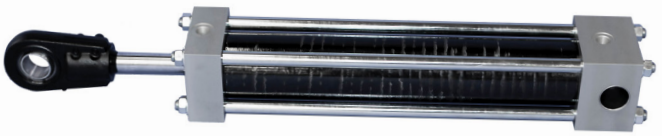

Lightraulics® Composite Hydraulic Cylinders

For working pressures up to 700 bar

Parker

ENGINEERING YOUR SUCCESS.

WARNING – USER RESPONSIBILITY

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker-Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.

The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.

To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

Offer of Sale

Please contact your Parker representation for a detailed 'Offer of Sale'.

Why Composite Lightraulics®? A

Lightraulics® Standard Cylinders B

Overview Lightraulics® Standard Cylinders 8
Lightraulics® C-Series Cylinders 10
Lightraulics® T-Series Cylinders 14
Lightraulics® A- / S-Series Cylinders 18
Spare Parts & Service 19
Order Code 21
Additional Features 22

Lightraulics® Heavy Duty Cylinders C

Overview Lightraulics® Heavy Duty Cylinders 24
Lightraulics® Heavy Duty Roundline Cylinders 26
Lightraulics® Heavy Duty Tie Rod Cylinders 30
Spare Parts & Accessories 34
Order Code & Service 35

Lightraulics® Hollow Piston Cylinders D

Overview Lightraulics® Hollow Piston Cylinders 36
Lightraulics® Hollow Piston Roundline Cylinders 38
Lightraulics® Hollow Piston Tie Rod Cylinders 44
Spare Parts & Accessories 52
Order Code & Service 53

Lightraulics® Yachting Cylinders E

Overview Lightraulics® Yachting Cylinders 54

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Stuhr, Germany

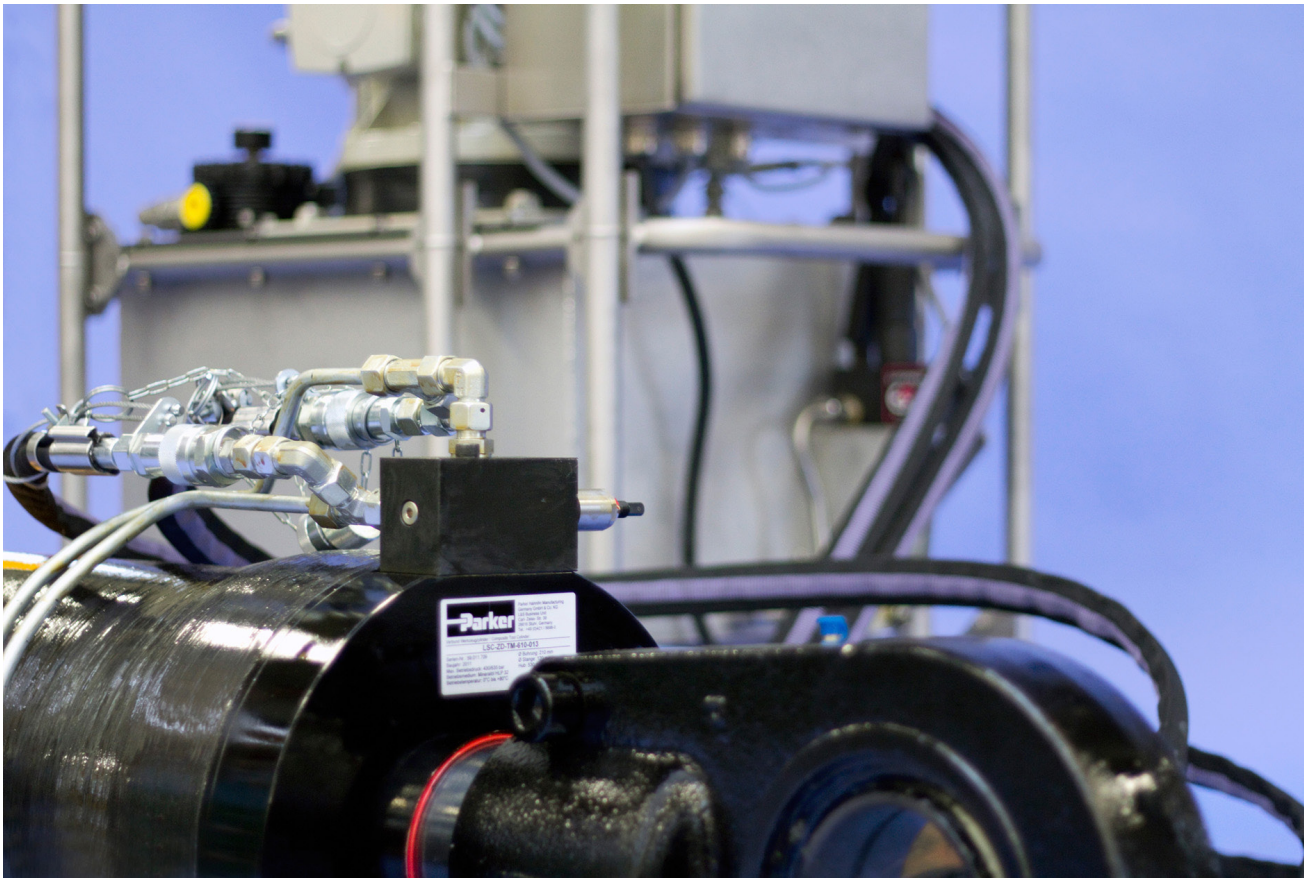
Composite Hydraulics From Parker Technology You Can Trust

High pressure hydraulic products require high strength structural components. Traditionally, high strength steels have been used for typical mobile and industrial applications, while more expensive lower density alloys were used where reduced weight was critical. The introduction of carbon fibre composite materials opened up new possibilities for the design of lightweight, high strength components.

Conventional composite designs use the composite material as a reinforcement to lighten steel components. The Parker Lightraulics® series include the classical composite design as well as high-end technologies with pure composite cylinder barrels for further weight benefits.

With longstanding experience in the development of composite materials, Parker is engineering hydraulic lightweight cylinders for a wide range of applications since 1996. The Lightraulics® products offer significant weight savings combined with exceptional burst and fatigue strengths. Tested over thousands of cycles, the standard cylinder ranges are designed for operating pressures up to either 380 bar or 700 bar.

In addition to various standard series, custom designs are available to order with working pressures up to 700 bar.



The Composite Advantage

- **High strength and stiffness at low weight**
  The strength to weight ratio of Parker's composite material is typically twice that of steel.
- **Superior fatigue life**
  Parker's composite products offer superior fatigue performance to that of lightweight alloys such as titanium, aluminium and magnesium.
- **High corrosion resistance**
  Carbon, glass and aramid fibre as well as the resin material do not corrode. This leads to a long product life associated with time and cost savings on maintenance.

Typical characteristics of cylinder barrel materials

Characteristics	Parker Composite	Aluminium Alloys	Standard Steels
Density (g/cm³)	1.6	2.8	7.85
Tensile strength (MPa)	> 1000	max. 500	max. 550
Fatigue performance	***	*	**
Corrosion resistance	***	**	*

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Higher Performance

Composite hydraulic cylinders deliver weight savings of up to 60%, saving energy and increasing productivity

Lighter, stronger, faster, greener …

Weight savings of up to 60%

- Cutting fuel/electricity consumption reduces operating costs and raises efficiency
- Cutting axle load saves energy and permits greater payloads
- Allows additional features where total weight is limited
- Portability of hydraulic tools for mobile operations

Image courtesy of Marum, University Bremen

Non-magnetic

- Suitable for applications sensitive to magnetic fields

Superior corrosion resistance

- Lightraulics® composite products deliver high performance in the toughest conditions and cut maintenance time and cost

Durable & longlife products

- High fatigue performance
- Greater number of cycles at high pressure levels
- Reduced maintenance

Faster acceleration

- Reduced energy demand
- Shorter cycle times improve productivity

© Vincent Curutchet / DPPI / Macif

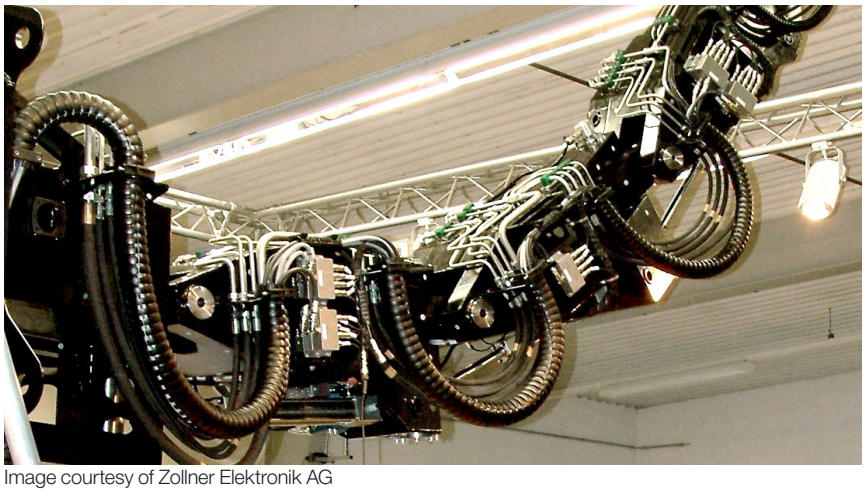

Image courtesy of Zollner Elektronik AG

Reduced vibration

- Excellent damping properties improve performance where vibration is undesirable

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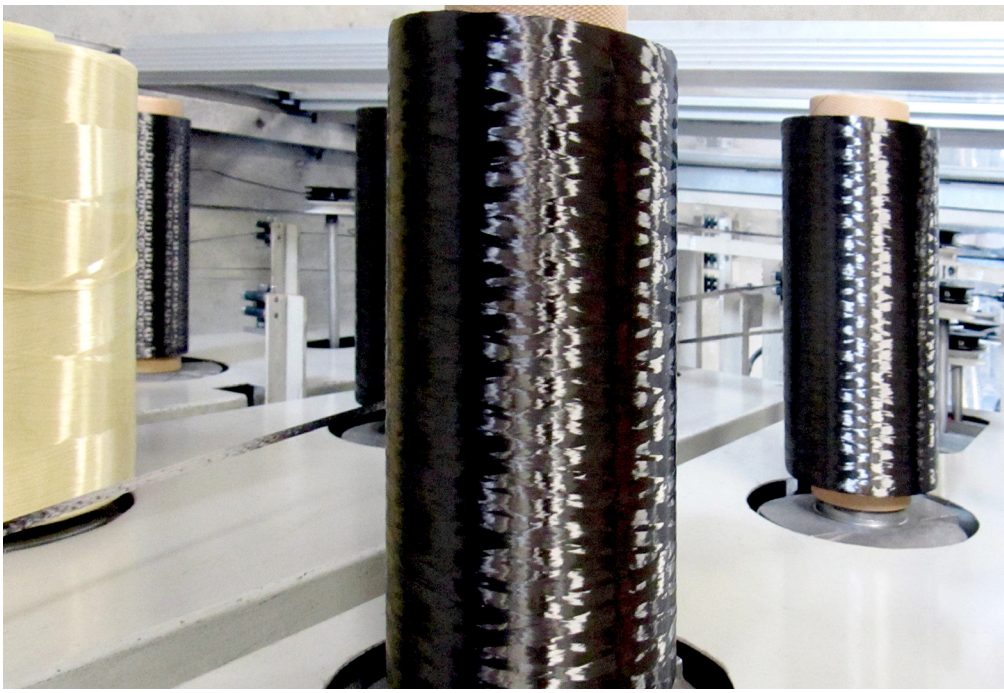
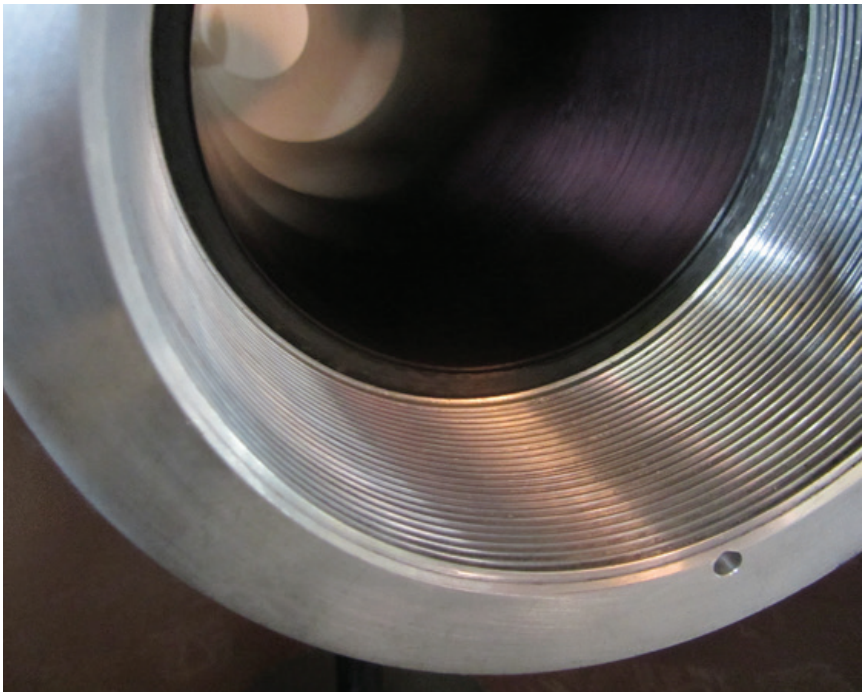
Outstanding And Proven Technology

Design, simulation and product testing of high-end performance products

Longstanding expertise in composite processing

- Carbon fibre, glass fibre, aramid fibre, epoxy resins
- Filament winding, prepreg winding
- Analytical & numerical calculation methods for anisotropic materials
- Purpose-built test equipment
- Continous research & development





◄ Leading edge technology

Parker's advanced composite products and technology are the result of an enduring commitment to research and development. Continuous investment in state-of-the-art production and testing technologies guarantees manufacturing capacity and ensures consistent product performance.

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Lightraulics® Standard Cylinders

Lightraulics® patented composite technologies enable Parker to offer ultra-lightweight high performance hydraulic products. Parker composite products use specially selected fibre reinforced polymer systems, allowing the customisation of the material properties through different combinations of fibres and matrix material.

Lightraulics® C-Series Cylinders

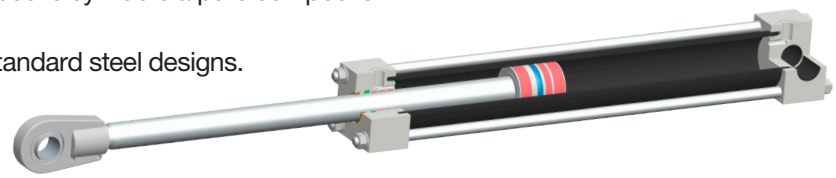
Parker's Lightraulics® C-Series composite cylinders use a pure composite cylinder barrel.

Weight saving up to 60% compared to standard steel designs.

Lightraulics® T-Series Cylinders

With Parker's Lightraulics® T-Series composite cylinders a pure composite barrel is combined with tie rods.

Weight saving up to 50% compared to standard steel designs.



Lightraulics® S- / A-Series Cylinders

The Lightraulics® A- and S-Series contain a thin-walled metal liner with a fibre reinforced composite overwrap.

Weight saving up to 45% compared to standard steel designs.

