

Illustration Sources Catalogue

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1 Purpose

This document is the working catalogue of *external* illustrations that are candidates for inclusion in the BSPPFit project. Each entry records:

- the source URL (where the file lives),
- the license under which the source publishes it,
- the attribution string the project is required to use,
- the role the illustration would play in the project (which facet, which scenario, which subsection),
- the file’s local filename once fetched (PascalCase per the Development Standard’s [File Naming rule](#)),

- a status: TODO (identified but not yet fetched), FETCHED (downloaded and present under [the project root](#)), DONE (incorporated into the relevant document with caption and attribution), DISMISSED (with rationale).

The catalogue exists because the project author has explicitly agreed to the trade-off *credited external illustration tainting the project's GPL-3 license is acceptable as an interim step, with the long-term plan to replace each external illustration with either a project-author photograph or an OpenSCAD-rendered view extracted from the model library*. See [ResearchJournal.pdf](#) (illustration sourcing strategy entry, iteration 0.7.0) for the full rationale.

Two slot classes. The *I-NN* slots above record *external* illustrations (web-sourced or project-author photographs), each carrying a source, a license, and an attribution obligation. The *M-NN* slots, added in iteration 0.60.0, record *model-library renders*: OpenSCAD views extracted from the project's own model files. These are the realisation of the long-term plan stated above — replacing external illustrations with project-owned renders — so they carry *no* external license or attribution (the geometry is project-owned, GPL-3). In place of the source/license/attribution fields, an M-NN slot records the source model file, the render variant(s), the still viewpoint (in the coordinate-encoded scheme, so the view is reproducible), and the committed illustration symlink(s) under the project root. See the [Development Standard](#), [Archetype-gallery illustrations](#) for the naming, viewpoint, and symlink-indirection conventions.

2 Project licence and the attribution chain

The BSPPFit project itself is licensed under GNU GPL v3 or later (see [COPYING](#)). External illustrations under different licenses are *not* relicensed by inclusion — they retain their original licenses. The aggregate work is then a *collective work* containing pieces under different licenses.

Practical consequences:

- *CC0 / Public domain* illustrations are unconstrained. Including them does not affect the project license at all. These are first preference.
- *CC BY 4.0* illustrations require credit; otherwise unconstrained. Including them is acceptable; the credit obligation transfers to anyone redistributing the project.
- *CC BY-SA 4.0* illustrations require credit *and* that any derivative of the illustration itself be released under the same license. They do *not* require the surrounding GPL project to be relicensed — the illustration is one component, not the whole. CC BY-SA 4.0 has been declared one-way compatible with GPL v3 by Creative Commons since 2015, so the aggregate is licensable consistently.
- *Other CC variants* (NC, ND) are *unfree* by Wikimedia and GNU standards; this catalogue does not list them.

- *All Rights Reserved* images can be referenced *by URL* in documentation but cannot be *included* in the project archive. This catalogue may list such items only as pointers for the project author to consult; it never includes their files.

The *Sources and Attributions* subsection at the end of every illustrated document carries the attribution strings.

3 Index

Slot	Role	Status	Local file
I-01	55° Whitworth thread profile	DONE	WhitworthThread.svg
I-02	Bonded seal washer cross-section	DONE	BondedWasher.png
I-03	60° cone seat / 37° JIC	RESTARTED	—
I-04	BSPP male straight thread photograph	DONE	BSPPMaleStraightThread.png
I-05	Worm-drive hose clamp (project photo)	DONE	WormDriveHoseClamp.png
I-06	Pipe fitting types overview	DISMISSED	—
I-07	O-ring cross-section	DEFERRED	—
I-08	BSPT taper geometry diagram	DEFERRED	—
I-09	Three-thread-form historical plate	DONE	ThreeThreadForms.png

Status values: TODO = identified, not yet fetched. STARTED = under investigation. FETCHED = file present in the project root but not yet embedded. DONE = embedded in the relevant document with caption and attribution. DISMISSED = considered and rejected (with rationale below). RESTARTED = previously identified source rejected by the project author on review; alternative source pending. DEFERRED = not pursued in the current illustration push; project author plans to provide own photograph or model-library render in a later iteration.

4 Model render index (M-NN)

Project-owned OpenSCAD renders extracted from the model library. Unlike the I-NN slots, these carry no external license or attribution. Each slot records the source model, the render variant(s), the still viewpoint, and the committed illustration symlink(s).

Slot	Role	Status	Stable illustration name(s)
M-01	G-02 Elbow archetype gallery (+ cut)	DONE	Elbow-gallery-archetypes[-cut]
M-02	G-01 Straight archetype gallery (+ cut)	DONE	Nipple-gallery-archetypes[-cut]
M-03	G-05 Reducer archetype gallery (+ cut)	DONE	Reducer-gallery-archetypes[-cut]
M-04	G-06 Cap archetype gallery (+ cut)	DONE	Cap-gallery-archetypes[-cut]
M-05	G-06 Plug archetype gallery (+ cut)	DONE	Plug-gallery-archetypes[-cut]

Continued from previous page

Slot	Role	Status	Stable illustration name(s)
M-06	G-09 Hose-tail archetype gallery (+ cut)	DONE	HoseTail-gallery-archetypes[-
M-07	G-08 Hex-bush archetype gallery (+ cut)	DONE	HexBush-gallery-archetypes[-
M-08	G-07 Union archetype gallery (+ cut)	DONE	Union-gallery-archetypes[-cu
M-09	G-10 Manifold archetype gallery (+ cut)	DONE	Manifold-gallery-archetypes[-
M-10	Glossary single-fitting renders (11 fitting-types, + cut)	DONE	<Model>-default[-cut].png,
M-11	Gender comparison (male vs female, G-01 family, + cut)	DONE	Nipple-gender-comparison[-c

Status values are as for the I-NN slots, with the same meanings; for M-NN, DONE means the render is committed under the project root (via the stable-name symlink) and embedded in the relevant document with caption.

