PRINTABLE THREAD REFERENCE

Cable Gland Thread & Hole Reference Chart

Four standard cable gland thread systems compared: none interchange across tapped ports. Check thread form, flank angle, pitch and entry type before cutting holes or ordering spares.

Thread family	Governing standard	Form	Angle	Pitch unit	Primary seal (tapped port)	Primary region
Metric (M8–M100)	IEC 60423 / ISO 261	Parallel	60°	mm (1.5 mm typical)	O-ring or washer under body	Global default
PG (PG7–PG48)	DIN 40430	Parallel	80°	TPI (20 / 18 / 16)	O-ring or washer under body	Legacy European
NPT (1/4"–3")	ANSI/ASME B1.20.1	Tapered (1:16)	60°	TPI (18 / 14 / 11.5)	Thread wedge + sealant	North America
G / BSPP / PF (G 1/4–G 3)	ISO 228-1	Parallel	55°	TPI (19 / 14 / 11)	O-ring or bonded washer	UK, Commonwealth, Japan

CABLE GLAND THREAD PROFILES AND SEALING

Flank angle, barrel taper and sealing method separate all four standards.

1. METRIC (IEC 60423) — Example: M20 x 1.5



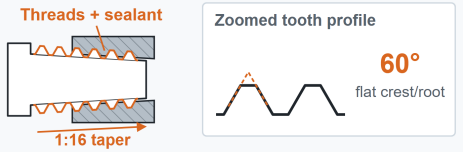
60° flank · Parallel · 1.5 mm pitch

2. PG (DIN 40430) — Example: PG13.5



80° shallow flank · Parallel · TPI pitch

3. NPT (ANSI/ASME B1.20.1) — Example: 1/2" NPT



60° flank · 1:16 taper · Narrows to tip

4. G / BSPP (ISO 228-1) — Example: G 1/2 (PF)



55° rounded · Parallel · 14 TPI ≠ NPT

20–21 mm	Taper	Crest OD (mm)	Pitch / TPI	5 pitches
M20×1.5	Parallel	20.0	1.5 mm	7.5 mm
PG13.5	Parallel	20.4	18 TPI (1.411)	7.1 mm
G 1/2	Parallel	20.955	14 TPI (1.814)	9.1 mm
1/2" NPT	1:16 taper	~20.5–21.3	14 TPI (1.814)	9.1 mm

3-step bench check (20–21 mm lookalikes)

1. Taper first: Measure crests at nose and shoulder; standard 8–13 mm NPT barrels narrow by ~0.5–0.8 mm toward the tip.
2. Pitch / 5-pitch span: Use a pitch gauge, or measure peak 1 to peak 6 across five threads (7.5 vs 7.1 vs 9.1 mm).
3. G vs NPT trap: 1/2" and 3/4" both use 14 TPI; G (55° parallel) jams after 1–2 turns in NPT (60° tapered) and leaks.

STANDARD DIMENSIONS & KNOCKOUTS

Metric, PG, NPT & G Dimension Tables

Reference major diameters, pitches and sheet-metal clearance/knockout openings. Final hole tolerances come from the gland and enclosure drawings.

Metric (IEC 60423)

Metric thread	Nominal OD (mm)	Pitch (mm)	Clearance hole (mm)
M12×1.5	12.0	1.5	12.2–12.5
M16×1.5	16.0	1.5	16.2–16.5
M20×1.5	20.0	1.5	20.2–20.5
M25×1.5	25.0	1.5	25.2–25.5
M32×1.5	32.0	1.5	32.3–32.5
M40×1.5	40.0	1.5	40.4–40.5
M50×1.5	50.0	1.5	50.4–50.5
M63×1.5	63.0	1.5	63.4–63.5

NPT (ANSI/ASME B1.20.1)

NPT size	Pipe OD (in)	Pipe OD (mm)	TPI	Pitch (mm)	US conduit knockout (UL 514B)
1/4" NPT	0.540	13.72	18	1.411	Per drawing (~14.0–14.3 mm)
3/8" NPT	0.675	17.14	18	1.411	Per drawing (~17.3–17.5 mm)
1/2" NPT	0.840	21.34	14	1.814	7/8" (0.875 in / 22.2 mm)
3/4" NPT	1.050	26.67	14	1.814	1-7/64" (1.109 in / 28.2 mm)
1" NPT	1.315	33.40	11.5	2.209	1-3/8" (1.375 in / 34.9 mm)
1-1/4" NPT	1.660	42.16	11.5	2.209	1-47/64" (1.734 in / 44.0 mm)
1-1/2" NPT	1.900	48.26	11.5	2.209	1-63/64" (1.984 in / 50.4 mm)
2" NPT	2.375	60.32	11.5	2.209	2-15/32" (2.469 in / 62.7 mm)

PG (DIN 40430)

