mm standard gap
f = closed flange dimension
h = depth of profile
s = thickness of profile
α = profile/flange angle
O = inside diameter of the profile
z = increase

$$f = a + z \qquad (2)$$

Recommended angle ranges

α	30°	40°	50°	60°
z	0,8	1,1	1,4	1,7

Standard profile clamps with an inside diameter of the profile of 301-999 mm are manufactured in two-part design (with 2 closures and 2 profile segments).

6. Good sealing results can be obtained with an axial round cord seal. For the groove, we recommend an insertion depth of approx. 0.75 · round cord diameter. This avoids wearfatigue on the round cord seals.
7. Pressure peaks and bending torques can increase the gap between the flanges. To prevent damage to the round cord seals during operation, the flange gap should not be more than 0.3 mm.
8. Select band width and bolt size for the closure type from the table on page 5.
9. For bolt tightening torques for the different closure types as well as bolt sizes, please see tables 9a and 9b.

9a **Closure types STC, QRC, TBS**

band width	bolt size	tightening torque
20 mm	M 6	≈ 6 Nm
25 mm	M 8	≈ 12 Nm
30 mm	M 10	≈ 30 Nm

9b **Closure type SVS**

bolt size	closure force
M 6	≈ 80 N

3 SEGMENT V CLAMP BOLTED

Available Diameters
50mm to 300mm

Available Materials
300 & 400 Series Stainless Steel, Inconel, others on request

Bolt Sizes Available - Metric
M6, M8, M10, M12

Bolt Sizes Available - Imperial
1/4", 5/16", 3/8"

Max.Torque Settings - Metric
M6 – 10Nm

M8 – 20Nm

M10 – 27Nm

M12 – 42Nm

M16 – 100Nm

Max. Torque Settings - Imperial
1/4" – 7.38 ft lb

5/16" – 14.75 ft lb

3/8" – 20 ft lb

Flange tip width range
4mm - 22mm

Flange depth range
3.5mm - 20mm

Strap Width Options
Strap width is determined by clamp design and bolt size

Operating Temperatures Guide
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From -40°C to 900°C Gas Temp based on correct material selection

Max. Operating Pressure Guide
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100mm Dia. Max 200 Barg

300mm Dia. Max 70 Barg

500mm Dia. Max 25 Barg

3 SEGMENT V CLAMP QUICK RELEASE

Available Diameters
50mm to 500mm

Available Materials
300 & 400 Series Stainless Steel, Inconel, others on request

Bolt Sizes Available - Metric
M6, M8, M10

Bolt Sizes Available - Imperial
1/4", 5/16", 3/8"

Max.Torque Settings - Metric
M6 – 10 Nm

M8 – 20Nm

M10 – 27Nm

M12 – 42Nm

M16 – 100 Nm

Max. Torque Settings - Imperial
1/4"- 7.38 ft lb

5/16" – 14.75 ft lb

3/8" – 20 ft lb

Flange tip width range
4mm - 22mm

Flange depth range
3.5mm - 20mm

Strap Width Options
Strap width is determined by clamp design and bolt size

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From -40°C to 900°C Gas Temp based on correct material selection

Max. Operating Pressure Guide
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100mm Dia. Max 200 Barg

300mm Dia. Max 70 Barg

500mm Dia. Max 25 Barg

3 SEGMENT V CLAMP BOLTED SPACE SAVING

Available Diameters
50mm-500mm

Available Materials
300 & 400 Series Stainless Steel, Inconel, others on request

Bolt Sizes Available - Metric
M6, M8, M10, M12

Bolt Sizes Available - Imperial
1/4", 5/16", 3/8"

Max.Torque Settings - Metric
M6 – 10 Nm

M8 – 20Nm

M10 – 27Nm

M12 – 42Nm

Max. Torque Settings - Imperial
1/4" – 7.38 ft lb

5/16" – 14.75 ft lb

3/8" – 20 ft lb

Flange tip width range
4mm - 22mm

Flange depth range
3.5mm - 20mm

Strap Width Options
Strap width is determined by clamp design and bolt size

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Max. Operating Pressure Guide
*Note Stated pressures are for general guidance at ambient temperature. For specific ratings for each clamp type and design please contact our Engineering Department.

100mm Dia. Max 200 Barg

300mm Dia. Max 70 Barg

500mm Dia. Max 25 Barg

3 SEGMENT V CLAMP WITH LEVER

Available Diameters
90mm - 800mm

Available Materials
300 & 400 Series Stainless Steel, Inconel, others on request

Bolt Sizes Available - Metric
M6, M8

Bolt Sizes Available - Imperial
1/4", 5/16"

Max.Torque Settings - Metric
M6 – 10Nm

M8 – 20Nm

Max. Torque Settings - Imperial
1/4" – 7.38 ft lb

5/16" – 14.75 ft lb

Flange tip width range
4mm - 22mm

Flange depth range
3.5mm - 20mm

Strap Width Options
Strap width is determined by clamp design and bolt size

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Max. Operating Pressure Guide
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100mm Dia. Max 200 Barg