5 DONE I-01 — 55° Whitworth thread profile

5.1 Source

URL https://commons.wikimedia.org/wiki/File:Whitworth_Thread.svg

Author Wikimedia Commons contributor (see file page for username; Self-published work)

License CC BY-SA 4.0

Format SVG, 1703 × 992 px nominal, ~63 KB

5.2 Attribution string (used)

Original: Tjt263. Vector: AntiCompositeNumber. CC BY-SA 4.0, via Wikimedia Commons.

This is the credit recorded in [Taxonomy.org §Sources and Attributions](#). The project author retrieved the SVG and confirmed the contributor identities at fetch time (2026-05-03).

5.3 Role in BSPPFit

Replaces the deficient `thread-profiles.svg` produced in v0.6.0 (since deleted). Embedded in F-03 BSPP section of the Taxonomy as the canonical 55° Whitworth profile illustration.

5.4 Resolution (iteration 0.8.0)

Project author downloaded the file from Wikimedia Commons, placed it under the project root, recorded the attribution. The illustration is embedded with caption and credited in *Sources and Attributions*. Slot is DONE.

Note: a side-by-side comparison with the 60° American profile (originally the F-03 *Comparison* ambition) is not provided by this single SVG, which shows only the 55° profile. The comparison aspect remains future research, possibly satisfied by an SVG composed locally from the Whitworth source plus a similarly-sourced Sellers profile, or by a render from the model library when it exists.

6 DONE I-02 — Bonded seal washer cross-section

6.1 Source

URL https://en.wikipedia.org/wiki/~Bonded_seal~ (article entry point) / Wikimedia Commons (file page)

Author Wikipedia user Brotherpete (created using the open-source raster editor Paint.net)

License Public domain

Format PNG cross-section diagram

6.2 Attribution string (used)

Original work created by Wikipedia user Brotherpete using open-source Paint.net. Public domain, via Wikimedia Commons.

6.3 Role in BSPPFit

Embedded in F-05 of the Taxonomy under the bonded seal washer entry. The diagram shows the construction clearly — outer hard annular ring, inner soft annular ring — with both labelled by callout in the source.

6.4 Resolution (iteration 0.8.0)

Project author selected this image from the Wikipedia *Bonded seal* article, confirmed its public-domain status, and placed it under the project root. The illustration is embedded with caption and credited in *Sources and Attributions*. Slot is DONE.

7 RESTARTED I-03 — 60° cone seat / 37° JIC flare cross-section

7.1 Source candidates — *reviewed and rejected in 0.8.0*

Iteration 0.7.0 listed the Wikipedia *JIC fitting* article (https://en.wikipedia.org/wiki/~JIC_fitting~) as the candidate source.

In iteration 0.8.0 the project author reviewed the article's available images and judged them unsuitable: the photographs do not isolate the cone-seat mechanism cleanly — they conflate it with adjacent-but-distinct mechanisms (flares, swivel ends, female-cone variants) such that the reader cannot extract from them a clear picture of the metal-to-metal cone-on-cone seal we want to teach.

7.2 Status

Slot reopened. No file in the project root. The forwarding paragraph in [Taxonomy.org §F-05 cone seat entry](#) reflects the rejection and points to FutureResearch.org for the search of an alternative.

7.3 Search for an alternative source — tracked in FutureResearch

See [FutureResearch.pdf](#) entry *I-03 alternative cone-seat illustration source*. Candidate angles to explore:

- A purely-geometric cross-section drawing (CC-licensed, non-photographic) that shows the male and female cones mating with no other features.
- A project-author photograph of an isolated 60° cone-seat pair.
- An OpenSCAD-rendered orthographic section, deferred until the model library renders such a section.

8 DONE I-04 — BSPP male straight thread photograph

8.1 Source

URL Wikimedia Commons (the original 65.5 MB `BSPP_Male_Straight_Thread.png`)

Author Kees08

License CC BY-SA 4.0

Format PNG; reduced by the project author from the 5717×4000 px / 65.5 MB original to a project-archive- reasonable size before placement.

8.2 Attribution string (used)

Kees08, CC BY-SA 4.0, via Wikimedia Commons.

8.3 Resolution (iteration 0.8.0)

Project author downloaded the original from Wikimedia Commons, downsampled to a reasonable size, and placed it as `Doc/Illustrations/BSPPMaleStraightThread.png` (now at the project root). The image is embedded in F-03 BSPP under the BSPP designation subsection of the Taxonomy and credited in *Sources and Attributions*. Slot is DONE.

