

ANEXO A

RLD10 0° detector head

For the fibre optic laser encoder

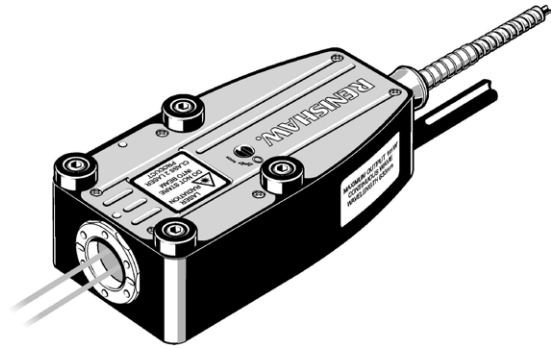
Renishaw's RLE fibre optic laser encoder uses interferometry to provide high resolution, high linearity position feedback.

The RLE system comprises an RLU laser unit and one or two RLD detector heads. This data sheet describes the RLD 0° detector head.

The detector head is the core of the optical measuring system containing the interferometer, reference optics, fringe detector, laser shutter and beam steerer.

To complete the interferometer configuration, only one additional optic is required in either plane mirror or retroreflector based configurations. For easy installation, the integral rotary beam steerer allows final adjustments to be made to optimise beam alignment after the head has been secured.

The head dissipates negligible power (<2 W) and is designed to be thermally stable.



Two versions of the RLD 0° head are available, one of which incorporates a plane mirror interferometer (PMI), the other a retroreflector interferometer (RRI). The fibre optic cable can be disconnected from the detector unit and the electrical cable can be disconnected from the laser unit, thus allowing each to be pulled through small cable tracks and ducting. The detector head incorporates a safety interlock that prevents a laser beam being emitted if either the fibre or electrical cable are disconnected.

General outline and dimensions

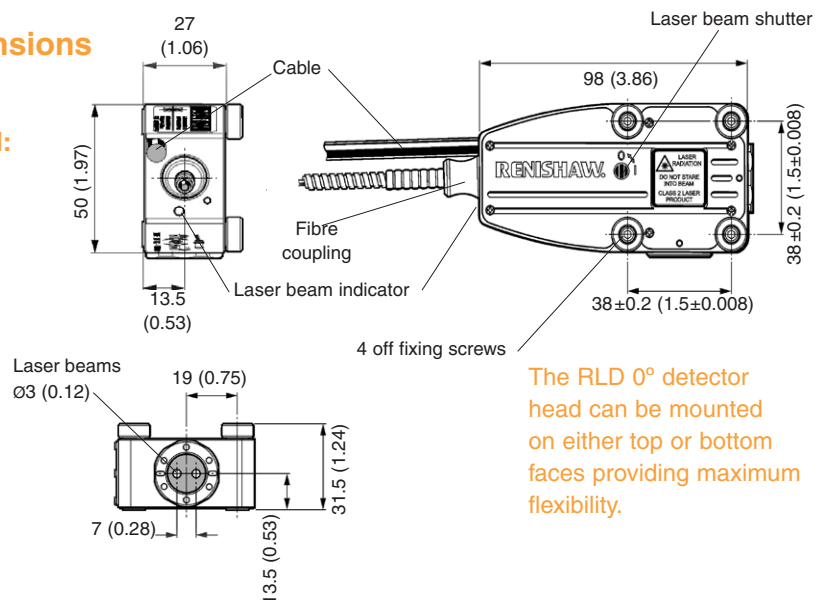
Dimensions in mm (inches)

Overall dimensions of the head:

Height: 31.5 (1.24)
Length: 98 (3.86)
Width: 50 (1.97)

Fixing:

4 off M3 x 0.5 x 35 mm or
5-40-UNC x 1³/₈ cap head screws
on a 38 mm square pitch.



The RLD 0° detector head can be mounted on either top or bottom faces providing maximum flexibility.

Legislative - Laser safety:

In accordance with IEC/EN60825-1, IEC/EN60825-2 and US standards 21CFR 1040 and ANSI Z136.1, Renishaw RLE lasers are Class II lasers and safety goggles are not required, since the blink reaction of a human will protect the eye from damage. Do not stare into the beam or shine it into the eyes of others. It is safe to view a diffuse-reflected beam. Do not dismantle the unit in any way; doing so may expose laser radiation in excess of Class II limits.

RLD 0° detector head operating parameters

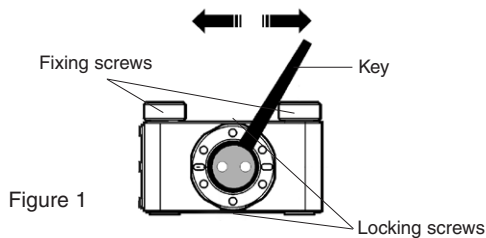
Axis travel	PMI	0 m to 1 m
	RRI	0 m to 4 m
Optical signal period	PMI	$\lambda/4$ (158 nm)
	RRI	$\lambda/2$ (316 nm)
System non-linearity error (SDE)* *excludes interface	PMI	< ± 2.5 nm below 50 mm/sec with >70% signal strength < ± 7.5 nm at 1 m/sec with >50% signal strength
	RRI	< ± 5 nm below 100 mm/sec with >70% signal strength < ± 13 nm at 2 m/sec with >50% signal strength
Thermal drift coefficient	<100 nm/°C	Measured by mounting mirror and detector close together on a Zerodur® base and changing the temperature
Beam diameter	3 mm	
Beam separation	7 mm	Centre to centre
Beam alignment adjustment	$\pm 0.65^\circ$ pitch $\pm 1.5^\circ$ yaw	Integrated beam steering to simplify beam alignment
Beam alignment tolerance for plane mirror (1 m axis)	± 25 arcseconds	Tolerance applies to both pitch and yaw during operation
Cable length (standard)	3 m	Permanent attachment to the detector head and 15-way D-type connector at the laser
Cable diameter	6.5 mm	Terminated with a 15-way D-type connector
Fibre diameter (armoured)	5 mm	Removable from the detector head (connector 12 mm diameter)
Component weight	0.25 kg	
Operating environment		
Pressure	650 mbar to 1150 mbar	Normal atmospheric
Humidity	0% to 95% RH	Non-condensing
Temperature	10 °C to 40 °C	

Zerodur® is a registered trademark of Schott Glass Technologies

It is possible to operate an RLE system at axis lengths greater than those stated above, although the resulting signal strength will be affected by axis length, system velocity and optical alignment.

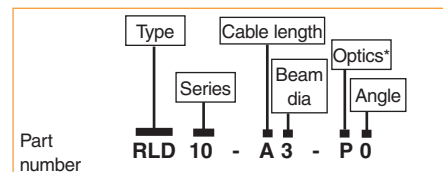
Laser beam alignment

The RLD 0° detector head incorporates a beam steerer to simplify the alignment process. Prior to installation, ensure that the alignment grooves are horizontal and that both locking screws are loose, as shown in Figure 1. Align the head on the 4 mounting screws by securing one of the two nearest the aperture and rotate (yaw) the detector head until the maximum output signal strength is achieved. To then increase the output signal strength to its optimum, rotate the beam steerer using the key, as shown in Figure 1 to adjust the pitch. Finally, tighten the locking screw on the top side and 4 fixing screws.



RLD identification and ordering

The RLD is normally supplied with the appropriate RLU laser unit as a configured RLE fibre optic laser encoder system. For full details of available RLE system configurations visit www.renishaw.com or consult a Renishaw representative. For special applications or spares requirements, the RLD is available separately; the generic form RLD detector head part number is shown below:



* P = plane mirror, R = retroreflector



Laser Interferometer



SP-NG Series

Design and Operation

The laser interferometers of the SP-NG series are precision length measuring instruments with a wide range of applications in research and industry. They can be adapted to specific tasks and are characterized by easy handling and beam adjustment. The compact design enables them to be used even in confined spaces.

In addition to small ball reflectors with screw and magnet attachments also plane mirrors, other tilt-invariant reflectors and surfaces with optical quality are used.

The long-range laser interferometer SP 15000 NG is available in different versions for measuring ranges up to 40 m, 60 m and 80 m.

By further additional components such as a 90° beam deflection in four spatial directions or a highly stable beam direction alignment for very compact designs expands the range of applications of laser interferometers.

Depending on the application, powerful software solutions for measurement and calibration are available.



Major Performance Features

- Flexible, ultraprecise length measuring system
- Robust design with splash-proof housing and sheathed fiber cable for industrial use
- Minimization of alignment errors
- Tilt-invariant reflectors and plane mirrors usable
- By measuring on plane mirrors also suitable for x-y-positioning
- Sensor head available of aluminum, stainless steel or invar version
- Open interfaces for OEM software under Windows and Linux
- Compact electronics unit for mobil calibration tasks available



Sensor head SP 15000 NG

Applications

- Precision length measuring system as a measuring or calibration instrument for installing in measuring tables, microscope stages, positioning tables, measuring machines, machine tools, hardness and material testing instruments
- Multiple coordinate measurements, e.g. on planar tables, by processing the output signals from two sensor heads simultaneously in one supply and evaluation unit
- Calibration of length measuring instruments
- Non-contact surface measurements

Technical Data	SP 5000 NG	SP 15000 NG
Measuring range (Max. distance reflector - sensor head)	5 m	≤80 m
Resolution	5 µm	5 µm
Maximum tilting angle (Center of rotation in centre of reflector) for Plane mirror reflector	±12.5° ±1.5 arcmin	±22.5° -
Laser wavelength	632.8 nm	
Frequency stability of the HeNe laser (after warm-up time)	2·10 ⁻⁸	
Warm-up time of the HeNe laser	10...20 min	
Operating temperature range	15...30°C	
Maximum displacement speed of the measuring reflector	800 mm/s	
Dimensions (L x W x H): Sensor head with alignment base Reflector Optoelectronic supply and evaluation unit (standard) Optoelectronic supply and evaluation unit (compact)	[130 x 90 x 58] mm Ø 15 mm x 15 mm	max. [227 x 90 x 67] mm [45 x 45 x 50] mm [450 x 400 x 150] mm [250 x 400 x 150] mm
Mass: Sensor head with alignment base Reflector Optoelectronic supply and evaluation unit (standard) Optoelectronic supply and evaluation unit (compact)	650 g 8 g	max. 820 g 105 g ca. 8 kg ca. 5.7 kg
Interfaces standard optional	RS232C, USB Digital 32-bit parallel interface Digital incremental signals (TTL level) Analog incremental signals (1V _{pp})	
Cable length between sensor head and electronic unit	3 m, optionally up to 10	
Line voltage / frequency	100...240 VAC / 47...60 Hz	
Laser safety class according to EN 60825-1:2007 and ANSI Z136.1 (CDRH)	2M II	

SIOS Meßtechnik GmbH

Am Vogelherd 46

98693 Ilmenau, Germany

Phone: +49-3677-64470

E-mail: contact@sios.de

Fax: +49-3677-64478

URL: <http://www.sios.de>

Warning:















Solid glass retroreflectors are valuable for applications requiring an exact 180° reflection without having to precisely orient the prism. Reflected images are both inverted and reversed.

