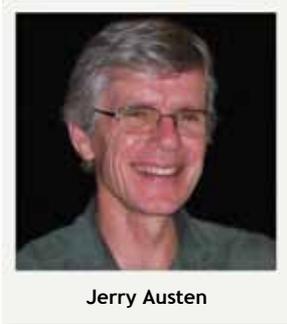




THE EVER-PRESENT TABLE D FLANGE

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What is a Table D flange - and what does it mean?

Table D is not a flange standard. Merely, it is just one part of one of the world's standards for flanges: namely the standard called BS 10 of the British Standards Institute.

Flange tables are not flange standards. The table defines the pressure rating within a flange standard. In this case, BS 10 is the standard. This standard has several tables; each table meaning that the flange is designed to withstand a defined pressure.

SOME OF BS 10'S TABLES ARE AS FOLLOWS:

If one was designing an irrigation system where the designed maximum pressure was 9,0 bar, one could use a flange from BS 10 if one so wished, but to choose Table D would be wrong. It is only rated to 6,89 bar. Rather one should use Table E which is rated to 13,78 bar .

British Standard BS 10	Flange pressure rating
Table D	6,89 bar
Table E	13,78 bar
Table F	20,67 bar

"But I have always only used Table D and never had a problem."

If the pressure is less than 6,89 bar, a BS 10 Table D flange is a reasonable choice. However, if it is higher, then a stronger flange should be used.

All product standards are made with a margin of safety. Just as a uPVC Class 6 pipe for instance will withstand pressures higher than 6,0 bar, the line has nevertheless been drawn and in the case of this uPVC pipe class, it is drawn at 6,0 bar.

Similarly BS 10 Table D's line was drawn by the British Standards Institute at 6,89 bar. They have already done the work and it should not be for us as irrigation designers to decide how far beyond the line we should push it. As members of SABI, we are bound to remain on the right side of the line.

"If BS 10 Table D if not used, which flange tables should be used?"

Having established that when the pressure exceeds 6,89 bar the BS 10 Table D flange is inappropriate - a different rated flange must be selected. One can change to a higher rated table within BS 10 such as Table E or Table F, but a change must, nevertheless, be made.

Consider when making the change, firstly there is little reason to import a foreign standard when a South African standard is available. This standard is South African National Standard



1123. Secondly, unlike BS 10, the South African standard conforms to the International Organisation for Standardisation ISO 7005 standard for flanges. Thirdly, the South African domestic water supply, mining and industrial sectors all commonly use SANS 1123 as their standard. Only the irrigation industry retains BS 10.

“What tables are available with SANS 1123?”

SANS 1123’s tables are easier to understand and relate directly to the flange’s pressure rating because the name of the table is just another word for pressure in kPa.

SANS 1123	Flange pressure rating
Table 600	6,0 bar
Table 1000	10,0 bar
Table 1600	16,0 bar

“It will be difficult to change to SANS 1123 - I have never used this standard before.”

It is highly unlikely you will experience difficulty. No South African pump supplier supplies pumps with flanges drilled to BS 10. Anyone who has bought a pump locally will invariably have bought that pump with its flanges drilled to SANS 1123. It may go by other names such as ‘DIN’, ‘ISO’ or even ‘BS 4504’ - but all are essentially the same.

“What are the physical differences between flange tables or pressure ratings?”

As a flange increases its pressure rating, either the number of bolts increases or the diameter of the bolts increases - or both increase. Sometimes, the flange thickness too increases.

A 100mm BS 10 Table D flange with a rating of 6,89 bar uses 4 x M16 bolts. A 100mm SANS 1123 Table 600 flange which is similarly rated at 6,0 bar also uses 4 x M16 bolts. However, SANS 1123 Table 1000, which is rated much higher at 10,0 bar, while still using the same M16 size bolts, uses 8 bolts instead of 4.

A 150mm BS 10 Table D flange uses 8 x M16 bolts. The 150mm SANS 1123 Table 600 flange also uses 8 x M16 bolts. The 150mm SANS 1123 Table 1000, however, while still using 8 bolts, increases the bolts’ size from M16 to M20.

“Where BS 10 and SANS 1123 use the same size bolts and the same number of bolts, are they compatible?”

No. The pitch circle diameters (PCD)* of the two standards are different (see figure 1). The filter manufacturer Arkal has developed a patented adaptation to accommodate the two standards in one flange but outside of this, they are not compatible.

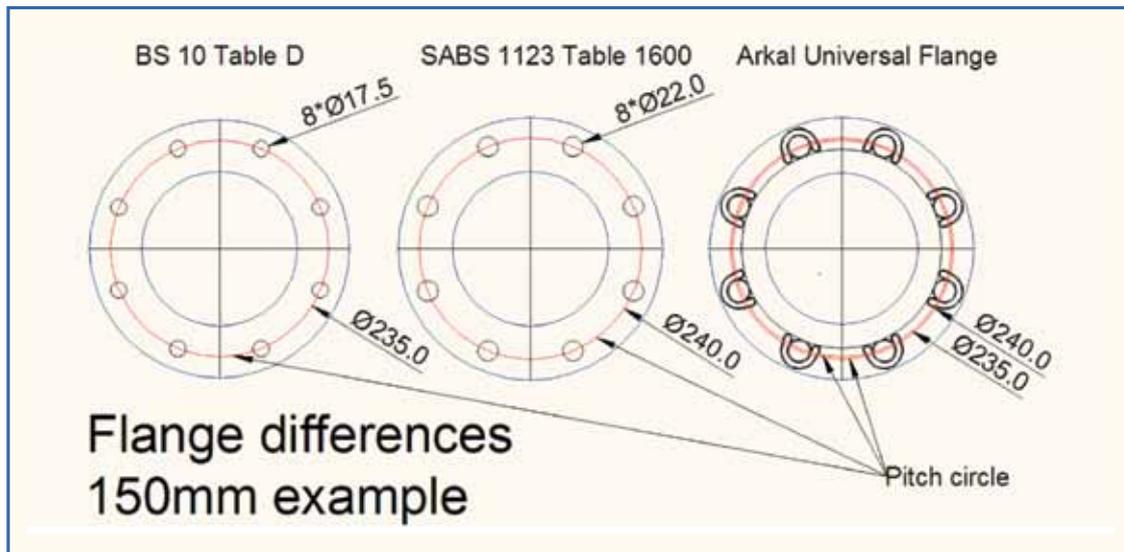


Figure 1 Differences between flanges - 150mm example.

*The pitch circle is an imaginary circular line that connects the centres of all the flange's bolt holes.

OTHER CONSEQUENCES OF STAYING WITH BS 10 TABLE D:

A chain is as strong as its weakest link. When an irrigation product such a valve or water meter is structurally manufactured to a pressure rating of 16,0 bar, asking that manufacturer to drill the product's flange to BS 10 Table D is asking him to effectively downgrade this rating to just 6,89 bar.

TO MAKE THE CHANGE TO SANS 1123...

Flanges must in all cases be chosen to match the pressure of the irrigation system. Irrigation systems are frequently designed at pressures higher than 6,89 bar. A change away from BS 10 Table D is needed, regardless. Rather than stay within BS 10, it makes sense to make the break totally away from BS 10 and move across to SANS 1123 in line with the rest of South Africa's water industry.