9 **DONE** I-05 — Worm-drive hose clamp photograph (project author)

9.1 Source

Project author's own photograph. Three hose-clamping mechanisms photographed side by side on a cork background: a worm-drive clamp (the canonical form), a wing-nut clamp installed on a hose tail with hose attached, and a smaller two-bolt clamp.

9.2 Licensing

Photograph by the project author. Released under the project's GNU GPL v3 or later license (the same license as the rest of *BSPPFit* that the project author owns). No external attribution constraints.

9.3 Resolution (iteration 0.8.0)

Photograph taken by the project author and embedded in the Taxonomy glossary under the *Worm-drive clamp* entry, with caption noting the three mechanisms shown and credited in *Sources and Attributions*. Slot is DONE.

10 **DISMISSED** I-06 — Pipe fitting types overview

10.1 Source candidate (rejected)

Iteration 0.7.0 listed the Wikipedia *Piping and plumbing fitting* article as the candidate source for a composite figure showing the most common geometries side-by-side.

In iteration 0.8.0 the project author reviewed the article's coverage and noted that it *mixes numerous other types of fittings outside our scope* — compression, push-to-connect, sweat, sanitary clamps, trade-specific shapes that are not part of BSPPFit's BSPP-centred scope plus adjacent confusion classes. A composite figure drawn from this article would dilute the project's focus rather than support it.

10.2 Status

Dismissed in 0.8.0. The geometry enumeration in F-01 of the Taxonomy stands without an overview figure for now; if a geometry overview is needed later it should come from the BSPP model library's renders, not from a third-party composite that conflates classes outside our scope.

11 DEFERRED I-07 — O-ring sealing cross-section

11.1 Source candidates (project author preference — own photographs)

Iteration 0.7.0 listed the Wikipedia *O-ring* article as the candidate. In iteration 0.8.0 the project author indicated a preference to provide own photographs for this slot rather than source externally; the slot is *deferred* pending those photographs.

11.2 Status

No file in the project root. The forwarding paragraph in F-05 of the Taxonomy will be added when the photograph is available, framed alongside the bonded-washer entry and the cone-seat entry.

12 DEFERRED I-08 — BSPT taper geometry diagram

12.1 Status

Deferred. The project author plans to search for a suitable diagram, provide one, or generate one when feasible. Tracked in [FutureResearch.pdf](#) (slot I-08).

This is the natural slot to be filled by an OpenSCAD render once the model library exists — the BSPT taper is a parametric construct that the library will already compute.

13 DONE I-09 — Three-thread-form historical plate

13.1 Source

URL Wikimedia Commons

Author William Sellers (1864 paper proposing the 60° symmetric thread profile)

License Public domain

Format PNG raster of the historical printed plate

13.2 Attribution string (used)

William Sellers (1864), public domain, via Wikimedia Commons.

13.3 Role in BSPPFit

Embedded in F-03 *Comparison* subsection of the Taxonomy as an *informational* historical plate showing three thread forms side by side. Together with the I-01 Whitworth SVG, this addresses most of the original I-01 ambition (a side-by-side comparison) while preserving I-01 as the technically-precise modern Whitworth profile.

13.4 Why *informational*, *not normative*

The plate is from 1864 and pre-dates modern ISO and ANSI dimensional standards by more than a century. It is reproduced for *visual comparison* of the profile shapes (rounded vs truncated crests; 55° vs 60° angles; symmetric vs the older "usual workshop" asymmetric form). Modern dimensional values must come from the standards: ISO 228 (BSPP), ISO 7 (BSPT), ANSI/ASME B1.20.1 (NPT). The figure caption is explicit on this point.

13.5 Resolution (iteration 0.8.4)

Project author supplied the file in iteration 0.8.4 and provided the public-domain attribution. File placed under the project root as `ThreeThreadForms.png` (PascalCase per project convention). Embedded in F-03 of the Taxonomy with caption noting the informational status; credited in *Sources and Attributions*. New glossary entry *Sellers profile* added in F-03 thread-forms sub-section to give the plate a definitional anchor. Slot is DONE.

14 **DONE M-11** — Gender comparison single-fitting render (zone A)

14.1 Source

Project-owned geometry: `bsppfit.scad` (the G-01 straight family). No external source, no licence obligation — GPL-3. This is a *single-fitting comparison*, not a gallery: a focused two-fitting scene of a male fitting beside a female fitting.

14.2 Render variants (added 0.71.0)

gender-comparison a male nipple ($M \times M$) at left and a female socket ($F \times F$) at right, both G1/2 hex, same size, so gender (external vs internal thread) is the only difference.

gender-comparison-cut the same pair sectioned (BOSL2 **BACK**), showing the male’s external thread / plain bore and the female’s internal thread running the bore.

14.3 Still viewpoint and regeneration

Viewpoint *lat 35°, lon 270°*; colour scheme *Tomorrow*; 1600×1200 — the same still scheme as zones B and C. Cut direction **BACK** coupled to the viewpoint. Regenerate:

```
render-views --scad-file bsppfitTest.scad \
--model-name Nipple-gender-comparison \
--render-variant nipple-gender-comparison --still 35,270 \
--colorscheme Tomorrow --imgsize 1600x1200 \
--output-dir Renders/Nipple
# ...and again with -cut / gender-comparison-cut.
```

Or make `render-archetype-stills`.

