

SECTION A — DOUBLE END STUDS

1. **Scope.** This standard covers double end studs of four types and in nominal thread diameters M5 thru M100.

2. **Types.**

- Type 1 — Unfinished
- Type 2 — Finished, Full or Undersize Body
- Type 3 — Finished, Full Body
- Type 4 — Finished, Close Body

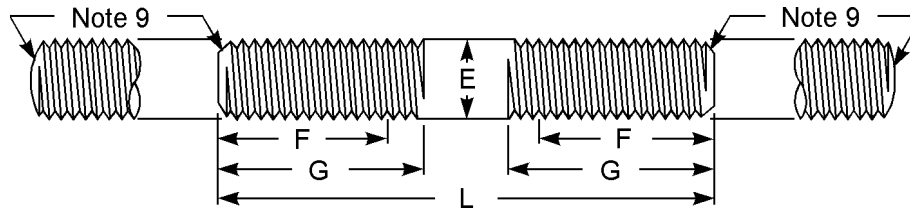


Table 1 Dimensions of Double End Studs

Nom Stud Size & Thread Pitch	Body Diameter								Nut Ends					
	E								F	G	F	G	F	G
	Type 1		Type 2		Type 3		Type 4		For Studs Up To And Including 125 mm Length		For Studs Over 125 To 200 mm Length		For Studs Over 200 mm Length	
									Thread Length		Thread Length		Thread Length	
									Full Thread	Total Thread	Full Thread	Total Thread	Full Thread	Total Thread
	Max	Min	Max	Min	Max	Min	Max	Min	Min	Max	Min	Max	Min	Max
M5 × 0.8	—	—	5.00	4.36	5.00	4.82	—	—	16	19.2	22	25.2	35	38.2
M6 × 1	—	—	6.00	5.21	6.00	5.79	—	—	18	22	24	28	37	41
M8 × 1.25	—	—	8.00	7.04	8.00	7.76	—	—	22	27	28	33	41	46
M10 × 1.5	—	—	10.00	8.86	10.00	9.73	—	—	26	32	32	38	45	51
M12 × 1.75	—	—	12.00	10.68	12.00	11.70	—	—	30	37	36	43	49	56
M14 × 2	—	—	14.00	12.50	14.00	13.68	—	—	34	42	40	48	53	61
M16 × 2	—	—	16.00	14.50	16.00	15.68	—	—	38	46	44	52	57	65
M20 × 2.5	—	—	20.00	18.17	20.00	19.62	—	—	46	56	52	62	65	75
M24 × 3	—	—	24.00	21.80	24.00	23.58	—	—	—	—	60	72	73	85
M30 × 3.5	—	—	30.00	27.46	30.00	29.52	—	—	—	—	72	86	85	99
M36 × 4	—	—	36.00	33.12	36.00	35.46	—	—	—	—	—	—	97	113
M42 × 4.5	—	—	42.00	38.78	42.00	41.43	—	—	—	—	—	—	109	127
M48 × 5	—	—	48.00	44.43	48.00	47.40	—	—	—	—	—	—	121	141
M56 × 5.5	—	—	56.00	52.09	56.00	55.36	—	—	—	—	—	—	137	159
M64 × 6	—	—	64.00	59.74	64.00	63.32	—	—	—	—	—	—	153	177
M72 × 6	—	—	72.00	67.74	72.00	71.32	—	—	—	—	—	—	169	193
M80 × 6	—	—	80.00	75.74	80.00	79.52	—	—	—	—	—	—	185	209
M90 × 6	—	—	90.00	85.74	90.00	89.32	—	—	—	—	—	—	205	229
M100 × 6	—	—	100.00	95.74	100.00	99.32	—	—	—	—	—	—	225	249
See Notes	2, 3		2, 3		2, 3		2, 3		4, 7, 8					

IFI STANDARD®	METRIC STUDS AND BENT BOLTS	IFI-528 Page 1 of 5
Published and issued by the Industrial Fasteners Institute of Independence, OH		Issued: 1982 Revised: 1999

All standards and specifications are advisory only. Their use by anyone is entirely voluntary. Reliance thereon for any purpose by anyone is at the sole risk of that person or the user of the product, and the IFI is not responsible for any loss, claim, or damage arising therefrom. In formulating and approving standards and specifications, the IFI has not investigated and will not investigate patents which may apply to the subject matter. Prospective users of the standards and specifications are responsible for advising themselves of and protecting themselves against any patent infringement liability which may arise out of such use. © INDUSTRIAL FASTENERS INSTITUTE 1999