- 180° reflection independent of angle of incidence
- 2 arc sec accuracy
- Image inverted and reversed

See All Features

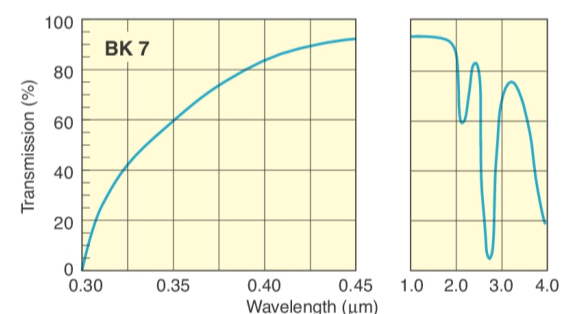
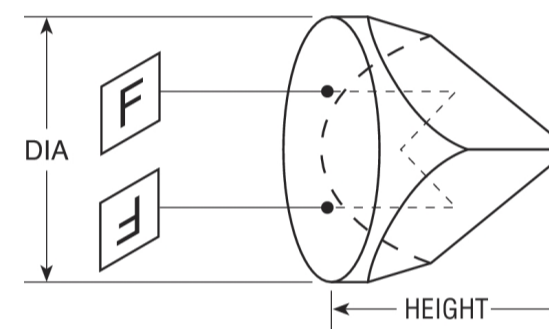


Compare	Model	Drawings, CAD & Specs	Availability	Price
 (/p/BGR-12.7)	BGR-12.7 (/p/BGR-12.7) Solid Glass Retroreflector, N-BK7, 12.7 mm Diameter, 9.5 mm Height	 	In Stock 	€377
 (/p/BGR-25.4)	BGR-25.4 (/p/BGR-25.4) Solid Glass Retroreflector, N-BK7, 25.4mm Diameter, 19.0 mm Height	 	In Stock 	€368
 (/p/BGR-6.35)	BGR-6.35 (/p/BGR-6.35) Solid Glass Retroreflector, N-BK7, 6.35 mm Diameter, 5.0 mm Height	 	In Stock 	€388

Features

180° Reflection Regardless of Beam Orientation

Solid glass retroreflectors are sometimes called corner cubes because the reflecting surfaces are three mutually perpendicular faces, like the corner of a cube. Light entering a retroreflector is reflected back 180°, and parallel to the original beam, regardless of its orientation to the beam. The three reflective surfaces are uncoated, relying on total internal reflection (TIR), which gives them limitations at severe angles of incidence. They also must be kept clean for TIR to work properly.



N-BK7 for VIS and NIR Applications

N-BK7 is an excellent prism material for most visible and near infrared applications. It is the most common borosilicate crown optical glass, and it provides great performance at a good value. Its high homogeneity, low bubble and inclusion content, and straightforward manufacturability make it a good choice for transmissive optics.

RoHS Compliant

These prisms have been tested for dangerous substances like Pb, Cd, Hg, Hex-Cr, PBB, and PBDE and have been found to be in compliance with RoHS allowable levels.



Related Products



(/f/broadband-hollow-retroreflectors)

Broadband Hollow Retroreflectors
(/f/broadband-hollow-retroreflectors)



(/f/replicated-hollow-metal-retroreflectors)

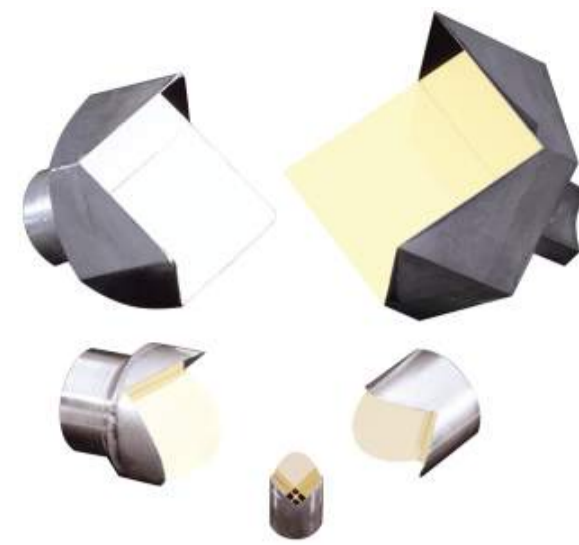
Replicated Hollow Metal Retroreflectors
(/f/replicated-hollow-metal-retroreflectors)



















































Our replicated hollow metal retro reflectors are fabricated from a single solid piece of aluminum, resulting in return beam accuracy unaffected by vibration. Mirrors are front surface coated with gold for maximum IR reflectivity.

- Monolithic, all metal retro reflector construction
- As low as 2 arc second return beam accuracy
- Rugged, impact resistant construction
- -40 to 60 °C operating temperature range
- Coating Adhesion/humidity resistance MIL-F-48616
- Integral mount

See All Features



Compare	Model	Drawings, CAD & Specs	Availability?	Price
 (/p/50326-0505)	50326-0505 (/p/50326-0505) Replicated Hollow Metal Retroreflector, 12.7mm OD, 5 arc sec RBA	 	In Stock 	€344
 (/p/50326-0510)	50326-0510 (/p/50326-0510) Replicated Hollow Metal Retroreflector, 12.7mm OD, 10 arc sec RBA	 	In Stock 	€272
 (/p/50326-0802)	50326-0802 (/p/50326-0802) Replicated Hollow Metal Retroreflector, 19.1mm OD, 2 arc sec RBA	 	In Stock 	€487
 (/p/50326-0805)	50326-0805 (/p/50326-0805) Replicated Hollow Metal Retroreflector, 19.1mm OD, 5 arc sec RBA	 	In Stock 	€408
 (/p/50326-0810)	50326-0810 (/p/50326-0810) Replicated Hollow Metal Retroreflector, 19.1mm OD, 10 arc sec RBA	 	In Stock 	€329
 (/p/50326-1002)	50326-1002 (/p/50326-1002) Replicated Hollow Metal Retroreflector, 25.4mm OD, 2 arc sec RBA	 	In Stock 	€544
 (/p/50326-1005)	50326-1005 (/p/50326-1005) Replicated Hollow Metal Retroreflector, 25.4mm OD, 5 arc sec RBA	 	In Stock 	€460
 (/p/50326-1010)	50326-1010 (/p/50326-1010) Replicated Hollow Metal Retroreflector, 25.4mm OD, 10 arc sec RBA	 	In Stock 	€376
 (/p/50326-1502)	50326-1502 (/p/50326-1502) Replicated Hollow Metal Retroreflector, 38.1mm OD, 2 arc sec RBA	 	In Stock 	€585
 (/p/50326-1505)	50326-1505 (/p/50326-1505) Replicated Hollow Metal Retroreflector, 38.1mm OD, 5 arc sec RBA	 	In Stock 	€507
 (/p/50326-1510)	50326-1510 (/p/50326-1510) Replicated Hollow Metal Retroreflector, 38.1mm OD, 10 arc sec RBA	 	In Stock 	€455
 (/p/50394-2530)	50394-2530 (/p/50394-2530) Replicated Hollow Metal Retroreflector, 63.5mm OD, 30 arc sec RBA	 	In Stock 	€283

Specifications

Note: Specifications below are common to all products presented. See Individual product details for complete information.

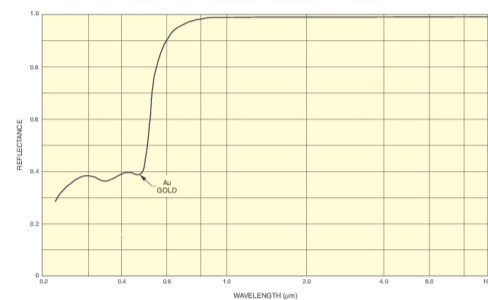
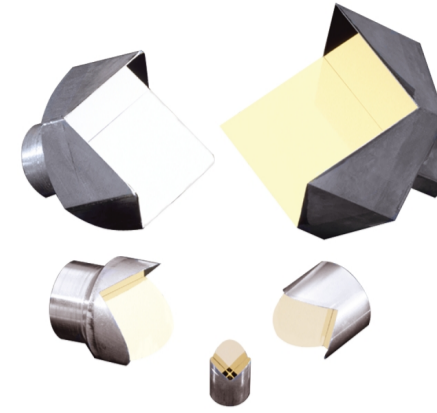
Mirror Shape	Hollow Retroreflector	Diameter	See model
Coating Type	Bare Gold	Coating Adhesion	MIL-F-48616
Material	Aluminum	Humidity Resistance	MIL-F-48616
Return Beam Accuracy	See model	Operating Temperature Range	-40 to 60°C
Surface Quality	80-50 scratch-dig	Thread Type	10-24 x 0.2 in. depth

Features



Stable Monolithic Construction

Our replicated hollow metal retroreflectors are monolithic, fabricated from a single piece of aluminum, resulting in return beam accuracy unaffected by vibration. Vibration sensitivity is reduced further by employing an integrated mount in the design.

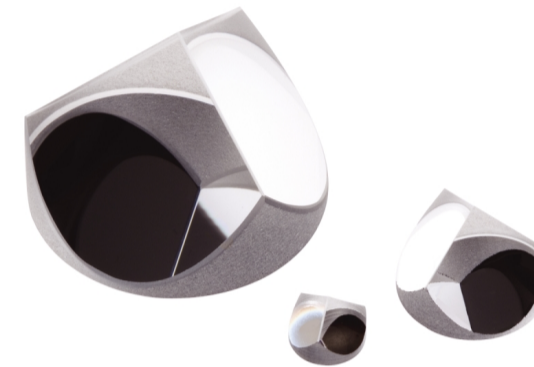


Gold Coating with High IR Reflectivity

Front surface coated with gold for high reflectivity in the IR and deep IR.