14.4 Illustration files (committed)

- `Nipple-gender-comparison.png` → `Nipple-gender-comparison_001+35+270.png`
- `Nipple-gender-comparison-cut.png` → `Nipple-gender-comparison-cut_001+35+270.png`

14.5 Role in BSPPFit

Illustrates the Gender facet in [Taxonomy.org](#), *Facet — Gender (F-02)* as figures `fig:gender-comparison` (solid) and `fig:gender-comparison-cut` (cutaway), showing the gender distinction at the geometry level (external vs internal thread) to complement the section’s thread-level explanation. Eleventh M-NN slot; the zone-A deliverable, completing the illustration programme (zones A, B, C and the D4 cross-reference pass all done).

14.6 Resolution (iteration 0.71.0)

Added the `gender-comparison` and `gender-comparison-cut` render variants (two-fitting scenes) to `bsppfit.scad`; rendered both stills at 35,270 and inspected (male external thread vs female internal thread reads clearly, and the cutaway makes it unambiguous); copied into the project root and linked under stable names; figures placed in the F-02 section; `RENDER_STILLS`, `EXTRA_DIST` and the `dist-hook` updated. Slot DONE.

15 DONE M-10 — Glossary single-fitting renders (zone C)

:OPENED: 2026-05-31 :CLOSED: 2026-05-31 :LOCAL: <Model>-default.png, <Model>-default-cut.png (×9 models); `Manifold-tee[-cut].png`, `Manifold-cross[-cut].png` :ROLE: Zone

C — per-fitting-type glossary illustrations

15.1 Source

Project-owned geometry: the nine model files (**Nipple**, **Elbow**, **Cap**, **Plug**, **Union**, **Reducer**, **HexBush**, **HoseTail**, **Manifold**). No external source, no licence obligation — GPL-3. Unlike the zone-B galleries (one gallery per model), these are *single-fitting* renders of each model's default configuration, for the lookup-driven reader who lands on a glossary entry.

15.2 Coverage

Eleven fitting-types, each solid + cutaway (22 renders total):

- Nipple, Elbow, Cap, Plug, Union, Reducer, Hex bush, Hose tail, Manifold — the **default** / **default-cut** render variants.
- Tee, Cross — the **tee~/~tee-cut** and **cross~/~cross-cut** variants of **Manifold.scad** (tee and cross are configurations of the Manifold class, so they render from that model file).

15.3 Render variants (added 0.68.0)

Each model gained a **default-cut** render variant (the default fitting with **cutaway = BACK**, matching the zone-B cut convention); Manifold additionally gained **tee-cut** and **cross-cut**. The solid **default** (and Manifold **tee~/~cross**) variants pre-existed.

15.4 Still viewpoint and regeneration

Viewpoint *lat 35°, lon 270°*; colour scheme *Tomorrow*; 1600 × 1200 — the same still scheme as the zone-B galleries. Single fittings read with more internal detail than the gallery cells (e.g. the hose-tail barb section and the union seat are clearer here). Regenerate any one, e.g.:

```
render-views --scad-file bsppfitTest.scad \
  --model-name Nipple-default \
  --render-variant nipple-default --still 35,270 \
  --colorscheme Tomorrow --imgsize 1600x1200 \
  --output-dir Renders/Nipple
# ...and default-cut, and likewise for each model;
# Manifold also tee / tee-cut / cross / cross-cut.
```

Or make **render-archetype-stills** (the **RENDER_STILLS** registry carries all 22).

15.5 Illustration files (committed)

Under the project root, the stable names are symbolic links onto the coordinate-encoded frames, e.g. `Nipple-default.png` → `Nipple-default_001+35+270.png` and `Nipple-default-cut.png` → `Nipple-default-cut_001+35+270.png`, for each of the 22.

15.6 Role in BSPPFit

Illustrates the fitting-type glossary entries in [Taxonomy.org](#), *Geometry and ports*: each entry (Cap, Cross, Elbow, Hex bush, Hose tail, Manifold, Nipple, Plug, Reducer, Tee, Union) carries an inline `fig:gloss-<term>` (solid) and `fig:gloss-<term>-cut` (cutaway) adjacent to its definition. Tenth M-NN slot; the zone-C deliverable.

15.7 Resolution (iteration 0.68.0)

`default-cut` (and Manifold `tee-cut`~/~`cross-cut`) render variants added to the models; 22 stills rendered at 35,270 and inspected; copied into the project root and linked under stable names; inline figures placed in the glossary; `RENDER_STILLS`, `EXTRA_DIST` and the `dist-hook` updated. Slot DONE.

16 DONE M-09 — Manifold archetype gallery (solid + cutaway)

:OPENED: 2026-05-31 :CLOSED: 2026-05-31 :LOCAL: `Manifold-gallery-archetypes.png`, `Manifold-gallery-archetypes-cut.png` :ROLE: G-10 (Geometry facet), Manifold entry; also covers the G-03 Tee and G-04 Cross configurations

16.1 Source

Project-owned geometry: `bsppfit.scad` (the G-10 unified branch-fitting class). No external source, no license or attribution obligation — GPL-3.

16.2 Render variants

gallery-archetypes solid 4×3 grid (perpendicular basics incl. tee and cross, leaning Y/X-forms, point/capped/mixed/ asymmetric variety).

gallery-archetypes-cut cutaway companion (BOSL2 BACK half) showing the run bore and the branch-to-run junctions.

