05150
Rev5

RONSTAN

structural rods

The Value of Experience

The field of tensile architecture is exacting and precise, its success demanding the aggregation of knowledge and experience.

From its facilities across Australia, Denmark and the USA, Ronstan supplies rod systems born from over 60 years of continual research, development and improvement. This Australian manufacturer is now recognised as a world leader with products available in 55 countries and in the following applications.

Ronstan Structural Rod Applications:

- Suspension Bridges
- Curtain Walls and Glazed Structures
- Sports Facilities
- Exhibition Buildings
- Entrance Structures
- Nets and Grid Structures
- Fabric Architecture
- Braces and Trusses

System Selection

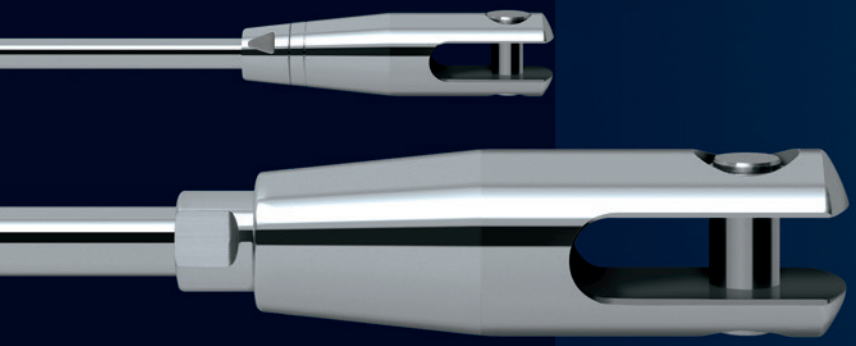
Specifying a Ronstan structural rod system begins by identifying your application and then utilising the catalogue to:

1. Select corrosion protection - Stainless Steel or High Tensile Carbon Steel.
2. Match the load case with rod type and system.
3. Select the rod diameter.

The Total Solution

And when assistance is required we offer:

- Design support
- Rod and fitting selection
- Assistance with corrosion protection
- Cost estimates and budgets
- Method statements and schedules
- Structural analysis
- Site supervision
- Installation



Certified System ISO 9001

JAS-ANZ

structural rods

Space. Simple form. Both mask a complexity inherent in tensile architecture. The structure in place, itself evidence of science and careful planning, stands to remind us of what can be achieved with the intelligent use of rods working together in tension. Be it a glazed curtain wall, a tensioned fabric roof, a simple yet elegant suspension bridge, or a cable net or grid structure, all can depend on rods as the primary load carrying elements. The results are structures of unique depth and openness, with large spans made possible by balancing the need for reduced self weight, with the application of minimalist and efficient high tensile rod tendons. This is lightweight tensile architecture and a Ronstan passion.

The intriguing capabilities of Ronstan structural rod systems are artfully revealed through their many applications. Our aim is to inspire and enthuse, and to provide a simple guide for selecting the right tension rod for your application. In this catalogue we are delighted to offer 6 rod options, in stainless steel or carbon steel with a complete range of diameters, load capacities and surface finishes. All parts can be specified with the simplicity of a single Ronstan “ARS” part number.

The process is simple. After determining the required material and suitable surface finish, the selection of rod diameter is a simple process of matching your load requirements. If the standard systems don’t suit, then you have a range of other Ronstan rod fittings from which to make your selection.

Even if you have never designed with tensile rods before, it need not be a mystery. Ronstan maintains a fully staffed design engineering department to assist clients with concept development, rod system selection, estimating or to tailor a solution to your needs. Often, attaching the rod system to your structure is the most difficult consideration. We can assist with design here as well, before our project management team takes over to ensure the proper coordination from concept to installation, and even commissioning.

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ARS1A | ARS2 | ARS3 | ARS4 | ARS6

Facade

The facade represents the ultimate expression of individuality, reflecting the image of the occupier, classic or modern, modest or impressive. At the same time facade systems may be designed to shade, provide fall protection, reflect dramatic lighting, or enhance the corporate identity.

Ronstan Structural rods are tools with which architects and engineers can shape facade and shade elements; their functional elegance obvious to the inspired, yet light and sufficiently transparent to allow the facade to convey its message.

Project:	MCG Members Entrance
Location:	Melbourne, Australia
Architect:	MCG5 - Daryl Jackson, Cox Sanderson Ness, Tomkins, Shaw & Evans, HOK Sport
Engineers:	Connell Mott MacDonald, Arup
Rods:	Ronstan Tensile Architecture
Photo:	Peter Hyatt

Curtain Walls and Glazed Structures

The technology of transparency. Of emerging glazing technology, the penultimate is a seamless glass structure without visible means of support. At Ronstan we embrace this challenge.

Our structural rod systems are the key. They replace larger compression elements in domes, facades and point supported glass systems, and heavy mullions in conventional curtain wall with high tensile minimalist elements of stainless or carbon steel.

Further, designers at the leading edge of tensile glazing technology appreciate our depth of experience in corrosion resistant stainless alloys and our elegant rod fittings.

Project:	Adelaide BMW
Location:	Adelaide, Australia
Architect:	Matthews Architects
Engineer:	Avrecon Group
Rods:	Ronstan Tensile Architecture
Photo:	Chameleon Photography

Tension & Compression Elements

While steel bars have long been used as tensile elements within trusses, the development of steel compression elements matching the aesthetics of their tensile counterparts presents new opportunities for integrated truss solutions.

The truss elements at San Diego Yacht Club used pre-stressed stainless steel tension and compression members in a combination that ensured uncompromised function and aesthetics.

Project:	Malin Burham Sailing Centre, San Diego Yacht Club
Location:	San Diego, USA
Architect:	Architects Hanna Gabriel Wells
Engineer:	KPFF Consulting Engineers
Rods:	Ronstan Tensile Architecture
Photo:	Architects Hanna Gabriel Wells

Bridges

Cable stayed or cable supported bridges provide mechanisms through which designers and engineers can engage with bridge users.

A truly successful bridge design is one where users can be seen paused on the bridge handling the cables or bars and marvelling at the simple function of the tensile elements.

While the structurally expressive nature of suspended bridges presents a form that can be simply understood, the engineering complexity remains. Ronstan understand the behaviour of cables and bars and can help realize the most exuberant of bridge concepts.

Project:	Kingsway Pedestrian Bridge
Location:	Burnaby, BC, Canada
Architect:	Busby Perkins + Will
Engineer:	Fast & Epp Structural Engineers
Rods:	Ronstan Tensile Architecture
Photo:	Busby Perkins + Will

Wide Span Structures

Integral to any wide span structure is the creation of exciting dynamic spaces, which are clean, clear and economical, and serve to enhance the architectural experience.

With increased spans tensile rods can be used to optimise truss efficiency, replacing heavy steel members and transferring load, whilst minimising the self weight of the structure.

Sports and exhibition facilities, airports and other public spaces all benefit from the minimalist efficiency of Ronstan structural rods with their unique design aesthetics, range of finishes and structural integrity.

Project:	WA Basketball Centre
Location:	Mt Claremont, Western Australia
Architect:	Peter Hunt & Daryl Jackson Architects
Engineer:	Wood & Grieve Engineers
Structural Rods:	Ronstan Tensile Architecture
Photo:	Scott Shirley Photography

Structural Bracing

Iconic structures like the Eiffel Tower and the Sydney Harbour Bridge provide the motivation for architects and engineers to express the beauty and crispness of exposed steel on buildings.

With recent developments in high tensile rod and bar systems, we see new applications of exposed steel engineering and a new generation of structurally expressive buildings.

And with the dream comes the reality; with the challenge comes the risk. This is why so many innovative and award winning architects and engineers are working with Ronstan.

Project:	QVB - Queen Victoria Building
Location:	Sydney, Australia
Architect:	Anchor Mortlock Wolley
Engineer:	Hyder Consulting
Rods:	Ronstan Tensile Architecture
Photo:	Martin Van De Wal

ARS1A - 316 Stainless Steel Rods

SS 316

The seamless stainless rod with optimal aesthetics, efficiency and performance.

Sizes/Diametres - 6.35mm to 31.8mm (0.250in. to 1.250in.).

Lengths - Up to 4.0m (13.1ft) for Ø6.35-15.88mm (0.250-0.625in.), Up to 6.0m (19.7ft) for Ø19.00-31.75mm (0.750-1.250in.), before joiners are required.

Finishes - Bright Polished #7+Passivation, Satin Polished #4. Others by request.

Finishes to ASTM - A380/A967/B912.

Threads - ASNZ:3635.

Mechanical Properties	Ø6.35 - 9.50mm (Ø0.250 - 0.374in.)	Ø12.70 - 31.75mm (Ø0.500 - 1.250in.)
Minimum Yield Stress	340N/mm² (49,300psi)	257N/mm² (37,250psi)
Minimum Breaking Stress	680N/mm² (98,600psi)	515N/mm² (74,690psi)
Minimum Elongation	30%	30%
Young's Modulus	193kN/mm² (27,992ksi)	193kN/mm² (27,992ksi)
Material to	ASTM A276-A	

SPECIFIC FEATURES

- Minimalist design ensures compact neat details.
- Easy adjustment of the rod from one end without the need to rotate the bar.
- Clean polished stainless steel finish to withstand the harshest environments.
- Good strength to weight ratio allows the mass of your structure to be kept low while minimising material and transport costs.
- Good corrosion resistance and low maintenance due to material choice decreases the life cycle cost of the structure.
- 316 grade stainless steel with 94% average recycled content*.

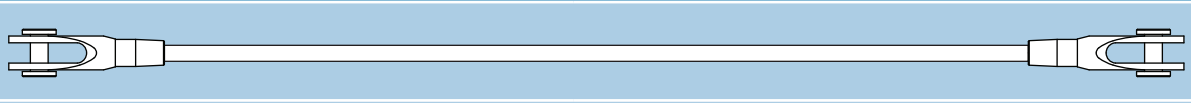
*Source: UGITECH, France.

- Hidden threads ensuring 'sleekness' of the rod carried through entire system.
- Moderate load capacity of Ronstan's Structural Stainless Steel Rods.

ARS1A

ARS2 - S520 Stainless Steel Rods

SS 520



A stainless rod solution for large diameter high load applications.

Sizes/Diametres - M12 to M56 as standard. Larger sizes available on request.

Lengths - Up to 6.0m (19.7ft) for Ø M12 - M16 (0.472-0.630in) Up to 7.5m (24.6ft) for Ø M20 - M42 (0.787-1.654in) Up to 6.0m (19.7ft) for Ø M48 - M56 (1.890-2.205in) before joiners/turnbuckles are required.

Finishes - Satin Polished or Bright Polished. Others by request.

Finishes to - EN 10088-2.

Threads to - BS3643.

Mechanical Properties	M12-M42 (0.472 - 1.654in)	M48 - M56 (1.890 - 2.205in)
Minimum Yield Stress	520N/mm² (75.400psi)	460N/mm² (66,700psi)
Minimum Breaking Stress	650N/mm² (94,300psi)	610N/mm² (88,400psi)
Minimum Elongation	19%	19%
Young's Modulus	193kN/mm² (27,992ksi)	193kN/mm² (27,992ksi)
Material to	EN 10283 / EN 10088 BS970	EN 10283 / EN 10088 BS970

SPECIFIC FEATURES

- Attractive tapered nut and recognisable "tear drop" fork for a simple elegant style that will not date.
- Simple connection detail of pin and fork minimising installation time.
- Satin finish stainless steel for a modern aesthetic. Other finishes available on request.
- Large range of diameters available to allow consistent detailing throughout a project.
- Austenitic material.

ARS2

ARS3 - 316 Stainless Steel Rods

SS 316

A simple and effective stainless rod for moderate loads.

Size/Diametres - 4.76mm to 31.75mm (0.188in to 1.250in.).

Lengths - Up to 4.0m (13.1ft) for Ø4.76 - 15.88mm (0.188 - 0.625in.),
Up to 6.0m (19.6ft) for Ø19.00 - 31.75mm (0.750 - 1.250in.),
before joiners are required.

Finishes - Electropolished, to ASTM A380/A967/B912.
Others by request.

Threads to - ASNZ:3635.

Mechanical Properties	Ø 4.76 - 9.53mm (Ø 0.188 - 0.375in.)	Ø 12.70 - 31.75mm (Ø 0.500 - 1.250in.)
Minimum Yield Stress	340N/mm² (49,300psi)	257N/mm² (37,250psi)
Minimum Breaking Stress	680N/mm² (98,600psi)	515N/mm² (74,690psi)
Minimum Elongation	30%	30%
Young's Modulus	193kN/mm² (27,992ksi)	193kN/mm² (27,992ksi)
Material to	ASTM A276-A	

SPECIFIC FEATURES

- Most economical solution when the good level finish of stainless steel is required, providing affordable good looks.
- ARS3 - the perfect marriage of economy, strength and corrosive resistance.
- The proven design provides ageless integrity to your structure.
- 316 grade stainless steel, utilising cold drawn bar material with 94% average recycled content*.

*Source: UGITECH, France.

ARS3

ARS4 - 520 Carbon Steel Rods

CS 520

An attractive carbon steel rod system of unparalleled tensile strength.

Sizes/Diametres - M12 to M100.

Lengths - Up to 6.0m (19.7ft) for Ø M12 - M16 (0.472-0.630in)
Up to 12m (39.4ft) for Ø M20 - M100 (0.787-3.937in)
before joiners/turnbuckles are required.

Finishes - Raw, hot-dip galvanised to BS EN ISO 1461:2009
grit blast + prime painted. Others by request.

Threads to - BS3643.

Mechanical Properties	M12 (0.472")	M16 - M100 0.630" - 3.940"
Minimum Yield Stress	355 N/mm² (51,490psi)	520 N/mm² (75,400psi)
Minimum Breaking Stress	610 N/mm² (88,400psi)	650 N/mm² (94,300psi)
Minimum Elongation	20%	19%
Young's Modulus	205 kN/mm² (29,700ksi)	205 kN/mm² (29,700ksi)
Material to	EN 10025	EN 10267

SPECIFIC FEATURES

- High load capacity reducing the mass of your structure with flow on benefits in transport and construction costs.
- Large range of sizes to allow consistent detailing throughout a project.
- Galvanised, raw or primed finish allows for on site paint matching to structure colour and finish.
- Attractive tapered nut and recognisable "tear drop" fork for a simple elegant style that will not date.
- Simple connection detail of pin and fork minimising installation time.
- A fine grain micro alloyed carbon steel which is fully weldable.

ARS4


Satin Polished


Electropolished


Bright Polished


Raw


Hot-dip Galvanised


Grit Blast and Primer Painted

Ronstan – ARS Surface Finishes

Ronstan ARS rod systems are available with a range of surface finish options to suit the project aesthetics, installation location, environmental corrosion criteria and available budget requirements. Considering these parameters and drawing on our many years of field experience, Ronstan can assist you select an appropriate finish to ensure the product performs adequately over the course of the products intended life.

The following surface finishes are offered as standard options.