Advantages vs. Glass Retro Reflectors

Unlike solid glass retroreflectors, the optical path is entirely in air so efficient performance is obtained without antireflection coatings which limit the operating wavelength range. Using a novel patented fabrication technique, parallelism up to 1 arc sec and wavefront distortion $\leq \lambda/3$ is economically achieved. These retroreflectors are offered in 12.7, 19.1, 25.4, 38.1, or 63.5 mm diameter apertures and 30, 10, 5, or 2 arc sec parallelism.



Alignment Free 180 Degree Reflection

Retroreflectors, also known as corner cubes as all three mirror surfaces are perpendicular, will reflect all incoming light 180° regardless of incidence angle. This enables 180 degrees reflection of a beam without requiring prior alignment (as with a flat mirror). Images reflected by a corner cube are reversed and inverted.

Related Products



(/c/optical-mounts)
Optical Mounts
(/c/optical-mounts)



(/c/optic-cleaning-supplies)
Optic Cleaning Supplies
(/c/optic-cleaning-supplies)



(/f/solid-glass-retroreflectors)
Solid Glass Retroreflectors
(/f/solid-glass-retroreflectors)



(/f/broadband-hollow-retroreflectors)
Broadband Hollow Retroreflectors
(/f/broadband-hollow-retroreflectors)

✉ [Contact Us \(/contact-us\)](#)



ANEXO B

Objet Eden350V



Características

Fabricante: Stratasys

Uso: Profesional

Tecnología: PolyJet

Materiales: Fotopolímero, Exclusivo de la marca

Tamaño máximo de impresión: 340x340x200 mm

Espesor de capa: 16 - 30 micras

Tipos de archivo: .stl

Conectividad: Ethernet

S.O. compatibles: Windows XP, 2000

Formato de entrega: Plug & Play

Peso: 410,00 kg

Tamaño de la impresora: 1320x990x1200 mm

Alimentación y consumo: 110 - 240 VAC 50/60 Hz 1.5 KW monofásico

País de fabricación: Estados Unidos

Enlace: www.stratasys.com



BQ Prusa i3 Hephestos Impresora 3D especificaciones

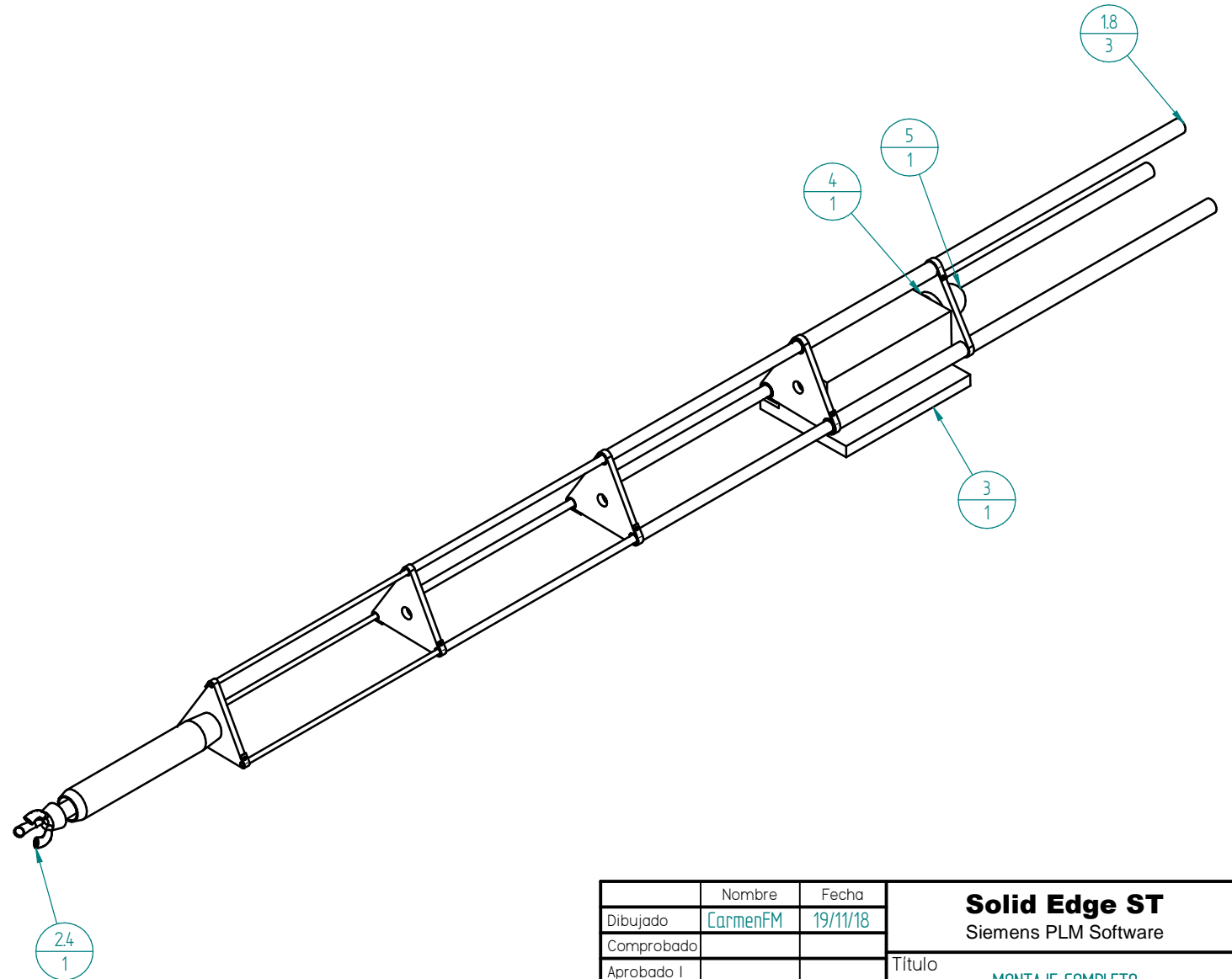
- Dimensiones
 - Impresora sin bobina PLA: 460 x 370 x 510 mm
 - Impresora con bobina PLA: 460 x 370 x 583 mm
 - Área de impresión: 215 x 210 x 180 mm
- Resolución
 - Muy Alta 60 micras
 - Alta 100 micras
 - Media 200 micras
 - Baja 300 micras
- Velocidad de impresión
 - Velocidad recomendada 40-60 mm/sec
 - Velocidad máxima recomendada 80-100 mm/sec
- Electrónica
 - Ramps 1.4
 - Mega 2560
 - Pantalla de LCD con encoder rotativo con pulsador para la navegación
 - Base fría de cristal tamaño 220 x 220 x 3 mm
 - Fuente de alimentación de 220 AC 12 DC 100W
 - Termistores 100k en extrusor
 - Cartucho calefactor 40W 12V
- Mecánica General
 - Marco y base de aluminio pintado al polvo
 - Barras de cromo duro para los carros X,Y,Z
 - Rodamiento lineal de bolas LM8UU para X, Y, Z
 - Rodamiento axial de bolas B623ZZ para las poleas X, Y
 - Cadenas portacables Igus

- Acoplamiento flexible para las varillas roscadas del eje Z
- Sistema de nivelado de base de impresión con 4 puntos y amortiguación
- Sistema de cambio rápido de base de impresión con Clips
- Ventiladores brushless axiales con rodamientos de bolas
- Piezas impresas en PLA
- Mecánica extrusor
 - Extrusor de diseño propio
 - Boquilla de 0.4 mm para filamento de 1.75 mm
 - Disipador de aletas con ventilador axial
 - Tobera de refrigeración de pieza
- Materiales PLA, HIPS, FilaFlex entre otros
- Software
 - Firmware derivado de Marlin
 - Entorno recomendado: Cura Software, Slic3r, Repetier, Kisslicer
 - Archivos admitidos: .gcode
 - Sistemas operativos compatibles: Windows XP y superiores, Mac OS X y superiores y Linux
- Comunicaciones
 - Lector de tarjetas SD
 - Puerto USB tipo B
- Seguridad Extrusor protegido con pieza de diseño propio

ANEXO C

PLANO	COMPONENTE
0000	MONTAJE COMPLETO
0001	EJE INTERIOR
0002	EJE EXTERIOR
0003	ANILLO FIJACION SISTEMA ELÁSTICO
0004	MUELLE 1
0005	MUELLE 2
0006	TAPON SUJECION SISTEMA ELASTICO
0007	TAPON UNION COSTILLA FINAL- BOLA MH
0008	TUBOS CAPILARES
0009	COSTILLA INICIAL D=4
0010	COSTILLA FINAL D=12
0011	COSTILLA D=12
0012	COSTILLA D= 9
0013	COSTILLA D=6

Número de elemento	Nombre archivo (sin extensión)	Cantidad
	Montaje_Completo	
1	Estructura	1
1.1*	Costilla 1 (d4)	1
1.2*	Capilar d4	3
1.3*	Costilla 2 (d6)	1
1.4*	Capilar d6	3
1.5*	Capilar d8	3
1.6*	Costilla 3 (d9)	1
1.7*	Costilla 4 (d12)	1
1.8	Capilar d12	3
1.9*	Costilla 5 (d12)	1
2	MONTAJE TRIDENTe	1
2.1*	Eje pequeño	1
2.2*	Eje grande	1
2.3*	MUELLEinferior	1
2.4	Tridente 6	1
2.5*	RODAMIENTOS EJES	2
2.6*	Muelle superior	1
2.7*	Tapon muelle	1
2.8*	soporte	1
3	Bloque Laser	1
4	Tapon sujecion bola	1
5	Bola base MH	1
6*	Tapon sujecion sistema tridente	1

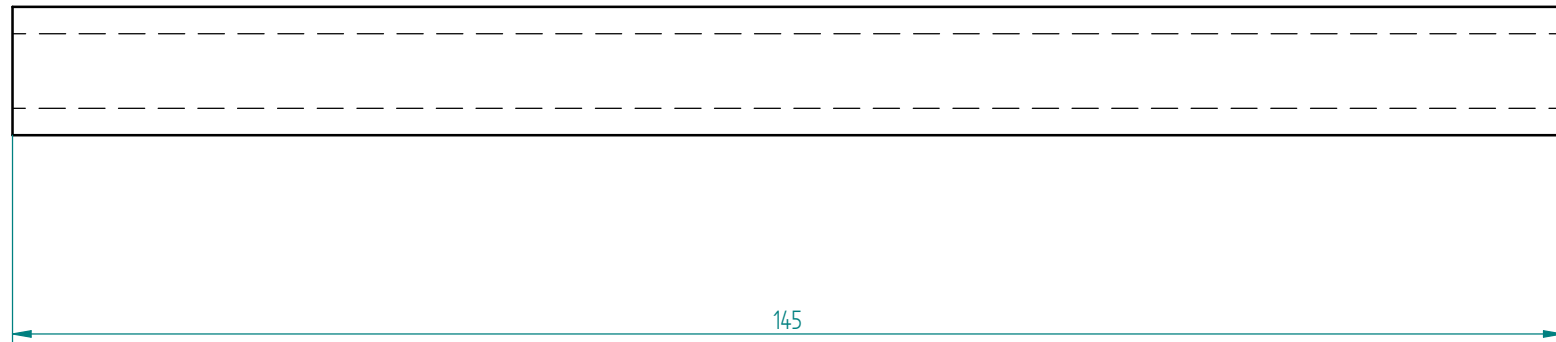
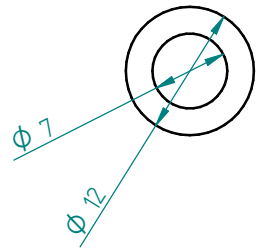