16.3 Still viewpoint and regeneration

Viewpoint *lat 35°, lon 270°*; colour scheme *Tomorrow*; 1600 × 1200. The Manifold is a horizontal-run form (run along X, branches perpendicular), unlike the eight upright-form galleries, so the viewpoint was re-checked: 35,270 keeps the clean 4 × 3 grid and shows the branch arrangement and lean angles well (30,315 and 25,340 collapsed the grid into diagonal scatter). Cut direction **BACK** coupled to the viewpoint — see the Development Standard and the 0.67.0 journal entry. Regenerate:

```
render-views --scad-file bsppfitTest.scad \
  --model-name Manifold-gallery-archetypes \
  --render-variant manifold-gallery-archetypes --still 35,270 \
  --colorscheme Tomorrow --imgsize 1600x1200 \
  --output-dir Renders/Manifold
# ...and again with -cut / gallery-archetypes-cut.
```

Or make `render-archetype-stills`.

16.4 Illustration files (committed)

- `Manifold-gallery-archetypes.png` → `Manifold-gallery-archetypes_001+35+270.png`
- `Manifold-gallery-archetypes-cut.png` → `Manifold-gallery-archetypes-cut_001+35+270.png`

16.5 Role in BSPPFit

Illustrates the G-10 Manifold entry in [Taxonomy.pdf](#) as figures `fig:manifold-archetypes` (configuration range: branch count and arrangement, lean angle, gender, end forms) and `fig:manifold-archetypes-cut` (run bore and branch-to-run junctions). *Also covers G-03 Tee and G-04 Cross*: the first two cells of each figure are the tee and cross configurations, so no separate Tee or Cross galleries exist. Ninth M-NN slot — completes the zone-B geometry galleries.

16.6 Resolution (iteration 0.67.0)

Viewpoint re-checked across three latitudes/longitudes (35,270 vs 30,315 vs 25,340); 35,270 chosen for grid integrity. Stills rendered, copied into the project root, linked under the stable names. Cut companion flipped **FRONT** → **BACK** to suit the viewpoint (verified by inspection; run bore and branch junctions read). Embedded in the Taxonomy G-10 subsection, with G-03 and G-04 cross-referencing the same figures. Slot **DONE**.

17 DONE M-08 — Union archetype gallery (solid + cutaway)

17.1 Source

Project-owned geometry: `bsppfit.scad` (the G-07 union). No external source, no license or attribution obligation — GPL-3.

17.2 Render variants

gallery-archetypes solid 4×3 grid (assembled gender row, exploded gender row, single-pieces + larger-size row).

gallery-archetypes-cut cutaway companion (BOSL2 **BACK** half) showing the internal conical seat, bore continuity, and the nut/collar coupling thread — the most informative view of a union, since the sealing seat is invisible from outside.

17.3 Still viewpoint and regeneration

Viewpoint *lat 35°, lon 270°*; colour scheme *Tomorrow*; 1600×1200 . Same viewpoint as the other upright-form galleries. Cut direction **BACK** coupled to the viewpoint — see the Development Standard and the 0.66.0 journal entry. Regenerate:

```
render-views --scad-file bsppfitTest.scad \  
  --model-name Union-gallery-archetypes \  
  --render-variant union-gallery-archetypes --still 35,270 \  
  --colorscheme Tomorrow --imgsize 1600x1200 \  
  --output-dir Renders/Union  
# ...and again with -cut / gallery-archetypes-cut.
```

Or make `render-archetype-stills`.

17.4 Illustration files (committed)

- `Union-gallery-archetypes.png` → `Union-gallery-archetypes_001+35+270.png`
- `Union-gallery-archetypes-cut.png` → `Union-gallery-archetypes-cut_001+35+270.png`

17.5 Role in BSPPFit

Illustrates the G-07 Union entry in [Taxonomy.pdf](#) as figures `fig:union-archetypes` (configuration space: pose $\times$ pipe-end gender $\times$ component pieces) and `fig:union-archetypes-cut` (internal conical seat and bore). Eighth M-NN slot.

17.6 Resolution (iteration 0.66.0)

Stills rendered at the chosen viewpoint, copied into the project root, linked under the stable names. Cut companion flipped **FRONT** → **BACK** to suit the viewpoint (verified by inspection; the exploded cutaways and the conical seat read clearly). Embedded in the Taxonomy G-07 subsection. Slot **DONE**.

18 **DONE** M-07 — Hex-bush archetype gallery (solid + cutaway)

18.1 Source

Project-owned geometry: `bsppfit.scad` (the G-08 hex / reducing bush). No external source, no license or attribution obligation — GPL-3.

18.2 Render variants

gallery-archetypes solid 4×3 grid (M-large size-ratio row, F-large gender-swapped row, specials row).

gallery-archetypes-cut cutaway companion (BOSL2 **BACK** half) showing the through-bore and the diameter step at the gender transition.

18.3 Still viewpoint and regeneration

Viewpoint *lat 35°, lon 270°*; colour scheme *Tomorrow*; 1600×1200 . Same viewpoint as the other upright-form galleries. Cut direction **BACK** coupled to the viewpoint — see the Development Standard and the 0.65.0 journal entry. Regenerate:

```
render-views --scad-file bsppfitTest.scad \
  --model-name HexBush-gallery-archetypes \
  --render-variant hexbush-gallery-archetypes --still 35,270 \
  --colorscheme Tomorrow --imgsize 1600x1200 \
  --output-dir Renders/HexBush
# ...and again with -cut / gallery-archetypes-cut.
```

Or make `render-archetype-stills`.