How to choose the best design for your application

Properties	Standard Steel Comparison	C-Series ► p. 10	T-Series ► p. 14	A-Series ► p. 18	S-Series ► p. 18
Weight saving	–	***	**	**	*
Outer dimensions	approx. 1.2 x bore Ø	approx. 1.4 x bore Ø	approx. 1.25 x bore Ø	approx. 1.2[1)] x bore Ø	approx. 1.3[1)] x bore Ø
Max. operating pressure	380 bar	380 bar	380 bar	700 bar	700 bar

1) Comparison value for 380 bar max. operating pressure, diameter might increase for higher operating pressures

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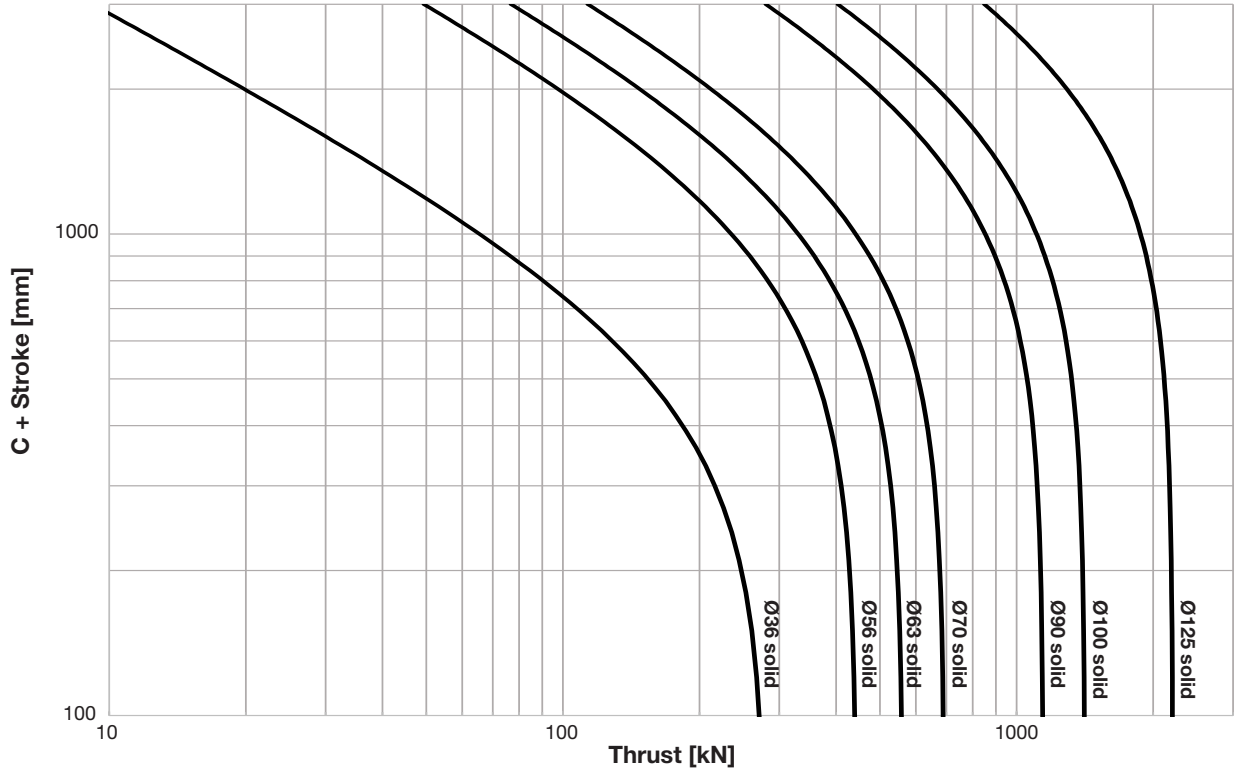
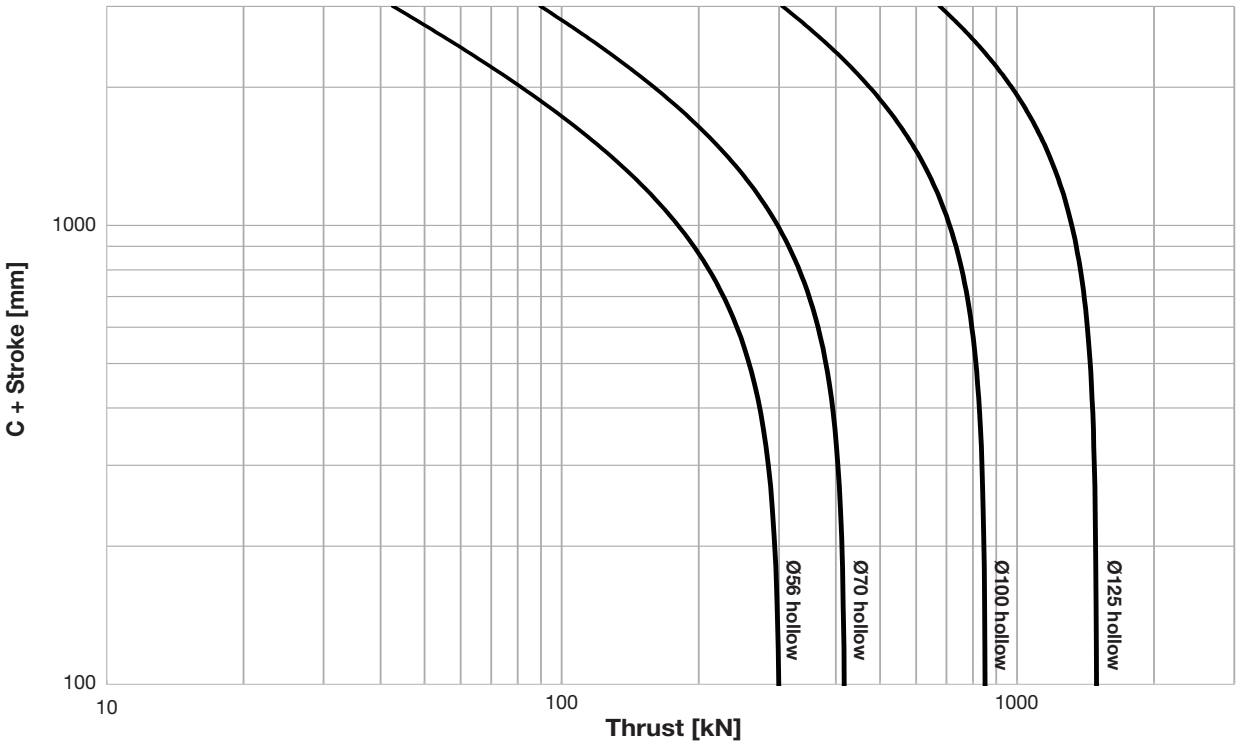
Piston Rod Selection Charts

To help you to specify the cylinder that fits best to your application, please use the selection charts below for solid and hollow piston rods. The diagrams are applicable to all Lightraulics® Standard Cylinder designs. For possible combinations of bore diameters and mentioned rod diameters, overall cylinder dimensions and performance please see page 12 - 13 respectively page 16 - 17.

Selection Chart for Solid Piston Rods



Selection Chart for Hollow Piston Rods



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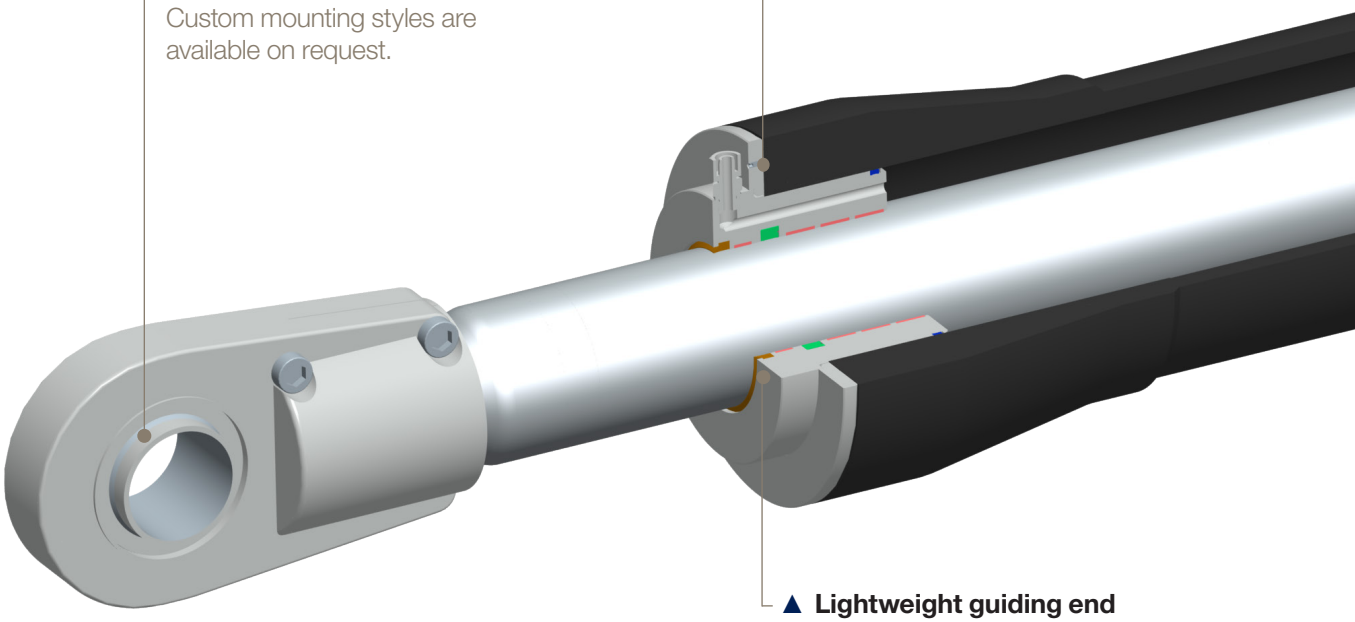
Lightraulics® C-Series Cylinders

Parker's Lightraulics® C-Series composite cylinders use a pure composite cylinder barrel to deliver weight savings up to 60% compared to standard steel designs.

Unique construction
In conventional composite designs (cf. A- / S-Series), a metal liner carries the axial and hoop loads, and also functions as a diffusion barrier for sealing. In such designs, the composite overwrap can only support hoop loads, but the metal liner must still carry the axial loads. Parker's Lightraulics® weight saving composite inner liner makes metal liners obsolete and maximises the use of composites' outstanding properties.

▼ Cylinder head
Parker's patented design creates a permanent, durable connection between the composite barrel and the aluminium base and guiding end caps.
The structural integrity of this connection has been proven at pressures in excess of 3 times rated working pressure.

▼ Spherical bearings
Standard cylinders feature spherical bearings with an optimised degree of freedom at both mounting points, permitting a smooth distribution of forces.
Custom mounting styles are available on request.



▲ Lightweight guiding end cap and seals
The cartridge-type rod gland is threaded into the cylinder head, permitting quick, easy servicing of rod seals, cutting downtime and ensuring high productivity.
Both gland and head are machined from high grade aluminium alloy and surface treated to resist corrosion, to deliver high performance under hostile conditions.

Parker Hannifin Corporation
Composite Technologies Europe CTE
Stuhr, Germany

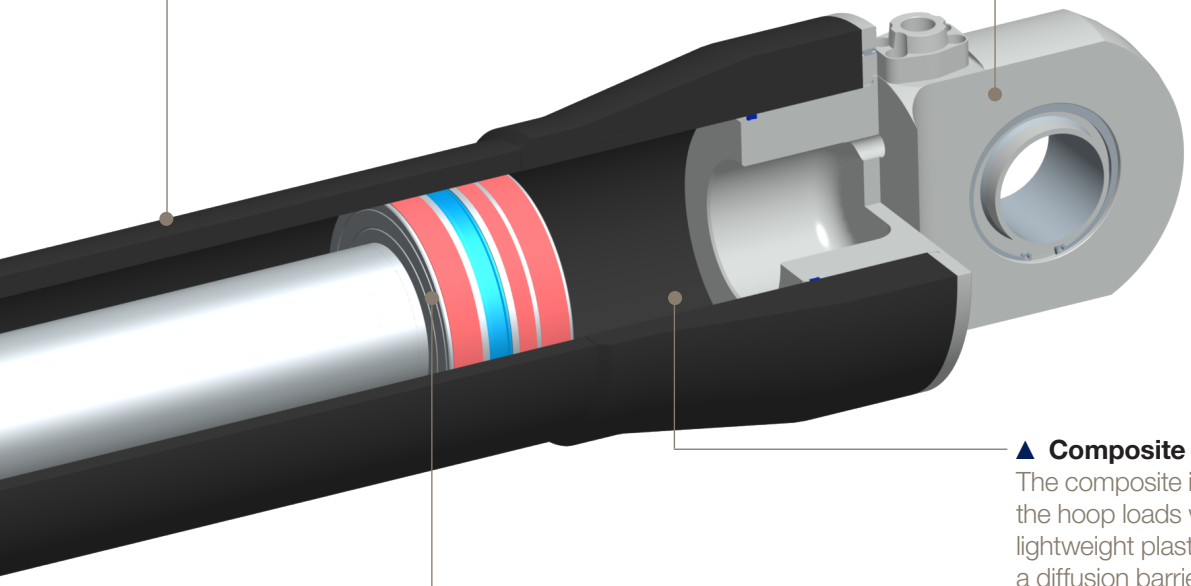
B

▼ Lightweight base end cap

The one-piece cylinder base end cap is machined from high grade aluminium alloy for superior fatigue performance under high working loads. All aluminium parts are surface treated to resist corrosion, even in aggressive environments.

▼ Composite outer barrel

The unique pure composite lightweight design carries the axial loads and obsoletes any metal barrels, liners or tie rods.



▲ Composite inner liner

The composite inner liner carries the hoop loads while its integrated lightweight plastic layer acts as a diffusion barrier. The high inner surface finish significantly reduces seal wear, ensuring a long and productive service life.

▲ Lightweight piston and rod

The low inertia aluminium piston permits rapid cycle times. Wide bearing rings provide stability and resist wear, ensuring long life and high productivity. For larger piston rod diameters, a hollowed out rod design can be choosen to minimise the moving mass.

Patented joint technology

One of the greatest challenges when working with composites and metal in high pressure hydraulic applications is to create a strong joint between the two materials. A glued joint will not withstand the high operating pressures, while bolted solutions would damage the structural integrity of the composite material.
Parker has developed a patented mechanical connection which overcomes these limitations, combining exceptional weight savings with proven high pressure, high cycling performance.

Parker Hannifin Corporation
Composite Technologies Europe CTE
Stuhr, Germany

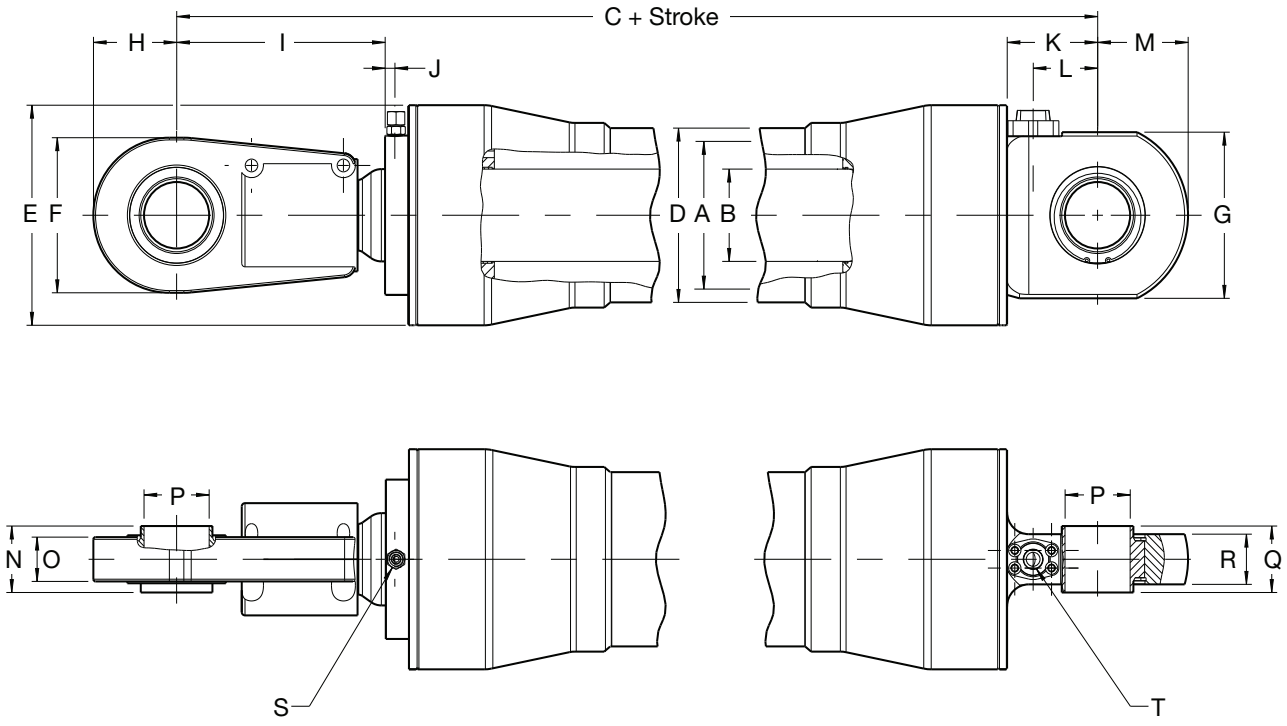
Lightraulics® C-Series Composite Cylinders

Product Specifications

Working pressure	380 bar (5500 psi)
Test pressure	570 bar (8250 psi)
Stroke length	up to 3000 mm
Rated fatigue life	250,000 cycles at 380 bar, tested for 500,000 cycles at 380 bar
Maximum piston speed	0.3 m/s
Barrel material	carbon fibre reinforced composite
Piston material	aluminium
Piston rod material	hard chrome plated steel
Mountings	spherical bearings, other mounting styles available to order
Sealing system	
– piston seal	thermoplastic polyester elastomer
– rod seal	polyurethane lip type
– wiper seal	polyester-based
– O-rings	polyurethane (PU)
Temperature range	-20 °C to +80 °C
Fluid medium	mineral hydraulic oil

For customised specifications, please contact lightraulics@parker.com with details of your application.

Specifying Your Cylinder



Dimensions

A Bore Ø	B Rod Ø	C	D Ø	E Ø	F	G	H	I	J	K	L	M	N	O	P Ø	Q	R	S (BSPP)	T (BSPP)
80	36	481	97	118	94	102	50	120	12	85	55.5	65	40	33	40	40	36	G1/4	G3/8
100	36 56	579 571	123	144	116	120	63	161 157	13.5	90	60.5	80	50	36	50	50	40	G3/8 G1/4	G3/8 G3/8
125	56 70	643 645	150	176	130	147	70	188 189	13.5	110	80.5	95	60	46	60	60	52	G3/8 G1/4	G1/2 G1/2
160	63 100	777 757	190	221	176	184	95	251 266	13.5	115	85.5	115	80	55	80	80	63	G3/8 G3/8	G1/2 G1/2
180	90 125	830 801	213	248	210	203	115	273.5 283.5	16	125	89	125	90	60	90	90	68	G1/2 G3/8	G3/4 G3/4
200	125	791	236	275	210	225	115	288	13.5	125	89	125	90	60	90	90	68	G3/8	G3/4

Performance

A Bore Ø	B Rod Ø	Rod type	Max. allowed force (kN)		Minimum stroke	Weight at minimum stroke[2] (kg)	Additional weight per 100 mm stroke (kg)
			Compression[1]	Tension			
80	36	solid	191	152	200	15.2	1.2
100	36	solid	267	260	200	23	1.7
	56	solid	298	205		29.5	2.4
	56	hollow	298	205		26	1.8
125	56	solid	437	373	250	44.9	2.7
	70	solid	466	320		50.2	3.8
	70	hollow	416	320		44.5	2.6
160	63	solid	555	555	300	90	3.8
	100	solid	764	466		99.3	7.1
	100	hollow	764	466		86	4.6
180	90	solid	967	725	300	133	6.6
	125	solid	967	501		146.5	10.0
	125	hollow	967	501		130.2	6.9
200	125	solid	1194	727	400	176.6	11.6
	125	hollow	1194	727		156.1	8.3

All dimensions are in millimeters unless otherwise stated. In line with our policy of continuous product improvement, specifications in this catalogue are subject to change without notice. Please enquire for exact dimensions when placing order.
Please use the order code on page 21 to enquire for a Lightraulics® C-Series Cylinder.

