APH HYDRAULIC ENGINEERING

CASE STUDY

PENCYL CYLINDER RANGE

Design, build and testing of high-quality stainless steel Pencil Cylinders, engineered to perform

TRUST RUNS DEEP

CHALLENGE

Due to a project being pulled forward unexpectedly, a leading global manufacturer of remotely operated subsea survey equipment required urgent support to design and build a high volume of bespoke 316 'Pencyl Cylinders' within 25 days.

The APH approach is very customer centric, and our production and engineering team worked hard to ensure production ran as smoothly as possible to avoid delays on this tight turnaround.

SCOPE

At the start of this year, our client specified their requirements and design for two types of Pencyl Cylinder, in high volume. The requirement included several features which had to consider a compact design, which would be robust and offer reliability in a highly corrosive environment.

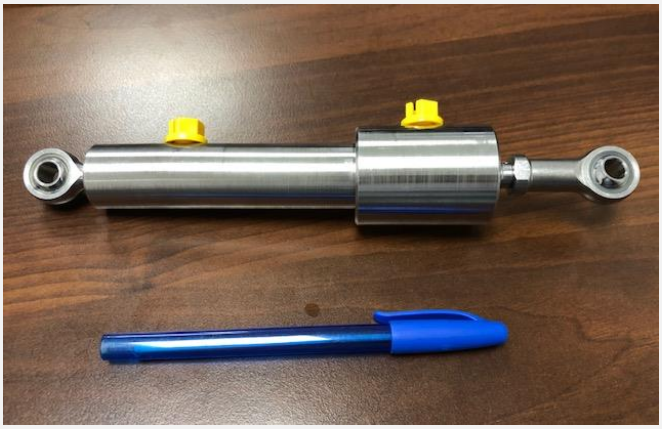
The scope, in total, included over sixty, 316 bespoke stainless steel Pencyl Cylinders which were then built and tested at the APH facility in Glasgow within 25 days.

SOLUTION

With over 50 years' experience in the subsea industry, APH has extensive in-house design expertise and manufacturing capability.

Our in-depth knowledge of subsea hydraulics, allowed for a great degree of flexibility as the project requirement evolved and changed throughout the design approval phase.

APH is fully self-sufficient and our well-established and trusted supply chain network as well as robust manufacturing capability and experienced engineering team meant APH could closely manage production. Minimising the risk of delay and subsequent impact on our client delivery date.



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RESULTS

Despite a full production schedule, APH were able to manufacture and test the full requirement in less than 2 weeks. This not only required an in-depth understanding and awareness of the customer requirement but also full visibility of holding stock components and an agile approach to work around existing manufacturing schedules.

An extensive stockholding and robust supply chain allowed us to respond quickly to the high-volume component manufacture. In addition, our team are very experienced with subsea hydraulics, and were able to draw upon this wealth of knowledge to expedite the build phase line with demanding deadlines.

For this particular application, the Pencyl Cylinder design was bespoke but has remained in operation within the manipulator arm of this subsea vehicle for several years, because of its compact design, reliability and cost effectiveness.

WANT TO KNOW MORE…

The APH Pencyl Cylinder range is a distinct range of 316 Stainless Steel cylinders with bore sizes of 10, 16, 20 and 25mm.

With working pressure up to 400 bar, these cylinders are perfectly suited for low temperatures in remote, compact and corrosive environments. .

Suitable for nuclear, offshore, food and chemical industries where high performance in remote and corrosive environments is required, design features include:

- Cylinder externals (BS970316S16 Stainless steel)
- Cylinder internals (DGS 1043 Aluminium bronze)
- Piston rod (BS970 431 S29-'T' Stainless steel hard chrome plated)
- 400 bar max working pressure
- -40ºC to+80º C temperature range

Sizes:

SERIES	BORE mm	ROD mm	AREA BORE cm²	AREA BORE in²	AREA ROD cm²	AREA ROD in²	ANNULUS cm²	ANNULUS in²
6	10	6	0.785	0.175	0.283	0.044	0.502	0.131
10	16	10	2.011	0.312	0.785	0.175	1.226	0.137
14	20	14	3.142	0.487	1.539	0.239	1.603	0.248
17	25	18	4.909	0.761	2.545	0.394	2.364	0.367

Weights:

SERIES	BORE	ROD	MAX BASE WT ZERO STROKE Kgs	SPHERICAL REAR EYE Kgs	SPHERICAL ROD EYE Kgs
6	10	6	0.37	0.012	0.014
10	16	10	0.55	0.035	0.038
14	20	14	0.86	0.087	0.167
17	25	18	1.22	0.17	0.20

SERIES	BORE	ROD	SCREWED CLEVIS Kgs	ADD PER MM OF STROKE Kgs
6	10	6	0.014	0.002
10	16	10	0.050	0.003
14	20	14	0.080	0.005
17	25	18	0.110	0.007