18.4 Illustration files (committed)

- HexBush-gallery-archetypes.png → HexBush-gallery-archetypes_001+35+270.png
- HexBush-gallery-archetypes-cut.png → HexBush-gallery-archetypes-cut_001+35+270.png

18.5 Role in BSPPFit

Illustrates the G-08 Hex bush entry in [Taxonomy.pdf](#) as figures `fig:hexbush-archetypes` (configuration space: gender layout $\times$ size ratio $\times$ hex height) and `fig:hexbush-archetypes-cut` (through-bore and gender-transition step). Seventh M-NN slot.

18.6 Resolution (iteration 0.65.0)

Stills rendered at the chosen viewpoint, copied into the project root, linked under the stable names. Cut companion flipped **FRONT** $\rightarrow$ **BACK** to suit the viewpoint (verified by inspection). Embedded in the Taxonomy G-08 subsection. Slot DONE.

19 DONE M-06 — Hose-tail archetype gallery (solid + cutaway)

19.1 Source

Project-owned geometry: `bsppfit.scad` (the G-09 hose tail). No external source, no license or attribution obligation — GPL-3.

19.2 Render variants

gallery-archetypes solid 4×3 grid (barb-profile + shouldered row, body-shape $\times$ gender row, barb-count + size row).

gallery-archetypes-cut cutaway companion (BOSL2 **BACK** half) showing the through-bore and — the point of the cut for this model — the barb wall profile in section.

19.3 Still viewpoint and regeneration

Viewpoint *lat 35°, lon 270°*; colour scheme *Tomorrow*; 1600×1200 . Same viewpoint as the other upright-form galleries. Note: the barb profiles (shark-fin, stepped, christmas-tree) are subtle on the solid exterior at grid scale — lower latitudes were tried (15, 20) but collapsed the grid into diagonal scatter, so the grid-legible 35,270 was kept and the cutaway carries the barb detail. Cut direction **BACK** coupled to the viewpoint — see the Development Standard and the 0.64.0 journal entry. Regenerate:

```
render-views --scad-file bsppfitTest.scad \
  --model-name HoseTail-gallery-archetypes \
  --render-variant hosetail-gallery-archetypes --still 35,270 \
  --colorscheme Tomorrow --imgsize 1600x1200 \
  --output-dir Renders/HoseTail
# ...and again with -cut / gallery-archetypes-cut.
```

Or make `render-archetype-stills`.

19.4 Illustration files (committed)

- `HoseTail-gallery-archetypes.png` → `HoseTail-gallery-archetypes_001+35+270.png`
- `HoseTail-gallery-archetypes-cut.png` → `HoseTail-gallery-archetypes-cut_001+35+270.png`

19.5 Role in BSPPFit

Illustrates the G-09 Hose tail entry in [Taxonomy.pdf](#) as figures `fig:hosetail-archetypes` (configuration space: barb profile × body shape × gender × barb count) and `fig:hosetail-archetypes-cut` (through-bore and barb profile in section). Sixth M-NN slot.

19.6 Resolution (iteration 0.64.0)

Stills rendered at the chosen viewpoint, copied into the project root, linked under the stable names. Cut companion flipped **FRONT** → **BACK** to suit the viewpoint and to expose the barb section (verified by inspection). Embedded in the Taxonomy G-09 subsection. Slot **DONE**.

20 **DONE** M-05 — Plug archetype gallery (solid + cutaway)

20.1 Source

Project-owned geometry: `bsppfit.scad` (the Plug half of the G-06 cap-and-plug pair). No external source, no license or attribution obligation — GPL-3.

20.2 Render variants

gallery-archetypes solid 4×3 grid (hex-head size sweep, round-head size sweep, thread-length variations).

gallery-archetypes-cut cutaway companion (BOSL2 **BACK** half) showing the solid head and solid threaded shaft in cross-section — the plug has no internal bore.

20.3 Still viewpoint and regeneration

Viewpoint *lat 35°, lon 270°*; colour scheme *Tomorrow*; 1600×1200 . Same viewpoint as the Cap (M-04) and the other upright-form galleries. Cut direction **BACK** coupled to the viewpoint — see the Development Standard and the 0.63.0 journal entry. Regenerate:

```
render-views --scad-file bsppfitTest.scad \
  --model-name Plug-gallery-archetypes \
  --render-variant plug-gallery-archetypes --still 35,270 \
  --colorscheme Tomorrow --imgsize 1600x1200 \
  --output-dir Renders/Plug
# ...and again with -cut / gallery-archetypes-cut.
```

Or make render-archetype-stills.

20.4 Illustration files (committed)

- Plug-gallery-archetypes.png → Plug-gallery-archetypes_001+35+270.png
- Plug-gallery-archetypes-cut.png → Plug-gallery-archetypes-cut_001+35+270.png

20.5 Role in BSPPFit

Illustrates the Plug half of the G-06 entry in [Taxonomy.pdf](#) as figures `fig:plug-archetypes` and `fig:plug-archetypes-cut`. The plug's solid cross-section contrasts with the cap's hollow bore (M-04), making the cap/plug duality concrete. Fifth M-NN slot.