SS Stainless Steel Rod Finishes

Satin Polished #4 (240 grit)

A grainy, matt finish. Often used in architectural applications for its unobtrusive & minimalist appearance. Better suited to internal non-corrosive environments.

Electropolished

The most cost effective stainless steel finish, providing a high level of corrosion protection and light aesthetics. Note; this process may sometimes produce an uneven 'frosting' appearance due to surface reaction with the chemical process. It may also highlight marks or imperfections in the raw material surface. A selective electro chemical metal removal process (exactly the reverse of plating). The process results in the simultaneous smoothing, levelling and brightening of stainless steel. It selectively removes surface flaws, embedded impurities and high points in the surface layer.

Bright Polished #7 with Passivation

The smoothest, shiniest finish providing an improved level of corrosion protection. Bars are mechanically polished then passivated. Passivation is a chemical treatment applied to the surface of the stainless steel to remove contaminants and assist in the formulation of a continuous chromium-oxide passive film. (Note-ARS2 passivation is not standard).

CS Carbon Steel Rod Finishes

Raw

Raw carbon steel as drawn or cast (sometimes referred to as "black" or "self colour"). The lowest cost surface but will require a secondary coating to prevent oxidisation and corrosion staining from forming. Note; raw carbon steel rods and components placed in storage or transport may suffer surface corrosion as a result of the environment they are subjected to.

Hot-Dip Galvanised

The most cost effective finish for carbon steel tendons providing well proven performance to BS EN ISO1461:2009.

Grit Blast and Prime Painted

A typical finish requirement for carbon steel items before receiving a final colour top coating. The grit blasting is done to remove surface impurities and provides a clean surface for a metal primer paint to key to. Note; painted surfaces may be affected/damaged by transport and handling.

Other surface finishes for the stainless steel or carbon steel rod systems are available on request. Contact Ronstan to discuss your requirements.

How to Dimension Your Rods for Manufacture

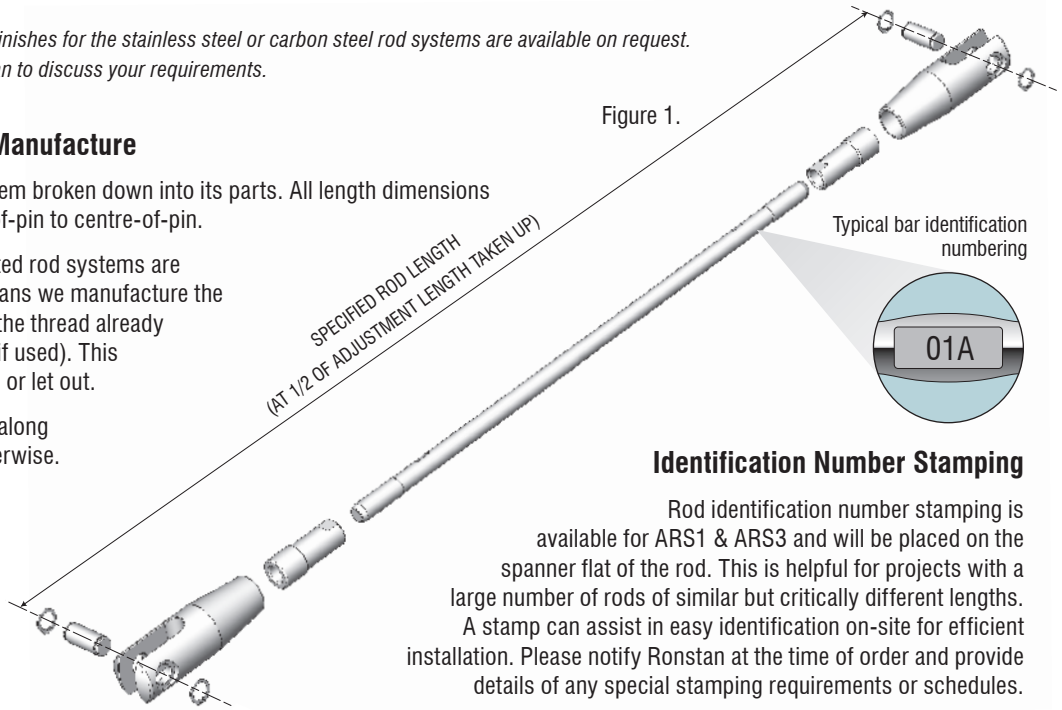
Figure 1 shows a typical Ronstan rod system broken down into its parts. All length dimensions for rod production are taken from centre-of-pin to centre-of-pin.

Thread setting – Unless otherwise requested rod systems are manufactured at mid-adjustment. This means we manufacture the rod to the dimension provided with 1/2 of the thread already taken up within each fork (and turnbuckle if used). This ensures adjustment can be either taken up or let out.

Joiners or turnbuckles will be equispaced along the assembly length, unless specified otherwise.

Other thread positions or end types available, (eg: hexnut) on request.

Figure 1.

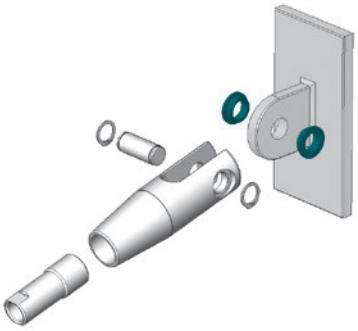


Identification Number Stamping

Rod identification number stamping is available for ARS1 & ARS3 and will be placed on the spanner flat of the rod. This is helpful for projects with a large number of rods of similar but critically different lengths. A stamp can assist in easy identification on-site for efficient installation. Please notify Ronstan at the time of order and provide details of any special stamping requirements or schedules.

Isolation Systems for Dissimilar Metals

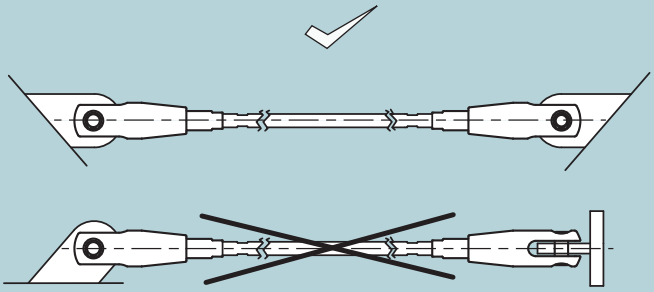
Installations that combine dissimilar metals (eg: stainless steel rods connecting to a carbon steel structure) may be subject to galvanic corrosion and require isolation systems to prevent damage to the rods and structure. Ronstan can provide isolation systems to suit typical installations. These are custom made to suit the installation.



End Connection Requirements

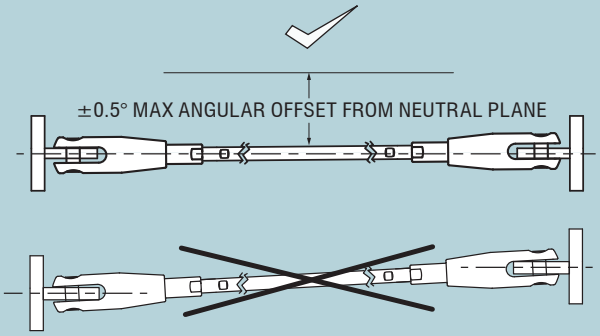
Ronstan threaded rod systems are suitable for a wide range of applications. However, like all properly engineered mechanical systems these products require certain basic structural engineering principles to be followed to ensure proper functionality.

1. FORK END PIN CONNECTIONS TO BE PARALLEL TO PERMIT SYSTEM SELF-ALIGNMENT. ENSURE MOUNTING TAKEOFF CLEATS ARE IN LINE WITH LOAD DIRECTION.



Fork pin orientation is to be such that both clevis pins are in the same plane. Eg, total system orientation should permit the rod assembly to pivot at both ends and follow natural movement within the connected structure, to avoid bending or restriction.

2. MOUNTING TAKE-OFF CLEAT CONNECTIONS SHOULD BE WELL ALIGNED. TO AVOID INCORRECT LOADING ON END FITTINGS & TAKE-OFF CLEATS.



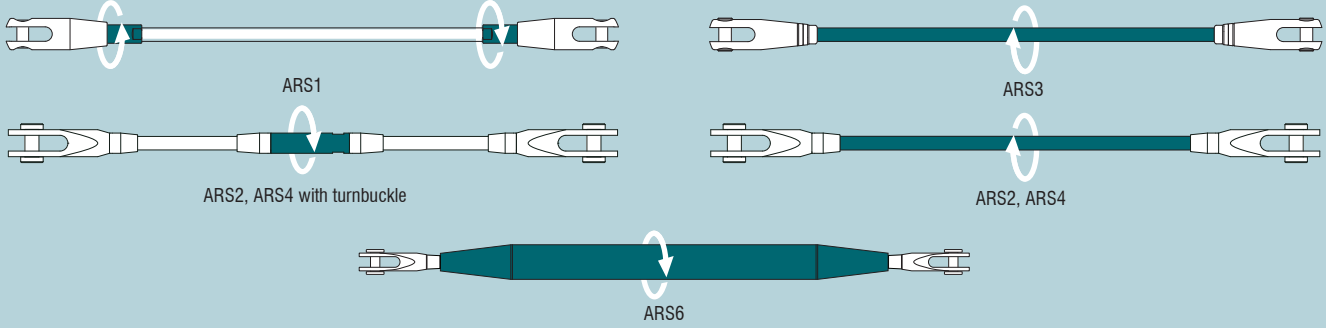
Rod assembly end connection alignment is required to be within +/- 0.5° from the neutral axis. Eg. the tendon assembly should connect structure and avoid bending of the pin, tang/cleat or clevis jaw & the resulting restriction of movement.

Tensioning/Length Adjustment

Ronstan ARS1A is tensioned by rotating the spanner flat on the adjuster while using a second spanner to hold the rod still. This can be done at one or both ends. Tensioning of the rod from one end (using one person) saves time, installation costs, and often the need to tension at height if the rods are elevated.

Ronstan ARS2, ARS3 & ARS4 are tensioned by rotating the rod only, via the spanner flats on the rod or turnbuckle. Once the required length/tension is achieved, the tapered lock nuts should be screwed down onto the fork/turnbuckle ends and firmly tensioned. ARS6 is tensioned by rotating the center tube, then locked by a grub screw at one end.

ARS2 & ARS4 systems can utilize Ronstan's pre-stressing equipment.



www.RonstanTensileArch.com *prides itself on key principles of concept development, design assistance, cable and fitting selection, structural analysis and installation. Comprehensive installation instructions and support is provided for each project.*

Custom System Solutions

The standard Ronstan ARS rod systems provide solutions for most applications however, there are some situations where a non-standard solution will be required. With over 60 years of in-the-field experience, Ronstan has the technical expertise and production capability to provide the exact product solution with the same ease, quality and competitive price as our standard options. Some of these other solutions include:

- **Threaded rod systems with hex nuts and washers**
  Some projects require simple threaded ends instead of a pinned connection. Ronstan offer threaded bars with plain nuts and washers.

- **Eye/spade end fittings**
  Eyes or spades may be required for linkages or other connections. Based on the standard fork sizes, we have many options available as made to order items.

- **Multi-segmented rod assemblies**
  Often used internally as stair tread supports or externally as louver or passive sun shade supports, sometimes a rod assembly requires a mix of fully threaded & short threaded elements connected by joiners to meet the design requirements.

- **Welded, machined or other non-standard items**
  We know that in the competitive world of tensile architecture and design, to stand out from the crowd you need a point of difference. While your product choice may not be available off-the-shelf today and has to be specially created for your cutting edge project, Ronstan Tensile Architecture is right there with you, ready to assist with your designs and ideas and make your vision a reality.

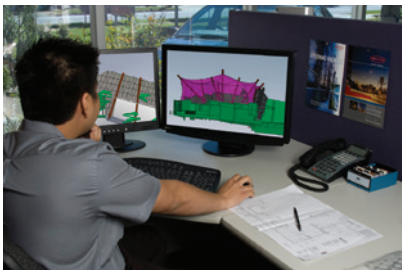
Ronstan has contributed to some of the world's most intriguing examples of tensile architecture, while providing a tailored solution for each installation. To experience the full scope of what our Tensile Architectural Services Department has achieved, please visit ***www.RonstanTensileArch.com***

Project Services

Ronstan Tensile Architecture draws on an unparalleled understanding of every phase and consideration involved in tensile design and construction, delivering a full range of design, engineering and installation capabilities. As a leading end-to-end specialty contractor and supplier, Ronstan brings continuity, efficiency, quality control and cost effectiveness to projects while providing a tailored solution for each installation.

Our services include:

- Concept development
- Design assistance
- Rod & Cable system and component selection
- Site supervision
- Project documentation eg. work method statements
- Cost / budget estimates
- Structural analysis
- Corrosion protection assistance
- On-site installation / tensioning
- Schedules & quality documentation

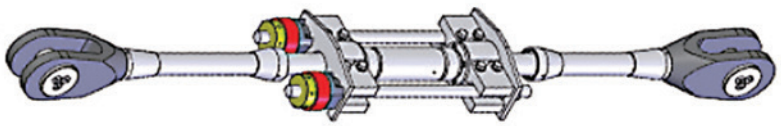

Ronstan's design engineers tailor solutions to meet the demands of each project, while our project management team ensures the proper coordination of project requirements. Working with a client's project team throughout the design-build process, Ronstan delivers the highest quality product and project installation world-wide. For a full overview of services available in your region, please contact your local Ronstan office. *Note: Some services not available in North America.*

Additionally, because Ronstan initially made its name in the industry as a manufacturer of architectural rigging, the company boasts invaluable expertise related to the performance characteristics of tensile architecture materials including:

- Load Requirements
- Cable Construction
- Clamps, Anchors and Assorted Fittings
- Cable Creep
- Temperature
- Corrosion Protection
- End Connections
- Factors affecting Cable Length
- Elongation Due to Clamping
- Elastic Elongation

Site Pre-Stressing

Certain applications may require tendons to be pre-stressed after installation. This can be performed provided jacking turnbuckles have been specifiied. Ronstan offer a robust and easy-to-use range of jacking equipment to provide a simple solution for the stressing of tendons which can be preformed by most competent steel erectors. Site supervision can be provided. *Note: Must be specified at time of rod ordering.*