1) For maximum allowed compression force, the piston rod selection charts on page 9 need to be considered in addition to the data given in the performance table above.
2) Further weight reduction possible by usage of customised rod eyes.

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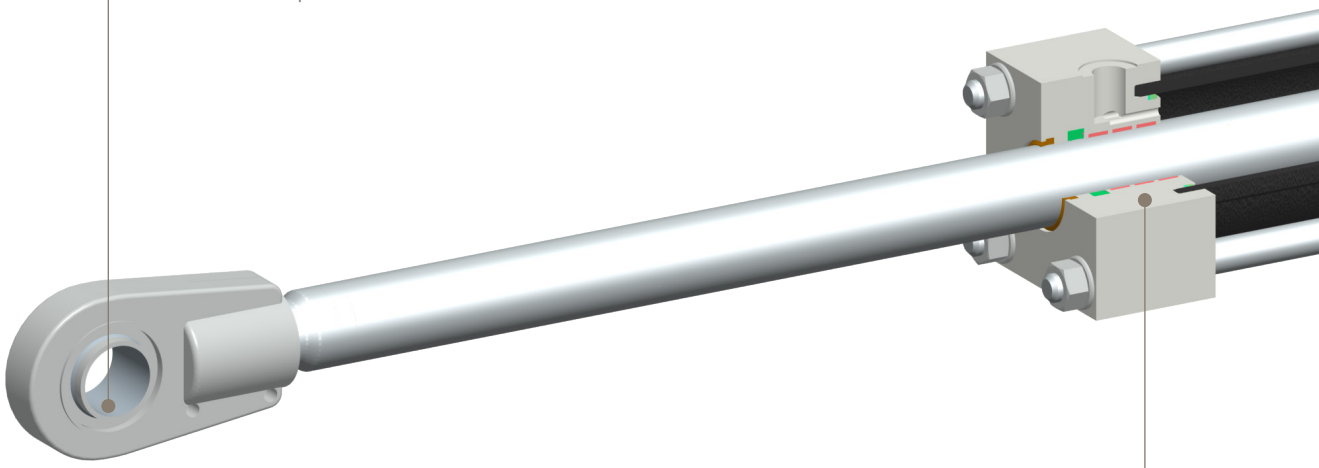
Composite Technologies Europe CTE
Stuhr, Germany

Lightraulics® T-Series Cylinders

With Parker's Lightraulics® T-Series composite cylinders a pure composite barrel is combined with tie rods, resulting in weight savings up to 50% compared to standard steel designs.

Optimised tie rod lightweight solution
As well as the C-Series, the T-Series composite cylinders are equipped with a fully composite barrel to maximise the product's weight saving potential. Parker's Lightraulics® composite barrel acts as a diffusion barrier for sealing and carries the hoop loads, unlike in conventional composite designs, where a metal liner is needed to fulfill these functions.

▼ Spherical bearing
Standard cylinders feature a spherical bearing at the piston rod. Custom mounting styles are available on request.



Lightweight guiding end ▲ cap and seals
The cylinder gland is machined from high grade aluminium alloy and surface treated to resist corrosion, to deliver high performance under hostile conditions.

Parker Hannifin Corporation
Composite Technologies Europe CTE
Stuhr, Germany

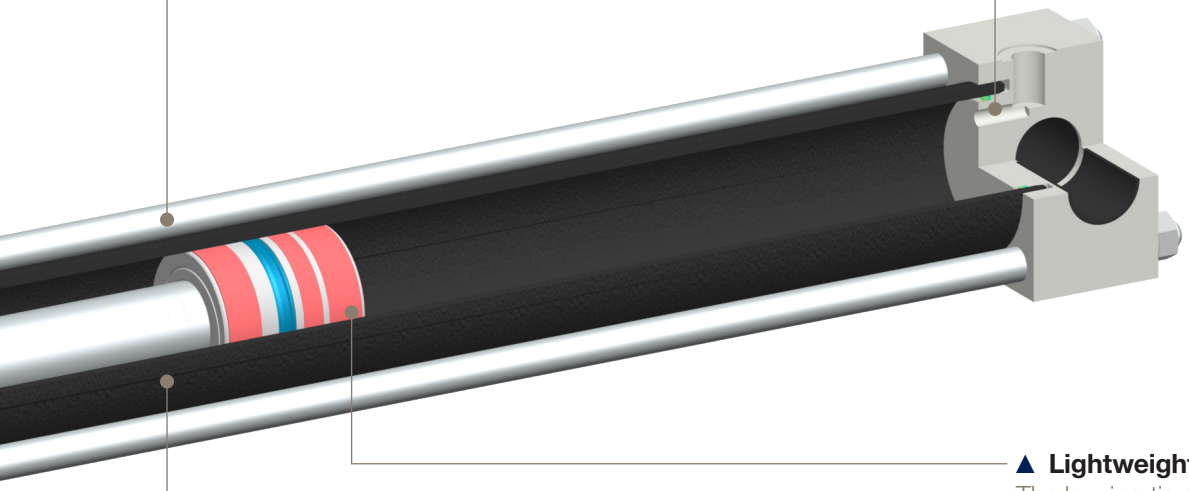
B

▼ Lightweight base end cap

The one-piece cylinder cap is machined from high grade aluminium alloy for superior fatigue performance under high working loads. All aluminium parts are surface treated to resist corrosion, even in aggressive environments.
Standard cylinders feature pivot bearings at the base end cap.

▼ Tie rods

The T-Series lighweight cylinders are equipped with surface treated steel tie rods to carry the axial loads.



▲ Lightweight piston and rod

The low inertia aluminium piston permits rapid cycle times. Wide bearing rings provide stability and resist wear, ensuring long life and high productivity. For larger piston rod diameters, a hollowed out rod design can be choosen to mini-mise the moving mass.

▲ Composite barrel

The lightweight pure composite barrel acts as a diffusion barrier and carries the hoop loads.
The high inner surface finish significantly reduces seal wear, ensuring a long and productive service life.

Parker Hannifin Corporation
Composite Technologies Europe CTE
Stuhr, Germany

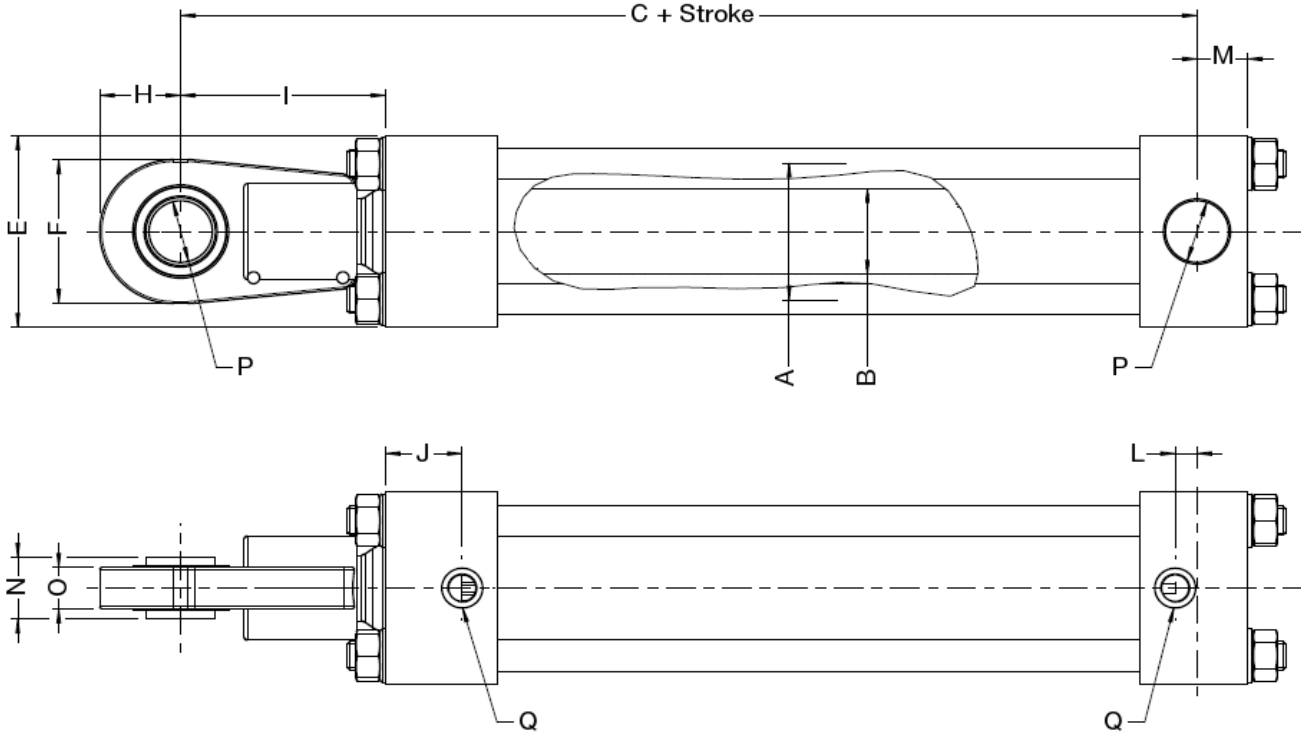
Lightraulics® T-Series Composite Cylinders

Product Specifications

Working pressure	380 bar (5500 psi)
Test pressure	570 bar (8250 psi)
Stroke length	standard – up to 3000 mm
Rated fatigue life	250,000 cycles at 380 bar, tested for 500,000 cycles at 380 bar
Maximum piston speed	0.3 m/s
Barrel material	carbon fibre reinforced composite
Piston material	aluminium
Piston rod material	hard chrome plated steel
Tie rod material	galvanised steel
Mountings	spherical bearings on piston rod, pivot bearing on base end cap, other mounting styles available to order
Sealing system	
– piston seal	thermoplastic polyester elastomer
– rod seal	polyurethane lip type
– wiper seal	polyester-based
– O-rings	polyurethane (PU)
Temperature range	-20 °C to +80 °C
Fluid medium	mineral hydraulic oil

For customised specifications, please contact lightraulics@parker.com with details of your application.

Specifying Your Cylinder



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B

Dimensions

A Bore Ø	B Rod Ø	C	E Ø	F	H	I	J	L	M	N	O	P Ø	Q (BSPP)
80	36	362	120	94	50	120	25	9	43	40	33	40	G3/4
100	36 56	451 448	147	116	63	161 157	25 53	15	57	50	36	50	G3/4
125	56 70	493 501	176	130	70	188 189	45 64	16	65	60	46	60	G1
160	63 100	620 576	219	176	95	251 266	62 94	29	93	80	55	80	G1
180	90 125	663 646	248	210	115	273.5 283.5	84 113	35	107	90	60	90	G1
200	125	644	280	210	115	288	109	31	103	90	60	90	G1 1/4

Performance

A Bore Ø	B Rod Ø	Rod type	Max. allowed force (kN)		Minimum stroke	Weight at minimum stroke[2] (kg)	Additional weight per 100 mm stroke (kg)
			Compression[1]	Tension			
80	36	solid	191	152	200	17	2
100	36	solid	267	260	200	27	2.7
	56	solid	298	205		33	3.8
	56	hollow	298	205		30	3.2
125	56	solid	437	373	250	51	4.7
	70	solid	466	320		58	5.8
	70	hollow	416	320		53	4.6
160	63	solid	555	646	300	99	6.3
	100	solid	764	466		118	10.0
	100	hollow	764	466		104	7.5
180	90	solid	967	725	300	153	10.0
	125	solid	967	501		178	14.6
	125	hollow	967	501		161	11.5
200	125	solid	1194	727	400	222	16.0
	125	hollow	1194	727		201	12.7

All dimensions are in millimetres unless otherwise stated. In line with our policy of continuos product improvement, specifications in this catalogue are subject to change without notice. Please enquire for exact dimensions when placing order.
Please use the order code on page 21 to enquire for a Lightraulics® T-Series Cylinder.

1) For maximum allowed compression force, the buckling diagrams on page 9 need to be considered in addition to the data given in the performance table above.
2) Further weight reduction possible by usage of customised rod eyes.

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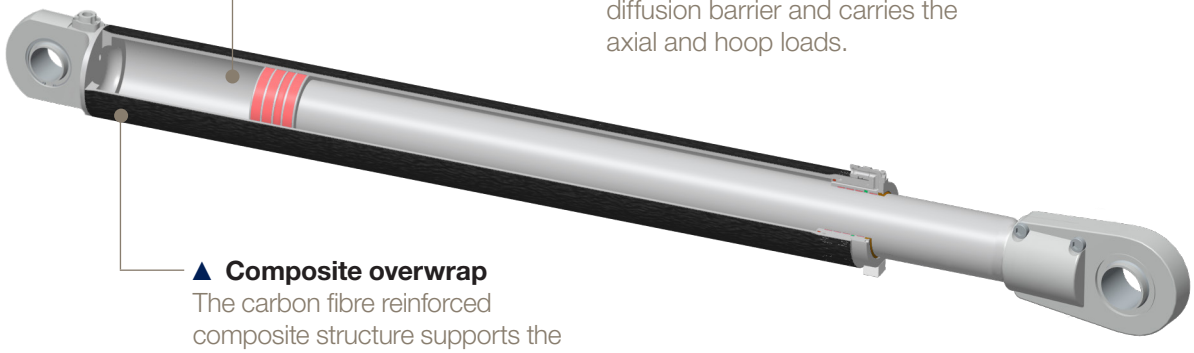
Composite Technologies Europe CTE
Stuhr, Germany

Lightraulics® A- / S-Series

The Lightraulics® A- and S-Series contain a thin-walled metal liner with a fibre reinforced composite overwrap, delivering weight savings of up to 45% compared to standard steel designs.



▼ Metal liner
A thin-walled aluminium (A-Series) or steel (S-Series) liner acts as a diffusion barrier and carries the axial and hoop loads.

▲ Composite overwrap
The carbon fibre reinforced composite structure supports the metal liner with carrying the hoop loads.

Product specifications

Working pressure	up to 700 bar (10150 psi)
Piston diameter	up to 250 mm
Stroke length	up to 3000 mm
Barrel material	thinwalled aluminium (A-Series) or steel (S-Series) with fibre reinforced composite overwrap
Piston material	aluminium
Piston rod material	hard chrome plated steel
Temperature range	-20 °C to +80 °C
Fluid medium	mineral hydraulic oil

Lightraulics® A-Series and S-Series cylinders will be designed especially for your application. Please contact lightraulics@parker.com with your specifications.

▲ Product example

A-Series	
Working pressure	700 bar
Piston diameter	210 mm
Stroke	550 mm
Maximum force	1480 kN
Weight	248 kg

Parker Hannifin Corporation
Composite Technologies Europe CTE
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B

Overhaul Service

Maintaining peak performance

Parker's unique composite cylinder technology delivers continuous high performance over hundreds of thousands of cycles.

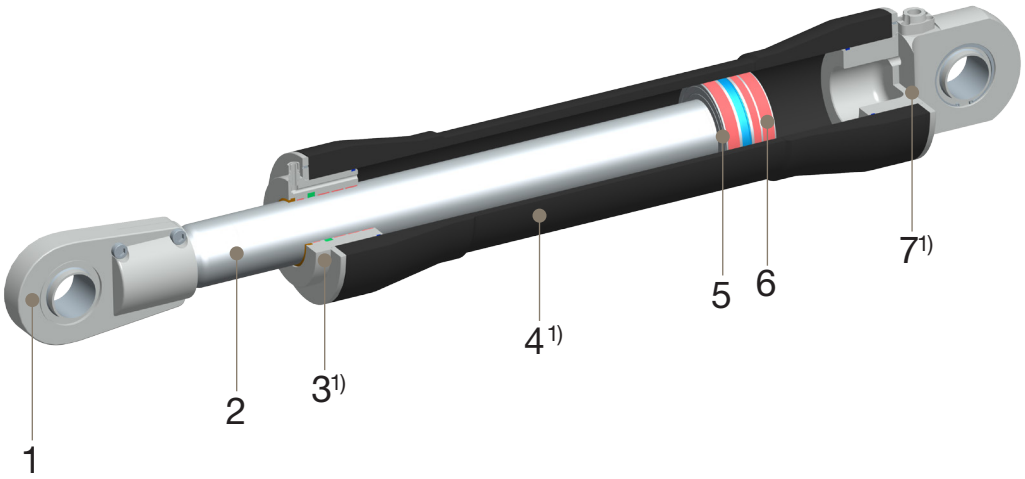
To maintain the performance and to protect your investment, we offer a maintenance and overhaul service in our factory, to the same exacting standards as the original manufacturing process. Factory refurbished cylinders are covered by the same warranty terms as the original product.

Spare Parts

For all Lightraulics® cylinders, spare parts are available. To keep the warranty in effect, we recommend to send your cylinder to our factory for any maintenance work.

Spare Parts for Lightraulics® C-Series Cylinders

If you like to enquire for a spare part for your Lightraulics® C-Series Cylinder, please provide your cylinder serial number together with the type of spare part referring to the list below.



Product Type

1 - Rod Eye incl. Bearing
2 - Piston Rod
3 - Guiding End Cap
4 - Composite Cylinder Barrel
5 - Piston
6 - Seal Kit
7 - Base End Cap

1) Allignment of the hydraulic ports can only be guarantied, when guiding and base end cap are ordered together with the composite cylinder barrel.