20.6 Resolution (iteration 0.63.0)

Stills rendered at the chosen viewpoint, copied into the project root, linked under the stable names. Cut companion flipped **FRONT** → **BACK** to suit the viewpoint (verified by inspection). Embedded in the Taxonomy G-06 subsection. Slot DONE.

21 **DONE** M-04 — Cap archetype gallery (solid + cut-away)

21.1 Source

Project-owned geometry: `bsppfit.scad` (the Cap half of the G-06 cap-and-plug pair). No external source, no license or attribution obligation — GPL-3.

21.2 Render variants

gallery-archetypes solid 4×3 grid (hex-head size sweep, round-head size sweep, head-height variations).

gallery-archetypes-cut cutaway companion (BOSL2 **BACK** half) revealing the internal female thread and the head's wall thickness around the bore.

21.3 Still viewpoint and regeneration

Viewpoint *lat 35°, lon 270°*; colour scheme *Tomorrow*; 1600 × 1200. Same viewpoint as the other upright-form galleries. Cut direction **BACK** coupled to the viewpoint — see the Development Standard and the 0.63.0 journal entry. Regenerate:

```
render-views --scad-file bsppfitTest.scad \
  --model-name Cap-gallery-archetypes \
  --render-variant cap-gallery-archetypes --still 35,270 \
  --colorscheme Tomorrow --imgsize 1600x1200 \
  --output-dir Renders/Cap
# ...and again with -cut / gallery-archetypes-cut.
```

Or make `render-archetype-stills`.

21.4 Illustration files (committed)

- `Cap-gallery-archetypes.png` → `Cap-gallery-archetypes_001+35+270.png`
- `Cap-gallery-archetypes-cut.png` → `Cap-gallery-archetypes-cut_001+35+270.png`

21.5 Role in BSPPFit

Illustrates the Cap half of the G-06 entry in [Taxonomy.pdf](#) as figures `fig:cap-archetypes` and `fig:cap-archetypes-cut`. The cap's hollow female bore contrasts with the plug's solid shaft (M-05). Fourth M-NN slot; first of the two-file G-06 pair.

21.6 Resolution (iteration 0.63.0)

Stills rendered at the chosen viewpoint, copied into the project root, linked under the stable names. Cut companion flipped **FRONT** → **BACK** to suit the viewpoint (verified by inspection). Embedded in the Taxonomy G-06 subsection. Slot **DONE**.

22 **DONE** M-03 — Reducer archetype gallery (solid + cutaway)

22.1 Source

Project-owned geometry: `bsppfit.scad` (the G-05 Reducer model). No external source, no license or attribution obligation — GPL-3, same as the rest of the project.

22.2 Render variants

gallery-archetypes solid 4×3 archetype grid (twelve cells: a gender row, a hex-body row, an eccentric-subtype row).

gallery-archetypes-cut cutaway companion, each cell sectioned (BOSL2 **BACK** half) so the conical size transition and the eccentric offset bore read from the still viewpoint.

22.3 Still viewpoint and regeneration

Viewpoint *lat 35°*, *lon 270°* (coordinate-encoded in the frame name); colour scheme *Tomorrow*; 1600×1200 . Same viewpoint as the Straight gallery (M-02): both are upright-form galleries that read as a grid from a front-elevated view. The cut direction **BACK** is coupled to this viewpoint — see the Development Standard and the 0.62.0 journal entry. Regenerate (per variant):

```
render-views --scad-file bspffitTest.scad \
  --model-name Reducer-gallery-archetypes \
  --render-variant reducer-gallery-archetypes --still 35,270 \
  --colorscheme Tomorrow --imgsize 1600x1200 \
  --output-dir Renders/Reducer
# ...and again with -cut / gallery-archetypes-cut.
```

Equivalently, make `render-archetype-stills` renders the committed-coordinate stills for every model that has one.

22.4 Illustration files (committed)

Under the project root, the stable names are symbolic links onto the chosen coordinate-encoded frames:

- `Reducer-gallery-archetypes.png` → `Reducer-gallery-archetypes_001+35+270.png`
- `Reducer-gallery-archetypes-cut.png` → `Reducer-gallery-archetypes-cut_001+35+270.png`

22.5 Role in BSPPFit

Illustrates the G-05 Reducer entry in [Taxonomy.pdf](#) as figures `fig:reducer-archetypes` (configuration space: gender $\times$ body shape $\times$ concentric/eccentric) and `fig:reducer-archetypes-cut` (conical size transition and offset bore). Third M-NN slot.

22.6 Resolution (iteration 0.62.0)

Stills rendered at the chosen viewpoint, copied into the project root, and linked under the stable names. The cut companion was flipped **FRONT** → **BACK** to suit the viewpoint (verified by inspection). Embedded in the Taxonomy G-05 subsection with captions. Slot is DONE.

23 **DONE M-02** — Straight archetype gallery (solid + cutaway)

23.1 Source

Project-owned geometry: `bsppfit.scad` (the straight / nipple family, G-01). No external source, no license or attribution obligation — GPL-3, same as the rest of the project.

23.2 Render variants

gallery-archetypes solid 4×3 archetype grid (twelve cells: a gender row, a shape $\times$ size row, a dimensional-specials row).

gallery-archetypes-cut cutaway companion, each cell sectioned (BOSL2 **BACK** half) so the axial through-bore reads from the still viewpoint.