INDUSTRIAL FASTENERS INSTITUTE
6363 Oak Tree Boulevard • Independence, Ohio 44131 USA, www.indfast.org

3. Body Diameter Tolerances. Type 1 studs shall have an unfinished body with no specified body diameter tolerances. Type 2 studs shall have a maximum body diameter equal to basic major diameter of the thread, and a minimum body diameter equal to the rolled thread blank size. Type 3 studs shall have a maximum body diameter equal to basic major diameter of the thread, and a minimum body diameter equal to the specified minimum major diameter of the thread. Type 4 studs shall have body diameter tolerances as specified by the purchaser (milled or ground body). Tolerances are given in Table 1.

4. Short Studs. Continuous thread studs shall be supplied for all studs too short to accommodate the standard thread length on each end. Continuous thread studs shall be supplied when the specified stud length is shorter than $4D + 8P + 12$ mm for stud lengths 125 mm and shorter, $4D + 8P + 24$ mm for stud lengths over 125 mm to and incl. 200 mm, and $4D + 8P + 50$ mm for stud lengths over 200 mm. D equals nominal stud diameter, and P is thread pitch.

5. Length. The length of stud, measured parallel to the axis, shall be the distance from extreme end to extreme end. The tolerance on length shall be:

Nom Stud Size	Tolerance on Length, mm	
	For Lengths 150 mm and Shorter	For Lengths Over 150 mm
M5 thru M12	± 0.8	± 1.5
M14 thru M24	± 1.5	± 2.3
M30 and M36	± 2.3	± 3.0
over M36	± 3.0	± 6.0

6. Threads. Threads shall be metric coarse threads with Class 6g tolerances in accordance with ASME B1.13M.

7. Full Thread Length, F. The full thread length is the distance, measured parallel to the axis of stud, from extreme end of the stud to the opposite face of a GO thread ring gage, having the chamfer and/or counterbore removed, which has been assembled by hand as far as the thread will permit.

8. Total Thread Length, G. The total thread length is the distance, measured parallel to the axis of stud, from the extreme end of the stud to the last scratch on cut threads or to the top of the extrusion angle on rolled threads.

9. Point. Both ends of the stud shall be pointed. At manufacturer's option, points may be rounded (oval) or flat and chamfered. When rounded, the stud shall have an oval point with a radius equal to approximately one times the basic stud diameter. When flat and chamfered, the end shall be chamfered from a diameter approximately 0.4 mm below the minor diameter of the thread to produce a length of chamfer or incomplete thread equivalent to 1 to 1.5 times the thread pitch.

10. Material and Mechanical Properties. Carbon steel studs shall conform to the requirements of the applicable property class as covered in ASTM F568M. Class 4.6 studs are available in sizes M5 thru M100; Class 9.8 in sizes M5 thru M16; Class 8.8 in sizes M20 thru M36; and Class 10.9 in sizes M5 thru M56. Studs of other materials such as stainless steel, brass, bronze, and aluminum alloys shall have properties as agreed upon by the manufacturer and purchaser. (For guidance refer to ASTM F738M and ASTM F468M.)

11. Designation. To avoid possible misunderstanding when specifying double end studs, it is recommended that they be designated in the following sequence: product type and name, nominal size and thread pitch; stud length; material, including grade identification; and finish (plating or coating) if required.

Example:

Type 2 double end stud, M10 × 1.5 × 100, ASTM F568M Class 9.8, zinc plated.

IFI STANDARD ®	METRIC STUDS AND BENT BOLTS	IFI-528 Page 2 of 5
Published and issued by the Industrial Fasteners Institute of Independence, OH		Issued: 1982 Revised: 1999

All standards and specifications are advisory only. Their use by anyone is entirely voluntary. Reliance thereon for any purpose by anyone is at the sole risk of that person or the user of the product, and the IFI is not responsible for any loss, claim, or damage arising therefrom. In formulating and approving standards and specifications, the IFI has not investigated and will not investigate patents which may apply to the subject matter. Prospective users of the standards and specifications are responsible for advising themselves of and protecting themselves against any patent infringement liability which may arise out of such use. © INDUSTRIAL FASTENERS INSTITUTE 1999