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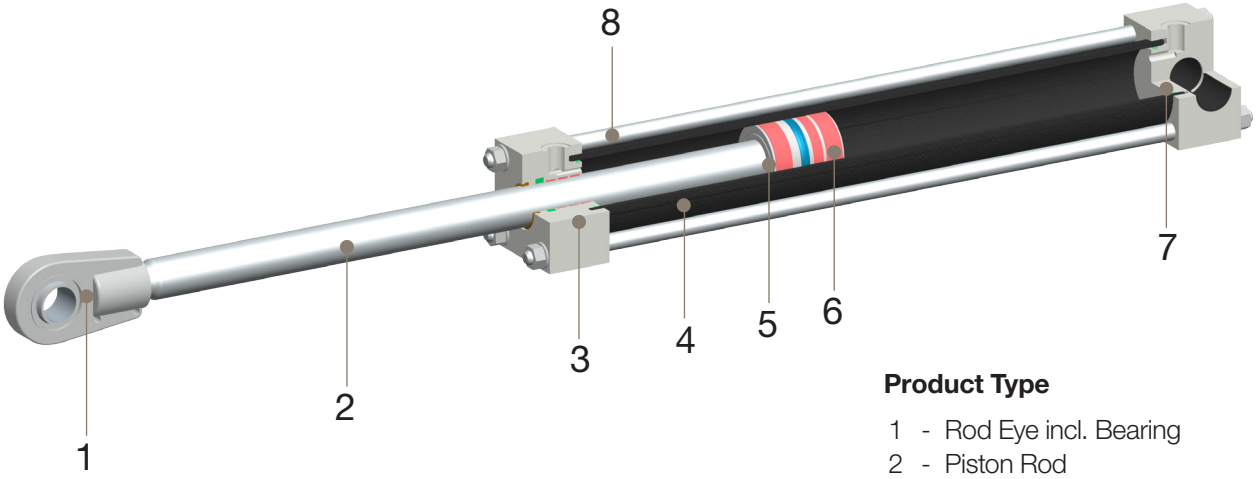
Spare Parts for Lightraulics® T-Series Cylinders

If you like to enquire for a spare part for your Lightraulics® T-Series Cylinder, please please provide your cylinder serial number together with the type of spare part referring to the list below.

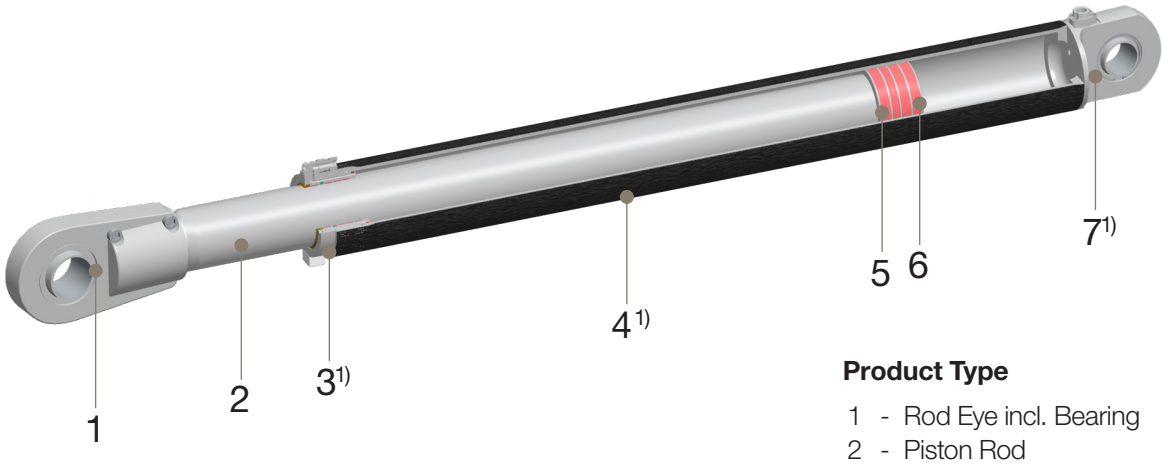


Product Type

1 - Rod Eye incl. Bearing
2 - Piston Rod
3 - Guiding End Cap
4 - Composite Cylinder Barrel
5 - Piston
6 - Seal Kit
7 - Base End Cap
8 - Tie Rod

Spare Parts for Lightraulics® A- / S-Series Cylinders

If you like to enquire for a spare part for your Lightraulics® A- / S-Series Cylinder, please provide your cylinder serial number together with the type of spare part referring to the list below.



Product Type

1 - Rod Eye incl. Bearing
2 - Piston Rod
3 - Guiding End Cap
4 - Composite Cylinder Barrel
5 - Piston
6 - Seal Kit
7 - Base End Cap

1) Allignment of the hydraulic ports can only be guarantied, when guiding and base end cap are ordered together with the composite cylinder barrel.

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Order Code Lightraulics® Standard Cylinders

B

Please use the following order code to enquire for your Lightraulics® C-, T-, A- or S-Series Cylinder.

L	C			380	D											00

Cylinder Type	
L	Lightraulics®

Product Type	
C	Cylinder

Operating Pressure in bar	
380	380 bar

Rod Type	
H	Hollow
S	Solid

Series Type	
C	C-Series
T	T-Series
A	A-Series
S	S-Series

Piston Ø in mm	
080	80 mm
100	100 mm
125	125 mm
160	160 mm
180	180 mm
200	200 mm

Operation	
D	Double acting

Rod Ø in mm	
036	36 mm
056	56 mm
063	63 mm
070	70 mm
090	90 mm
100	100 mm
125	125 mm

For possible piston / rod combinations please see p. 13 (C-Series) or p. 17 (T-Series).

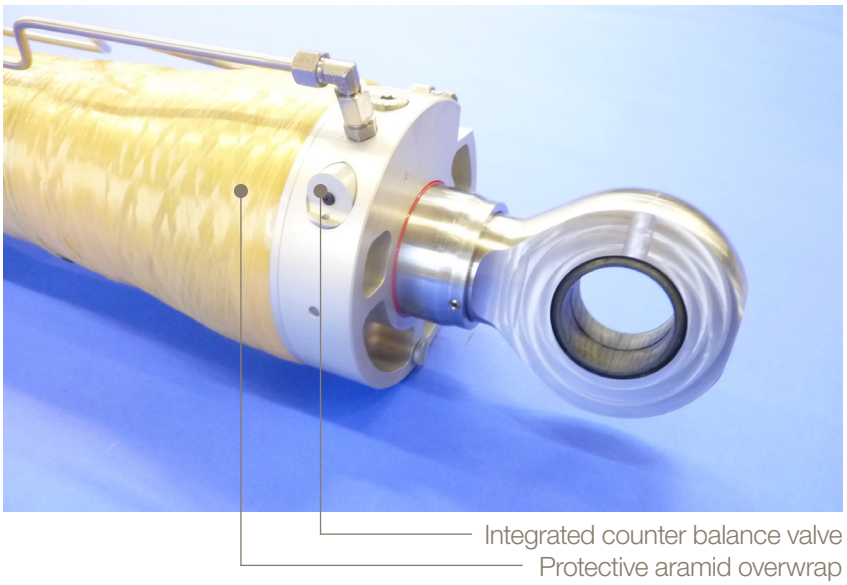
Stroke in mm	
e.g. 0800	800 mm

Stroke up to 3000 mm. For minimum stroke please see p. 13 (C-Series) or p. 17 (T-Series).

Factory Use	
00	-

Additional Features

Customising your cylinder



Your product can additionally be equipped with optional features, for example:

- integrated valves
- feedback sensor systems
- alternative sealing systems
- protective overwraps
- ...

If you cannot find the specific cylinder you need for your application, we will gladly work out an offer for a custom built lightweight cylinder based on your specifications.

Exterior finishes for every application

All Lightraulics® products are available with different surface finishes:

Standard – black primed, pure carbon finish for general use.

Optional – abrasion resistant aramid fibre overwrap for harsh conditions.

Optional – clear coat or painted to customer specification.
Other cosmetic finishes on request.

For further questions on additional features, please contact lightraulics@parker.com.

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Notes

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Lightraulics® Heavy Duty Cylinders

For working pressures up to 700 bar

A Revolution in Lifting
Ultra-lightweight Heavy Duty Cylinders from Parker Hannifin use Lightraulics® materials technology to transform the way in which loads are managed on-site.
In place of traditional steel lifting cylinders, which are heavy, cannot be moved without assistance and are difficult to locate accurately, Lightraulics® Heavy Duty Cylinders are built from corrosion-resistant lightweight alloys and carbon fibre composite materials.
Weighing typically between 1/3 and 1/4 of a comparable steel cylinder, they can be positioned quickly and accurately – often by a single operator.
The result: Higher productivity, a saving in time and manpower, and a reduced risk of injury.

Parker's ultra-light Composite Heavy Duty Tool Cylinders cut time on site, boost productivity, reduce the need for mechanical handling and enhance operator safety –
a win-win lifting solution.

Lightraulics® Heavy Duty Tool Cylinders for easy on-site load management are available in Roundline and Tie Rod design. To find the cylinder which fits your applications requirements, please see the table on page 25 and choose from a wide range of capacities on the following pages.

Typical Masses of Comparable Cylinders

Load tons	Stroke mm	Steel Cylinder kg	Aluminium Cylinder kg	Lightraulics® Cylinder kg
50	200	27	19	10
80	200	42	27	16
120	200	58	36	22
150	200	78	45	25
190	300	150	not available	36
220	300	180	not available	44
280	300	300	not available	57
405	300	420	not available	92

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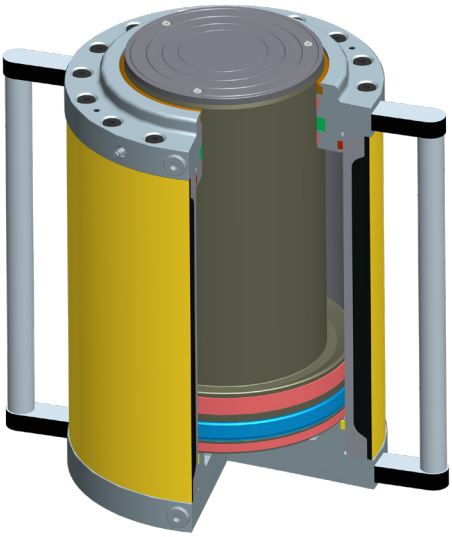
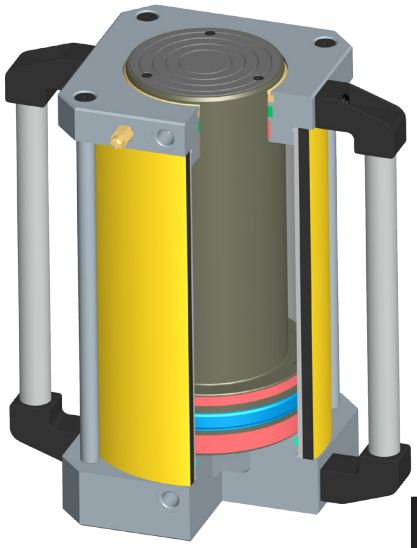


◄ Lightraulics® Heavy Duty Roundline Cylinder
with 150 bar retraction pressure
Available capacities: 150t - 535t

Lightraulics® Heavy Duty ► Tie Rod Cylinder
with 50 bar retraction pressure
Available capacities: 50t - 410t



C

How to choose the best design for your application

Properties	Heavy Duty Roundline Cylinder ► p. 26	Heavy Duty Tie Rod Cylinder ► p. 30
Tonnage	150t - 535t	50t -410t
Stroke Length	150 - 300 mm	50 - 300 mm
Retraction Pressure	150 bar	50 bar
Retraction Speed	***	*
Weight saving	***	**
Outer dimensions	1.2 - 1.3 x bore Ø	1.1 - 1.2 x bore Ø

Lightraulics® Heavy Duty Roundline Cylinders

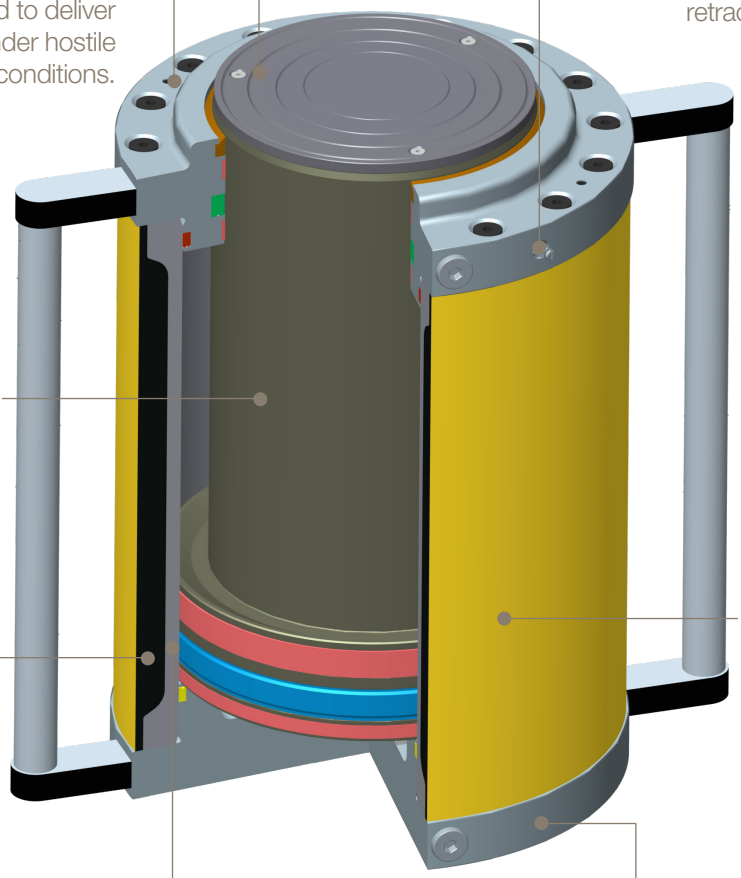
For 700 bar working pressure

Product Specifications

Working pressure	700 bar (10,152 psi)
Retraction pressure	150 bar (2,175 psi)
Test pressure	770 bar (11,167 psi)
Stroke length	up to 300 mm
Maximum piston speed	0.3 m/s
Barrel material	thinwalled metal with composite reinforcement and abrasion protective aramid overwrap
Port size	both ports M 18x1,5 or BSPP G3/8. Please specify when placing order using the order code on page 35.
Sealing system	
– piston seal	thermoplastic polyester elastomer
– rod seal	polyurethane lip type
– wiper seal	polyester-based
– O-rings	polyurethane (PU)
Temperature range	-20 °C to +80 °C
Fluid medium	mineral hydraulic oil

Product example ▶

Working pressure	700 bar (10,152 psi)
Retraction pressure	150 bar (2,175 psi)
Tonnage	150 t
Stroke	150 mm
Force	1496 kN
Weight	24,5 kg



▼ Steel pressure plate
The steel pressure plate is machined from robust and hardened materials and is easily replaceable.

Lightweight gland end cap ▼
The gland end cap is machined from high grade aluminium alloy and surface treated to resist corrosion and to deliver high performance under hostile conditions.

▼ Pressure relief valve
A safety valve protects the cylinder by preventing over-pressurizing during retraction.

Aluminium piston rod ►
The low inertia lightweight piston rod permits rapid cycle times. The hard anodized rod resists wear, ensuring long life and high productivity.

◄ Aramid overwrap
The abrasion resistant aramid fibre overwrap protects the composite structure in harsh conditions.

Composite barrel ▲
With the carbon fibre reinforced composite structure working pressures up to 700 bar (10.152 psi) are possible.

▲ Liner
A thin-walled metal liner acts as a diffusion barrier and supports hoop loads. The wear resistant hard coating ensures high performance for thousands of cycles.

▲ Lightweight base end cap
The base end cap is machined from high grade aluminium alloy for superior fatigue performance under high working loads and surface treated to resist corrosion, even in aggressive environments.