Revisiones			
Rev	Descripción	Fecha	Aprobado

	Nombre	Fecha	Solid Edge ST	
Dibujado	CarmenFM	19/11/18	Siemens PLM Software	
Comprobado			Título	
Aprobado 1			MONTAJE COMPLETO	
Aprobado 2			A3 Plano	
Salvo indicación contraria cotas en milímetros ángulos en grados tolerancias ±0,5 y ±1°			Rev	
			Archivo: 0000.dft	
Escala		Peso	Hoja 1 de 1	

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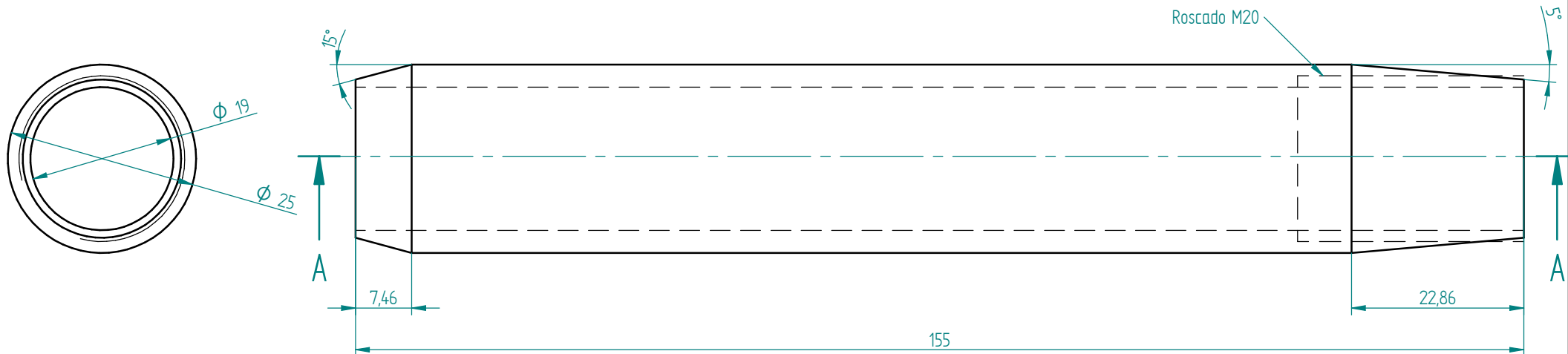
Revisiones			
Rev	Descripción	Fecha	Aprobado



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Dibujado	CarmenFM	16/11/18			
Comprobado			Título EJE INTERIOR SISTEMA ELASTICO		
Aprobado 1					
Aprobado 2					
Salvo indicación contraria cotas en milímetros ángulos en grados tolerancias $\pm 0,5$ y $\pm 1^\circ$			A3	Plano	Rev
			Archivo: 0001.dft		
			Escala	Peso	Hoja 1 de 1

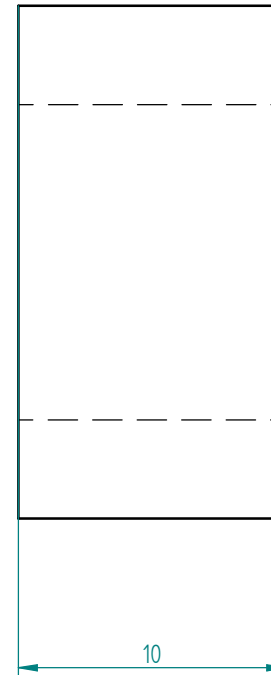
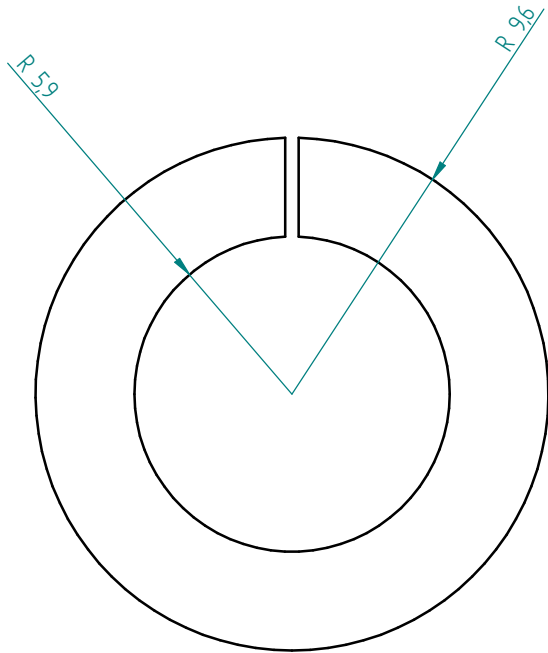
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Rev	Descripción	Fecha	Aprobado



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Comprobado		Título	
Aprobado 1		EJE EXTERIOR DEL SISTEMA ELASTICO	
Aprobado 2		Rev	
Salvo indicación contraria cotas en milímetros ángulos en grados tolerancias $\pm 0,5$ y $\pm 1^\circ$		A3	Plano
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		Hoja 1 de 1	

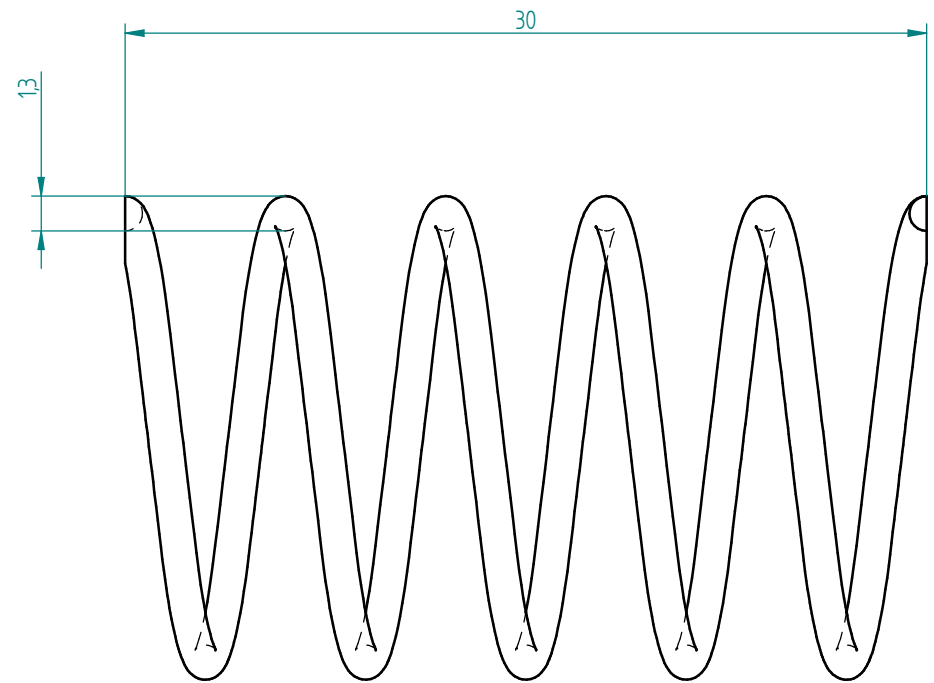
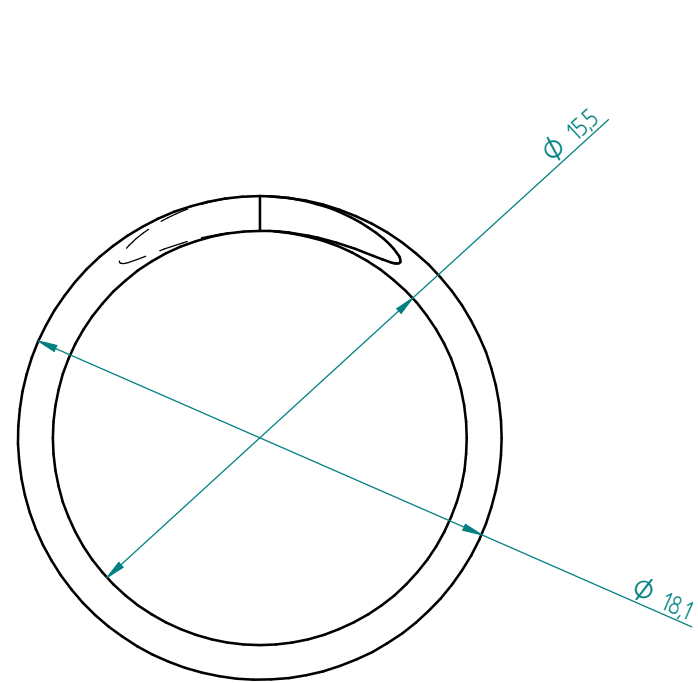
Revisiones			
Rev	Descripción	Fecha	Aprobado



