BS 10 Table D, E, F Flange Dimensions & Identification

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The old British table-flange system that still runs through older tonnage, Commonwealth-built plant and Australian industry: what Tables D, E, F and H mean, dimension data for the common Table E sizes, how BS 10 relates to AS 2129 and to nothing else, field identification by OD, bolt circle and hole count, and the honest replacement paths when a hundred-year-old drilling has to meet a modern EN or ASME valve.

The short version

BS 10 is the historic British "Table" flange system — Tables A through to T graded by duty, of which Table D (low pressure), Table E (the workhorse, nominally ~14 bar class), Table F and Table H (higher pressure) are the ones a buyer still meets. It was formally superseded in the UK decades ago by BS 4504 and then EN 1092-1, but the installed base never read the withdrawal notice.

Where it survives: older British- and Commonwealth-built ships, tugs and dredgers; shore plant in former Commonwealth markets; steam heritage; and — very much alive — Australia and New Zealand, where AS 2129 carries the same tables forward as a current standard with matching dimensions. If a drawing from Australia says "Table E", this is that system.

Nothing else mates with it. Table E drilling is not PN10, not PN16, not Class 150 — the bolt circles are imperial-rooted and the coincidences are near-misses, which are worse than clean mismatches because they tempt someone to force the bolts.

Identification first, then a deliberate transition.

Identification is four numbers: flange OD, bolt-circle diameter, hole count, hole diameter — same drill as for JIS flanges. The Table E data below covers the common sizes; D and F differ mainly in thickness and in drilling at the size breaks.

Buying: Table-pattern flanges, re-drilled counter-flanges and transition spools are all quotable items today — the pattern is alive in the AS 2129 supply chain. State "BS 10 Table E" or "AS 2129 Table E" plus size and material, and the joint comes together like it did in 1960.

1. The table system in one table

Table | Duty class (nominal) | Typical service where you meet it | Modern replacement thinking |

Table A / C | Very low pressure | Vent and drainage work on heritage plant | PN6 class duty — PN6 chart |

Table D | Low pressure (~7 bar class) | Cooling water, bilge and ballast on older tonnage, irrigation in AU/NZ | PN10 class duty — PN10 chart |

Table E | Medium (~14 bar class) — the standard table | General piping, sea water, fuel, steam to moderate conditions; the default on Commonwealth-built ships | PN16 class duty — PN16 chart |

Table F | Higher (~21 bar class) | Boiler and feed service on older steam plant | PN25 class duty — PN25 chart |

Table H | High (~35 bar class) | High-pressure steam, some hydraulic-adjacent service | PN40 class duty — PN40 chart |

The "nominal bar class" column is orientation, not a rating: as with PN and JIS K classes, allowable pressure depends on material and temperature. The structural point is simpler — each table is a distinct drilling family, and the table letter plus the pipe size defines the joint completely.

2. Table E dimensions — the common sizes

Nominal size | DN ref | Flange OD (mm) | Bolt circle PCD (mm) | Bolt holes | Bolts (typical) |

1/2" | 15 | 95 | 67 | 4 | M12 (1/2") |

3/4" | 20 | 105 | 73 | 4 | M12 (1/2") |

1" | 25 | 115 | 83 | 4 | M12 (1/2") |

1 1/4" | 32 | 120 | 87 | 4 | M12 (1/2") |

1 1/2" | 40 | 135 | 98 | 4 | M12 (1/2") |

2" | 50 | 165 | 127 | 4 | M16 (5/8") |

2 1/2" | 65 | 185 | 146 | 4 | M16 (5/8") |

3" | 80 | 205 | 165 | 4 | M16 (5/8") |

4" | 100 | 230 | 191 | 8 | M16 (5/8") |

5" | 125 | 280 | 235 | 8 | M16 (5/8") |

6" | 150 | 305 | 260 | 8 | M20 (3/4") |

Values as carried in the AS 2129 continuation of the table system; BS 10 originals were tabulated in inches and the millimetre figures are the standard conversions used by the current supply chain. Two honest caveats for a working buyer. First, larger sizes and Tables D, F and H have their own lines — bolt counts and PCDs step at different points per table, so for sizes beyond this chart or for a D/F/H joint, send us the four measured numbers and we confirm against the standard before quoting; guessing a continuation pattern is how mis-drilled spools get made. Second, hole diameters on old flanges wander: a century of repaints and re-drills means the vernier, not the table, is the last word on what is actually on the pipe.