C

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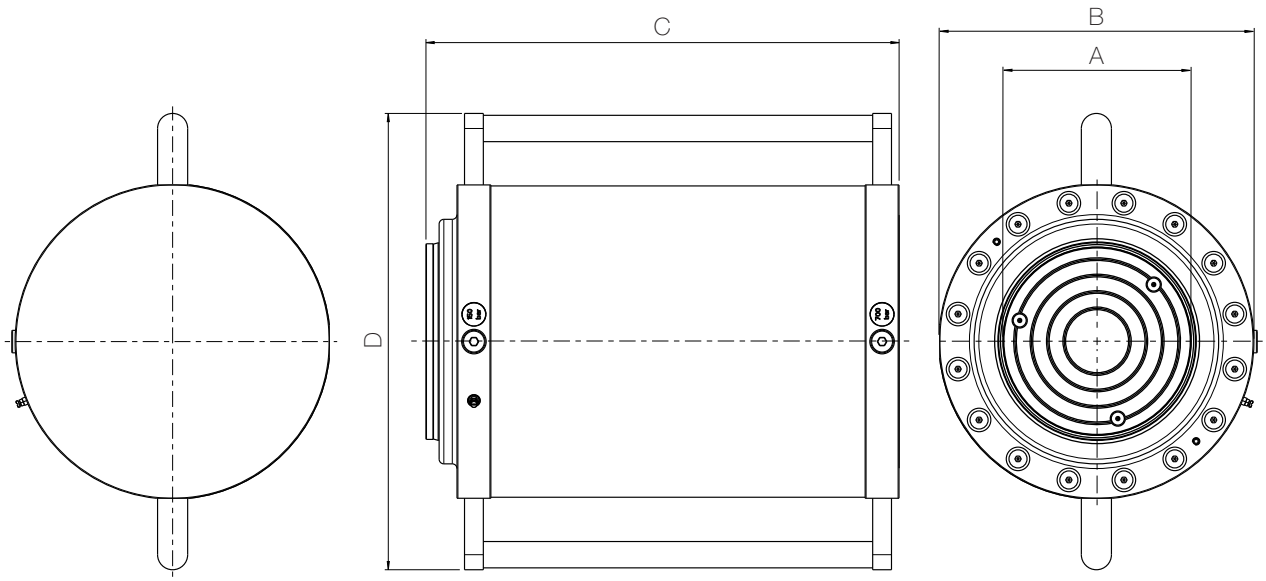
Lightraulics® Heavy Duty Roundline Cylinders - 150 bar Retraction

Performance

	Stroke	Piston Area (cm^2)	Force (kN)	Mass (kg)
150t	150	213.8	1496	23
	200	213.8	1496	24.5
200t	150	283.5	1984	29.5
	180	283.5	1984	31
	250	283.5	1984	34.5
220t	150	314.1	2199	32
	250	314.1	2199	37
280t	150	397.6	2783	41.5
	250	397.6	2783	48
405t	150	572.5	4007	63.5
	250	572.5	4007	73.5
	300	572.5	4007	78.5
535t	150	754.7	5283	85
	250	754.7	5283	98.5

Dimensions

	Stroke	A	B	C	D
150t	150	119	208	368	360
	200	119	208	418	360
200t	150	139	237	368	389
	180	139	237	398	389
	250	139	237	468	389
220t	150	144	247	372	399
	250	144	247	472	399
280t	150	164	280	382	432
	250	164	280	482	432
405t	150	204	335	398	487
	250	204	335	498	487
	300	204	335	548	487
535t	150	234	385	398	537
	250	234	385	498	537



All dimensions are in millimetres unless otherwise stated. In line with our policy of continuos product improvement, specifications in this catalogue are subject to change without notice. Please enquire for exact dimensions when placing order.

C

Lightraulics® Heavy Duty Tie Rod Cylinders

For 700 bar working pressure

Product Specifications

Working pressure	700 bar (10,152 psi)
Retraction pressure	50 bar (725 psi)
Test pressure	770 bar (11,167 psi)
Stroke length	up to 300 mm
Maximum piston speed	0.3 m/s
Barrel material	thinwalled metal with composite reinforcement and abrasion protective aramid overwrap
Piston rod material	hard anodized aluminium
Tie rod material	anodized aluminium
Port size	both ports M 18x1,5 or BSPP G3/8. Please specify when placing order using the order code on page 35.
Sealing system	
– piston seal	thermoplastic polyester elastomer
– rod seal	polyurethane lip type
– wiper seal	polyester-based
– O-rings	polyurethane (PU)
Temperature range	-20 °C to +80 °C
Fluid medium	mineral hydraulic oil

For customised specifications, please contact lightraulics@parker.com with details of your application.

Product example ►	
Working pressure	700 bar (10,152 psi)
Retraction pressure	50 bar (725 psi)
Tonnage	80 t
Stroke	200 mm
Force	792 kN
Weight	15.5 kg

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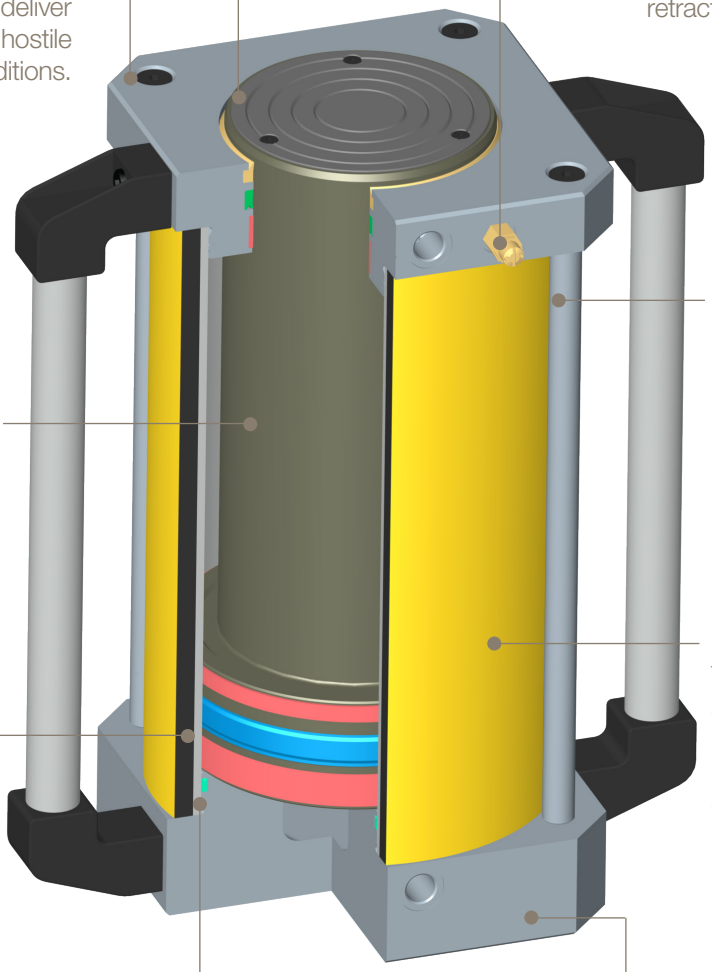

▼ Steel pressure plate
The steel pressure plate is machined from robust and hardened materials and is easily replaceable.

Lightweight gland end cap ▼
The gland end cap is machined from high grade aluminium alloy and surface treated to resist corrosion and to deliver high performance under hostile conditions.

▼ Pressure relief valve
A safety valve protects the cylinder by preventing over-pressurizing during retraction.

◄ Tie rods
The Heavy Duty Tool Cylinder is equipped with aluminium tie rods to carry the axial loads.

Aluminium piston rod ►
The low inertia lightweight piston rod permits rapid cycle times. The hard anodized rod resists wear, ensuring long life and high productivity.

◄ Aramid overwrap
The abrasion resistant aramid fibre overwrap protects the composite structure in harsh conditions.

Composite barrel ▲
With the carbon fibre reinforced composite structure working pressures up to 700 bar (10.152 psi) are possible.

▲ Liner
A thin-walled metal liner acts as a diffusion barrier and supports hoop loads. The wear resistant hard coating ensures high performance for thousands of cycles.

▲ Lightweight base end cap
The base end cap is machined from high grade aluminium alloy for superior fatigue performance under high working loads and surface treated to resist corrosion, even in aggressive environments.

C

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Lightraulics® Heavy Duty Cylinders - 50 bar Retraction

Performance & Dimensions

	Stroke	Piston Area (cm^2)	Force (kN)	Mass (kg)	A	B	C	D
50t	50	70,9	496	7.5	55	115	221	115[1)]
	100	70,9	496	8.5	55	115	271	115[1)]
	150	70,9	496	9	55	115	321	115[1)]
	200	70,9	496	10	55	115	371	115[1)]
	250	70,9	496	10.5	55	115	421	115[1)]
	300	70,9	496	11	55	115	471	115[1)]
80t	50	113,1	792	12	75	140	234	140[1)]
	100	113,1	792	13	75	140	284	140[1)]
	150	113,1	792	14	75	140	334	140[1)]
	200	113,1	792	15.5	75	140	384	140[1)]
	250	113,1	792	16.5	75	140	434	140[1)]
	300	113,1	792	17.5	75	140	484	140[1)]
120t	50	165,1	1156	17.5	99	165	244	165[1)]
	100	165,1	1156	19	99	165	294	165[1)]
	150	165,1	1156	21	99	165	344	165[1)]
	200	165,1	1156	22	99	165	394	165[1)]
	250	165,1	1156	23	99	165	444	165[1)]
	300	165,1	1156	25	99	165	494	165[1)]
150t	50	213,8	1497	19.5	108	190	249	346
	100	213,8	1497	21	108	190	299	346
	150	213,8	1497	24	108	190	349	346
	200	213,8	1497	25	108	190	399	346
	250	213,8	1497	27	108	190	449	346
	300	213,8	1497	29	108	190	499	346
195t	50	268,8	1882	25.5	133	215	269	371
	100	268,8	1882	27.5	133	215	319	371
	180	268,8	1882	31	133	215	399	371
	200	268,8	1882	31.5	133	215	419	371
	250	268,8	1882	34	133	215	469	371
	300	268,8	1882	36	133	215	519	371
220t	50	311	2177	29.5	143	232	269	389
	100	311	2177	33	143	232	319	389
	150	311	2177	35	143	232	369	389
	200	311	2177	38.5	143	232	419	389
	250	311	2177	41.5	143	232	469	389
	300	311	2177	44	143	232	519	389
285t	50	397,6	2783	38	163	260	279	416
	100	397,6	2783	42	163	260	329	416
	180	397,6	2783	47.5	163	260	409	416
	200	397,6	2783	49	163	260	429	416
	250	397,6	2783	53	163	260	479	416
	300	397,6	2783	56.5	163	260	529	416
410t	50	572,6	4008	49	192	324	284	480
	100	572,6	4008	54.5	192	324	334	480
	150	572,6	4008	70	192	324	384	480
	200	572,6	4008	77.5	192	324	434	480
	250	572,6	4008	83.5	192	324	484	480
	300	572,6	4008	91.5	192	324	534	480

1) Cylinder is not equipped with handle bars.

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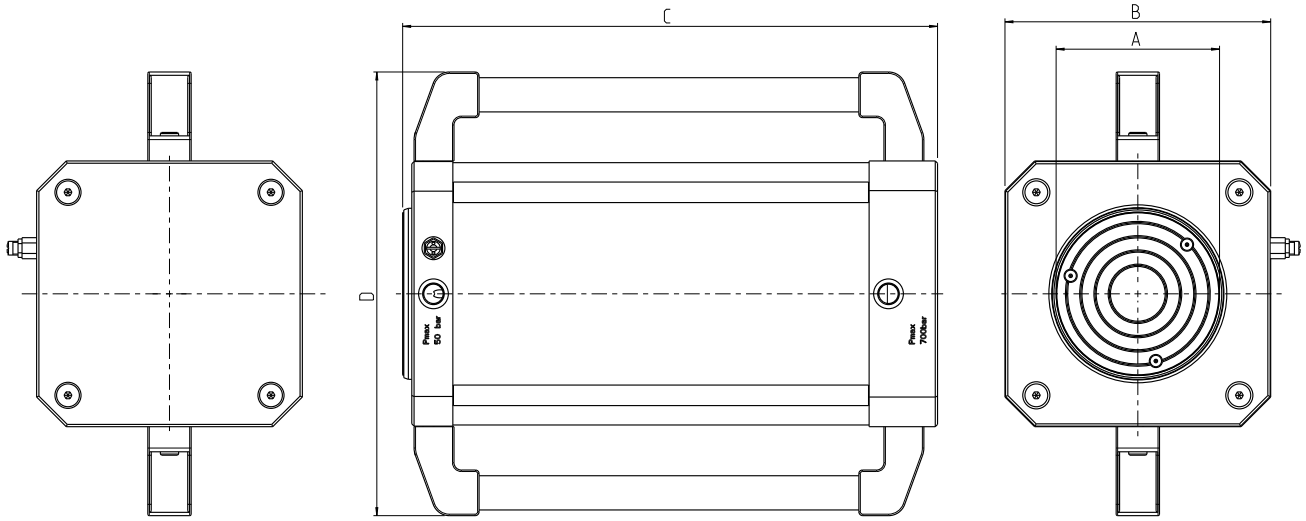
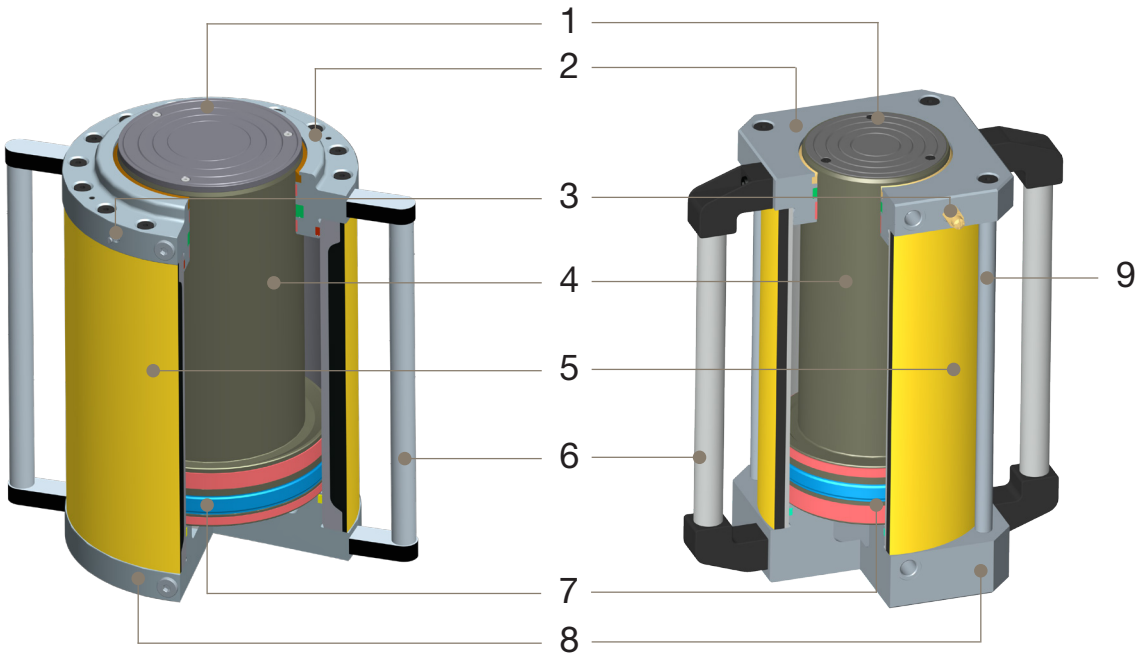


All dimensions are in millimeters unless otherwise stated. In line with our policy of continuous product improvement, specifications in this catalogue are subject to change without notice. Please enquire for exact dimensions when placing order.

C

Spare Parts

For all Lightraulics® cylinders, spare parts are available. To keep the warranty in effect, we recommend to send your cylinder to our factory for any maintenance work. If you like to enquire for a spare part for your Lightraulics® Heavy Duty Cylinder, please provide your cylinder serial number together with the type of spare part referring to the list below.



Product Type

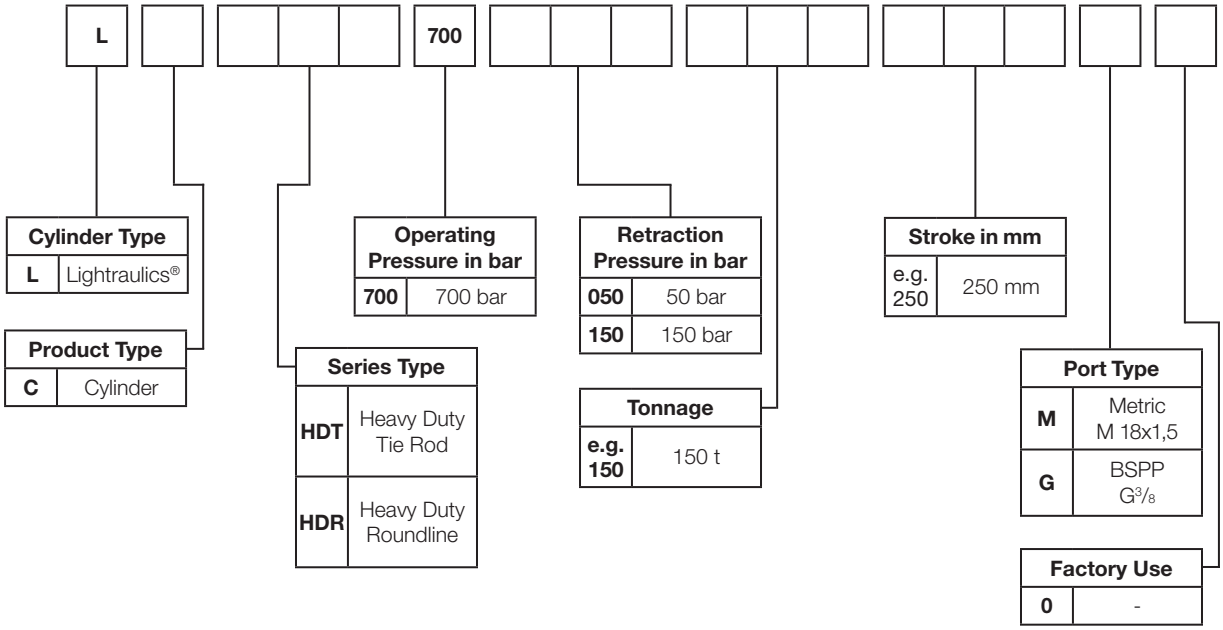
1 - Pressure Plate
2 - Guiding End Cap
3 - Pressure Relief Valve
4 - Piston Rod
5 - Composite Cylinder Barrel
6 - Handle Bar
7 - Seal Kit
8 - Base End Cap
9 - Tie Rod

Accessories

For further accessories like quick couplings, hoses, etc. please contact your local authorized Parker distributor.

Order Code Lightraulics® Heavy Duty Cylinders

Please use the following order code to enquire for your Lightraulics® Heavy Duty Cylinder.



C

Overhaul Service

Maintaining peak performance

Parker's unique composite cylinder technology delivers continuous high performance over thousands of cycles.

To maintain the performance and to protect your investment, we offer a maintenance and overhaul service in our factory, to the same exacting standards as the original manufacturing process. Factory refurbished cylinders are covered by the same warranty terms as the original product.