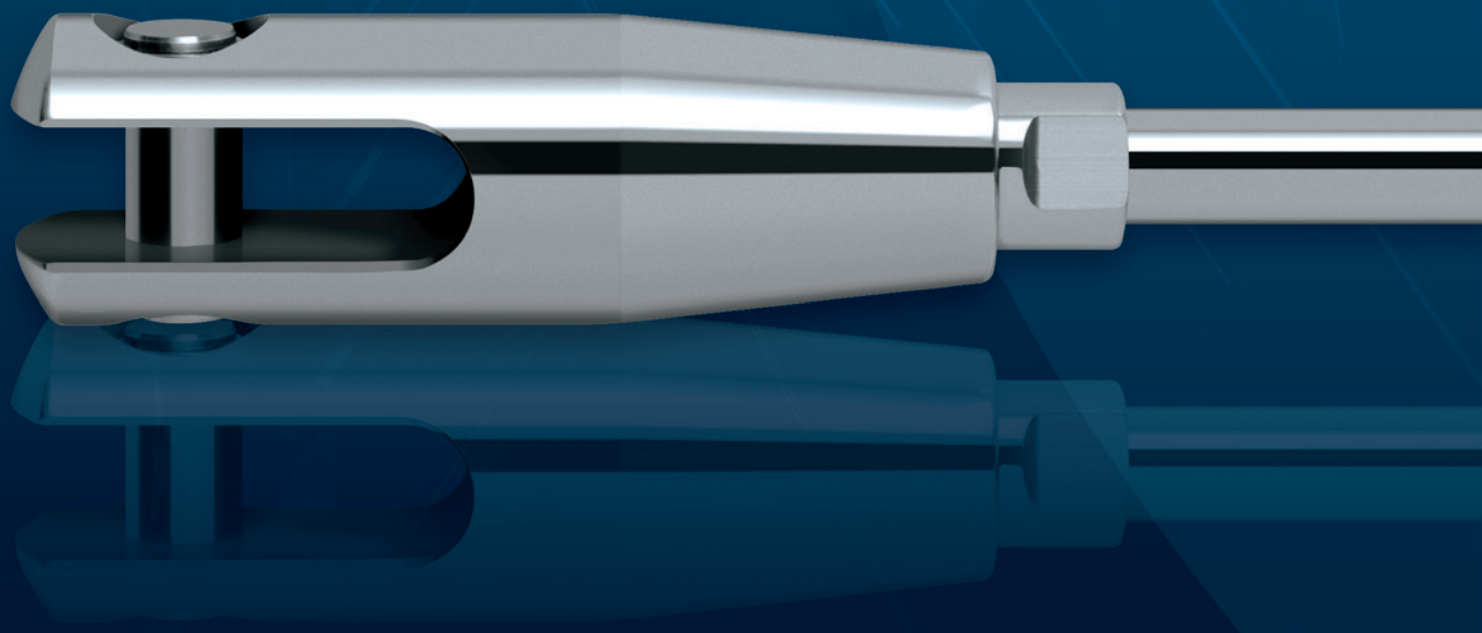
316 Stainless Steel Rods

ARS1A

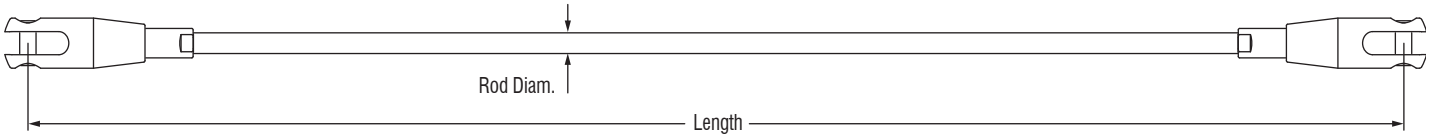
The beauty and form of tensile architecture demands more from a tendon than the simple transfer of load. Proof that optimal structural performance does not always come at the expense of aesthetics, lies in the existence of ARS1A; a rod system of such elegance that its real purpose and role in the structure are disguised.

The optimal strength to weight ratio of ARS1A ensures a minimal cross sectional area for your detail. With minimalist proportions, unique adjustable end connections, and rods in highly polished Grade 316 stainless steel, ARS1A will guarantee tendons of the highest efficiency and minimal self weight.

ARS1A - The optimal tensile stainless rod.



ARS1A - Systems



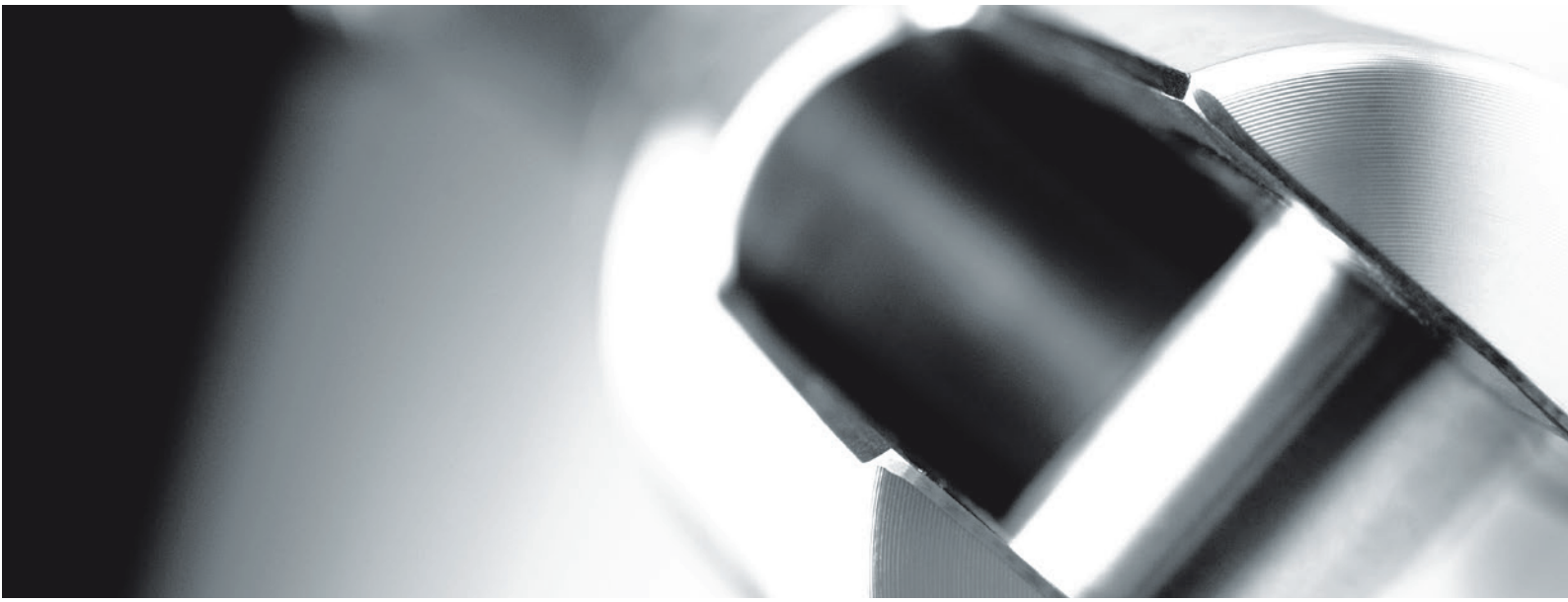
METRIC

PRODUCT No.	THREAD TYPE	ROD Ø mm	ROD MASS kg/m	ADJUSTMENT ± PER ASSY mm	*MAX SINGLE ROD LENGTH m	MIN. YIELD LOAD kN	MIN. ULT LOAD kN
ARS1A-SS-04	1/4" UNF	6.4	0.25	18.0	4.0	8	16
ARS1A-SS-05	5/16" UNF	7.9	0.39	20.0	4.0	13	26
ARS1A-SS-06	3/8" UNF	9.5	0.56	23.0	4.0	16	33
ARS1A-SS-08	1/2" UNF	12.7	1.00	26.0	4.0	27	53
ARS1A-SS-10	5/8" UNF	15.9	1.56	30.0	4.0	42	85
ARS1A-SS-12	3/4" UNF	19.1	2.25	31.0	6.0	62	124
ARS1A-SS-14	7/8" UNF	22.5	3.06	33.0	6.0	85	169
ARS1A-SS-16	1" UNF	25.4	4.0	32.0	6.0	110	220
ARS1A-SS-20	1 1/4" UNF	31.8	6.3	32.0	6.0	178	356

IMPERIAL

	TYPE	in.	lbs/ft	in.	ft	kips	kips
ARS1A-SS-04	1/4" UNF	0.252	0.168	0.709	13.1	1.80	3.60
ARS1A-SS-05	5/16" UNF	0.311	0.262	0.787	13.1	2.92	5.85
ARS1A-SS-06	3/8" UNF	0.374	0.378	0.906	13.1	3.60	7.42
ARS1A-SS-08	1/2" UNF	0.500	0.673	1.024	13.1	6.07	11.91
ARS1A-SS-10	5/8" UNF	0.626	1.051	1.181	13.1	9.44	19.11
ARS1A-SS-12	3/4" UNF	0.752	1.513	1.220	19.7	13.94	27.88
ARS1A-SS-14	7/8" UNF	0.874	2.060	1.299	19.7	19.11	37.99
ARS1A-SS-16	1" UNF	1.000	2.690	1.260	19.7	24.73	49.46
ARS1A-SS-20	1 1/4" UNF	1.252	4.203	1.260	19.7	40.02	80.03

* Joiner(s) may be used if maximum rod length material is not available and/or to reduce shipping costs or time.
Note - ARS1A systems now use Condition A grade 316 stainless steel (with the same yield and ultimate loads as ARS3). Pre-2011 Condition B material was used. Contact Ronstan for further information.



ARS1A - Component Dimensions

Compact Adjusters - Internal RH Thread Only.

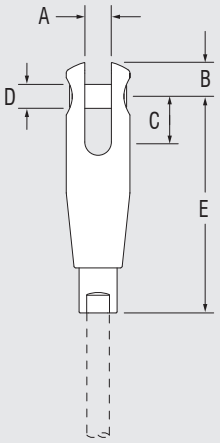
METRIC

THREAD TYPE	ROD Ø	A	B	C	D	E MIN.	E MAX.	F	WEIGHT
	mm	mm	mm	mm	mm	mm	mm	mm	g
1/4" UNF	6.35	7.0	9.0	11.0	6.4	53.0	71.0	16.3	55
5/16" UNF	7.93	8.5	11.0	13.2	7.9	66.0	86.0	20.0	103
3/8" UNF	9.53	10.0	13.2	18.0	9.5	78.0	101.0	24.0	177
1/2" UNF	12.70	14.0	17.7	24.0	12.7	101.0	127.0	33.5	444
5/8" UNF	15.88	18.0	22.2	30.0	15.9	122.0	152.0	42.0	834
3/4" UNF	19.05	22.0	26.5	38.0	19.1	146.0	177.0	51.0	1439
7/8" UNF	22.23	24.0	31.3	45.0	22.2	164.0	197.0	57.3	2049
1" UNF	25.40	26.0	35.2	53.0	25.4	187.0	219.0	64.8	2998
1 1/4" UNF	31.75	32.0	44.7	66.0	31.8	229.0	262.0	78.3	5300

IMPERIAL

	in.	in.	in.	in.	in.	in.	in.	in.	oz
1/4" UNF	0.250	0.276	0.354	0.433	0.250	2.087	2.795	0.640	1.9
5/16" UNF	0.312	0.335	0.433	0.520	0.312	2.598	3.386	0.787	3.6
3/8" UNF	0.375	0.394	0.520	0.709	0.375	3.071	3.976	0.945	6.2
1/2" UNF	0.500	0.551	0.697	0.945	0.500	3.976	5.000	1.319	15.7
5/8" UNF	0.625	0.709	0.874	1.181	0.625	4.803	5.984	1.654	29.4
3/4" UNF	0.750	0.866	1.043	1.496	0.750	5.748	6.969	2.001	50.8
7/8" UNF	0.875	0.945	1.232	1.772	0.875	6.457	7.756	2.256	72.3
1" UNF	1.000	1.024	1.386	2.087	1.000	7.362	8.622	2.551	105.8
1 1/4" UNF	1.250	1.260	1.760	2.598	1.250	9.016	10.315	3.083	187.0

* Joiner(s) may be used if maximum rod length material is not available and/or to reduce shipping costs or time.
Note - ARS1A systems now use Condition A grade 316 stainless steel (with the same yield and ultimate loads as ARS3).
Pre-2011 Condition B material was used. Contact Ronstan for further information.



Joiners - Internal RH Thread Only.

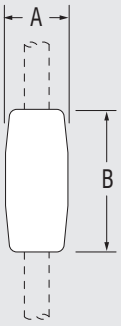
METRIC

THREAD TYPE	ROD Ø	A	B	WEIGHT
	mm	mm	mm	g
1/4" UNF	6.35	10.2	24.0	10
5/16" UNF	7.93	12.5	32.0	17
3/8" UNF	9.53	14.2	38.0	25
1/2" UNF	12.70	19.8	50.0	65
5/8" UNF	15.88	23.8	60.0	110
3/4" UNF	19.05	30.2	72.0	270
7/8" UNF	22.23	34.5	83.0	330
1" UNF	25.40	39.5	90.0	460
1 1/4" UNF	31.75	50.0	112.0	680

IMPERIAL

in.	in.	in.	in.	oz
1/4" UNF	0.250	0.394	0.945	0.4
5/16" UNF	0.312	0.492	1.260	0.6
3/8" UNF	0.375	0.559	1.496	0.9
1/2" UNF	0.500	0.780	1.969	2.3
5/8" UNF	0.625	0.937	2.362	3.9
3/4" UNF	0.750	1.181	2.835	9.5
7/8" UNF	0.875	1.358	3.268	11.7
1" UNF	1.000	1.555	3.543	16.3
1 1/4" UNF	1.250	1.969	4.409	24.0

* Joiner(s) may be used if maximum rod length material is not available and/or to reduce shipping costs or time.
Note - ARS1A systems now use Condition A grade 316 stainless steel (with the same yield and ultimate loads as ARS3).
Pre-2011 Condition B material was used. Contact Ronstan for further information.

