



press release

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**Time to think again about whether the more cost effective
API 610 VS4 pump can deliver the duty instead of a VSI pump**

There are various types of vertical pumps available from VSI to VS7, each of which suits a range of applications. Within the oil and gas industry the two most common API 610 vertical pumps employed are VSI and VS4. Oliver Brigginshaw, Managing Director of Amarinth, a leading company specialising in the design, application and manufacture of pumps and associated equipment, explains why companies who have always specified a VSI pump should think again about whether a more cost effective VS4 pump could meet the duty required.

Within the oil and gas industry there are many engineers who continue to specify the well-known but complex VSI pumps, more through historic reasoning than whether or not a much simpler VS4 pump may be adequate for the duty. VSI pumps will always be suited to those duties that require high flow or head but for many applications a VS4 pump (with or without a booster pump) will perform the required duty perfectly well (see Figure 1).

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Multistage VSI pumps

VSI pumps can be single or multistage and in theory can work to a limitless depth. VSI pumps achieve this through the ability to have multiple stages stacked one on top of the other (see Figure 2). The fluid is pumped from the sump through the support column and out into a discharge bend. The sharp bend on the discharge however produces a loss in performance and a VSI pump generally requires an expensive double mechanical seal and Plan 53 seal support system to prevent leakage.

The bearings of the shaft in each stage of a VSI pump are mounted inside the support column by spiders. This works well for relatively clean fluids but where the fluid being pumped contains sand or grit, which is typical in oil and gas applications, wear of the spiders occurs. In addition, where sand or grit is present, VSI pumps require an expensive seal support system to enable a clean flush to be fed to the bearings. The grease lubrication of the bearings in VSI pumps is also expensive to manufacture and whilst all vertical pumps require removal from time to time, disassembly and reassembly of VSI pumps is quite time consuming.

VS4 pumps overcome many issues

In comparison, VS4 pumps overcome most of these issues. In a VS4 pump the central column contains the drive shaft to the pump which is supported by a number of bearings depending on the length, but the pumped fluid exits via a separate discharge pipe running parallel to the column from the sump to the top plate which means it can pump the gritty fluid independently of the shaft bearings using various filtering techniques (see Figure 2).

There is no need for a complex mechanical seal at the top plate, usually just a simple vapour seal is required which costs significantly less than a double mechanical seal system. The discharge pipework can also be better designed to reduce losses.

The shaft bearings, sometimes also referred to as line bearings, in the VS4 pump can be easily lubricated and flushed, either by recirculating some of the pumped fluid (which can be filtered through strainers if sand or grit content is high) or using a separate clean fluid flush system should this be available on site.

VS4 pumps can also be built in stages allowing for the quick and easy removal for maintenance in areas of limited headroom. Where a higher flow is required, a VS4 can act as a booster pump with the main pump operating in series and feeding a horizontal centrifugal pump above ground which will then achieve similar head and flows to a VSI, but with the added advantage of maintenance to the horizontal centrifugal pump being much quicker and easier as it does not require lifting out of a sump before maintenance can commence.

Carefully consider whether VS4 will meet the requirements

There are definitely occasions where a VSI pump must be specified, such as when there is not enough NPSH available to feed the pump, but increasingly customers are finding a VS4 pump can offer a cost effective and easier to maintain option than selecting a VSI pump, even when an additional horizontal pump is brought into the equation.

If you have a requirement for a vertical sump pump and have to date only specified VSI pumps, then consider whether a VS4 pump will meet your needs. If the VS4 pump can perform the duty, then they are less expensive, simpler and less costly to maintain than VSI pumps, particularly if the fluid being pumped contains abrasive solids.