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Lightraulics® Hollow Piston Cylinders

For working pressures up to 700 bar

Lightraulics® Hollow Piston Cylinders are mainly used in steel reinforced concrete construction, foundation engineering and wind turbine applications. Parker's ultra-light Hollow Piston Cylinders cut time on site, boost productivity, reduce the need for mechanical handling and enhance operator safety.
In place of traditional steel cylinders, which are heavy, cannot be moved without assistance and are difficult to locate accurately, Lightraulics® Hollow Piston Cylinders are weighing typically between 1/3 and 1/4 of a comparable steel cylinder. They are built from corrosion-resistant lightweight alloys and carbon fibre composite materials and can be positioned quick and easy – often by a single operator. The result: Higher productivity, a saving in time and manpower, and a reduced risk of injury.

Lightraulics® Hollow Piston Cylinders are available in tie rod and roundline design. All Hollow Piston Cylinder series are available in a wide range of capacities, with stroke lengths up to 350 mm. To find the series, which fits best for your application, please see the table on page 37.

Typical Masses of Comparable Tie Rod Cylinders

Load tones	Stroke mm	Steel Cylinder kg	Aluminium Cylinder kg	Lightraulics® Cylinder kg
80	250	80	44	23
120	180	88	57	25
140	250	125	75	36
170	250	185	not available	52
270	250	340	not available	69
400	250	590	not available	93

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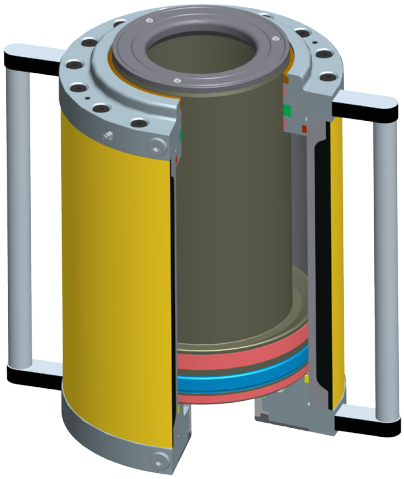
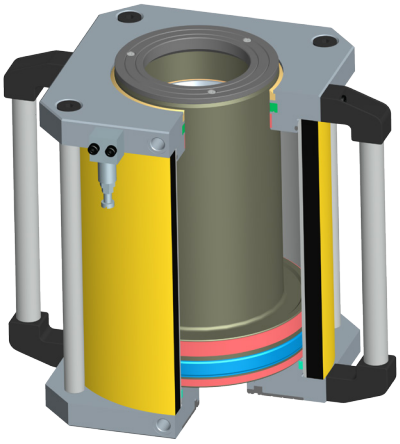
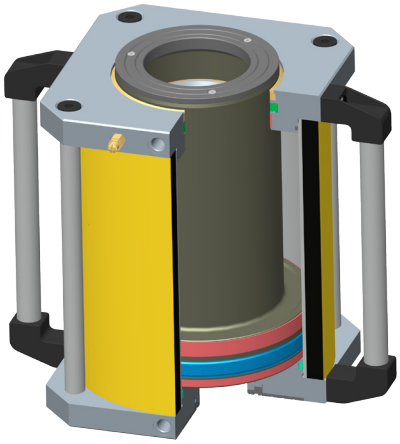


◄ Lightraulics® Hollow Piston Roundline Cylinder
with 150 bar retraction pressure
Available capacities: 100t - 500t

Lightraulics® Hollow Piston ► Tie Rod Cylinder
with 100 bar retraction pressure
Available capacities: 100t - 400t





◄ Lightraulics® Hollow Piston Tie Rod Cylinder
with 50 bar retraction pressure
Available capacities: 40t - 270t

How to choose the best design for your application

Properties	Hollow Piston Roundline Cylinders 150 bar retraction ► p. 38	Hollow Piston Tie Rod Cylinders 100 bar retraction ► p. 50	Hollow Piston Tie Rod Cylinders 50 bar retraction ► p. 46
Tonnage	100t -500t	100t -400t	40t -270t
Stroke Length	150 - 350 mm	100 - 300 mm	100 - 300 mm
Retraction Speed	***	**	*
Weight saving	***	**	***
Outer dimensions	1.6 - 1.7 x bore Ø	1.4 - 1.7 x bore Ø	1.4 - 2.0 x bore Ø
Additional attachment options	Alternative bolt pattern at bottom or top and bottom side	Alternative bolt pattern at top and bottom side	-

D

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Lightraulics® Hollow Piston Roundline Cylinders

For 700 bar working pressure

Product Specifications

Working pressure	700 bar (10,152 psi)
Retraction pressure	150 bar (2,175 psi)
Test pressure	770 bar (11,167 psi)
Stroke length	up to 300 mm
Maximum piston speed	0.3 m/s
Barrel material	thinwalled metal with composite reinforcement and abrasion protective aramid overwrap
Piston rod material	hard anodized aluminium
Port size	both ports M 18x1,5 or BSPP G3/8. Please specify when placing order using the order code on page 53.
Sealing system	
– piston seal	thermoplastic polyester elastomer
– rod seal	polyurethane lip type
– wiper seal	polyester-based
– O-rings	polyurethane (PU)
Temperature range	-20 °C to +80 °C
Fluid medium	mineral hydraulic oil

For customised specifications, please contact lightraulics@parker.com with details of your application.

Product example ▶

Working pressure	700 bar (10,152 psi)
Retraction pressure	150 bar (2,175 psi)
Tonnage	495 t
Passage	140 mm
Stroke	150 mm
Force	4859 kN
Weight	111.5 kg

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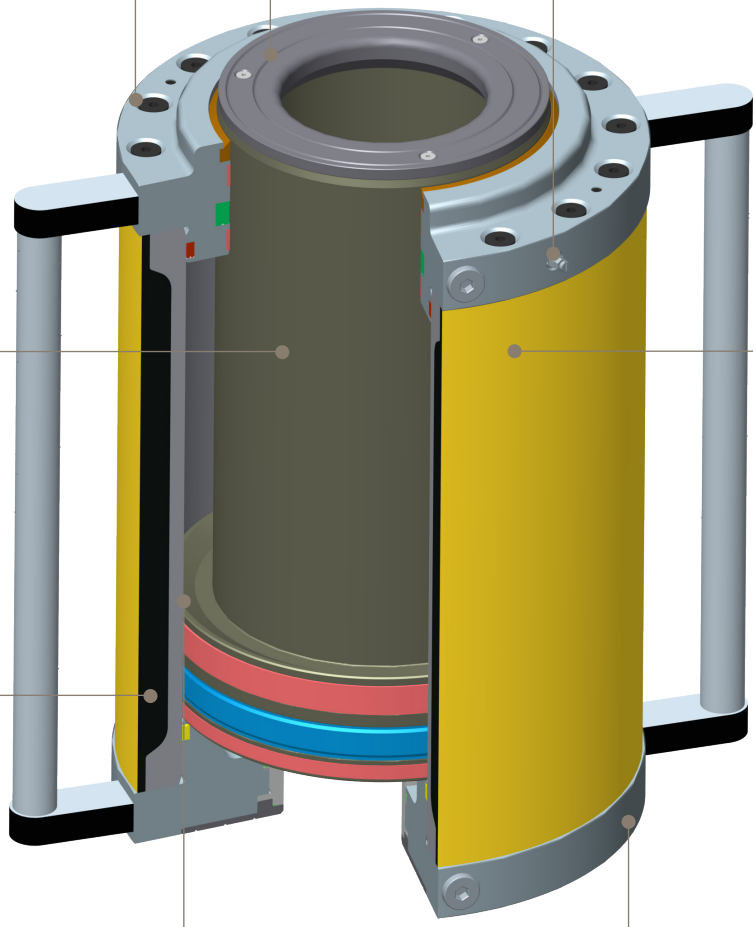
Stuhr, Germany

▼ Steel pressure plate
The steel pressure plate is machined from robust and hardened materials and is easily replaceable.

Lightweight gland end cap ▼
The gland end cap is machined from high grade aluminium alloy and surface treated to resist corrosion and to deliver high performance under hostile conditions.

▼ Pressure relief valve
A safety valve protects the cylinder by preventing over-pressurizing during retraction.



Lightweight hollow piston rod ►
The low inertia aluminium piston rod permits rapid cycle times. The hard anodized rod resists wear, ensuring long life and high productivity.

◄ Aramid overwrap
The abrasion resistant aramid fibre overwrap protects the composite structure in harsh conditions.

Composite barrel ▲
With the carbon fibre reinforced composite structure working pressures up to 700 bar (10.152 psi) are possible.

▲ Liner
A thin-walled metal liner acts as a diffusion barrier and supports hoop loads. The wear resistant hard coating ensures high performance for thousands of cycles.

▲ Lightweight base end cap
The base end cap is machined from high grade aluminium alloy for superior fatigue performance under high working loads and surface treated to resist corrosion, even in aggressive environments.

D

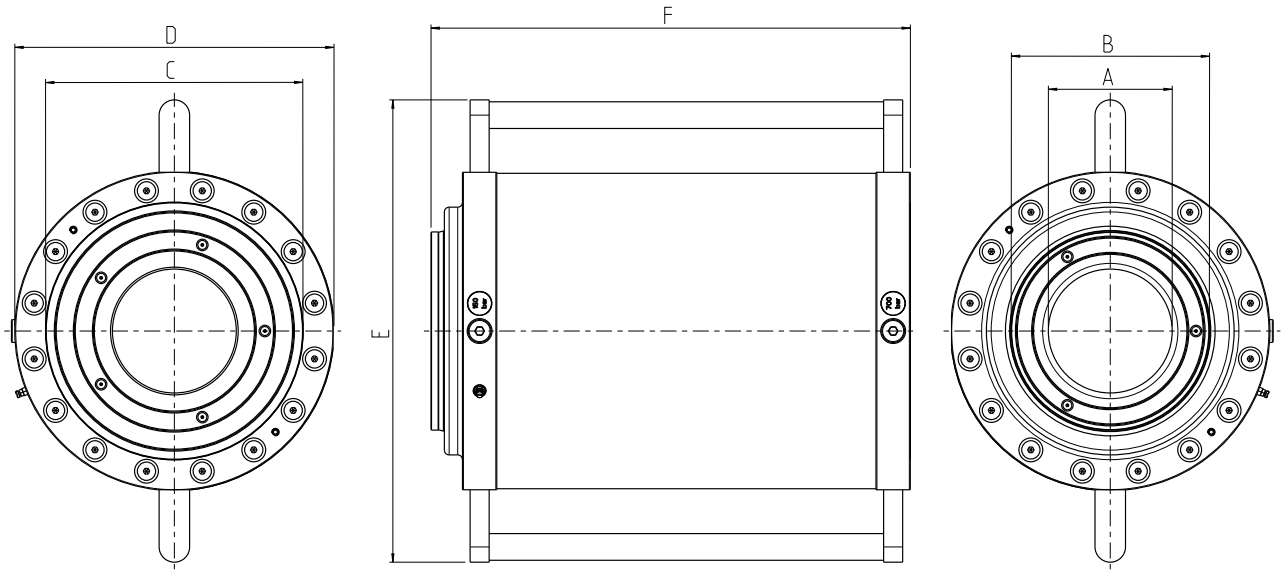
Lightraulics® Hollow Piston Roundline Cylinders - 150 bar Retraction

Performance

	Passage	Stroke	Mass (kg)	Piston Area (cm^2)	Force (kN)
100t	83	150	24	142.9	1000
	83	200	27	142.9	1000
125t	90	150	29	179.6	1257
	90	180	30.5	179.6	1257
	90	250	34.5	179.6	1257
140t	105	150	35	201	1407
	105	250	42	201	1407
180t	110	150	47	264.8	1854
	110	250	56.5	264.8	1854
270t	130	150	68	395.8	2771
	130	250	81.5	395.8	2771
	130	300	88.5	395.8	2771
370t	145	150	90.5	527.7	3694
	145	250	108.5	527.7	3694
430t	110	150	88.5	600.8	4206
495t	140	150	111.5	694.1	4859
500t	200	300	185	718.6	5030
	200	350	199.5	718.6	5030

Dimensions - Standard Version

	Passage	Stroke	A	B	C	D	E	F
100t	83	150	83	124	165	208	357	370
	83	200	83	124	165	208	357	420
125t	90	150	90	144	190	237	386	370
	90	180	90	144	190	237	386	400
	90	250	90	144	190	237	386	470
140t	105	150	105	149	200	247	397	374
	105	250	105	149	200	247	397	474
180t	110	150	110	168	225	276	426	384
	110	250	110	168	225	276	426	484
270t	130	150	130	208	270	335	485	403
	130	250	130	208	270	335	485	503
	130	300	130	208	270	335	485	553
370t	145	150	145	238	310	385	535	403
	145	250	145	238	310	385	535	503
430t	110	150	110	238	310	385	535	403
495t	140	150	140	258	340	425	576	403
500t	200	300	200	303	380	489	640	571
	200	350	200	303	380	489	640	621



In addition to this standard version, Lightraulics® Hollow Piston Roundline Cylinders with 150 bar retraction pressure are also available with two alternative bolt patterns for additional attachement options at bottom or top and bottom side. For dimensions of this version please see pages 42/43.

All dimensions are in millimeters unless otherwise stated. In line with our policy of continuous product improvement, specifications in this catalogue are subject to change without notice. Please enquire for exact dimensions when placing order.

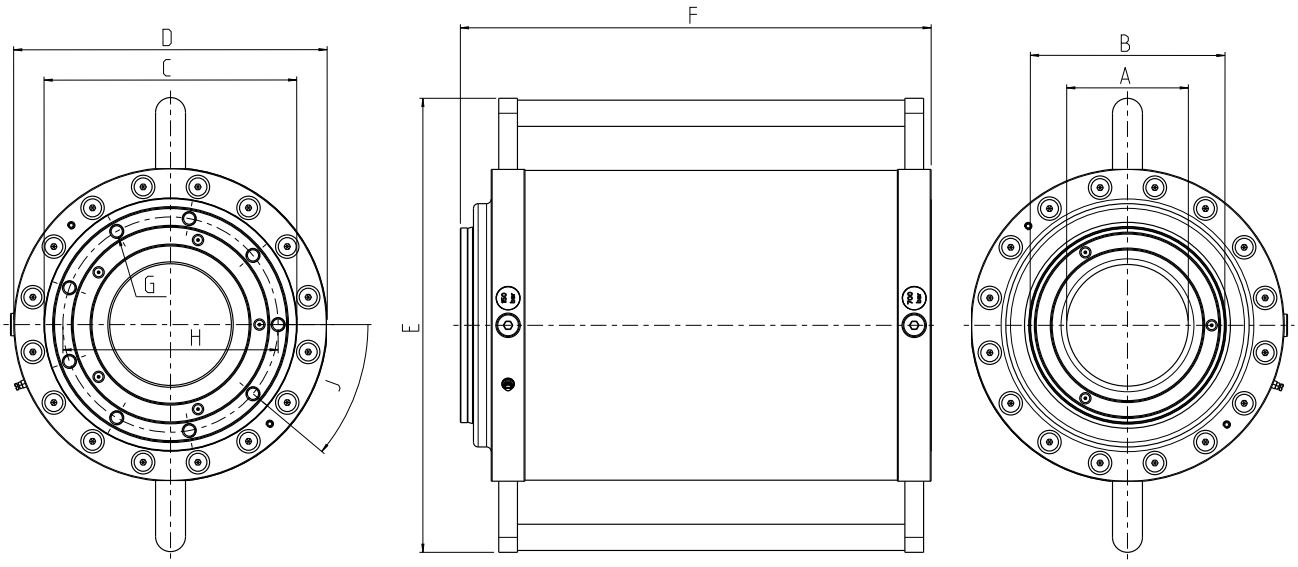
D

Lightraulics® Hollow Piston Roundline Cylinders - 150 bar Retraction

Dimensions - Alternative Bolt Pattern

For Additional Attachments at Bottom Side

	Passage	Stroke	A	B	C	D	E	F	G	H	J
100t	83	150	83	124	165	208	357	370	M12	142	5x72°
	83	200	83	124	165	208	357	420	M12	142	5x72°
125t	90	150	90	144	190	237	386	370	M12	165	8x45°
	90	180	90	144	190	237	386	400	M12	165	8x45°
	90	250	90	144	190	237	386	470	M12	165	8x45°
140t	105	150	105	149	200	251	401	374	M12	175	8x45°
	105	250	105	149	200	251	401	474	M12	175	8x45°
180t	110	150	110	168	225	280	430	393	M12	190	9x40°
	110	250	110	168	225	280	430	493	M12	190	9x40°
270t	130	150	130	208	270	335	485	403	M14	230	9x40°
	130	250	130	208	270	335	485	503	M14	230	9x40°
	130	300	130	208	270	335	485	553	M14	230	9x40°
370t	145	150	145	238	310	385	535	403	M16	260	9x40°
	145	250	145	238	310	385	535	503	M16	260	9x40°
430t	110	150	110	238	310	385	535	403	M16	257	9x40°
495t	140	150	140	258	340	425	576	403	M18	287	9x40°
500t	200	300	200	303	380	489	640	571	M20	320	6x60°
	200	350	200	303	380	489	640	621	M20	320	6x60°