300mm Dia. Max 70 Barg

500mm Dia. Max 25 Barg

2 SEGMENT V CLAMP WITH LEVER AND HINGE

Available Diameters
70mm - 500mm

Available Materials
300 & 400 Series Stainless Steel, Inconel, others on request

Bolt Sizes Available - Metric
M6, M8, M10

Bolt Sizes Available - Imperial
1/4", 5/16", 3/8"

Max.Torque Settings - Metric
M6 – 10 Nm

M8 – 20Nm

M10 – 27Nm

Max. Torque Settings - Imperial
1/4" – 7.38 ft lb

5/16" – 14.75 ft lb

3/8" – 20 ft lb

Flange tip width range
4mm - 22mm

Flange depth range
3.5mm - 20mm

Strap Width Options
Strap width is determined by clamp design and bolt size

Operating Temperatures Guide
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From -40°C to 900°C Gas Temp based on correct material selection

Max. Operating Pressure Guide
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100mm Dia. Max 200 Barg

300mm Dia. Max 70 Barg

500mm Dia. Max 25 Barg

3 SEGMENT V CLAMP QUICK RELEASE

Available Diameters
50mm - 800mm

Available Materials
300 & 400 Series Stainless Steel, Inconel, others on request

Bolt Sizes Available - Metric
M6, M8, M10

Bolt Sizes Available - Imperial
1/4", 5/16", 3/8"

Max.Torque Settings - Metric
M6 – 10 Nm

M8 – 20Nm

M10 – 27Nm

Max. Torque Settings - Imperial
1/4" – 7.38 ft lb

5/16" – 14.75 ft lb

3/8" – 20 ft lb

Flange tip width range
4mm - 22mm

Flange depth range
3.5mm - 20mm

Strap Width Options
Strap width is determined by clamp design and bolt size

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Max. Operating Pressure Guide
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100mm Dia. Max 200 Barg

300mm Dia. Max 70 Barg

500mm Dia. Max 25 Barg

4 SEGMENT V CLAMP QUICK RELEASE WITH HINGE

Available Diameters
100mm - 1000mm

Available Materials
300 & 400 Series Stainless Steel, Inconel, others on request

Bolt Sizes Available - Metric
M6, M8, M10

Bolt Sizes Available - Imperial
1/4", 5/16", 3/8"

Max.Torque Settings - Metric
M6 – 10Nm

M8 – 20Nm

M10 – 27Nm

Max. Torque Settings - Imperial
1/4" – 7.38 ft lb

5/16" – 14.75 ft lb

3/8" – 20 ft lb

Flange tip width range
4mm - 22mm

Flange depth range
3.5mm - 20mm

Strap Width Options
Strap width is determined by clamp design and bolt size

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100mm Dia. Max 200 Barg

300mm Dia. Max 70 Barg

500mm Dia. Max 25 Barg

3 SEGMENT V CLAMP QUICK RELEASE

Available Diameters
60mm - 500mm

Available Materials
300 & 400 Series Stainless Steel, Inconel, others on request

Bolt Sizes Available - Metric
M6, M8

Bolt Sizes Available - Imperial
1/4", 5/16"

Max.Torque Settings - Metric
M6 – 10 Nm

M8 – 20Nm

Max. Torque Settings - Imperial
1/4" – 7.38 ft lb

5/16" – 14.75 ft lb

Flange tip width range
4mm - 22mm

Flange depth range
3.5mm - 20mm

Strap Width Options
Strap width is determined by clamp design and bolt size

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100mm Dia. Max 200 Barg

300mm Dia. Max 70 Barg

500mm Dia. Max 25 Barg

2 SEGMENT V CLAMP WITH T BOLT

Available Diameters
50mm - 800mm

Available Materials
300 & 400 Series Stainless Steel, Inconel, others on request

Bolt Sizes Available - Metric
M6, M8, M10, M12, M16

Bolt Sizes Available - Imperial
1/4", 5/16", 3/8"

Max.Torque Settings - Metric
M6 – 10Nm

M8 – 20Nm

M10 – 27Nm

M12 – 42Nm

M16 – 100Nm

Max. Torque Settings - Imperial
1/4" – 7.38 ft lb

5/16" – 14.75 ft lb

3/8" – 20 ft lb

Flange tip width range
4mm - 22mm

Flange depth range
3.5mm - 20mm

Strap Width Options
Strap width is determined by clamp design and bolt size

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100mm Dia. Max 200 Barg

300mm Dia. Max 70 Barg

500mm Dia. Max 25 Barg

3 SEGMENT V CLAMP WITH T BOLT

Available Diameters
50mm - 1000mm

Available Materials
300 & 400 Series Stainless Steel, Inconel, others on request

Bolt Sizes Available - Metric
M6, M8, M10, M12, M16

Bolt Sizes Available - Imperial
1/4", 5/16", 3/8"

Max.Torque Settings - Metric
M6 – 10Nm

M8 – 20Nm

M10 – 27Nm

M12 – 42Nm

M16 – 100Nm

Max. Torque Settings - Imperial
1/4" – 7.38 ft lb

5/16" – 14.75 ft lb

3/8" – 20 ft lb

Flange tip width range
4mm - 22mm

Flange depth range
3.5mm - 20mm

Strap Width Options
Strap width is determined by clamp design and bolt size

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100mm Dia. Max 200 Barg

300mm Dia. Max 70 Barg

500mm Dia. Max 25 Barg

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