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Aprobado 2				
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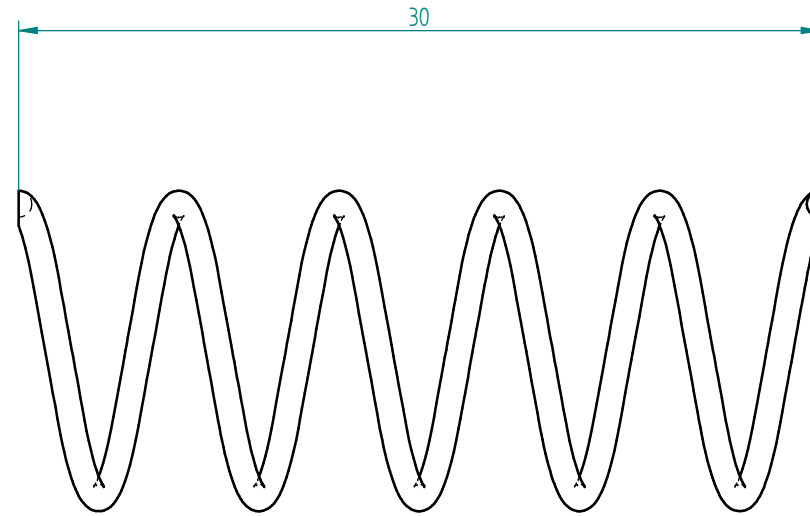
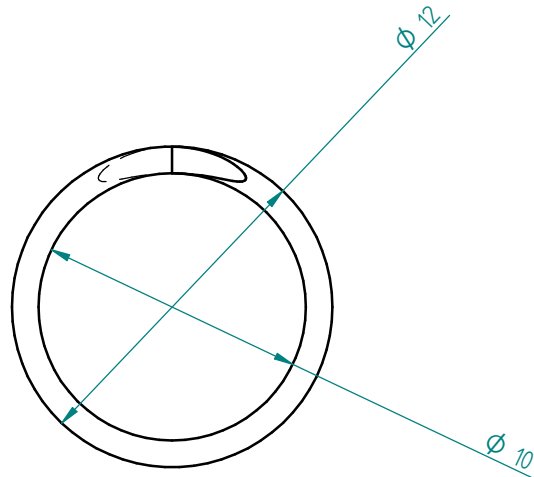
Revisiones			
Rev	Descripción	Fecha	Aprobado



SOLID EDGE ACADEMIC COPY

Nombre	Fecha	Solid Edge ST Siemens PLM Software		
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Comprobado		Título MUELLE 1		
Aprobado 1				
Aprobado 2				
Salvo indicación contraria cotas en milímetros ángulos en grados tolerancias $\pm 0,5$ y $\pm 1^\circ$		A3	Plano	Rev
		Archivo: 0004.dft		
		Escala	Peso	Hoja 1 de 1

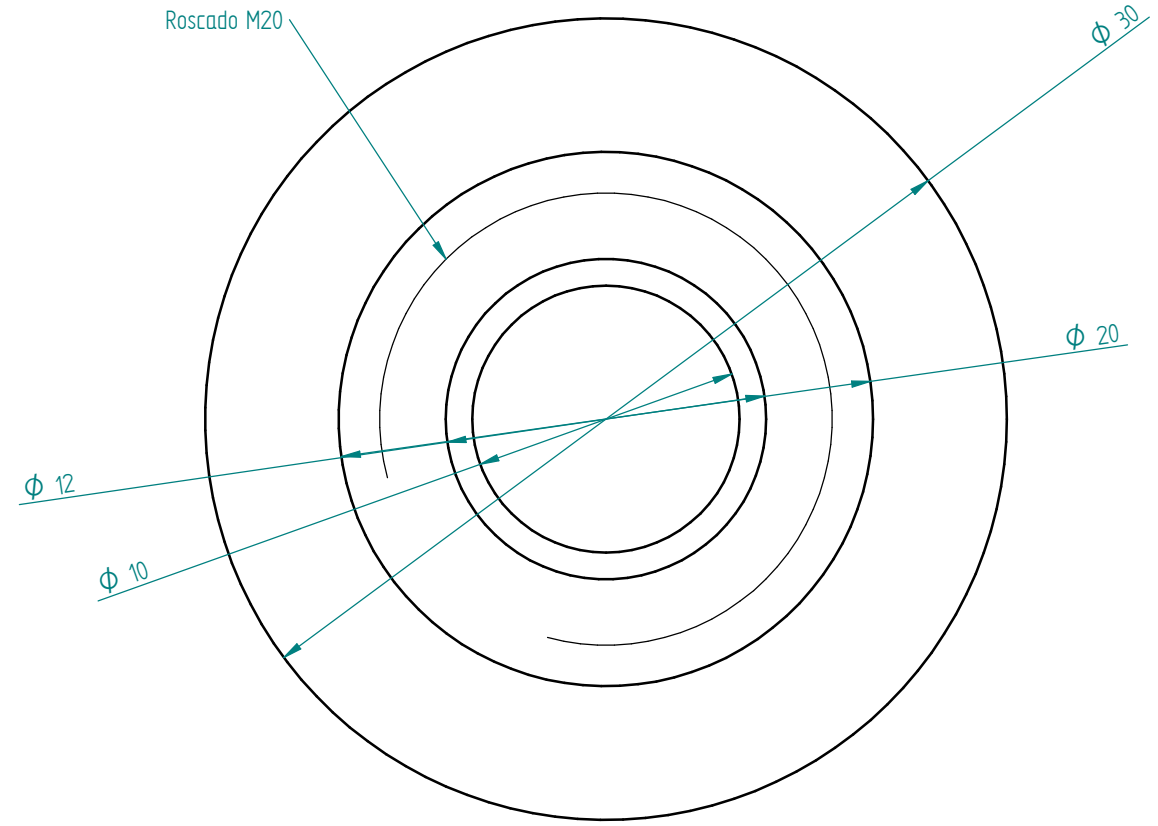
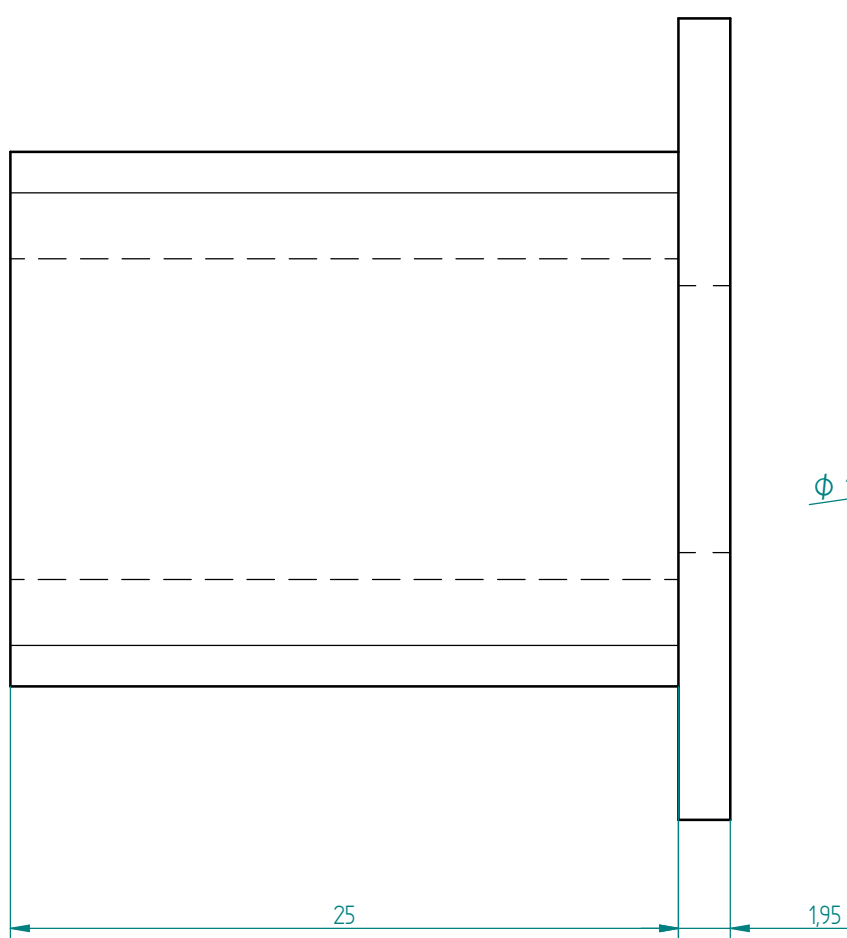
Revisiones			
Rev	Descripción	Fecha	Aprobado



SOLID EDGE ACADEMIC COPY

Nombre	Fecha	Solid Edge ST Siemens PLM Software		
Dibujado	CarmenFM 16/11/18			
Comprobado		Título MUELLE 2		
Aprobado 1				
Aprobado 2				
Salvo indicación contraria cotas en milímetros ángulos en grados tolerancias $\pm 0,5$ y $\pm 1^\circ$		A3	Plano	Rev
		Archivo: 0005.dft		
		Escala	Peso	Hoja 1 de 1

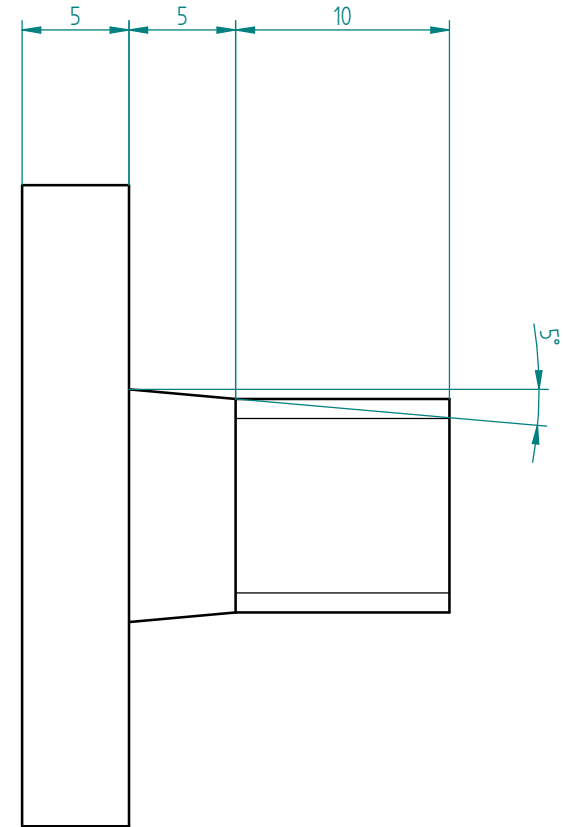
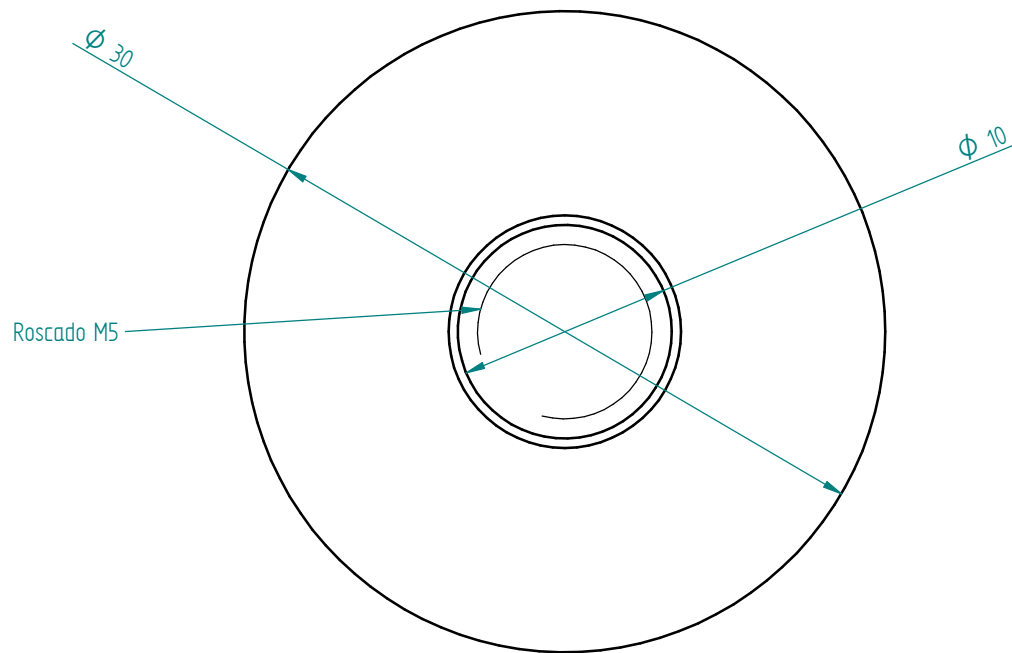
Revisiones			
Rev	Descripción	Fecha	Aprobado