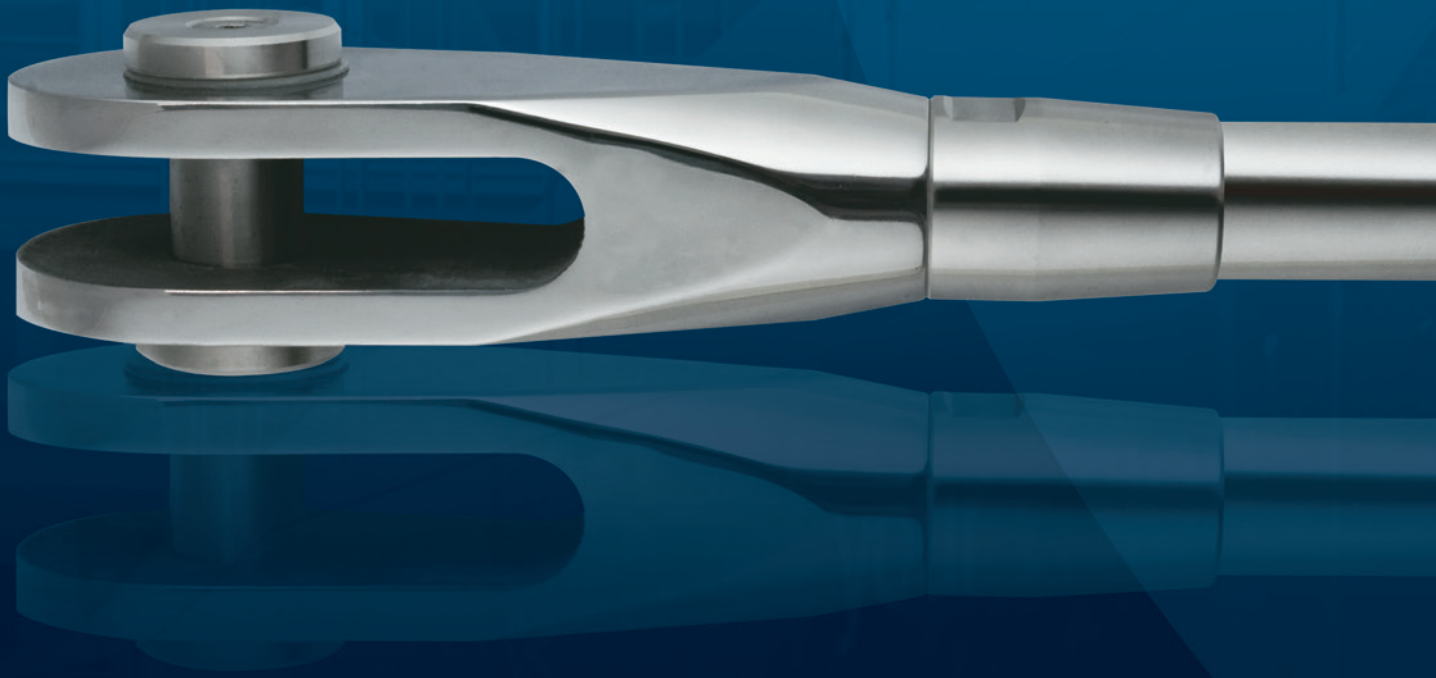


S520 Stainless Steel Rods

ARS2

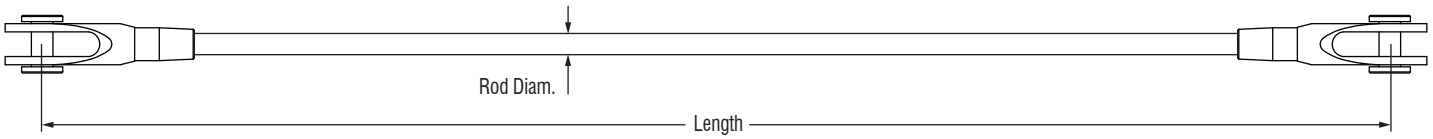
A great all-rounder, ARS2 is the rod system that goes all the way, available right up to the largest stainless diameters our mills can provide. So when strength and aesthetics are still the driving design consideration, but exceed the capability of other stainless rods, ARS2 is the system to specify.
And with the larger diameters requiring cast stainless forks, the fork design takes on a purpose and style reflective of strength and durability, but with uncompromised architectural form.

ARS2 - A robust stainless rod solution.



SS520 ARS2 - S520 Stainless Steel Rods

ARS2 - Systems



METRIC

PRODUCT No.	THREAD TYPE	ROD Ø mm	ROD MASS kg/m	ADJUSTMENT ± PER ASSY mm	**ADJUSTMENT ± PER TB IF USED mm	*MAX SINGLE ROD LENGTH m	MIN. YIELD LOAD kN	MIN. ULT LOAD kN
ARS2-SSM12	M12	12	0.72	15.0	25.0	6.0	44.0	55
ARS2-SSM16	M16	16	1.39	15.0	25.0	6.0	82.0	104
ARS2-SSM20	M20	19	2.23	15.0	50.0	7.5	127	162
ARS2-SSM24	M24	22	2.98	20.0	50.0	7.5	184	233
ARS2-SSM30	M30	28	4.83	20.0	50.0	7.5	292	370
ARS2-SSM36	M36	34	7.13	20.0	50.0	7.5	425	539
ARS2-SSM42	M42	39	9.38	25.0	50.0	7.5	583	740
ARS2-SSM48	M48	45	12.5	25.0	50.0	7.5	677	898
ARS2-SSM56	M56	52	16.7	25.0	50.0	6.0	933	1279

* Larger sizes available upon request.

IMPERIAL

		in.	lbs/ft	in.	in.	ft	kips	kips
ARS2-SSM12	M12	0.472	0.484	0.591	0.984	19.7	9.85	12.5
ARS2-SSM16	M16	0.630	0.934	0.591	0.984	19.7	18.3	23.3
ARS2-SSM20	M20	0.748	1.498	0.591	1.969	24.6	28.55	36.3
ARS2-SSM24	M24	0.866	2.002	0.787	1.969	24.6	41.36	52.3
ARS2-SSM30	M30	1.102	3.246	0.787	1.969	24.6	65.64	83.1
ARS2-SSM36	M36	1.339	4.791	0.787	1.969	24.6	95.54	121.2
ARS2-SSM42	M42	1.535	6.303	0.984	1.969	24.6	131.06	166.4
ARS2-SSM48	M48	1.772	8.386	0.984	1.969	24.6	152.20	201.9
ARS2-SSM56	M56	2.047	11.202	0.984	1.969	19.7	209.75	287.5

* Joiners or turnbuckles may be used if maximum rod length material is not available and/or to reduce shipping costs or time.

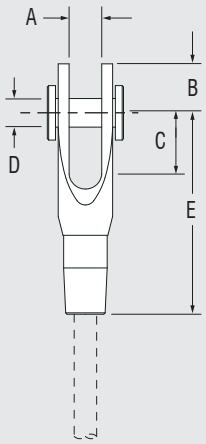
** Where Turnbuckle required order: ARS2-SS**xxxTB**

ARS2 - Component Dimensions

Fork Ends - Internal RH or LH Threads. Including Lock Covers.

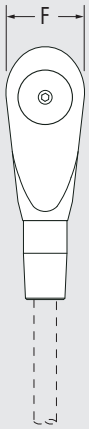
METRIC

THREAD TYPE	ROD Ø	A	B	C	D	E	F	WEIGHT
	mm	mm	mm	mm	mm	mm	mm	kg
M12	12	14	21	25	12	94	32	0.43
M16	16	16	27	30	16	111	43	0.94
M20	19	19	33	42	20	139	51	1.61
M24	22	24	41	50	24	159	62	2.24
M30	28	30	52	59	30	187	79	4.26
M36	34	36	61	68	36	211	93	5.79
M42	39	39	69	78	42	234	107	13.1
M48	45	44	78	87	48	248	121	16.2
M56	52	49	96	105	56	292	145	23.9



IMPERIAL

	in.	in.	in.	in.	in.	in.	in.	lbs
M12	0.472	0.551	0.827	0.984	0.472	3.701	1.260	0.94
M16	0.630	0.630	1.063	1.181	0.630	4.370	1.693	2.06
M20	0.748	0.748	1.299	1.654	0.787	5.472	2.008	3.55
M24	0.866	0.945	1.614	1.969	0.945	6.260	2.441	4.94
M30	1.102	1.181	2.047	2.323	1.181	7.362	3.110	9.39
M36	1.339	1.417	2.402	2.677	1.417	8.307	3.661	12.8
M42	1.535	1.535	2.717	3.071	1.654	9.213	4.213	28.9
M48	1.772	1.732	3.071	3.425	1.890	9.764	4.764	35.7
M56	2.047	1.929	3.780	4.134	2.205	11.496	5.709	52.7



ARS2 - Component Dimensions

ARS2 Joiners - Internal RH Threads Only.

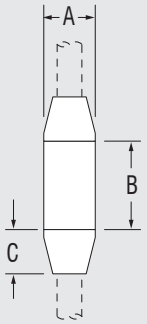
Use Joiner for joining rods only.

METRIC

THREAD TYPE	ROD Ø	A	B	C	WEIGHT
	mm	mm	mm	mm	kg
M12	12	18	37	30	0.11
M16	16	24	45	33	0.22
M20	19	29	53	78	0.36
M24	22	35	64	84	0.54
M30	28	43	75	87	0.94
M36	34	52	89	93	1.58
M42	39	60	100	102	2.14
M48	45	68	115	105	3.22
M56	52	80	135	106	4.74

IMPERIAL

THREAD TYPE	ROD Ø	A	B	C	WEIGHT
	in.	in.	in.	in.	lbs
M12	0.472	0.709	1.457	1.181	0.24
M16	0.630	0.945	1.772	1.299	0.49
M20	0.748	1.142	2.087	3.071	0.80
M24	0.866	1.378	2.520	3.307	1.19
M30	1.102	1.693	2.953	3.425	2.07
M36	1.339	2.047	3.504	3.661	3.48
M42	1.535	2.362	3.937	4.016	4.72
M48	1.772	2.677	4.528	4.094	7.1
M56	2.047	3.150	5.315	4.173	10.5



* Joiners or turnbuckles may be used if maximum rod length material is not available and/or to reduce shipping costs or time.
** Where joiner required order: ARS2-SS**xxxJ.**

Turnbuckle Dimensions - Internal RH & LH Threads. Including Lock Nuts.

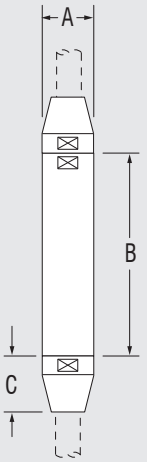
Use Turnbuckle where extra adjustment required or for rod joining.

METRIC

THREAD TYPE	ROD Ø	A	B	C	WEIGHT
	mm	mm	mm	mm	kg
M12	12	18	70	30	0.13
M16	16	24	85	33	0.19
M20	19	29	144	78	0.64
M24	22	35	155	84	1.0
M30	28	43	170	87	1.8
M36	34	52	180	93	2.7
M42	39	60	195	102	3.8
M48	45	68	210	105	5.2
M56	52	80	230	106	7.9

IMPERIAL

	in.	in.	in.	in.	lbs
M12	0.472	0.709	2.756	1.181	0.29
M16	0.630	0.945	3.346	1.299	0.42
M20	0.748	1.142	5.669	3.071	1.42
M24	0.866	1.378	6.102	3.307	2.11
M30	1.102	1.693	6.693	3.425	3.88
M36	1.339	2.047	7.087	3.661	5.85
M42	1.535	2.362	7.677	4.016	8.43
M48	1.772	2.677	8.268	4.134	11.6
M56	2.047	3.150	9.055	4.173	17.3



* Joiners or turnbuckles may be used if maximum rod length material is not available and/or to reduce shipping costs or time.

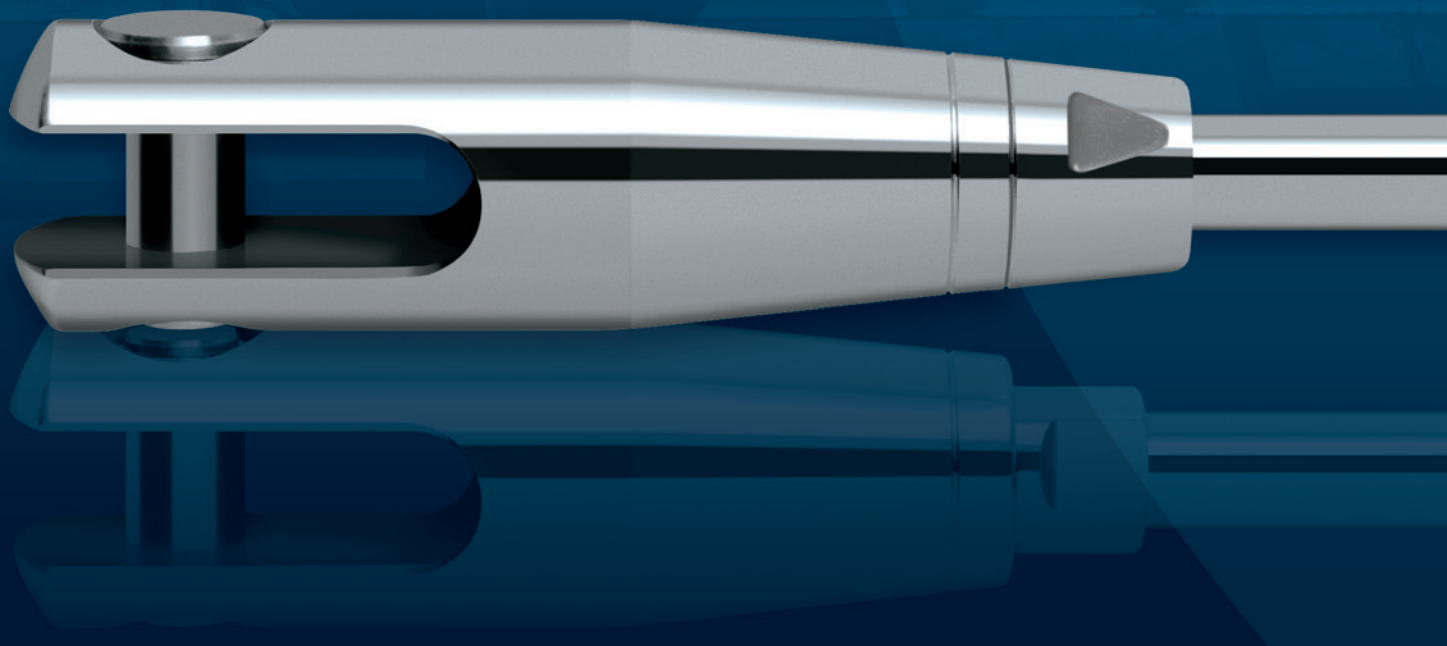
** Where Turnbuckle required order: ARS2-SS**xxxTB.**

316 Stainless Steel Rods

ARS3

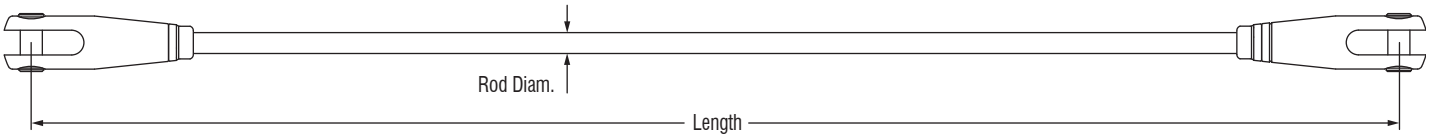
The industry benchmark. ARS3 is known world-wide as one of the original stainless rod systems. It marries the qualities of timeless aesthetics, lasting good looks, corrosion resistance and strength, in an economical and functional stainless rod tendon. So if a moderate static load needs to be carried or braced between two points, with simple efficiency and good looks at the same time, ARS3 should be the rod of choice.
And the philosophy behind ARS3's enduring appeal - no compromise on quality, with an electropolished finish now as standard for long lasting performance.

ARS3 - An efficient, economical rod for moderate loads.