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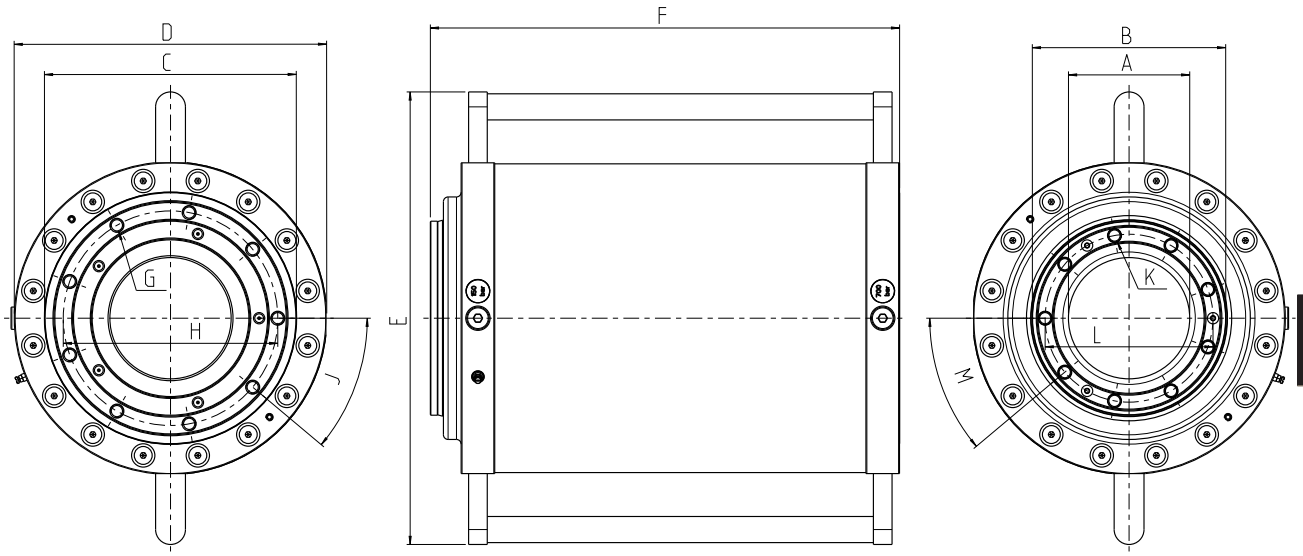
Dimensions - Alternative Bolt Pattern

For Additional Attachments at Top and Bottom Side

	Passage	Stroke	A	B	C	D	E	F	G	H	J	K	L	M
100t	83	150	83	124	165	208	357	370	M12	142	5x72°	M8	110	12x30°
	83	200	83	124	165	208	357	420	M12	142	5x72°	M8	110	12x30°
125t	90	150	90	144	190	237	386	370	M12	165	8x45°	M8	130	15x24°
	90	180	90	144	190	237	386	400	M12	165	8x45°	M8	130	15x24°
	90	250	90	144	190	237	386	470	M12	165	8x45°	M8	130	15x24°
140t	105	150	105	149	200	251	401	374	M12	175	8x45°	M8	135	15x24°
	105	250	105	149	200	251	401	474	M12	175	8x45°	M8	135	15x24°
180t	110	150	110	168	225	280	430	393	M12	190	9x40°	M10	150	12x30°
	110	250	110	168	225	280	430	493	M12	190	9x40°	M10	150	12x30°
270t	130	150	130	208	270	335	485	403	M14	230	9x40°	M14	180	9x40°
	130	250	130	208	270	335	485	503	M14	230	9x40°	M14	180	9x40°
	130	300	130	208	270	335	485	553	M14	230	9x40°	M14	180	9x40°
370t	145	150	145	238	310	385	535	403	M16	260	9x40°	M16	205	9x40°
	145	250	145	238	310	385	535	503	M16	260	9x40°	M16	205	9x40°
430t	110	150	110	238	310	385	535	403	M16	257	9x40°	M16	190	9x40°
495t	140	150	140	258	340	425	576	403	M18	287	9x40°	M18	216	9x40°
500t	200	300	200	303	380	489	640	571	M20	320	6x60°	M20	270	6x60°
	200	350	200	303	380	489	640	621	M20	320	6x60°	M20	270	6x60°



All dimensions are in millimeters unless otherwise stated. In line with our policy of continuous product improvement, specifications in this catalogue are subject to change without notice. Please enquire for exact dimensions when placing order.

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Lightraulics® Hollow Piston Tie Rod Cylinders

For 700 bar working pressure

Product Specifications

Working pressure	700 bar (10,152 psi)
Retraction pressure	50 bar (725 psi) and 100 bar (1,450 psi)
Test pressure	770 bar (11,167 psi)
Stroke length	up to 300 mm
Maximum piston speed	0.3 m/s
Barrel material	thinwalled metal with composite reinforcement and abrasion protective aramid overwrap
Piston rod material	hard anodized aluminium
Tie rod material	anodized aluminium (for 50 bar retraction pressure) galvanised steel (for 100 bar rectraction pressure)
Port size	both ports M 18x1,5 or BSPP G3/8. Please specify when placing order using the order code on page 53.
Sealing system	
– piston seal	thermoplastic polyester elastomer
– rod seal	polyurethane lip type
– wiper seal	polyester-based
– O-rings	polyurethane (PU)
Temperature range	-20 °C to +80 °C
Fluid medium	mineral hydraulic oil

For customised specifications, please contact lightraulics@parker.com with details of your application.

Product example ►

Working pressure	700 bar (10,152 psi)
Retraction pressure	50 bar (725 psi)
Tonnage	140 t
Passage	105 mm
Stroke	250 mm
Force	1385 kN
Weight	35.5 kg

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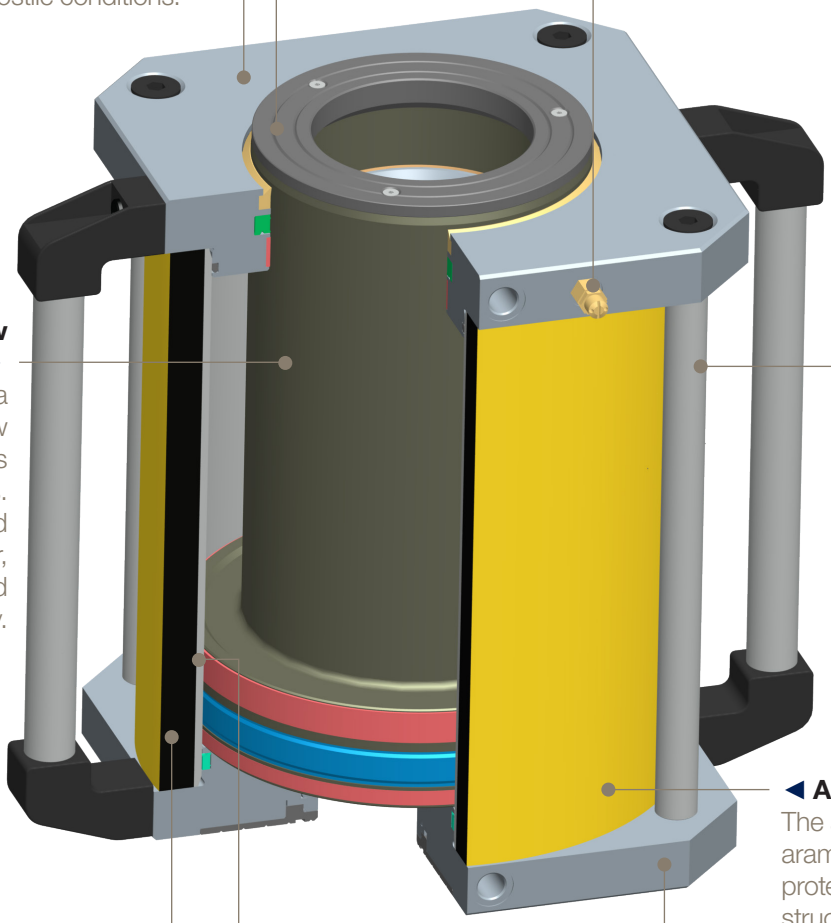
▼ Steel pressure plate
The steel pressure plate is machined from robust and hardened materials and is easily replaceable.

Lightweight gland end cap ▼
The gland end cap is machined from high grade aluminium alloy and surface treated to resist corrosion and to deliver high performance under hostile conditions.

▼ Pressure relief valve
A safety valve protects the cylinder by preventing over-pressurizing during retraction.



Lightweight hollow piston rod ►
The low inertia aluminium hollow piston rod permits rapid cycle times. The hard anodized rod resists wear, ensuring long life and high productivity.

◄ Tie rods
The Hollow Piston Cylinder is equipped with aluminium tie rods (for 50 bar retraction) or steel tie rods (for 100 bar retraction) to carry the axial loads.

◄ Aramid overwrap
The abrasion resistant aramid fibre overwrap protects the composite structure in harsh conditions.

Composite barrel ▲
With the carbon fibre reinforced composite structure working pressures up to 700 bar (10.152 psi) are possible.

▲ Liner
A thin-walled metal liner acts as a diffusion barrier and supports hoop loads. The wear resistant hard coating ensures high performance for thousands of cycles.

▲ Lightweight base end cap
The base end cap is machined from high grade aluminium alloy for superior fatigue performance under high working loads and surface treated to resist corrosion, even in aggressive environments.

D

Lightraulics® Hollow Piston Tie Rod Cylinders - 100 bar Retraction

Performance

	Passage	Stroke	Piston Area (cm^2)	Force (kN)	Mass (kg)
100t	83	100	141.4	990	20
	83	150	141.4	990	22.5
	83	200	141.4	990	25.5
	83	250	141.4	990	28
120t	90	100	167.8	1175	22.5
	90	180	167.8	1175	27
	90	250	167.8	1175	30.5
	90	300	167.8	1175	33
	100	100	167.8	1175	24.5
	100	180	167.8	1175	29.5
	100	250	167.8	1175	34
	100	300	167.8	1175	37.5
140t	105	100	197.9	1385	28
	105	180	197.9	1385	33
	105	250	197.9	1385	38
	105	300	197.9	1385	41.5
170t	110	100	254.5	1781	40
	110	180	254.5	1781	48.5
	110	250	254.5	1781	55.5
	110	300	254.5	1781	60.5
200t	150	100	274.5	1922	51
	150	180	274.5	1922	61
	150	250	274.5	1922	70
	150	300	274.5	1922	76.5
270t	130	100	396.5	2775	55
	130	180	396.5	2775	66.5
	130	250	396.5	2775	76.5
	130	300	396.5	2775	84
320t	100	100	450.5	3153	59
	100	180	450.5	3153	70
	100	250	450.5	3153	79.5
	100	300	450.5	3153	86.5
360t	145	100	505.6	3539	83
	145	180	505.6	3539	97
	145	250	505.6	3539	110
	145	300	505.6	3539	119
400t	100	100	584.1	4089	73
	100	180	584.1	4089	92.5
	100	250	584.1	4089	109.5
	100	300	584.1	4089	122

All dimensions are in millimeters unless otherwise stated. In line with our policy of continuous product improvement, specifications in this catalogue are subject to change without notice. Please enquire for exact dimensions when placing order.

In addition to the standard version (page 47), Lightraulics® Hollow Piston Tie Rod Cylinders with 100 bar retraction are also available with alternative bolt patterns for additional attachement options at top and bottom side. For dimensions of this version please see pages 48/49.

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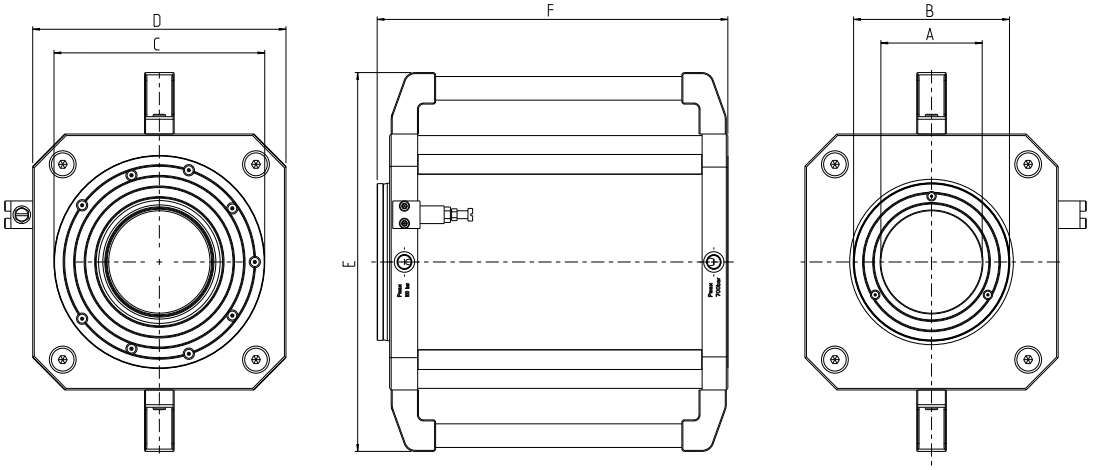
Dimensions - Standard Version

	Passage	Stroke	A	B	C	D	E	F
100t	83	100	83	125	165	194	350	282
	83	150	83	125	165	194	350	332
	83	200	83	125	165	194	350	382
	83	250	83	125	165	194	350	432
120t	90	100	90	145	186	217	273	282
	90	180	90	145	186	217	273	362
	90	250	90	145	186	217	273	432
	90	300	90	145	186	217	273	482
	100	100	100	150	186	217	273	383
	100	180	100	150	186	217	273	363
	100	250	100	150	186	217	273	433
	100	300	100	150	186	217	273	483
140t	105	100	105	150	199	235	391	283
	105	180	105	150	199	235	391	363
	105	250	105	150	199	235	391	433
	105	300	105	150	199	235	391	483
170t	110	100	110	170	225	265	421	297
	110	180	110	170	225	265	421	377
	110	250	110	170	225	265	421	447
	110	300	110	170	225	265	421	497
200t	150	100	150	230	270	325	481	299
	150	180	150	230	270	325	481	379
	150	250	150	230	270	325	481	449
	150	300	150	230	270	325	481	499
270t	130	100	130	200	270	325	481	300
	130	180	130	200	270	325	481	380
	130	250	130	200	270	325	481	450
	130	300	130	200	270	325	481	500
320t	100	100	100	200	270	325	481	300
	100	180	100	200	270	325	481	380
	100	250	100	200	270	325	481	450
	100	300	100	200	270	325	481	500
360t	145	100	145	250	320	405	561	319
	145	180	145	250	320	405	561	399
	145	250	145	250	320	405	561	469
	145	300	145	250	320	405	561	519
400t	100	100	100	220	300	380	536	308
	100	180	100	220	300	380	536	388
	100	250	100	220	300	380	536	458
	100	300	100	220	300	380	536	508



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Lightraulics® Hollow Piston Tie Rod Cylinders - 100 bar Retraction

Dimensions - Alternative Bolt Pattern

For Additional Attachments at Top and Bottom Side

	Passage	Stroke	A	B	C	D	E	F	G	H	J	K	L	M
100t	83	100	83	125	165	194	350	282	M12	131.5	5x72°	M6	111	15x24°
	83	150	83	125	165	194	350	332	M12	131.5	5x72°	M6	111	15x24°
	83	200	83	125	165	194	350	382	M12	131.5	5x72°	M6	111	15x24°
	83	250	83	125	165	194	350	432	M12	131.5	5x72°	M6	111	15x24°
120t	90	100	90	145	186	217	273	282	M12	162.5	5x72°	M6	130	15x24°
	90	180	90	145	186	217	273	362	M12	162.5	5x72°	M6	130	15x24°
	90	250	90	145	186	217	273	432	M12	162.5	5x72°	M6	130	15x24°
	90	300	90	145	186	217	273	482	M12	162.5	5x72°	M6	130	15x24°
	100	100	100	150	186	217	273	383	M12	162.5	5x72°	M8	133	12x30°
	100	180	100	150	186	217	273	363	M12	162.5	5x72°	M8	133	12x30°
	100	250	100	150	186	217	273	433	M12	162.5	5x72°	M8	133	12x30°
	100	300	100	150	186	217	273	483	M12	162.5	5x72°	M8	133	12x30°
140t	105	100	105	150	199	235	391	283	M12	175	6x60°	M8	135	12x30°
	105	180	105	150	199	235	391	363	M12	175	6x60°	M8	135	12x30°
	105	250	105	150	199	235	391	433	M12	175	6x60°	M8	135	12x30°
	105	300	105	150	199	235	391	483	M12	175	6x60°	M8	135	12x30°
170t	110	100	110	170	225	265	421	297	M16	185	5x72°	M10	153	12x30°
	110	180	110	170	225	265	421	377	M16	185	5x72°	M10	153	12x30°
	110	250	110	170	225	265	421	447	M16	185	5x72°	M10	153	12x30°
	110	300	110	170	225	265	421	497	M16	185	5x72°	M10	153	12x30°
200t	150	100	150	230	270	325	481	299	M14	242.5	5x72°	M8	212	12x30°
	150	180	150	230	270	325	481	379	M14	242.5	5x72°	M8	212	12x30°
	150	250	150	230	270	325	481	449	M14	242.5	5x72°	M8	212	12x30°
	150	300	150	230	270	325	481	499	M14	242.5	5x72°	M8	212	12x30°
270t	130	100	130	200	270	325	481	300	M14	205	8x45°	M12	175	12x30°
	130	180	130	200	270	325	481	380	M14	205	8x45°	M12	175	12x30°
	130	250	130	200	270	325	481	450	M14	205	8x45°	M12	175	12x30°
	130	300	130	200	270	325	481	500	M14	205	8x45°	M12	175	12x30°
320t	100	100	100	200	270	325	481	300	M20	210	5x72°	M12	155	12x30°
	100	180	100	200	270	325	481	380	M20	210	5x72°	M12	155	12x30°
	100	250	100	200	270	325	481	450	M20	210	5x72°	M12	155	12x30°
	100	300	100	200	270	325	481	500	M20	210	5x72°	M12	155	12x30°
360t	145	100	145	250	320	405	561	319	M20	270	5x72°	M12	220	12x30°
	145	180	145	250	320	405	561	399	M20	270	5x72°	M12	220	12x30°
	145	250	145	250	320	405	561	469	M20	270	5x72°	M12	220	12x30°
	145	300	145	250	320	405	561	519	M20	270	5x72°	M12	220	12x30°
400t	100	100	100	220	300	380	536	308	M20	250	5x72°	M16	173	9x40°
	100	180	100	220	300	380	536	388	M20	250	5x72°	M16	173	9x40°
	100	250	100	220	300	380	536	458	M20	250	5x72°	M16	173	9x40°
	100	300	100	220	300	380	536	508	M20	250	5x72°	M16	173	9x40°