Nombre	Fecha	Solid Edge ST	
Dibujado: CarmenFM	16/11/18	Siemens PLM Software	
Comprobado		Título: TAPON SUJECION SISTEMA ELASTICO	
Aprobado 1			
Aprobado 2			
Salvo indicación contraria cotas en milímetros ángulos en grados tolerancias ±0,5 y ±1°		A3	Plano
		Archivo: 0006.dft	
		Escala	Peso
		Hoja 1 de 1	

SOLID EDGE ACADEMIC COPY

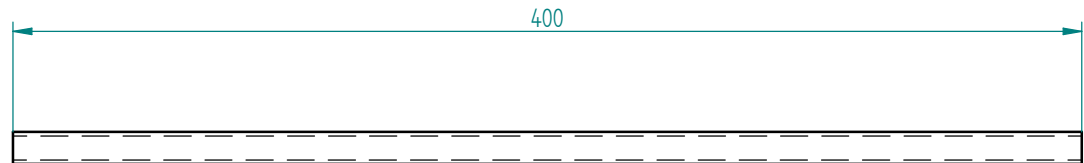
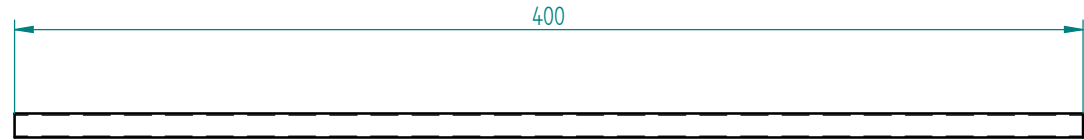
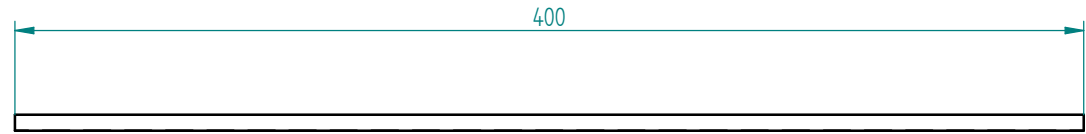
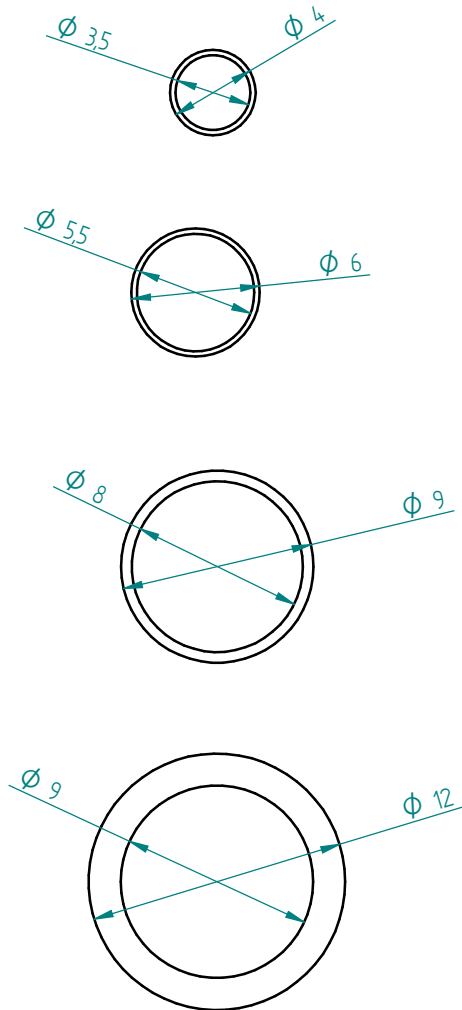
Revisiones			
Rev	Descripción	Fecha	Aprobado



SOLID EDGE ACADEMIC COPY

Nombre	Fecha	Solid Edge ST Siemens PLM Software	
Dibujado: CarmenFM	19/11/18		
Comprobado		Título TAPON UNION COSTILLA FINAL- BOLA MESA MH	
Aprobado 1		A3 Plano	
Aprobado 2		Rev	
Salvo indicación contraria cotas en milímetros ángulos en grados tolerancias $\pm 0,5$ y $\pm 1^\circ$		Archivo: 0007.dft	
Escala	Peso	Hoja 1 de 1	

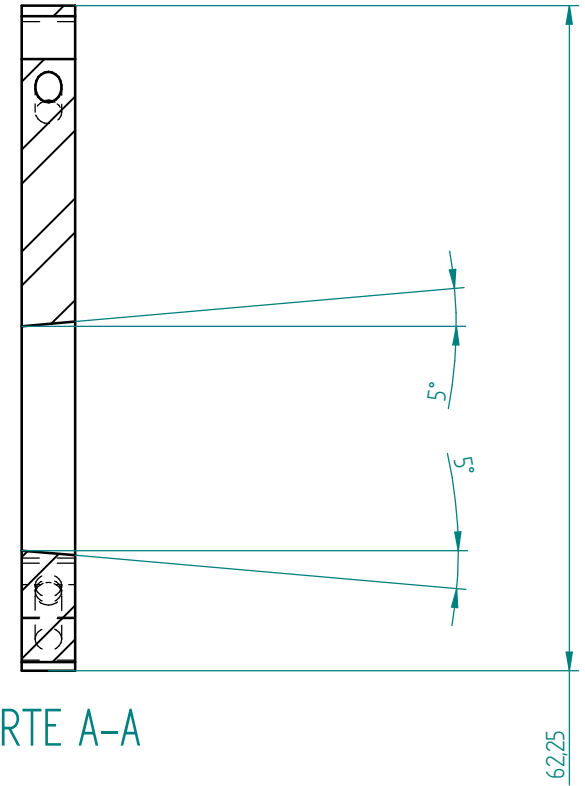
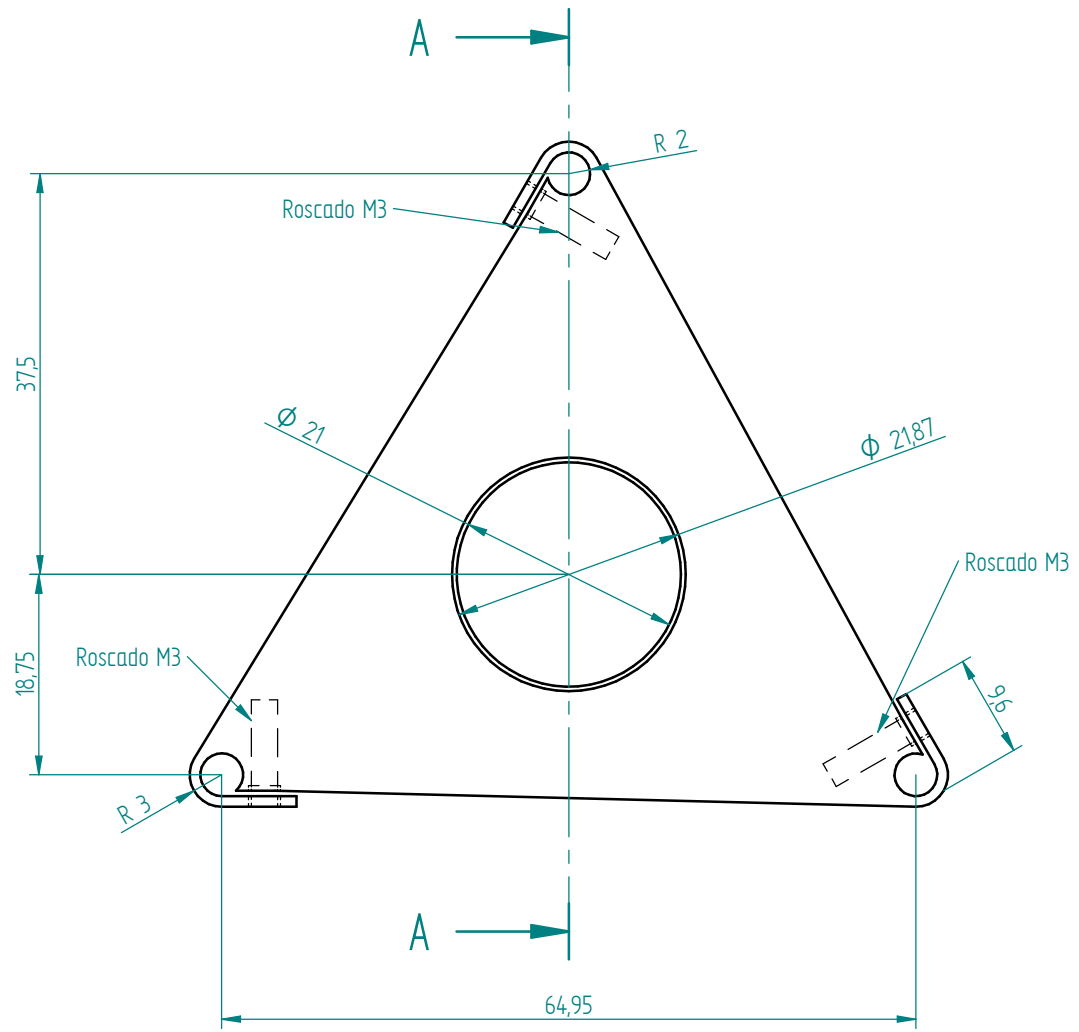
Revisiones			
Rev	Descripción	Fecha	Aprobado