23.3 Still viewpoint and regeneration

Viewpoint *lat* 35° , *lon* 270° (coordinate-encoded in the frame name); colour scheme *Tomorrow*; 1600×1200 . This is a *different* viewpoint from the Elbow's (*lat* 30° , *lon* 315°): the straight gallery's upright forms read as a grid from a front-elevated view (*lon* 270°), whereas the Elbow's diagonal layout reads from *lon* 315° . The cut direction **BACK** is coupled to this viewpoint (camera from $-Y$, so the far $+Y$ half is kept and the cut face turns toward the viewer) — see the Development Standard and the 0.61.0 journal entry. Regenerate (per variant):

```
render-views --scad-file bsppfitTest.scad \
  --model-name Nipple-gallery-archetypes \
  --render-variant nipple-gallery-archetypes --still 35,270 \
  --colorscheme Tomorrow --imgsize 1600x1200 \
  --output-dir Renders/Nipple
# ...and again with -cut / gallery-archetypes-cut.
```

Equivalently, make `render-archetype-stills` renders the committed-coordinate stills for every model that has one.

23.4 Illustration files (committed)

Under the project root, the stable names are symbolic links onto the chosen coordinate-encoded frames:

- `Nipple-gallery-archetypes.png` → `Nipple-gallery-archetypes_001+35+270.png`
- `Nipple-gallery-archetypes-cut.png` → `Nipple-gallery-archetypes-cut_001+35+270.png`

23.5 Role in BSPPFit

Illustrates the G-01 Straight entry in [Taxonomy.pdf](#) as figures `fig:straight-archetypes` (configuration space: gender $\times$ size $\times$ shape) and `fig:straight-archetypes-cut` (axial through-bore). Second M-NN slot; follows the pattern established by M-01.

23.6 Resolution (iteration 0.61.0)

Stills rendered at the chosen viewpoint, copied into the project root, and linked under the stable names. The cut companion was flipped `FRONT` $\rightarrow$ `BACK` to suit the viewpoint (verified by inspection). Embedded in the Taxonomy G-01 subsection with captions. Slot is DONE.

24 DONE M-01 — Elbow archetype gallery (solid + cutaway)

24.1 Source

Project-owned geometry: `bsppfit.scad` (the G-02 Elbow model). No external source, no license or attribution obligation — GPL-3, same as the rest of the project.

24.2 Render variants

gallery-archetypes solid 4×3 archetype grid (twelve cells: a gender row, a size-sweep row, a dimensional-specials row).

gallery-archetypes-cut cutaway companion, each cell sectioned (BOSL2 `BACK` half) so the swept-bend through-bore reads from the still viewpoint.

24.3 Still viewpoint and regeneration

Viewpoint *lat* 30° , *lon* 315° (coordinate-encoded in the frame name); colour scheme *Tomorrow*; 1600×1200 . The cut direction `BACK` is coupled to this viewpoint — see the Development Standard and the 0.60.0 journal entry. Regenerate (per variant):

```
render-views --scad-file bsppfitTest.scad \
  --model-name Elbow-gallery-archetypes \
  --render-variant elbow-gallery-archetypes --still 30,315 \
  --colorscheme Tomorrow --imgsize 1600x1200 \
  --output-dir Renders/Elbow
# ...and again with -cut / gallery-archetypes-cut.
```

Equivalently, make `render-archetype-stills` renders the committed-coordinate stills for every model that has one.

24.4 Illustration files (committed)

Under the project root, the stable names are symbolic links onto the chosen coordinate-encoded frames (the link is the physical trace of the choice; the target name records the view):

- `Elbow-gallery-archetypes.png` → `Elbow-gallery-archetypes_001+30+315.png`
- `Elbow-gallery-archetypes-cut.png` → `Elbow-gallery-archetypes-cut_001+30+315.png`

24.5 Role in BSPPFit

Illustrates the G-02 Elbow entry in [Taxonomy.pdf](#) as figures `fig:elbow-archetypes` (configuration space: gender $\times$ size $\times$ dimensional specials) and `fig:elbow-archetypes-cut` (internal bore). First M-NN slot; establishes the model-render pattern the remaining geometry entries will follow.

24.6 Resolution (iteration 0.60.0)

Stills rendered from the model at the chosen viewpoint, copied into the project root, and linked under the stable names. Embedded in the Taxonomy G-02 subsection with captions. Slot is DONE.

25 What was tried in v0.6.0 and why it was retracted

In iteration 0.6.0 I (the assistant) hand-wrote three SVGs directly:

- `illustrations/dowty-seal.svg` — hodge-podge, geometrically wrong.
- `illustrations/cone-seat.svg` — hodge-podge, geometrically wrong.
- `illustrations/thread-profiles.svg` — "passable" per the project author's review, but not *correct*.

The project author judged the result skeptically and asked for either correct illustrations or web-sourced ones. The correct path was the second option: I cannot, from this environment, see the parts I am drawing, so my hand-drawn SVGs are unreliable. They have all been deleted in v0.7.0.

The lesson is documented in [ResearchJournal.pdf](#) and should guide future iterations: the assistant *researches and catalogues* external illustrations; the project author *fetches, inspects, places, and attributes* them; eventually the model library replaces them.