SS 316 ARS3 - 316 Stainless Steel Rods

ARS3 - Systems



METRIC

PRODUCT No.	THREAD TYPE	ROD Ø mm	ROD MASS kg/m	ADJUSTMENT ± PER ASSY mm	*MAX SINGLE BAR LENGTH m	MIN. YIELD LOAD kN	MIN. ULT LOAD kN
ARS3-SS-03	# 10-32 UNF	4.76	0.14	13.0	4.0	4.4	8.7
ARS3-SS-04	1/4" UNF	6.35	0.25	13.0	4.0	8	16
ARS3-SS-05	5/16" UNF	7.93	0.39	17.0	4.0	13	26
ARS3-SS-06	3/8" UNF	9.53	0.56	21.0	4.0	16	33
ARS3-SS-08	1/2" UNF	12.70	1.00	29.0	4.0	27	53
ARS3-SS-10	5/8" UNF	15.88	1.56	37.0	4.0	42	85
ARS3-SS-12	3/4" UNF	19.05	2.25	47.0	6.0	62	124
ARS3-SS-14	7/8" UNF	22.23	3.06	55.0	6.0	85	169
ARS3-SS-16	1" UNF	25.40	4.0	64.0	6.0	110	220
ARS3-SS-20	1 1/4" UNF	31.75	6.3	64.0	6.0	178	356

IMPERIAL

		in.	lbs/ft	in.	ft	kips	kips
ARS3-SS-03	# 10-32 UNF	0.188	0.094	0.512	13.1	0.99	1.96
ARS3-SS-04	1/4" UNF	0.250	0.168	0.512	13.1	1.80	3.60
ARS3-SS-05	5/16" UNF	0.312	0.262	0.669	13.1	2.92	5.85
ARS3-SS-06	3/8" UNF	0.375	0.378	0.827	13.1	3.60	7.42
ARS3-SS-08	1/2" UNF	0.500	0.673	1.142	13.1	6.07	11.91
ARS3-SS-10	5/8" UNF	0.625	1.051	1.457	13.1	9.44	19.11
ARS3-SS-12	3/4" UNF	0.750	1.513	1.850	19.7	13.94	27.88
ARS3-SS-14	7/8" UNF	0.875	2.060	2.165	19.7	19.11	37.99
ARS3-SS-16	1" UNF	1.000	2.690	2.520	19.7	24.73	49.46
ARS3-SS-20	1 1/4" UNF	1.250	4.203	2.520	19.7	40.02	80.03

* Joiner(s) may be used if maximum rod length material is not available and/or to reduce shipping costs or time.

ARS3 - Component Dimensions

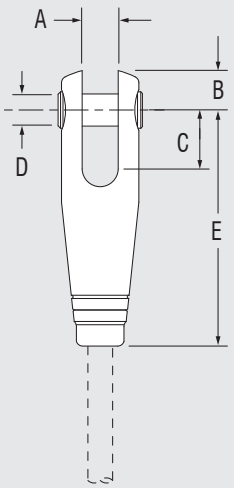
Fork Ends - Internal RH or LH Threads. Including Lock Nuts.

METRIC

THREAD TYPE	ROD Ø	A	B	C	D	E	F	WEIGHT
	mm	mm	mm	mm	mm	mm	mm	g
10/32" UNF	4.76	6.0	7.0	9.0	4.7	40.0	10.6	30
1/4" UNF	6.35	7.0	9.0	11.0	6.4	46.0	13.5	40
5/16" UNF	7.93	8.5	10.8	13.2	7.9	55.0	16.7	80
3/8" UNF	9.53	10.0	12.0	18.0	9.5	70.0	19.3	130
1/2" UNF	12.70	14.0	16.0	24.0	12.7	95.0	28.1	370
5/8" UNF	15.88	18.0	20.0	30.0	15.9	119.0	35.1	710
3/4" UNF	19.05	22.0	24.0	38.0	19.1	149.0	41.1	1250
7/8" UNF	22.23	24.0	28.0	45.0	22.2	171.0	45.5	1700
1" UNF	25.40	26.0	32.0	53.0	25.4	198.0	55.7	2900
1 1/4" UNF	31.75	32.0	40.0	66.0	31.8	229.0	66.4	4200

IMPERIAL

	in.	in.	in.	in.	in.	in.	in.	oz
10/32" UNF	0.188	0.236	0.276	0.354	0.187	1.575	0.417	1.1
1/4" UNF	0.250	0.276	0.354	0.433	0.250	1.811	0.531	1.4
5/16" UNF	0.312	0.335	0.425	0.520	0.312	2.165	0.657	2.8
3/8" UNF	0.375	0.394	0.472	0.709	0.375	2.756	0.760	4.6
1/2" UNF	0.500	0.551	0.630	0.945	0.500	3.740	1.106	13.1
5/8" UNF	0.625	0.709	0.787	1.181	0.625	4.685	1.382	25.0
3/4" UNF	0.750	0.866	0.945	1.496	0.750	5.866	1.618	44.1
7/8" UNF	0.875	0.945	1.102	1.772	0.875	6.732	1.791	60.0
1" UNF	1.000	1.024	1.260	2.087	1.000	7.795	2.193	102.3
1 1/4" UNF	1.250	1.260	1.575	2.598	1.250	9.016	2.614	148.1

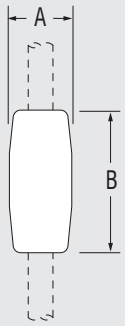


ARS3 - Component Dimensions

Joiners - Internal RH & LH Threads.

METRIC

ROD Ø	THREAD TYPE	A	B	WEIGHT
mm		mm	mm	g
4.76	10/32" UNF	7.8	18.0	7
6.35	1/4" UNF	10.0	24.0	10
7.93	5/16" UNF	12.5	32.0	20
9.53	3/8" UNF	14.2	38.0	25
12.70	1/2" UNF	19.8	50.0	65
15.88	5/8" UNF	23.8	60.0	110
19.05	3/4" UNF	30.0	72.0	270
22.23	7/8" UNF	34.5	83.0	330
25.40	1" UNF	39.5	90.0	460
31.75	1 1/4" UNF	50.0	112.0	680



IMPERIAL

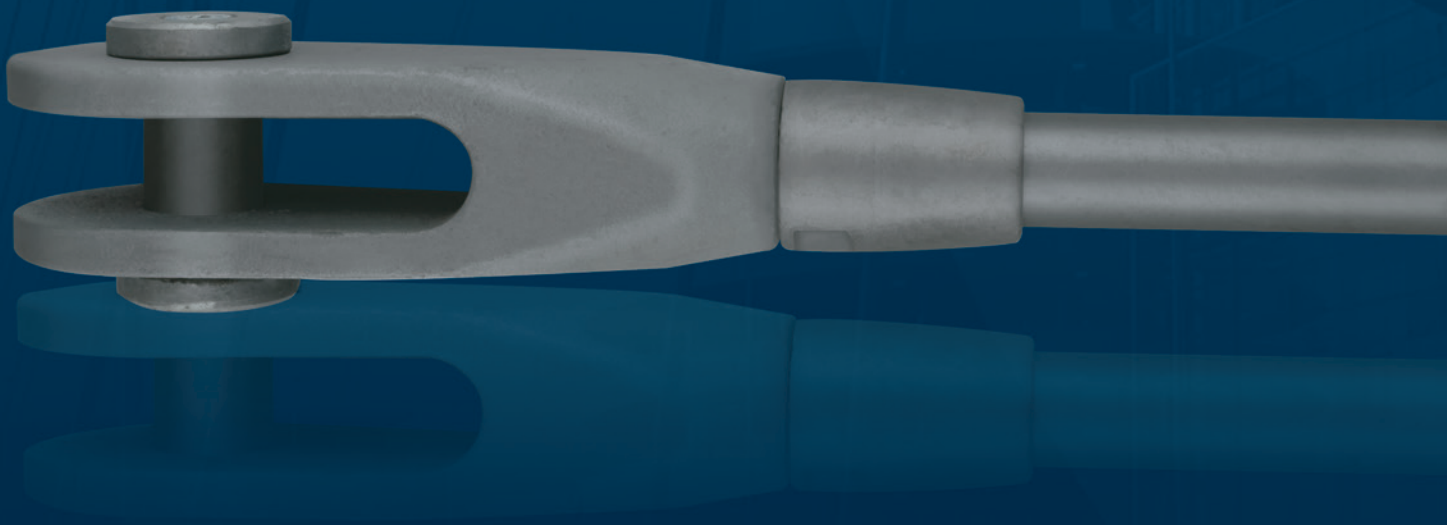
in.		in.	in.	oz
0.188	10/32" UNF	0.307	0.709	0.2
0.250	1/4" UNF	0.394	0.945	0.4
0.312	5/16" UNF	0.492	1.260	0.7
0.375	3/8" UNF	0.559	1.496	0.9
0.500	1/2" UNF	0.780	1.969	2.3
0.625	5/8" UNF	0.937	2.362	3.9
0.750	3/4" UNF	1.181	2.835	9.5
0.875	7/8" UNF	1.358	3.268	11.7
1.000	1" UNF	1.555	3.543	16.3
1.250	1 1/4" UNF	1.969	4.409	24.0

520 Carbon Steel Rods

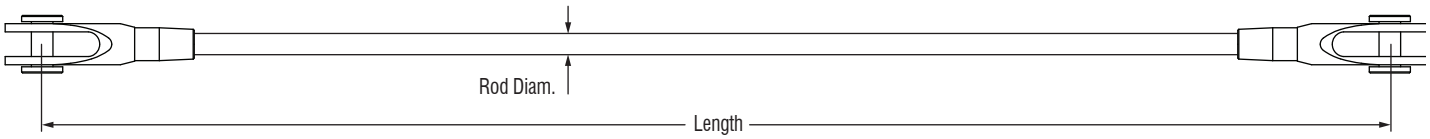
ARS4

The latest innovative development in carbon steel rod tendons, ARS4 now has even higher load capacity with its grade 520 minimum yield carbon steel. The hero of the Ronstan range, ARS4 is ideal for those high load applications where a simple, efficient and minimalist carbon steel rod solution is required. ARS4 rod tendons can be used to replace heavy steel structure with a lightweight tendon that can be painted or finished to blend into the surrounding structure.

ARS4 - The carbon steel rod of unparalleled tensile strength.



ARS4 - Systems



METRIC

PRODUCT No.	THREAD TYPE	ROD Ø mm	ROD MASS kg/m	ADJUSTMENT ± PER ASSY mm	**Adjustment ± PER TB mm	*MAX SINGLE BAR LENGTH m	MIN. YIELD LOAD kN	MIN. ULT LOAD kN
ARS4-CSM12	M12	12	0.72	15.0	25.0	6.0	30.0	52
ARS4-CSM16	M16	16	1.39	15.0	25.0	6.0	82.0	102
ARS4-CSM20	M20	19	2.23	15.0	50.0	12.0	127	159
ARS4-CSM24	M24	22	2.98	20.0	50.0	12.0	184	229
ARS4-CSM30	M30	28	4.83	20.0	50.0	12.0	292	364
ARS4-CSM36	M36	34	7.13	20.0	50.0	12.0	425	531
ARS4-CSM42	M42	39	9.38	25.0	50.0	12.0	583	729
ARS4-CSM48	M48	45	12.5	25.0	50.0	12.0	766	958
ARS4-CSM56	M56	52	16.7	25.0	50.0	12.0	1056	1320
ARS4-CSM64	M64	60	21.5	0.0	50.0	12.0	1392	1739
ARS4-CSM76	M76	72	32.0	0.0	50.0	12.0	1999	2528
ARS4-CSM90	M90	85	44.5	0.0	50.0	12.0	2879	3634
ARS4-CSM100	M100	97	56.8	0.0	50.0	12.0	3605	4547

IMPERIAL

		in.	lbs/ft	in.	in.	ft	kips	kips
ARS4-CSM12	M12	0.472	0.484	0.591	0.984	19.7	6.72	11.6
ARS4-CSM16	M16	0.630	0.934	0.591	0.984	19.7	18.3	22.9
ARS4-CSM20	M20	0.748	1.498	0.591	1.969	39.4	28.6	35.8
ARS4-CSM24	M24	0.866	2.002	0.787	1.969	39.4	41.2	51.5
ARS4-CSM30	M30	1.102	3.246	0.787	1.969	39.4	65.5	81.9
ARS4-CSM36	M36	1.339	4.791	0.787	1.969	39.4	95.4	119
ARS4-CSM42	M42	1.535	6.303	0.984	1.969	39.4	131	164
ARS4-CSM48	M48	1.772	8.386	0.984	1.969	39.4	172	215
ARS4-CSM56	M56	2.047	11.202	0.984	1.969	39.4	237	297
ARS4-CSM64	M64	2.362	14.420	0.000	1.969	39.4	313	391
ARS4-CSM76	M76	2.835	21.476	0.000	1.969	39.4	449	568
ARS4-CSM90	M90	3.346	29.929	0.000	1.969	39.4	647	817
ARS4-CSM100	M100	3.819	38.181	0.000	1.969	39.4	810	1022

* Joiners or turnbuckles may be used if maximum rod length material is not available and/or to reduce shipping costs or time.

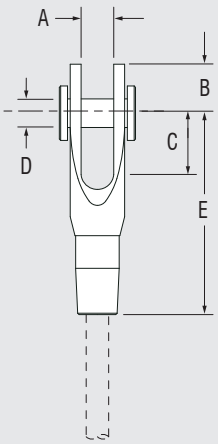
** Where Turnbuckle required order: ARS4-CS**xxxTB**

ARS4 - Component Dimensions

Fork Ends - Internal RH or LH Threads. Including Lock Covers.

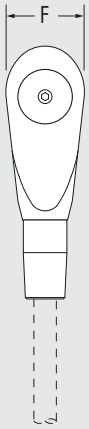
METRIC

THREAD TYPE	ROD Ø	A	B	C	D	E	F	WEIGHT
	mm	mm	mm	mm	mm	mm	mm	kg
M12	12	14	21	25	12	94	32	0.426
M16	16	16	27	30	16	111	43	0.935
M20	19	19	33	42	20	139	51	1.61
M24	22	24	41	50	24	159	62	2.24
M30	28	30	52	59	30	187	79	4.26
M36	34	36	61	68	36	211	93	5.79
M42	39	39	69	78	42	234	107	13.1
M48	45	44	78	87	48	248	121	16.2
M56	52	49	96	105	56	283	145	23.9
M64	60	59	110	120	64	323	167	33.4
M76	72	76	131	141	76	380	199	52.2
M90	85	86	161	171	94	463	246	76
M100	97	91	188	197	109	521	287	108



IMPERIAL

	in.	in.	in.	in.	in.	in.	in.	oz
M12	0.472	0.551	0.827	0.984	0.472	3.701	1.260	0.94
M16	0.630	0.630	1.063	1.181	0.630	4.370	1.693	2.06
M20	0.748	0.748	1.299	1.654	0.787	5.472	2.008	3.55
M24	0.866	0.945	1.614	1.969	0.945	6.260	2.441	4.94
M30	1.102	1.181	2.047	2.323	1.181	7.362	3.110	9.39
M36	1.339	1.417	2.402	2.677	1.417	8.307	3.661	12.8
M42	1.535	1.535	2.717	3.071	1.654	9.213	4.213	28.9
M48	1.772	1.732	3.071	3.425	1.890	9.764	4.764	35.7
M56	2.047	1.929	3.780	4.134	2.205	11.142	5.709	52.7
M64	2.362	2.323	4.331	4.724	2.520	12.717	6.575	73.6
M76	2.835	2.992	5.157	5.551	2.992	14.961	7.835	115
M90	3.346	3.386	6.339	6.732	3.701	18.228	9.685	168
M100	3.819	3.583	7.402	7.756	4.291	20.512	11.299	238



ARS4 - Component Dimensions

Joiners - Internal RH Threads Only. Including Lock Covers

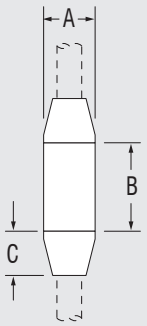
Use joiners for connecting rods only.