PG thread	Major OD (mm)	TPI	Pitch eq. (mm)	Clearance hole (mm)
PG7	12.5	20	1.270	12.5–12.7
PG9	15.2	18	1.411	15.2–15.4
PG11	18.6	18	1.411	18.6–18.8
PG13.5	20.4	18	1.411	20.4–20.7
PG16	22.5	18	1.411	22.5–22.8
PG21	28.3	16	1.588	28.3–28.6
PG29	37.0	16	1.588	37.0–37.4
PG36	47.0	16	1.588	47.0–47.5
PG42	54.0	16	1.588	54.1–54.5
PG48	59.3	16	1.588	59.4–59.8

G / BSPP / PF (ISO 228-1)

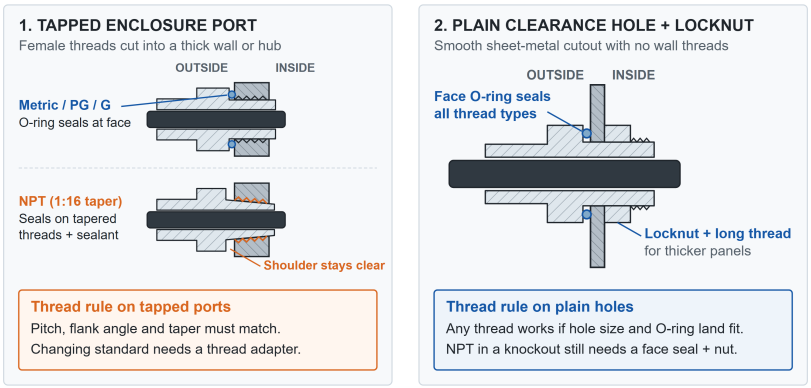
G thread	OD (mm)	TPI	Pitch (mm)	G thread	OD (mm)	TPI	Pitch (mm)
G 1/4	13.157	19	1.337	**G 1**	33.249	11	2.309
G 3/8	16.662	19	1.337	**G 1-1/4**	41.910	11	2.309
G 1/2	20.955	14	1.814	**G 1-1/2**	47.803	11	2.309
G 3/4	26.441	14	1.814	**G 2**	59.614	11	2.309

Important notes: Clearance holes apply to unthreaded sheet-metal panels with locknut; tapped ports require the smaller tap-drill bore (e.g. M20×1.5 minor diameter ~18.4 mm). IEC 60423 keeps 1.5 mm pitch from M12–M75 and 2.0 mm at M90/M110; verify M8/M10 and M75+ series pitch before ordering locknuts.

ENTRY TYPES & CONVERSION LIMITS

Tapped vs Plain Holes & Thread Conversions

Conversion charts compare closest physical sizes for hole re-sizing, knockout swaps or selecting a thread adapter. Entry thread size still does not set cable clamping range — confirm cable OD separately.



PG (OD mm)	Closest Metric	Closest NPT	Closest G	Plain-hole / replacement note (never cross-thread tapped ports)
PG7 (12.5)	M12×1.5 (12.0)	1/4" NPT (13.72)	G 1/4 (13.16)	M12 fits PG7 plain hole cleanly with locknut
PG9 (15.2)	M16×1.5 (16.0)	3/8" NPT (17.14)	G 3/8 (16.66)	Open PG9 plain hole slightly to 16.2 mm for M16
PG11 (18.6)	M16 / M20×1.5	3/8" / 1/2" NPT	G 3/8 / G 1/2	Sits between M16 and M20; open plain hole to 20.2 mm
PG13.5 (20.4)	M20×1.5 (20.0)	1/2" NPT (21.34)	G 1/2 (20.96)	Most common PG-to-Metric swap on plain knockouts
PG16 (22.5)	None (M20 / M25)	1/2" NPT (21.34)	G 1/2 (20.96)	1/2" NPT fits PG16 hole; for Metric open to 25.2 mm (M25) or fit reducing washer so M20 O-ring cannot slip in
PG21 (28.3)	M25 / M32×1.5	3/4" NPT (26.67)	G 3/4 (26.44)	3/4" NPT fits PG21 plain hole (PG21 fits 1-1/8" / 28.6 mm punch); step up plain hole to M32 or adapt
PG29 (37.0)	M32 / M40×1.5	1" NPT (33.40)	G 1 (33.25)	Sits between M32 and M40; open plain hole to M40
PG36 (47.0)	M50×1.5 (50.0)	1-1/2" NPT (48.26)	G 1-1/2 (47.80)	Open plain hole slightly to 50.4 mm for M50
PG42 (54.0)	M50 / M63×1.5	1-1/2" / 2" NPT	G 1-1/2 / G 2	Sits between M50 and M63
PG48 (59.3)	M63×1.5 (63.0)	2" NPT (60.32)	G 2 (59.61)	Closest large metric match is M63

Mounting & sealing checkpoints

- Tapped ports: Match exact standard, pitch, angle and taper; use an adapter/reducer to change standards.
- Plain knockouts: Fit an external O-ring or washer + inside locknut (even for NPT glands).
- Long threads: Standard barrels (8–12 mm) fit 1.5–3 mm sheet; specify 15 mm+ long thread for walls > 4 mm or earth tags.
- PA66 + sealant: Check chemical compatibility before applying anaerobic liquid dope to nylon NPT threads.