SOLID EDGE ACADEMIC COPY

Nombre	Fecha	Solid Edge ST	
Dibujado: CarmenFM	19/11/18	Siemens PLM Software	
Comprobado		Título: TUBOS CAPILARES	
Aprobado 1			
Aprobado 2			
Salvo indicación contraria cotas en milímetros ángulos en grados tolerancias $\pm 0,5$ y $\pm 1^\circ$		A3	Plano
		Archivo: 0008.dft	
		Escala	Peso
		Hoja 1 de 1	

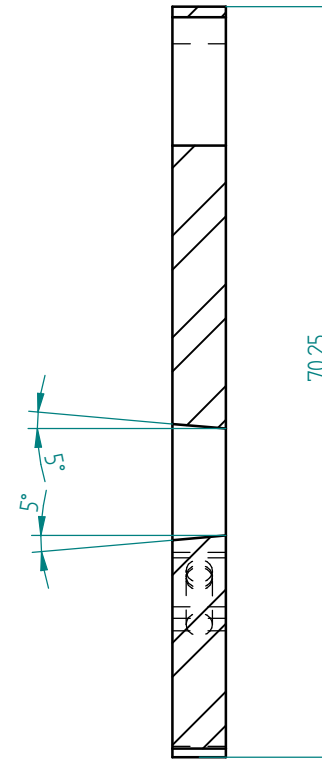
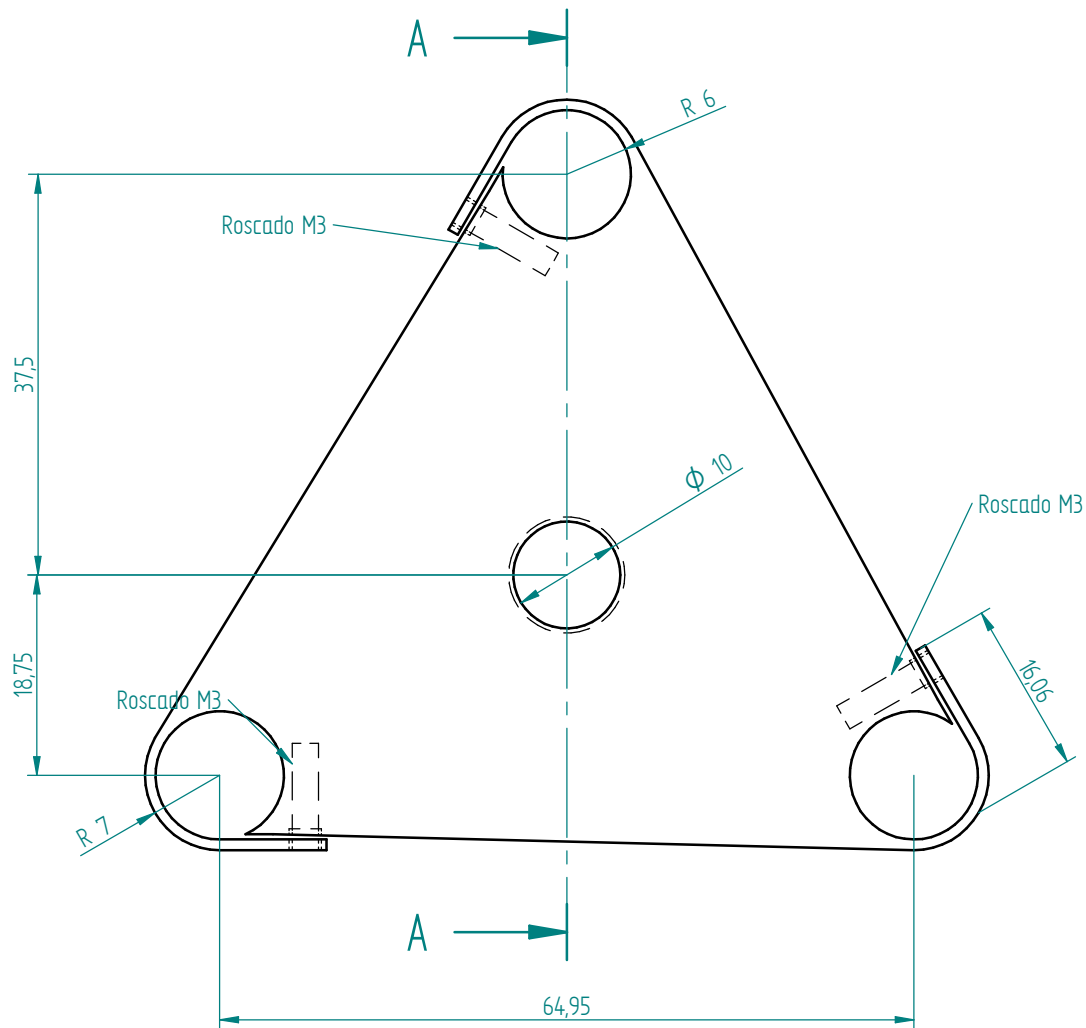
Revisiones			
Rev	Descripción	Fecha	Aprobado



SOLID EDGE ACADEMIC COPY

Nombre	Fecha	Solid Edge ST	
Dibujado: CarmenFM	19/11/18	Siemens PLM Software	
Comprobado		Título	
Aprobado 1		COSTILLA INICIAL P/CAPILAR D=4	
Aprobado 2		A3 Plano	
Salvo indicación contraria cotas en milímetros ángulos en grados tolerancias $\pm 0,5$ y $\pm 1^\circ$		Rev	
Archivo: 0009.dft		Escala	
Peso		Hoja 1 de 1	

Revisiones			
Rev	Descripción	Fecha	Aprobado

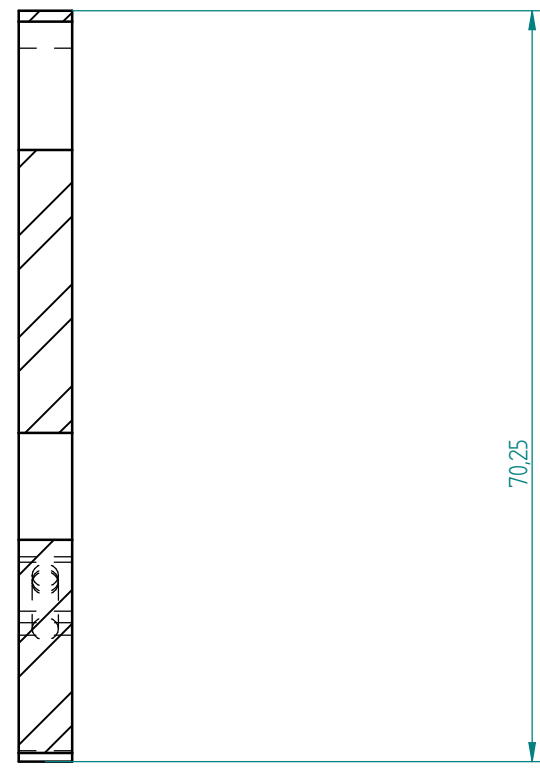
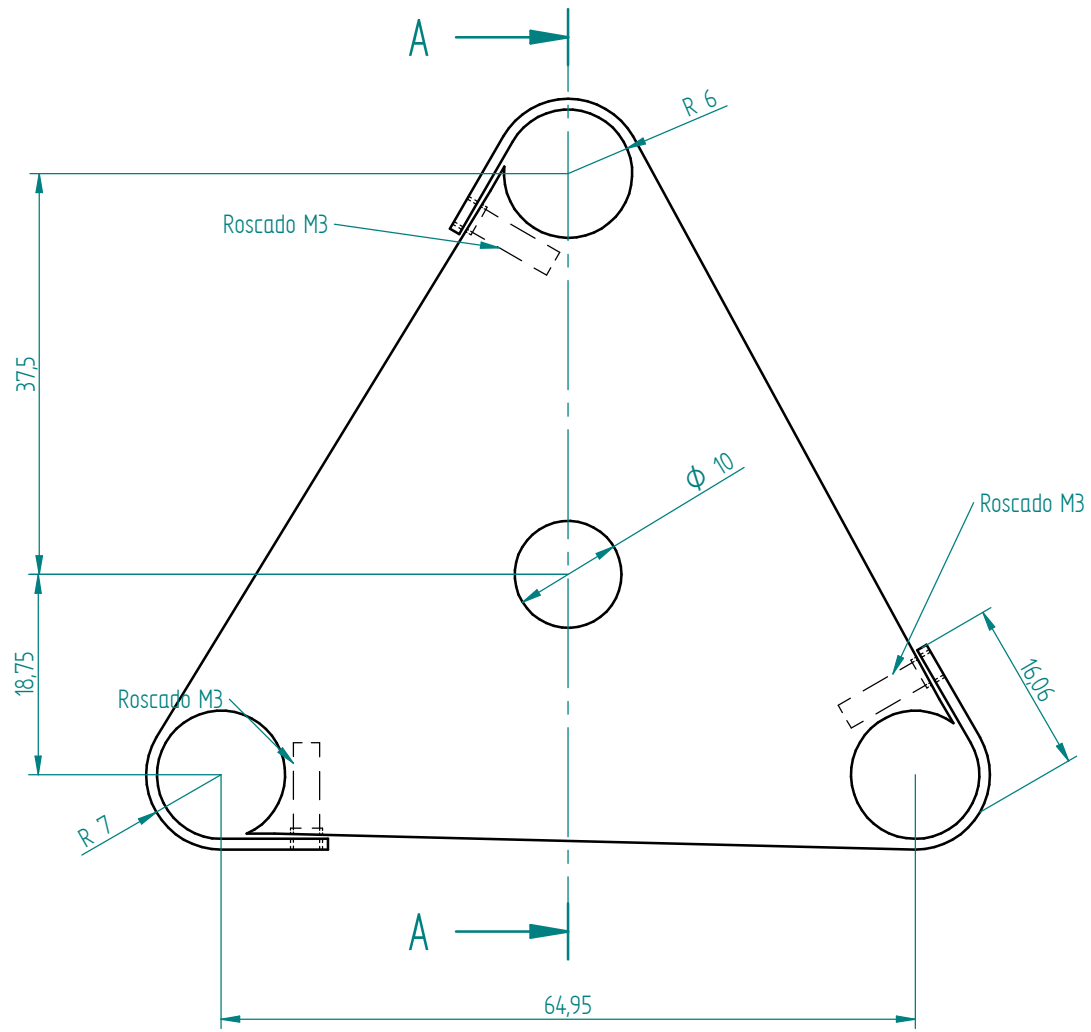