METRIC

THREAD TYPE	ROD Ø	A	B	C	WEIGHT
	mm	mm	mm	mm	g
M12	12	18	37	25	0.11
M16	16	24	45	26	0.22
M20	19	29	53	40	0.36
M24	22	35	64	45	0.54
M30	28	43	75	50	0.94
M36	34	52	89	55	1.58
M42	39	60	100	60	2.14
M48	45	68	115	60	3.22
M56	52	80	135	75	4.74
M64	60	91	145	85	6.74
M76	72	108	165	91	10.5
M90	85	129	195	126	17.3
M100	97	143	215	134	24.2

IMPERIAL

THREAD TYPE	ROD Ø	A	B	C	WEIGHT
	in.	in.	in.	in.	lbs
M12	0.472	0.709	1.457	0.984	0.24
M16	0.630	0.945	1.772	1.024	0.49
M20	0.748	1.142	2.087	1.575	0.80
M24	0.866	1.378	2.520	1.772	1.19
M30	1.102	1.693	2.953	1.969	2.07
M36	1.339	2.047	3.504	2.165	3.48
M42	1.535	2.362	3.937	2.362	4.72
M48	1.772	2.677	4.528	2.362	7.1
M56	2.047	3.150	5.315	2.953	10.4
M64	2.362	3.583	5.709	3.346	14.9
M76	2.835	4.252	6.496	3.583	23.2
M90	3.425	5.079	7.677	4.961	38.1
M100	3.819	5.630	8.465	5.276	53.4



* Joiners or turnbuckles may be used if maximum rod length material is not available and/or to reduce shipping costs or time.

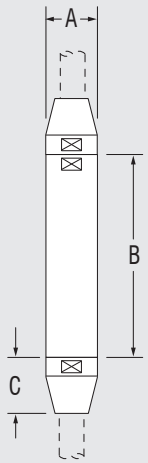
** Where Joiner required order: ARS4-CS**xxxJ.**

Turnbuckle - Internal RH & LH Threads. Including Lock Covers.

Use turnbuckles where additional adjustment is required.

METRIC

THREAD TYPE	ROD Ø	A	B	C	WEIGHT
	mm	mm	mm	mm	kg
M12	12	18	70	30	0.13
M16	16	24	85	33	0.19
M20	19	29	144	78	0.64
M24	22	35	155	84	1.0
M30	28	43	170	87	1.8
M36	34	52	180	93	2.7
M42	39	60	195	102	3.8
M48	45	68	210	105	5.2
M56	52	80	230	106	7.9
M64	60	91	240	112	10.4
M76	72	108	268	118	16.1
M90	85	129	290	153	26.2
M100	97	143	315	160	34.1



IMPERIAL

	in.	in.	in.	in.	lbs
M12	0.472	0.709	2.756	1.181	0.29
M16	0.630	0.866	3.346	1.299	0.42
M20	0.748	1.142	5.669	3.071	1.42
M24	0.866	1.378	6.102	3.307	2.11
M30	1.102	1.693	6.693	3.425	3.88
M36	1.339	2.047	7.087	3.661	5.85
M42	1.535	2.362	7.677	4.016	8.43
M48	1.772	2.677	8.268	4.134	11.6
M56	2.047	3.150	9.055	4.173	17.3
M64	2.362	3.583	9.449	4.409	22.9
M76	2.835	4.252	10.551	4.646	35.5
M90	3.346	5.079	11.417	6.024	57.7
M100	3.819	5.630	12.402	6.299	75.2

* Joiners or turnbuckles may be used if maximum rod length material is not available and/or to reduce shipping costs or time.

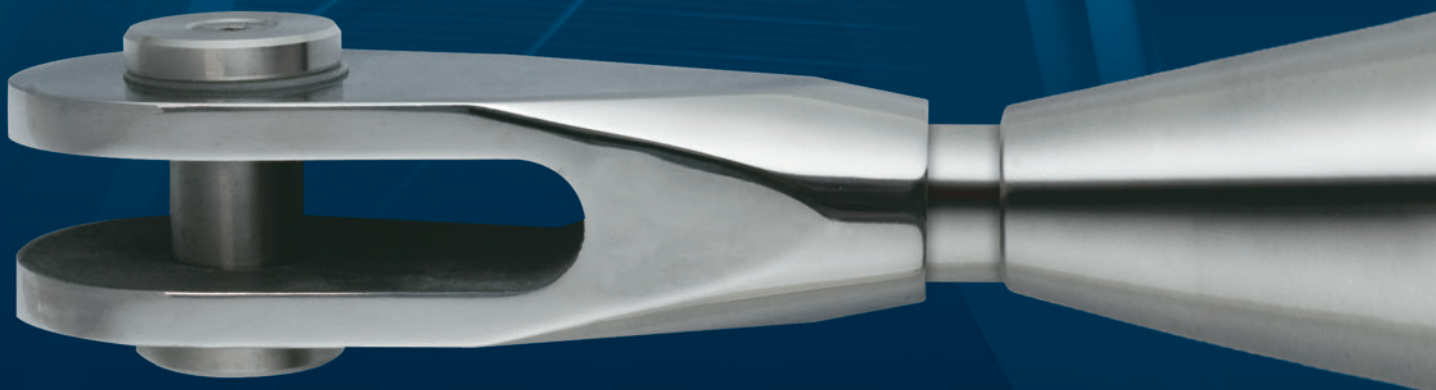
** Where Turnbuckle required order: ARS4-CS**xxxTB**

355 Carbon Steel & 316 Stainless Steel Structural Compression Struts

ARS6

To compliment our existing tension bar ranges, Ronstan now offer a range of adjustable compression struts. A compression strut comprises a central tubular section with a welded cone at either end and a threaded fork and pin end. Styling uniformity with the ARS2 and ARS4 ranges is maintained by using the same threaded fork ends in the welded cones of the ARS6 compression struts. Whether your loads are compressive or both compressive and tensile in nature, the ARS6 is the perfect product to meet these loading conditions.

ARS6 – The carbon or stainless steel product solution for compressive loads.



ARS6 - 316 Stainless Steel and S355JR Carbon Steel Compression Struts

SS 316
CS 355

Compression struts for structural design in steel and timber construction

Lengths & Diameters Wide range of sizes, load values & resulting span lengths achievable. See tables on the following pages.
Carbon steel - up to 12m (39.4ft) length
Stainless steel - up to 6m (19.6ft) length

Finishes Electropolished, to ASTM A380/A967/B912. Others by request.

Threads to BS3643

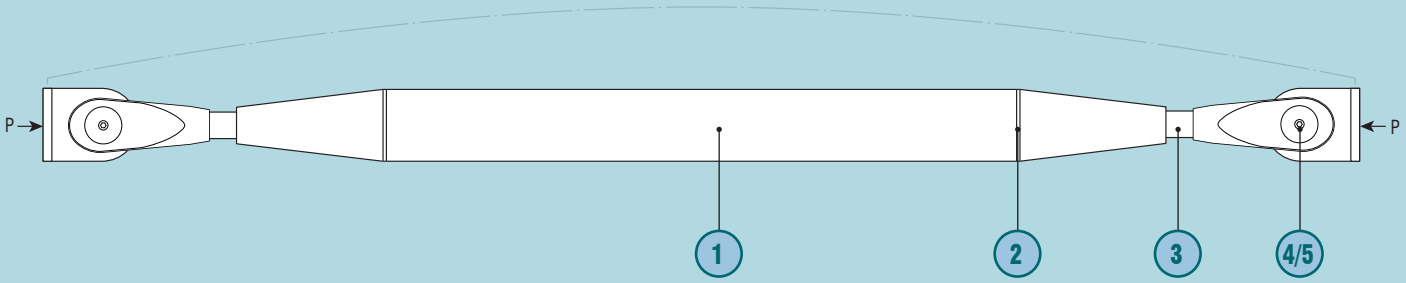
Threads Stainless Steel M12 to M56 (0.472" - 2.205")
Carbon steel M12 to M100 (0.472" - 3.940")

TYPICAL SPECIFICATION EXAMPLES

- Ronstan ARS6-CSM30 Carbon steel compression strut 76.1 x 5 CHS Raw - 3500mm pin to pin length Qty 10
- Ronstan ARS6-GSM42 Carbon steel compression strut 114.3 x 5 CHS Galvanized 2550mm pin to pin length Qty 4
- Ronstan ARS6-PSM42 Carbon steel compression strut 114.3 x 5 CHS Painted 10500mm pin to pin length Qty 2
- Ronstan ARS6-SSM20 Stainless steel compression strut 48.3 x 5 CHS - Satin #4 6ft 4inch pin to pin length Qty 20

SPECIFIC FEATURES

- Range of adjustable compression struts to complement our existing tensile threaded bar systems.
- A compression strut comprises a central tubular section with a welded cone at either end and a threaded fork and pin end.
- End fittings are the same style as ASR2 & ARS4 end fittings for common appearance throughout a specific project.
- All threads concealed under adjustable end fittings.
- Standard compression strut systems are available in both Carbon steel and Stainless steel.
- The Carbon steel system can be supplied as raw steel, hot dip galvanised or blast / primer painted for final top coat.
- The Stainless steel system is supplied standard with a satin polish, other finishes available upon request.
- Structural design service of compression strut systems available.
- Please contact us for Structural design assistance with your project details and for pricing.
- Certified to Execution Class 2 (EXC2) BS EN 1090-2:2008 + A1:2011



BASIC PRINCIPALS

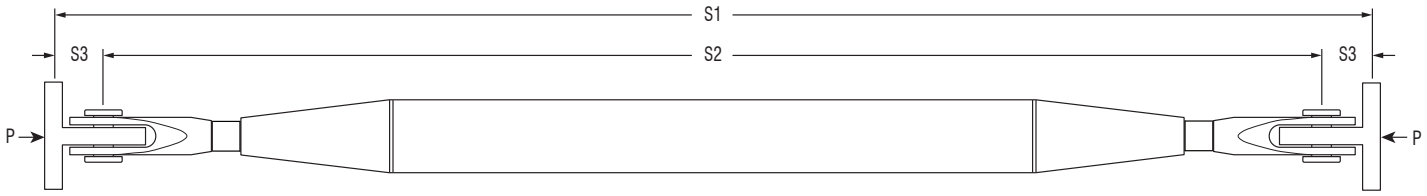
- A compression strut comprises a central tubular section with a threaded taper connection welded at each end.
- The taper connection is assembled with a threaded fork/pin end connection and threaded lock cover.
- The threaded fork end connection enables the compression strut to be adjusted in length. The nominal strut adjustment length is +/- 50 mm.
- The tapered lock cover and machined cone conceal the threads.
- The installed compression strut is fixed to the final length by use of a grub screw set into the cone.
- The strut system is designed in accordance with EN1993-1-1 and EN1993 -1-8 and their respective UK National Annexes.
- The ultimate capacities quoted take account of self-weight bending of the strut in accordance with equation 6.10, Table NA.A1.2(B) UK National Annex to EN1990.

CRITICAL SECTIONS

1. **CHS Verification**
   Section Capacity (combined bending & axial)
2. **Interface between CHS & Welded Cone**
   Weld size required
3. **Threaded Bar**
   Combined bending & axial
   Axial resistance of thread
4. **Fork**
   Combined bending & axial (major axis only)
5. **Pin**
   Combined Bending & Shear

NB: Reference to 'bending' above means the summation of strut buckling and self-weight bending effects. All material factors are as the UK National Annex.

ARS6 - Systems



Stainless Steel – Stainless steel G316 tubes: BS EN10296-1 — METRIC

Fork/Bar Sizes	M12	M16	M20	M24	M30	M36	M42	M48	M56
CHS Size (Dia. x t mm)	33.7x4	42.4x4	48.3x5	60.3x5	76.1x5	88.9x5	114.3x6.3	139.7x10	168.3x10
S1 (m)	**P — Design Resistance in kN**								
1.5	6	18	39	78	159	270	382	426	772
2		12	26	48	123	261	382	426	772
2.5		10	19	35	84	178	382	426	772
3			16	27	65	133	287	400	772
3.5			13	23	53	107	222	388	772
4			12	20	45	90	181	327	636
4.5			10	17	39	78	154	275	523
5				16	35	67	134	237	441
5.5				14	32	55	119	208	381
6				12	27	45	108	187	336
S3 (mm) max	50	50	50	75	100	100	100	125	125
Minimum assy lengths									
S2 (mm) min		296	350	394	454	542	614	726	820

Stainless Steel – Stainless steel G316 tubes: BS EN10296-1 — IMPERIAL

Fork/Bar Sizes	M12	M16	M20	M24	M30	M36	M42	M48	M56
CHS Size (Dia. x wt in.)	1.327 x 0.157	1.661 x 0.157	1.902 x 0.197	2.374 x 0.197	2.996 x 0.197	3.5 x 0.197	4.5 x 0.248	5.5 x 0.394	6.626 x 0.394
S1 (ft)	**P — Design Resistance in kip**								
4.921	1.348	4.045	8.765	17.529	35.732	60.678	85.848	95.736	173.493
6.562		2.697	5.843	10.787	27.642	58.655	85.848	95.736	173.493
8.202		2.247	4.270	7.866	18.877	40.002	85.848	95.736	173.493
9.843			3.596	6.068	14.608	29.889	64.498	89.893	173.493
11.483			2.922	5.169	11.911	24.046	49.891	87.196	173.493
13.123			2.697	4.495	10.113	20.226	40.677	73.487	142.930
14.764			2.247	3.820	8.765	17.529	34.609	61.801	117.535
16.404				3.596	7.866	15.057	30.114	53.262	99.107
18.045				3.146	7.191	12.360	26.743	46.744	85.623
19.685				2.697	6.068	10.113	24.271	42.025	75.510
S3 (in.) max	1.969	1.969	1.969	2.953	3.937	3.937	3.937	4.921	4.921
Minimum assy lengths									
S2 (in.) min		11.65	13.78	15.51	17.87	21.34	24.17	28.58	32.28

The data supplied is appropriate for inclusion in the relevent design calculations

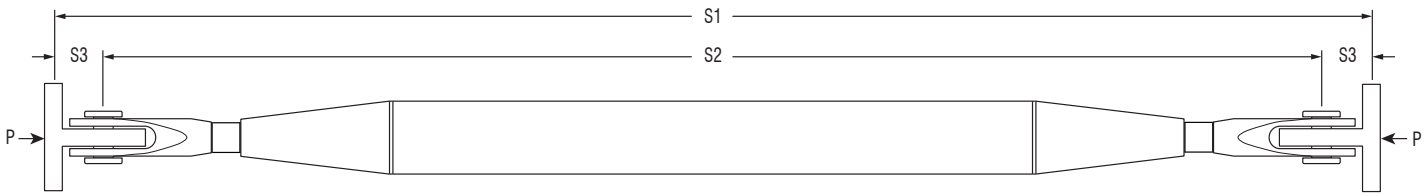
Partial factors

The allowable loads refer to the minimum design resistance in KN, calculated using the UK National Annex, material and Load Factors.