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OPTIONAL PANEL or BOX ITEMS

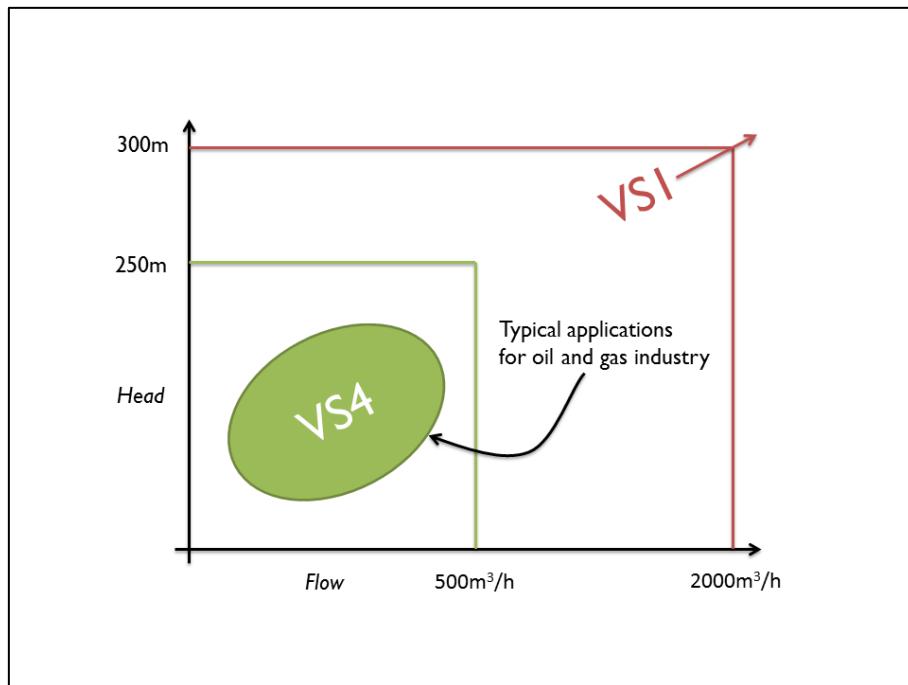


Figure I – VS1 vs. VS4 Head and Flow

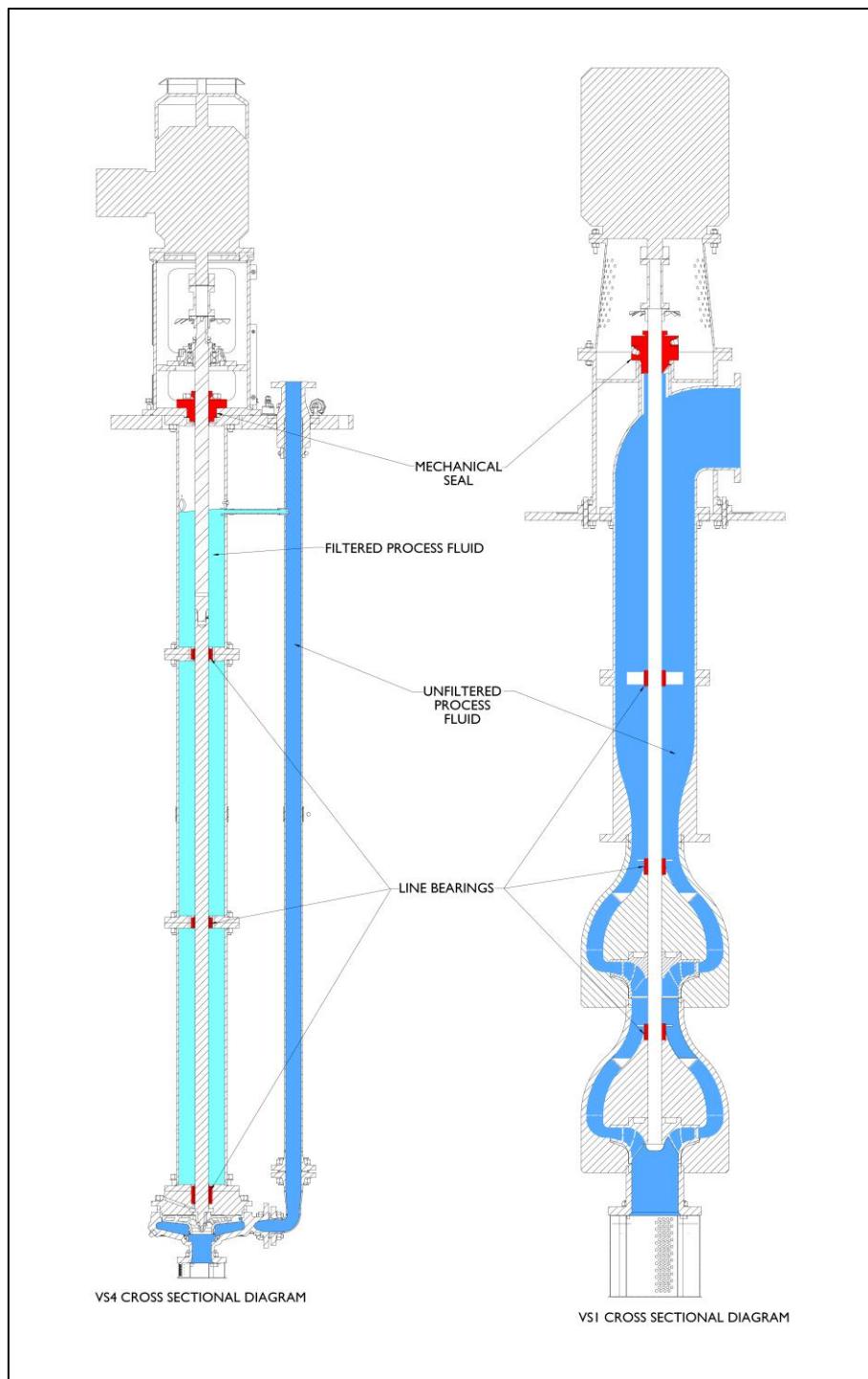


Figure 2 – Comparison of VS4 and VSI Vertical Pumps

NOTES TO EDITORS:

Founded in 2002, Amarinth has harnessed the skills, creativity and passion of people who have worked in the pump industry for many years. Amarinth delivers world-leading expertise in the design, application and manufacture of centrifugal pumps and associated equipment to ISO, ANSI & API standards, primarily for the industrial, chemical & petrochemical markets. Their portfolio includes:

- **Pumps:** Horizontal and vertical API 610 pumps, chemical and industrial pumps, many of which are interchangeable with the Girdlestone pump ranges, eliminating the need for expensive modifications when replacements are required.
- **Pressure Vessels:** Protect System Plan 52 and 53A and 53B sealant systems with inbuilt condition monitoring for pumps and mixers that are suitable for Safe area up to Zone 1.
- **Spares & Service:** High quality, fast lead-time re-engineered spare parts to improve performance and extend pump life, including many which are directly interchangeable with the Girdlestone pump ranges.
- **Packages & Modules:** Condensate Recovery Units manufactured for Spirax Sarco incorporating the innovative Ci-Nergy intelligent variable speed control system, plus bespoke packages & skids built to order.
- **Business Systems:** state-of-the-art e-commerce technologies that deliver 24/7 support enabling customers to select pumps and place orders on-line and then track every stage of manufacture through to delivery, any time, anywhere in the world.

The company operates globally from its base in Rendlesham Suffolk, United Kingdom and has a customer base of world-leading companies, including BP, Shell, ExxonMobil, GlaxoSmithKline, Pfizer, Spirax Sarco, Diageo, AMEC, Fluor and Halliburton.

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