CORTE A-A

SOLID EDGE ACADEMIC COPY

Nombre	Fecha	Solid Edge ST	
Dibujado CarmenFM	19/11/18	Siemens PLM Software	
Comprobado		Título	
Aprobado 1		COSTILLA P/CAPILAR $\Phi=12$	
Aprobado 2		A3 Plano	
Salvo indicación contraria cotas en milímetros ángulos en grados tolerancias $\pm 0,5$ y $\pm 1^\circ$		Rev	
		Archivo: 0010.dft	
Escala	Peso	Hoja 1 de 1	

Revisiones			
Rev	Descripción	Fecha	Aprobado

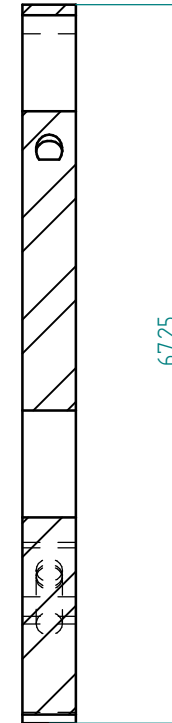
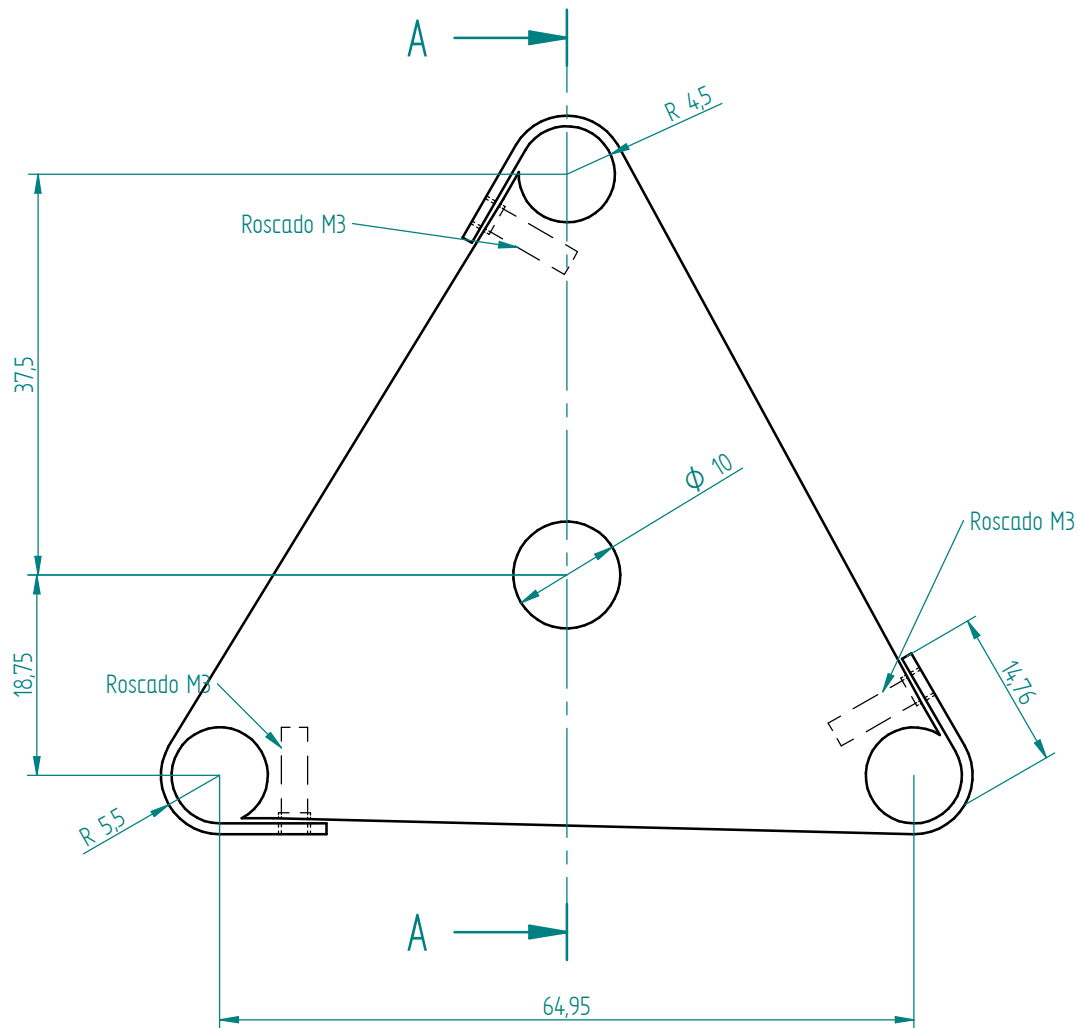


CORTE A-A

SOLID EDGE ACADEMIC COPY

Nombre	Fecha	Solid Edge ST	
Dibujado: CarmenFM	19/11/18	Siemens PLM Software	
Comprobado		Título: COSTILLA P/CAPILAR $\varnothing=12$	
Aprobado 1			
Aprobado 2			
Salvo indicación contraria cotas en milímetros ángulos en grados tolerancias $\pm 0,5$ y $\pm 1^\circ$		A3	Plano
		Archivo: 0011.dft	
		Escala	Peso
		Hoja 1 de 1	

Revisiones			
Rev	Descripción	Fecha	Aprobado

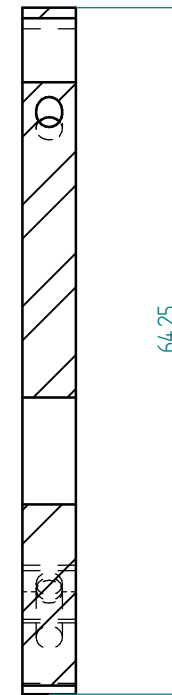
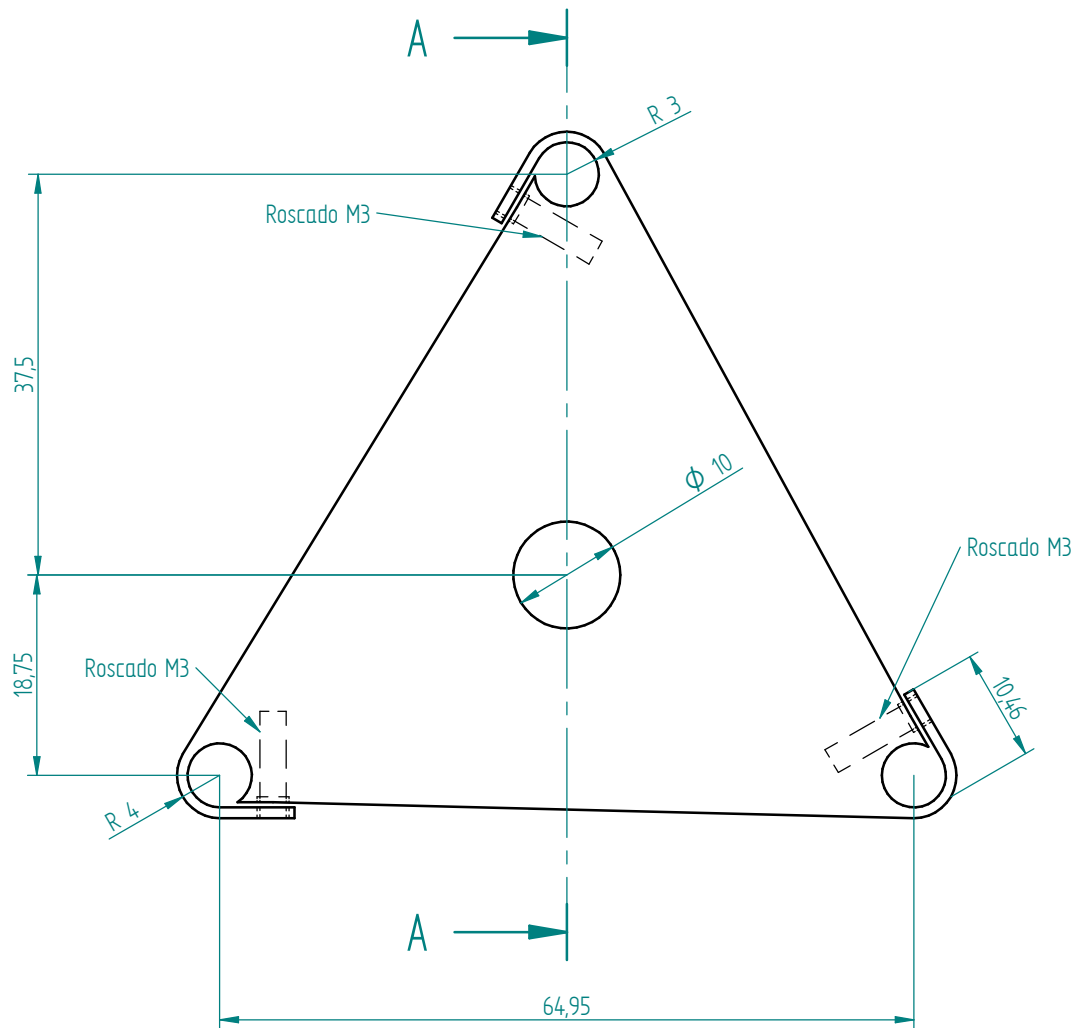


CORTE A-A

SOLID EDGE ACADEMIC COPY

Nombre	Fecha	Solid Edge ST	
Dibujado: CarmenFM	19/11/18	Siemens PLM Software	
Comprobado		Título	
Aprobado 1		COSTILLA P/CAPILAR D=9	
Aprobado 2		A3 Plano	
Salvo indicación contraria cotas en milímetros ángulos en grados tolerancias $\pm 0,5$ y $\pm 1^\circ$		Rev	
		Archivo: 0012.dft	
		Escala	Peso

Revisiones			
Rev	Descripción	Fecha	Aprobado



CORTE A-A

SOLID EDGE ACADEMIC COPY

	Nombre	Fecha	Solid Edge ST Siemens PLM Software		
Dibujado	CarmenFM	19/11/18			
Comprobado			Título COSTILLA P/CAPILAR D=9		
Aprobado 1					
Aprobado 2			A3	Plano	Rev
Salvo indicación contraria cotas en milímetros ángulos en grados tolerancias $\pm 0,5$ y $\pm 1^\circ$			Archivo: 0013.dft		
			Escala	Peso	Hoja 1 de 1