Partial factors for design of building members/sections EN1993-1-1							
YM0	YM1	YM2	YM3	YM4	YM5	YM6	YM7
1	1	1.1	1.25	1.1	1	1	1

Partial factors for design of building connections/joints EN1993-1-8								
YM0	YM1	YM2	YM3	YM4	YM5	YM6	YM6,ser	YM7
1	1	1.25	1.25	1.1	1	1	1	1.1

ARS6 - Systems



Carbon Steel – Carbon steel tubes: BS EN10210-1 Grade S355JR

METRIC

Fork/Bar Sizes	M12	M16	M20	M24	M30	M36	M42	M48	M56	M64	M76	M90	M100
CHS Size (Dia. x t mm)	33.7x4	42.4x4	48.3x5	60.3x5	76.1x5	88.9x5	114.3x6.3	139.7x10	168.3x10	193.7x10	244.5x16	273x16	323.9x16
S1 (m)	**P — Design Resistance in kN**												
1.5	8	25	45	74	127	216	306	426	600	837	1207	1807	2376
2		17	29	56	127	216	306	426	600	837	1207	1807	2376
2.5		13	22	40	98	202	306	426	600	837	1207	1807	2376
3		10	18	31	74	153	306	426	600	837	1207	1807	2376
3.5			15	26	60	122	244	426	600	837	1207	1807	2376
4			13	22	51	102	199	359	600	837	1207	1807	2376
4.5			12	20	44	88	168	300	560	837	1207	1807	2376
5			10	17	39	78	146	258	480	781	1207	1807	2376
5.5				16	35	66	129	226	416	683	1207	1807	2376
6				14	32	55	116	201	367	600	1194	1807	2376
6.5				13	29	47	106	182	328	532	1074	1783	2376
7				11	24	40	97	166	297	478	965	1624	2376
7.5				10	21	35	90	154	272	434	872	1475	2376
8					18	30	82	143	251	398	793	1342	2226
8.5					16	27	72	133	233	368	727	1226	2062
9					14	23	64	125	218	342	670	1126	1908
9.5					12	21	57	118	205	320	623	1041	1767
10					11	18	51	112	194	301	582	968	1640
11					9	15	41	101	175	270	515	849	1429
12						12	34	93	159	245	464	759	1265
S3 (mm) max	50	50	50	75	100	100	100	125	125	175	200	225	250
Minimum assy lengths													
S2 (mm) min	296	350	394	454	542	614	726	820	952	1060	1302	1474	1704

The data supplied is appropriate for inclusion in the relevent design calculations

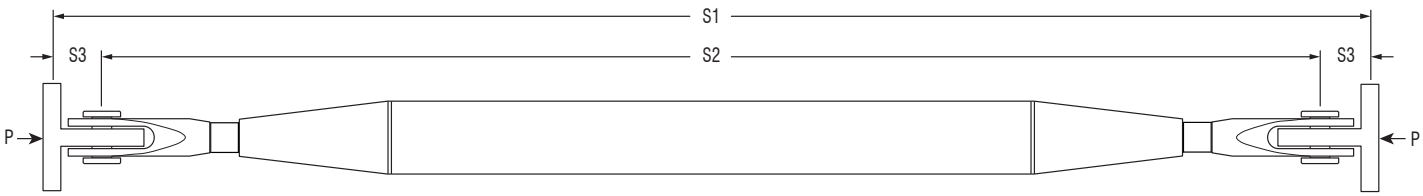
Partial factors

The allowable loads refer to the minimum design resistance in KN, calculated using the UK National Annex, material and Load Factors.

Partial factors for design of building members/sections EN1993-1-1							
YM0	YM1	YM2	YM3	YM4	YM5	YM6	YM7
1	1	1.1	1.25	1.1	1	1	1

Partial factors for design of building connections/joints EN1993-1-8								
YM0	YM1	YM2	YM3	YM4	YM5	YM6	YM6,ser	YM7
1	1	1.25	1.25	1.1	1	1	1	1.1

ARS6 - Systems



Carbon Steel – Carbon steel tubes: BS EN10210-1 Grade S355JR

IMPERIAL

Fork/Bar Sizes	M12	M16	M20	M24	M30	M36	M42	M48	M56	M64	M76	M90	M100
CHS Size (Dia. x wt in.)	1.327 x 0.157	1.661 x 0.157	1.902 x 0.197	2.374 x 0.197	2.996 x 0.197	3.5 x 0.197	4.5 x 0.248	5.5 x 0.394	6.626 x 0.394	7.626 x 0.394	9.626 x 0.63	10.748 x 0.63	12.752 x 0.63
S1 (ft)	**P — Design Resistance in kip**												
4.921	1.798	5.618	10.113	16.630	28.541	48.542	68.768	95.736	134.839	188.101	271.252	406.091	533.963
6.562		3.820	6.517	12.585	28.541	48.542	68.768	95.736	134.839	188.101	271.252	406.091	533.963
8.202		2.922	4.944	8.989	22.024	45.396	68.768	95.736	134.839	188.101	271.252	406.091	533.963
9.843		2.247	4.045	6.967	16.630	34.384	68.768	95.736	134.839	188.101	271.252	406.091	533.963
11.483			3.371	5.843	13.484	27.417	54.835	95.736	134.839	188.101	271.252	406.091	533.963
13.123			2.922	4.944	11.461	22.923	44.722	80.679	134.839	188.101	271.252	406.091	533.963
14.764			2.697	4.495	9.888	19.776	37.755	67.420	125.850	188.101	271.252	406.091	533.963
16.404			2.247	3.820	8.765	17.529	32.811	57.981	107.871	175.516	271.252	406.091	533.963
18.045				3.596	7.866	14.832	28.990	50.789	93.489	153.492	271.252	406.091	533.963
19.685				3.146	7.191	12.360	26.069	45.171	82.477	134.839	268.330	406.091	533.963
21.325				2.922	6.517	10.562	23.822	40.901	73.712	119.557	241.362	400.697	533.963
22.966				2.472	5.394	8.989	21.799	37.306	66.745	107.422	216.866	364.965	533.963
24.606				2.247	4.719	7.866	20.226	34.609	61.127	97.534	195.966	331.480	533.963
26.247					4.045	6.742	18.428	32.137	56.408	89.443	178.213	301.590	500.254
27.887					3.596	6.068	16.181	29.889	52.363	82.701	163.380	275.522	463.398
29.528					3.146	5.169	14.383	28.092	48.992	76.858	150.571	253.048	428.789
31.168					2.697	4.719	12.810	26.518	46.070	71.914	140.008	233.946	397.102
32.808					2.472	4.045	11.461	25.170	43.598	67.644	130.794	217.541	368.561
36.089					2.023	3.371	9.214	22.698	39.328	60.678	115.737	190.798	321.142
39.370						2.697	7.641	20.900	35.732	55.059	104.276	170.572	284.286
S3 (in.) max	1.969	1.969	1.969	2.953	3.937	3.937	3.937	4.921	4.921	6.890	7.874	8.858	9.843
Minimum assy lengths													
S2 (in.) min	11.65	13.78	15.51	17.87	21.34	24.17	28.58	32.28	37.48	41.73	51.26	58.03	67.09

The data supplied is appropriate for inclusion in the relevent design calculations

Partial factors

The allowable loads refer to the minimum design resistance in KN, calculated using the UK National Annex, material and Load Factors.

Partial factors for design of building members/sections EN1993-1-1							
YM0	YM1	YM2	YM3	YM4	YM5	YM6	YM7
1	1	1.1	1.25	1.1	1	1	1

Partial factors for design of building connections/joints EN1993-1-8								
YM0	YM1	YM2	YM3	YM4	YM5	YM6	YM6,ser	YM7
1	1	1.25	1.25	1.1	1	1	1	1.1

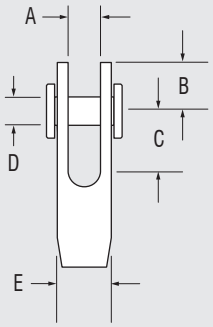
ARS6 - Component Dimensions

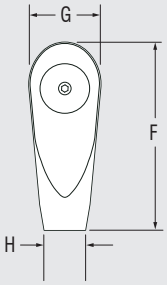
Fork Ends - Internal RH or LH Threads. Including Lock Covers.

METRIC

THREAD TYPE	A	B	C	D	E	F	G	H
	mm	mm	mm	mm	mm	mm	mm	mm
M12	14	21	25	13	24	90	32	18
M16	16	27	30	17	28	112	43	22
M20	19	33	42	21	35	132	51	29
M24	24	41	50	25	42	155	62	35
M30	30	52	59	31	52	189	79	43
M36	36	61	70	37	64	217	93	52
M42	39	69	78	43	74	243	107	60
M48	44	78	87	50	84	266	121	68
M56	49	96	105	58	95	313	145	80
M64	59	110	120	66	120	348	167	91
M76	76	131	141	78	148	420	199	108
M90	86	161	171	96	170	498	246	129
M100	91	188	198	111	181	575	287	143

Materials: Carbon steel M12 to M100, Stainless steel M12 to M64



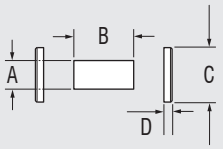


IMPERIAL

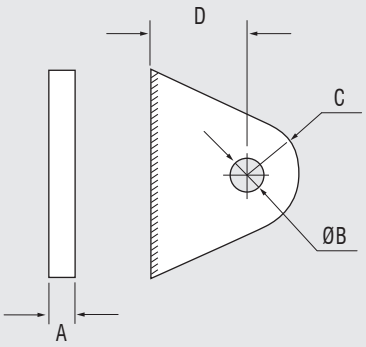
THREAD TYPE	A	B	C	D	E	F	G	H
	in.	in.	in.	in.	in.	in.	in.	in.
M12	0.55	0.83	0.99	0.51	0.95	3.55	1.26	0.71
M16	0.63	1.06	1.18	0.67	1.10	4.41	1.69	0.87
M20	0.75	1.30	1.65	0.83	1.38	5.20	2.01	1.14
M24	0.95	1.62	1.97	0.99	1.65	6.11	2.44	1.38
M30	1.18	2.05	2.32	1.22	2.05	7.45	3.11	1.69
M36	1.42	2.40	2.76	1.46	2.52	8.55	3.66	2.05
M42	1.54	2.72	3.07	1.69	2.92	9.57	4.22	2.36
M48	1.73	3.07	3.43	1.97	3.31	10.48	4.77	2.68
M56	1.93	3.78	4.14	2.29	3.74	12.33	5.71	3.15
M64	2.32	4.33	4.73	2.60	4.73	13.71	6.58	3.59
M76	2.99	5.16	5.56	3.07	5.83	16.55	7.84	4.26
M90	3.39	6.34	6.74	3.78	6.70	19.62	9.69	5.08
M100	3.59	7.41	7.80	4.37	7.13	22.66	11.31	5.63

Materials: Carbon steel M12 to M100, Stainless steel M12 to M64

Standard Pinsets and Connection Plates – Carbon Steel or Stainless Steel



Standard Pinsets



*Not to scale

Connection Plate

Standard Pinsets — METRIC

	A	B	C	D
	mm	mm	mm	mm
M12	12	24	20	3
M16	16	28	25	5
M20	20	36	32	6
M24	24	43	35	6
M30	30	53	50	10
M36	36	65	55	10
M42	42	75	60	12
M48	48	86	60	12
M56	56	96	70	12
M64	64	121	86	14
M76	76	153	100	15
M90	94	173	120	20
M100	109	183	140	20

Standard Pinsets — IMPERIAL

	A	B	C	D
	in.	in.	in.	in.
M12	0.47	0.95	0.79	0.12
M16	0.63	1.10	0.99	0.20
M20	0.79	1.42	1.26	0.24
M24	0.95	1.69	1.38	0.24
M30	1.18	2.09	1.97	0.39
M36	1.42	2.56	2.17	0.39
M42	1.65	2.96	2.36	0.47
M48	1.89	3.39	2.36	0.47
M56	2.21	3.78	2.76	0.47
M64	2.52	4.77	3.39	0.55
M76	2.99	6.03	3.94	0.59
M90	3.70	6.82	4.73	0.79
M100	4.29	7.21	5.52	0.79

(Material - carbon steel raw or galvanized or stainless steel). Custom pin sets are available on request.

Connection Plates — METRIC

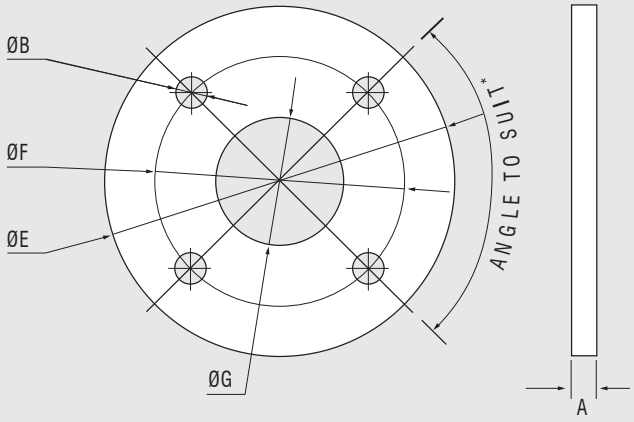
MATCHING ROD SIZE THREAD	A	B	C	D	Plate Grade
	mm	mm	mm	mm	
M12	10	13	21	32	S355
M16	12	17	27	38	S355
M20	15	21	33	52	S355
M24	20	25	41	62	S355
M30	25	31	52	74	S355
M36	30	37	61	87	S355
M42	35	43	69	97	S355
M48	40	49	78	107	S355
M56	45	57	96	125	S355
M64	55	65	110	140	S355
M76	70	78	131	161	S355
M90	80	96	161	196	S355
M100	85	111	188	222	S355

Connection Plate — IMPERIAL

MATCHING ROD SIZE THREAD	A	B	C	D	Plate Grade
	in.	in.	in.	in.	
M12	0.39	0.51	0.83	1.26	S355
M16	0.47	0.67	1.06	1.50	S355
M20	0.59	0.83	1.30	2.05	S355
M24	0.79	0.99	1.62	2.44	S355
M30	0.99	1.22	2.05	2.92	S355
M36	1.18	1.46	2.40	3.43	S355
M42	1.38	1.69	2.72	3.82	S355
M48	1.58	1.93	3.07	4.22	S355
M56	1.77	2.25	3.78	4.93	S355
M64	2.17	2.56	4.33	5.52	S355
M76	2.76	3.07	5.16	6.34	S355
M90	3.15	3.78	6.34	7.72	S355
M100	3.35	4.37	7.41	8.75	S355

All structural plate Grades to BS EN 10025 (Carbon steel) or BS EN 10088 (Stainless steel). Custom connection plates are available on request.