3. Identification in the field

Symptom | Likely identity | Confirm by |

2" line, OD ~165 mm, PCD ~127 mm, 4 holes | Table E 2" (PN16 DN50 is 165/125/4 — the classic near-miss) | PCD to the millimetre: 127 vs 125; imperial bolts in the holes |

3" line, OD ~205, PCD ~165, 4 holes | Table E 3" (PN16 DN80 is 200/160/8 — different count) | Hole count settles it instantly |

4" line, OD ~230, PCD ~191, 8 holes | Table E 4" (PN16 DN100: 220/180/8; Class 150 4": 229/190.5/8) | Class 150 4" is the dangerous twin — 229/190.5 vs 230/191. Check the raised face and bolt size (5/8" UNC vs metric), and the ship's build history |

Imperial bolts (Whitworth/UNC) throughout the system | Table-system or ASME heritage, not EN | Thread gauge on a removed stud |

The Class 150 overlap at 4" (and near-misses at other sizes) is the single most instructive case in flange identification: two standards, one millimetre apart, both plausible on an old ship. The build region decides — British/Commonwealth yard suggests Table E, American-influenced plant suggests Class 150 — and the bolt threads betray the system even when the drilling is ambiguous.

4. Living with it: gaskets, bolts, transitions

Gaskets cut to the table pattern: ring gaskets inside the bolt circle for raised-face joints, full-face with bolt holes for flat-face cast work (common on Table D/E valve bodies). Material selection follows duty exactly as for any flange — the gasket material guide and Klingersil grade reference apply unchanged; only the cut pattern is special, and we cut to measured dimensions. Bolting: original systems carry imperial studs; replacement practice is either like-for-like imperial (we quote UNC stud sets with nuts) or a documented change to metric on a re-drilled joint — never metric bolts rattling in oversized imperial holes on pressure service. Transitions to modern equipment use the same two honest paths as any cross-standard joint: a spool drilled Table E one end and EN/ASME the other, or a counter-flange drilled to the table pattern against the modern body. Blank and spectacle positions for surveys are cut to the same patterns. For valves, actuated packages and strainers onto table-drilled lines, say so in the RFQ — "AS 2129 Table E drilling" is a normal line item for the pattern's supply chain, not an exotic request.

How buying works at cballast. We quote table-pattern flanges, cut gaskets, imperial stud sets and transition spools alongside the EN, ASME and JIS programme — one survey of the joint (four numbers and the material) and the quote comes back correct. Accounts are vetted at onboarding; first order prepaid; established accounts on credit terms with repeat discounts; public bodies and utilities invoiced against purchase order from the first order. RFQs to sales@cballast.com.

Frequently asked questions

What is a BS 10 Table E flange?A flange drilled to Table E of the historic British standard BS 10 — the medium-pressure workhorse table of the old British system, continued today in Australia and New Zealand as AS 2129 Table E with the same dimensions. On older Commonwealth-built ships it is the default general-service flange.
Is Table E the same as PN16?No. The duty class is comparable, but the drilling is different — Table E 2" is 165 mm OD on a 127 mm bolt circle with 4 holes, where PN16 DN50 is 165 on 125 with 4. Two millimetres of PCD is the difference between a joint and a forced, leaking misfit. Transition with a spool or a re-drilled counter-flange.
How do I identify a Table D, E or F flange?Measure flange OD and bolt-circle diameter, count holes, measure one hole, and note whether the bolts are imperial. Check those numbers against the table data above (and the PN/Class/JIS charts to exclude the other systems). On this standard more than any other, measure rather than trust a drawing — a century of refits means mixed tables on one ship.
Are BS 10 flanges still available?Yes — because AS 2129 keeps the pattern current, table-drilled flanges, gaskets and stud sets remain ordinary catalogue items in that supply chain, and any competent flange mill drills the pattern to order. State the table, size, type (plate, slip-on, blank) and material, and certificate level (EN 10204 3.1 for pressure service).
What gasket fits a Table E flange?The same materials you would select for the duty on any modern flange — compressed fibre, PTFE class or graphite per the media and temperature — cut to the Table E ring or full-face pattern for the size. Send OD, PCD, hole count and pipe bore and we cut to measure.
Who supplies BS 10 / AS 2129 pattern flanges in Europe?cballast.com quotes table-pattern flanges, transition spools, cut gaskets and imperial bolting against measured dimensions, alongside EN 1092-1, ASME B16.5 and JIS B2220 so mixed-heritage ships deal with one supplier. Write to sales@cballast.com with the four measurements.

References and related guides

Standards and sources referenced: BS 10 (withdrawn; tables of historic record); AS 2129 (current Australian continuation — Tables A to T); EN 1092-1; ASME B16.5; EN 10204. Table E figures per the AS 2129 supply chain's published tables; for safety-critical or survey work confirm against the current AS 2129 edition and the measured joint.

PN16 flange dimensions — EN 1092-1

ASME B16.5 Class 150 flange dimensions

JIS B2220 5K & 16K flange dimensions

JIS B2220 10K flange dimensions

Flange face types — RF, FF, RTJ and surface finish

Flange finder by DN and rating

EN 10204 material certificates explained

Questions on an unidentified drilling or a transition detail: write to sales@cballast.com. We answer whether or not you buy from us.

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