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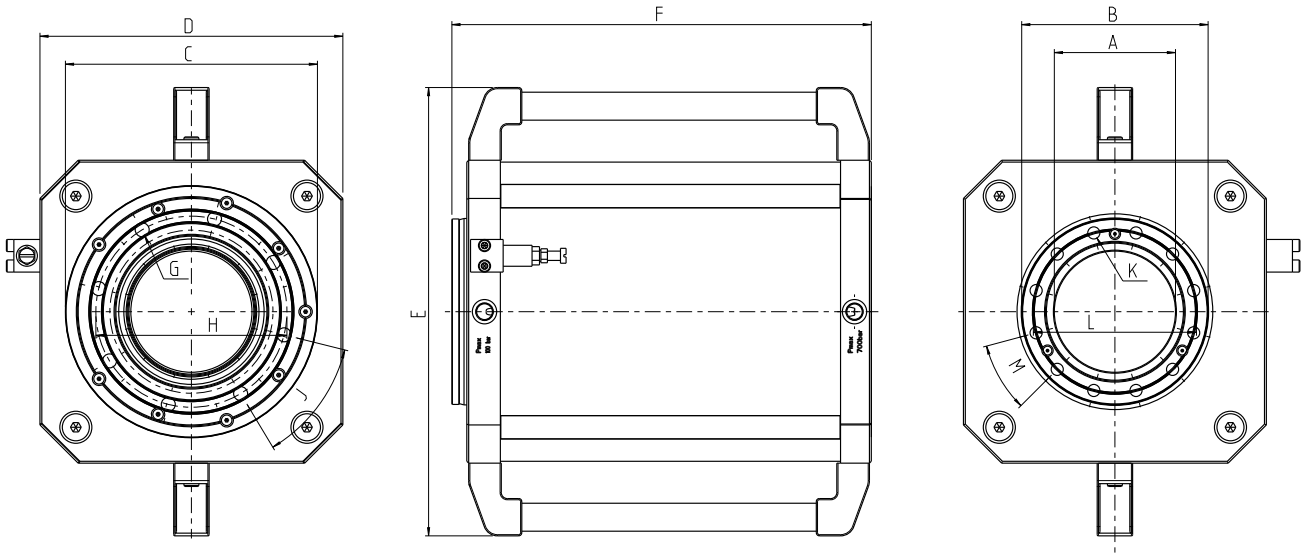

All dimensions are in millimeters unless otherwise stated. In line with our policy of continuous product improvement, specifications in this catalogue are subject to change without notice. Please enquire for exact dimensions when placing order.

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Lightraulics® Hollow Piston Tie Rod Cylinders - 50 bar Retraction

Performance

	Passage	Stroke	Piston Area (cm^2)	Force (kN)	Mass (kg)
40t	38	100	58.9	412	10.5
	38	150	58.9	412	11.5
	38	200	58.9	412	13
80t	80	100	118.8	832	18
	80	150	118.8	832	20
	80	200	118.8	832	22
	80	250	118.8	832	24
100t	83	100	141.4	990	19
	83	150	141.4	990	21.5
	83	200	141.4	990	23.5
	83	250	141.4	990	26
120t	90	100	167.8	1175	21.5
	90	180	167.8	1175	25.5
	90	250	167.8	1175	28.5
	90	300	167.8	1175	31
	100	100	167.8	1175	23.5
	100	180	167.8	1175	28
	100	250	167.8	1175	32
	100	300	167.8	1175	35
140t	105	100	197.9	1385	26.5
	105	180	197.9	1385	31.5
	105	250	197.9	1385	35.5
	105	300	197.9	1385	39
170t	110	100	254.5	1781	38
	110	180	254.5	1781	45.5
	110	250	254.5	1781	51.5
	110	300	254.5	1781	56.5
200t	150	100	274.5	1922	49
	150	180	274.5	1922	58.5
	150	250	274.5	1922	66.5
	150	300	274.5	1922	72.5
270t	130	100	396.5	2775	54.5
	130	180	396.5	2775	64.5
	130	250	396.5	2775	73
	130	300	396.5	2775	79.5

Standard cylinder sizes are highlighlited.

All dimensions are in millimeters unless otherwise stated. In line with our policy of continuous product improvement, specifications in this catalogue are subject to change without notice. Please enquire for exact dimensions when placing order.

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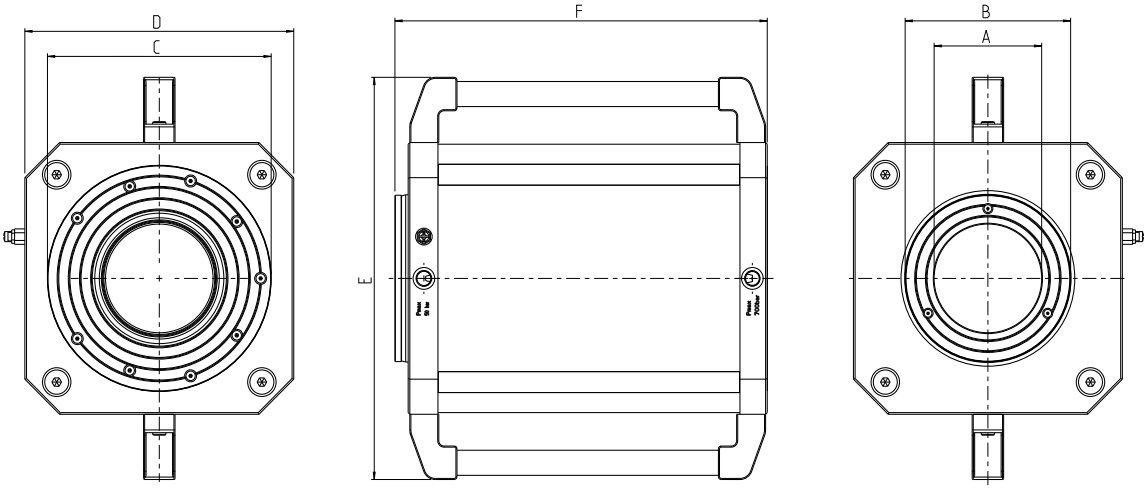
Dimensions

	Passage	Stroke	A	B	C	D	E	F
40t	38	100	38	70	100	140	140[1)]	266
	38	150	38	70	100	140	140[1)]	316
	38	200	38	70	100	140	140[1)]	366
80t	80	100	80	130	165	194	350	282
	80	150	80	130	165	194	350	332
	80	200	80	130	165	194	350	382
	80	250	80	130	165	194	350	432
100t	83	100	83	125	165	194	350	282
	83	150	83	125	165	194	350	332
	83	200	83	125	165	194	350	382
	83	250	83	125	165	194	350	432
120t	90	100	90	145	186	217	373	282
	90	180	90	145	186	217	373	362
	90	250	90	145	186	217	373	432
	90	300	90	145	186	217	373	482
	100	100	100	147	186	217	373	283
	100	180	100	147	186	217	373	363
	100	250	100	147	186	217	373	433
	100	300	100	147	186	217	373	483
140t	105	100	105	150	199	235	391	283
	105	180	105	150	199	235	391	363
	105	250	105	150	199	235	391	433
	105	300	105	150	199	235	391	483
170t	110	100	110	170	225	265	421	297
	110	180	110	170	225	265	421	377
	110	250	110	170	225	265	421	447
	110	300	110	170	225	265	421	497
200t	150	100	150	230	270	325	481	299
	150	180	150	230	270	325	481	379
	150	250	150	230	270	325	481	449
	150	300	150	230	270	325	481	489
270t	130	100	130	200	270	325	481	300
	130	180	130	200	270	325	481	380
	130	250	130	200	270	325	481	450
	130	300	130	200	270	325	481	500

Standard cylinder sizes are highlighlited.



1) Cylinder is not equipped with handle bars.

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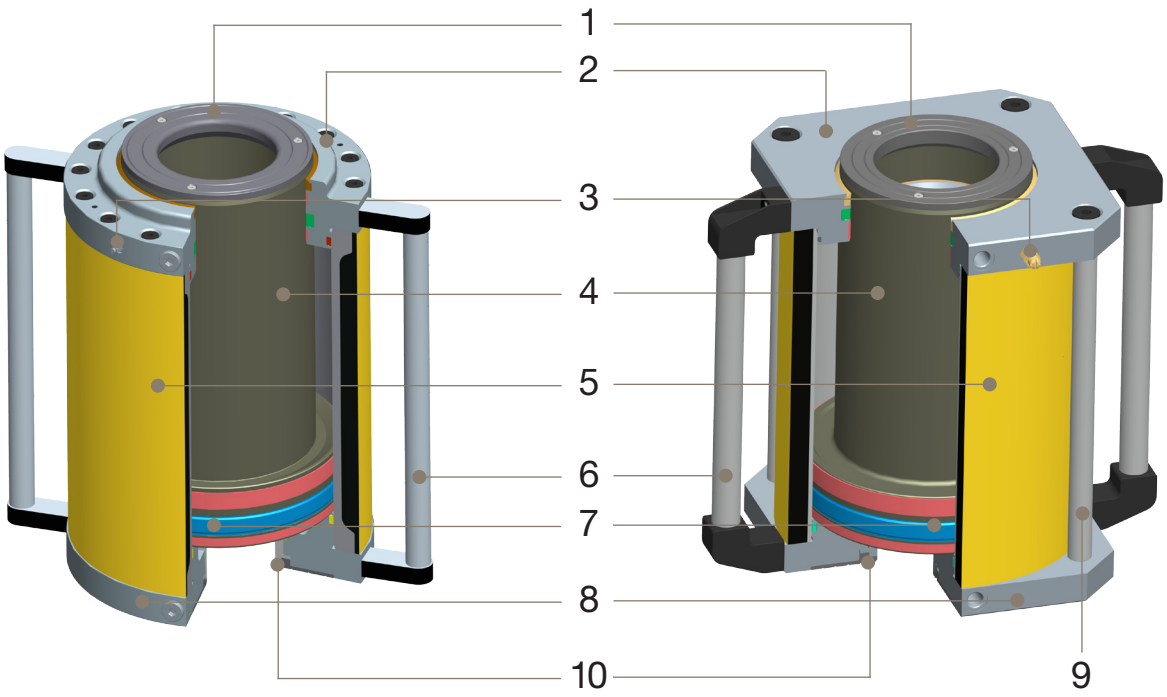
Spare Parts

For all Lightraulics® cylinders, spare parts are available. To keep the warranty in effect, we recommend to send your cylinder to our factory for any maintenance work. If you like to enquire for a spare part for your Lightraulics® Hollow Piston Cylinder, please provide your cylinder serial number together with the type of spare part referring to the list below.



Product Type

1 - Pressure Plate
2 - Guiding End Cap
3 - Pressure Relief Valve
4 - Piston Rod
5 - Composite Cylinder Barrel
6 - Handle Bar
7 - Seal Kit
8 - Base End Cap
9 - Tie Rod
10 - Locking Plate

Accessories

For further accessories like quick couplings, hoses, etc. please contact your local authorized Parker distributor.

Order Code Lightraulics® Hollow Piston Cylinders

Please use the following order code to enquire for your Lightraulics® Hollow Piston Cylinder.

L	C	_ _ _	700	_ _ _	_ _ _	_ _ _	_ _ _	_	_

Cylinder Type	
L	Lightraulics®

Product Type	
C	Cylinder

Series Type	
HPT	Hollow Piston Tie Rod
HPR	Hollow Piston Roundline

Operating Pressure in bar	
700	700 bar

Retraction Pressure in bar	
050	50 bar
100	100 bar
150	150 bar

Tonnage	
e.g. 080	80 t

Passage in mm	
e.g. 083	83 mm

Stroke in mm	
e.g. 250	250 mm

Port Type	
M	Metric M 18x1,5
G	BSPP G3/8

Bolt Pattern	
0	Standard
1	Additional Attachments Bottom Side
2	Additional Attachments Top and Bottom Side

D

Overhaul Service

Maintaining peak performance

Parker's unique composite cylinder technology delivers continuous high performance over hundreds of thousands of cycles.

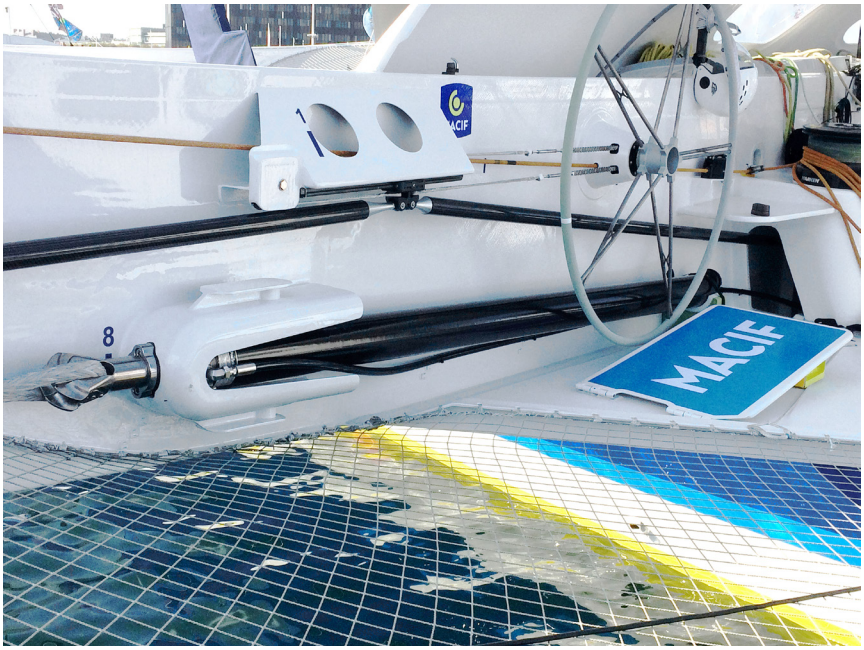
To maintain the performance and to protect your investment, we offer a maintenance and overhaul service in our own factory, to the same exacting standards as the original manufacturing process. Factory refurbished cylinders are covered by the same warranty terms as the original product.

Lightraulics® Yachting Cylinders

Carbon fibre composite components deliver enhanced performance in yachting applications through light weight, exceptional strength, corrosion resistance and the inherent damping characteristics of the material.
Stylish and technically sophisticated, Parker's Lightraulics® Composite Cylinders are ideally suited to marine leisure and competition applications.
Lightraulics® Cylinders for yachting applications are available in a wide product range, e. g.

- Vang cylinders
- Canting keel cylinders
- Lifting keel cylinders
- Mast canting cylinders
- Rigging cylinders
- Foil setting cylinders
- Deck crane cylinders

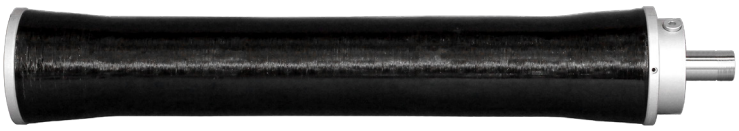
Lightraulics® yachting cylinders will be designed especially for your application. Please contact lightraulics@parker.com with your specifications.



© Trimaran MACIF

▲ Mast Canting Cylinder

Woring pressure	350 bar
Piston diameter	100 mm
Stroke	2500 mm
Weight	30 kg



▲ Stay Tensioning Cylinder

Working pressure	350 bar (5076 psi)
Piston diameter	100 mm
Stroke	700 mm
Weight	11 kg

Foil Setting Cylinder ▲

Working pressure	300 bar (4351 psi)
Piston diameter	100 mm
Stroke	1550 mm
Weight	28 kg

Lifting Keel Cylinders ►

Working pressure	350 bar (5076 psi)
Piston diameter	125 mm
Stroke	2250 mm
Weight	93 kg

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© ORACLE TEAM USA / Photo Javier Salinas

◄ ORACLE TEAM USA

The America's Cup 2017 ORACLE TEAM USA racing yacht is completely supplied with hydraulics from Parker.

All participating yachts are exclusively equipped with Parker Lightraulics® Composite Piston Accumulators for foil setting and float rudder raking.

MACIF100 Trimaran ►

The new trimaran MACIF100, designed by the french skipper François Gabart, is equipped with Parker Lightraulics® cylinders for mast canting, foil setting and tensioning of the stays. Amongst many more, the programme for the trimaran includes the Route du Rhum race 2018 and a solo round the world attempt.

© Vincent Curutchet / DPPI / Macif

◄ Artemis II racing yacht

Fitted with Parker composite canting keel cylinders, Artemis II set a new record for Open 60 class in the 2010 Sevenstar Race around Britain and Ireland.

E

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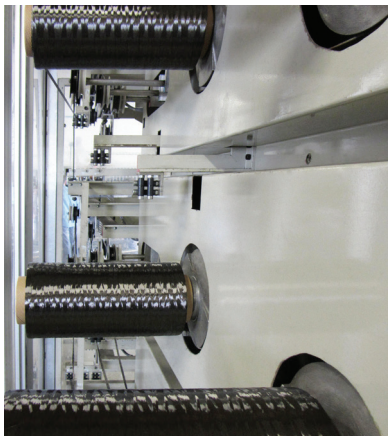

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