Centre Discs - Carbon Steel or Stainless Steel



Centre Disk

*Not to scale

METRIC

MATCHING ROD SIZE THREAD	A mm	B mm	C mm	D mm	E mm	F mm	(Optional) G mm
M12	10	13.0	21.0	32	145	110	50
M16	12	17.0	27.0	38	185	140	60
M20	15	21.0	33.0	52	245	180	70
M24	20	25.0	41.0	62	285	210	90
M30	25	31.0	52.0	74	350	260	100
M36	30	37.0	61.0	87	420	310	120
M42	35	43.0	69.0	97	490	360	140
M48	40	49.0	78.0	107	560	410	160
M56	45	57.0	96.0	125	660	480	200

IMPERIAL

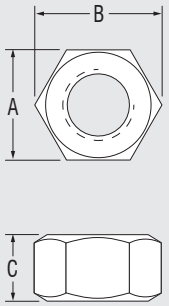
TYPE	in.	in.	in.	in.	in.	in.	in.
M12	0.394	0.512	0.827	1.260	5.709	4.331	1.969
M16	0.472	0.669	1.063	1.496	7.283	5.512	2.362
M20	0.591	0.827	1.299	2.047	9.646	7.087	2.756
M24	0.787	0.984	1.614	2.441	11.220	8.268	3.543
M30	0.984	1.220	2.047	2.913	13.780	10.236	3.937
M36	1.181	1.457	2.402	3.425	16.535	12.205	4.724
M42	1.378	1.693	2.717	3.819	19.291	14.173	5.512
M48	1.575	1.929	3.071	4.213	22.047	16.142	6.299
M56	1.772	2.244	3.780	4.921	25.984	18.898	7.874

Note:
- Centre disk designs are based on grade S355J2G3 plate to BS EN 10025 for carbon steel or BS EN 10088 for Stainless Steel.
- Local plate equivalents may be used, but must match associated ARS rod or compression strut system mechanical properties. See pages 6-7.
- Ensure adequate clearances for for paint or galvanising thickness to match fork ends.
- Suits ARS2, ARS4 and ARS6 systems. ARS1 and ARS3 systems upon request.

SS Hex Nuts - Stainless Steel. 316 to ANSI B18.6.3.

METRIC

PRODUCT No.	THREAD TYPE	THREADS PER INCH	A mm	B mm	C mm	WEIGHT g
NS-03	#10 (3/16" UNF)	32	9.5	10.7	3.1	1
NS-04	1/4" UNF	28	11.0	12.5	5.6	2
NS-05	5/16" UNF	24	12.5	14.3	6.8	4
NS-06	3/8" UNF	24	14.1	16.2	8.3	6
NS-08	1/2" UNF	20	18.8	21.5	11.0	12
NS-10	5/8" UNF	18	23.6	27.0	13.9	32
NS-12	3/4" UNF	16	27.8	32.0	16.3	50
NS-14	7/8" UNF	14	32.6	37.4	19.0	82
NS-16	1" UNF	12	37.4	42.8	21.8	126
NS-20	1 1/4" UNF	12	47.5	54.5	28.0	265
NS-22	1 3/8" UNF	12	57.0	65.0	30.5	450

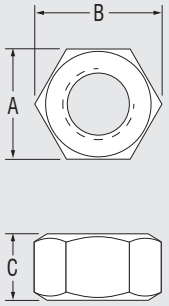


Metric thread nuts are available on request.

Hex Nuts - Chrome Plated Brass. To ANSI B18.6.3.

METRIC

PRODUCT No.	THREAD TYPE	THREADS PER INCH	A mm	B mm	C mm	WEIGHT g
NB-03*	#10 (3/16" UNF)	32	7.9	8.9	3.2	2
NB-04*	1/4" UNF	28	11.1	12.7	5.5	4
NB-05*	5/16" UNF	24	12.7	14.4	6.7	6
NB-06*	3/8" UNF	24	14.3	16.3	8.5	8
NB-08	1/2" UNF	20	19.0	21.6	11.0	18
NB-10	5/8" UNF	18	23.7	27.2	13.8	34
NB-12	3/4" UNF	16	28.3	32.3	15.8	56
NB-14	7/8" UNF	14	33.2	37.9	18.9	94
NB-16	1" UNF	12	37.8	43.2	22.0	142
NB-20	1 1/4" UNF	12	47.5	54.2	27.8	276
NB-22	1 3/8" UNF	12	57.0	65.1	30.5	478

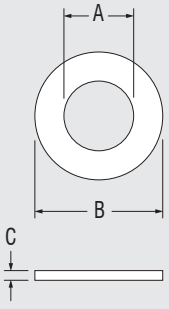


*Nickel Plated. Metric thread nuts are available on request.

SS Flat Washers - Stainless Steel 316.

METRIC

PRODUCT No.	A mm	B mm	C mm	WEIGHT g
WS-03	4.8	11.1	0.9	1
WS-04	6.4	14.3	1.2	1
WS-05	8.0	16.0	1.2	1
WS-06	9.5	19.0	1.2	2
WS-08	12.7	25.4	2.0	5
WS-10	16.0	38.0	2.0	13
WS-12	19.0	38.0	2.0	12
WS-14	22.2	50.8	3.0	23
WS-16	25.4	47.6	2.0	18
WS-20	31.8	70.0	3.0	64
WS-22	36.0	66.0	5.0	82

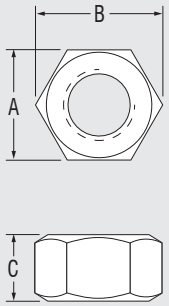


SS Nuts, Washers

SS Hex Nuts - Stainless Steel. 316 to ANSI B18.6.3.

IMPERIAL

PRODUCT No.	THREAD TYPE	TPI	A in.	B in.	C in.	WEIGHT oz
NS-03	#10 (3/16" UNF)	32	0.374	0.421	0.122	0.1
NS-04	1/4" UNF	28	0.433	0.492	0.220	0.1
NS-05	5/16" UNF	24	0.492	0.563	0.268	0.1
NS-06	3/8" UNF	24	0.555	0.638	0.327	0.2
NS-08	1/2" UNF	20	0.740	0.846	0.433	0.4
NS-10	5/8" UNF	18	0.929	1.063	0.547	1.1
NS-12	3/4" UNF	16	1.094	1.260	0.642	1.8
NS-14	7/8" UNF	14	1.283	1.472	0.748	2.9
NS-16	1" UNF	12	1.472	1.685	0.858	4.4
NS-20	1 1/4" UNF	12	1.870	2.146	1.102	9.3
NS-22	1 3/8" UNF	12	2.244	2.559	1.201	15.9

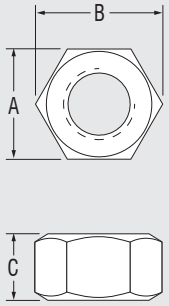


Hex Nuts - Chrome Plated Brass. To ANSI B18.6.3.

IMPERIAL

PRODUCT No.	THREAD TYPE	TPI	A in.	B in.	C in.	WEIGHT oz
NB-03*	#10 (3/16" UNF)	32	0.311	0.350	0.126	0.1
NB-04*	1/4" UNF	28	0.437	0.500	0.217	0.1
NB-05*	5/16" UNF	24	0.500	0.567	0.264	0.2
NB-06*	3/8" UNF	24	0.563	0.642	0.335	0.3
NB-08	1/2" UNF	20	0.748	0.850	0.433	0.6
NB-10	5/8" UNF	18	0.933	1.071	0.543	1.2
NB-12	3/4" UNF	16	1.114	1.272	0.622	2.0
NB-14	7/8" UNF	14	1.307	1.492	0.744	3.3
NB-16	1" UNF	12	1.488	1.701	0.866	5.0
NB-20	1 1/4" UNF	12	1.870	2.134	1.094	9.7
NB-22	1 3/8" UNF	12	2.244	2.563	1.201	16.9

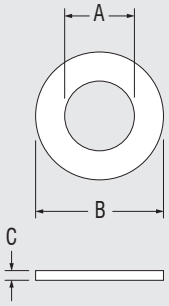
**Nickel plated*



SS Flat Washers - Stainless Steel 316.

IMPERIAL

PRODUCT No.	A in.	B in.	C in.	WEIGHT oz
WS-03	0.189	0.437	0.035	0.1
WS-04	0.252	0.563	0.047	0.1
WS-05	0.315	0.630	0.047	0.1
WS-06	0.374	0.748	0.047	0.1
WS-08	0.500	1.000	0.079	0.2
WS-10	0.630	1.496	0.079	0.5
WS-12	0.748	1.496	0.079	0.4
WS-14	0.874	2.000	0.118	0.8
WS-16	1.000	1.874	0.079	0.6
WS-20	1.252	2.756	0.118	2.3
WS-22	1.417	2.598	0.197	2.9



Stainless Steel Considerations

Stainless steel generally has good natural corrosion resistance in common uses but can still suffer degradation and discoloration if subject to certain environmental, physical conditions or lack of suitable maintenance schedule and servicing. In general, clean and smooth surfaces are preferred to rough finishes to encourage a protective oxide layer to be maintained and enable stainless steel to remain bright. Specifying the cleaning & maintenance of stainless steel surfaces by regular washing to avoid staining and dirt marks is highly recommended, especially when used in more severe environments. Natural rain can often be sufficient to remove basic contaminants but more frequent scheduled cleaning may be required when products are used in inner urban and more aggressive environments. Technical advice on appropriate cleaning techniques for specific situations is available from specialist cleaning firms. Stainless steel representative associations are another good contact to consult for the most up to date advice. Information on material grades, selection, specification, end usage and other topics is also available from these organizations.

Stainless Steel Specialist Websites of Interest

Australian Stainless steel development association	***www.assda.asu.au***	Specialty steel industry of North America	***www.ssina.com***
British stainless steel association	***www.bssa.org.uk***	European stainless steel development association	***www.euro-inox.org***

Care & Use of Threaded Products

Ronstan produces and supplies many threaded items. All are made to the relevant thread standard, gauging processes and supplied under ISO9001 quality assurance system.

Stainless steel is a material which when used in male / female threaded elements and loaded with an applied torque can “Gall” or “cold weld”. This occurs when the stainless steel oxide surface film breaks down as a result of direct metal to metal contact. Solid-phase welding takes place (whereby material is transferred from one surface to another via contact pick-up). The symptoms of galling include thread surface damage and permanent seizure of the thread. Galling can be minimized with the use of dissimilar metals. Ronstan generally supplies SS threaded items
pre-assembled to ensure thread performance. Other Ronstan products uses brass alloys on turnbuckle ranges and use of brass nuts for the load carrying nuts as used in cable systems.
If using stainless steel male / female threaded systems, use of high pressure lubrication compound is required to help reduce the possibility of thread seizure. Care using these lubricated products is required to ensure threads stay clean during installation / service. Suitable clean up of lubricants after installation is required to avoid staining and grime build up.

Protection of threads during transport & in preparation for installation must be done to avoid any thread damage. Keeping threads wrapped until final installation is recommended. Threads must be clean of burrs, dirt, coarse grime or sand to help reduce the possibility of thread seizure and ensure the correct functionality of the product. Use of a secondary tensioning system for pre-stressing tension members on-site may be required to achieve the desired tension forces and avoid thread or product damage.

Contact your local Ronstan representative for any further assistance on these topics.

Quality Assurance

Ronstan holds full accreditation to ISO9001. Ronstan is committed to the design, manufacture, supply and installation of high, quality cable, rod and tensile architectural projects worldwide.

Environment and Sustainability

Ronstan is committed to reducing its impact on the environment through staff awareness and education, the use of responsible metal, paper, plastic and chemical recycling practices, water catchment-recycling for use within production processes, the use of energy efficient technologies which create advantages for the business and the environment. These initiatives are undertaken in conjunction with on-going government environmental programmes and other like-minded “Green” manufacturering and supply partners.

CUSTOMER CONSIDERATIONS

Factor of Safety

An appropriate factor of safety(>2) should be applied to Breaking Load (B.L.) figures to suit each application before choosing or specifying a particular product. For many industrial and safety related applications, a factor of safety should be used or may be required by law or other regulations. It is the customer’s responsibility to ensure that an appropriate factor of safety is used, and it should allow for safety implications, service life, fatigue (as may be caused by wind stresses or repetitive cyclical loading), type of load, exposure to ultraviolet light, corrosion and stress corrosion (such as in high humidity or chlorine environments). Note that a ‘safe working load’ is not specified as this is dependent on the factor of safety, which must be determined by the user relative to each application.

Useful Life

The useful life of any product is determined by the above factors and must be assessed in each application, and thus no guarantee can be provided for product life, load capacity or any other factor due to the variability in usage. In some jurisdictions government regulations require the replacement of rigging components within certain periods of time, usually every three to five years. You must ascertain whether any such regulations affect you. While every precaution is taken in the product design and manufacturing processes to minimise the effects of corrosion and stress corrosion, there are also preventative as well as corrective treatments that can be carried out after installation. Contact Ronstan for further information.

Product Information Amendments

All catalogue information is subject to specification changes during a product’s life-cycle. Any alterations will be posted on the Websites: www.RonstanTensileArch.com or www.RonstanRigging.com which should be considered the most up to date source of product information.

DEFINITIONS

Yield Load

Yield Load is the maximum static and/or dynamic load at which the product will still function without distortion, wear or permanent deformation of components. Above this load moving parts may seize and stainless steel components may begin to bend, stretch or otherwise deform. Yield loads should never be exceeded in use.

Ultimate Load (ULT)

Ultimate Load (ULT) is the load at, or around which, a major failure can be expected to occur to some part of the product’s structure when new.

The Yield and Ultimate loads detailed in the catalogue should only be considered in the context of the project application. Final product selection is the sole responsibility of the user and/or their consultants.

WARRANTY

In addition to your rights implied by law, the goods manufactured or sold are warranted to be free of defects in materials or workmanship for three (3) years from the date of purchase by the original purchaser except that:

- This warranty shall not apply to any product which has been improperly fitted, improperly maintained, or used in any application for which it was not intended.
- This warranty shall not apply to normal wear which can reasonably be expected in normal use of the product.
- No warranties are made that any products are fit for a particular purpose.
- The liability shall be limited to the repair or replacement, at the manufacturer's discretion, of the defective goods.
- The useful life of any rigging product is determined by the above factors and must be assessed in each application, and thus no guarantee can be provided for product life, load capacity or any other factor due to the variability in usage.

www.RonstanTensile Arch.com

Ronstan Tensile Architecture also specialises in providing architectural products for:

- Structural Cable applications
- Cable Nets
- Balustrade Cables
- Greening Cables
- Facade Cables

Contact us for catalogues or further information

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