Concept 1.2

Soft-Shell Hybrid

R8 | Rapid Product Solutions | Supplier brief

WIDTH (mm)	HEIGHT (mm)	DEPTH (mm)
88	136	24.5

Modeled size dimensions.

Inspiration photo

CAD assembly / R8

Appearance intent; CAD shows the current engineering proposal. Views are not to scale.

CAD front

CAD rear

CAD exploded

02 Quote and materials / 03 Build and inspect / 04 Inputs and delivery

Quote and materials

R8 | Rapid Product Solutions | Soft silicone exterior with a woven front and a removable guided play mechanism.

Please review manufacturability and quote a staged enclosure prototype for Walkie One, a handheld push-to-talk voice device. We need to evaluate grip, button operation, speaker/microphone openings, status light, charging access and serviceability.

What to quote first

One PA12 rigid fit set, one complete guided play coupon, one curved skin/core bond coupon, a woven cloth/W sample and a split PMMA optical sample. Quote the full silicone appearance article after these pass review.

Materials and processes

Rigid structure	SLS unfilled PA12; EOS PA 2200 is the requested candidate. Rapid lists RPS Nylon PA, but equivalence and current powder grade need confirmation. Machine the precision lands and guides.
Silicone skins	0.80 mm nominal, 40 +/-5 Shore A. LR3003/40 LSR is a benchmark, not an assumed Rapid process. Ask for a named RTV silicone prototype route or separately priced LSR route. PU is not an approved silicone substitute.
Cloth and optics	Real breathable woven polyester with the supplied W; 0.60 +/-0.05 mm installed textile. PMMA uses a 0.60 mm sheet transport and separate output post. Quote optical finishing and assembly trials.

Published capability is not acceptance of this specific geometry. Exact grades, fine tolerances, thin-section casting, specialty coatings/cutting and test services need Rapid confirmation. General website tolerances do not replace the finished drawing tolerances.

Build and inspect

Body and bonding	88 x 136 x 24.5 mm body. Keep the 30.8 mm play face and existing controls/artwork. Skin adhesive belongs in 0.10 +/-0.03 mm reservoirs, flush with dry lands; no added full-face film.
Guided play	Finished stems 3.000-3.002 mm; cassette bores 3.010-3.012 mm. These are precision-machined targets, not SLS accuracy. Rapid must confirm a practical matched-part process before this coupon.
Calibration	Measure 0.060 +/-0.010 mm positive rest gap. The 0.040 +/-0.010 mm post-contact setting is provisional and needs Walkie One mechanical/electrical approval of switch loading. Never preload the switch to obtain contact.
Optics and battery space	Keep the 0.90 mm tray floor and lateral mic-lead relief. Test the thin PMMA route with the actual LED. The nominal mic-to-cell space does not establish battery expansion or solder clearance.

Assembly order

1. Inspect the rigid parts; install the play key, cassette, actual switch and measured support/stop shims from the rear before PCB and battery obstruct access. Use the detailed sequence in Engineering_Detail.pdf, original page 9.

2. Measure contact, stop and return at the center and eight rim positions. Fit side controls, speaker/cloth, guide and microphone; confirm lateral solder/lead clearance.

3. Trial the actual charging cable and complete harness. Bond front and rear skins separately after fit approval; demonstrate three open/remove/refit cycles without tearing skins or trapping leads.

Keep separate

U1 centered USB mouth and A1 sculpted surround are separate studies, excluded from the base quote. U1 does not relocate the actual socket. A1 has an unqualified thin silicone edge.

Use the supplied artwork at its specified size and position. Approve physical color, texture and marking samples together; screen colors are visual intent. Keep finish and adhesive off guides, stops, acoustic openings, optical faces and service seams unless the drawing explicitly calls for them. Record any proposed substitution before using it.

Inputs and delivery

Rapid is asked to make, finish, inspect and optionally assemble agreed parts using Walkie One-supplied hardware. Walkie One owns electrical design, firmware, battery/charging, RF and acoustic validation. Rapid may quote specialist support separately; these services are not assumed from its website.

Before mechanism trial	Walkie One mechanical/electrical	Actual switches, final switch retention/lead detail and approved force/travel limits.
Before powered assembly	Walkie One electrical	Populated board identity, cable and receptacle mating data, dressed leads, actual battery maximum/aged envelope and retention limits.
Before full finish	Rapid proposes; Walkie One approves	Named silicone/cure/bond recipe, cloth SKU and W treatment, rear ink/primer and optical result.

Quote and return

Quote each concept separately: one unpowered fit set and the priority samples on page 2, followed by one finished appearance article after sample approval. This is a comparison basis, not an order for all concepts. Show any minimum quantity; confirm the selected concept, quantity, delivery date and ship-to with Walkie One before work starts.

Please itemize parts, fixtures/coupons, tooling, finishing, assembly, inspection and shipping; state lead time from receipt of approved inputs. Identify partner-made work, exclusions and tolerances you cannot hold. Quote a feasible alternative with its effect on fit/appearance rather than silently changing the design.

Return identified parts/samples, the material and finish selections, measured critical dimensions, assembly photos and the completed applicable inspection record. List hand fitting, deviations and unresolved items. Leave unperformed tests blank or NOT TESTED. Walkie One approves samples and engineering changes before repeat finished units.

Use these files

This brief controls supplier scope and responsibilities. The current per-part STEP, BOM and finished-interface drawings retain the technical requirements. Stop and return a marked question if they disagree. Millimetres throughout. Assembly STEP is a reference, not a single part to print. Purchased hardware, foam, cloth and adhesive solids are not rigid-print instructions.

BOM: docs/BOM.csv

Records: docs/Build_Traveler.csv; docs/Rapid_Open_Items.csv.

Original detail pages 4-10: bonds, mechanisms, optics, materials, assembly and physical tests; drawings remain with the package.

Supplier capabilities checked 06 Sep 2026. Source links and confirmation limits: docs/Rapid_Capabilities.md.
https://www.rapid-products.com/

Build files: start here

Read the four-page supplier brief first. The remaining pages consolidate the required engineering detail and drawings; use the PDF bookmarks to jump to an appendix. Original engineering page numbers are retained inside those appendices.

The companion ZIP contains this same PDF. Parts_and_Process.csv maps every BOM entry to its exact delivered files. File_Manifest.csv maps original paths mentioned in retained drawings to their delivered locations.

01_Parts_to_Print: individual STEP and existing STL for the specified print process. 02_Other_Manufacturing: cast, machined, cut and artwork definitions. 03_Assembly_and_Drawings: assembly references and essential process / inspection records. 04_Required_Fit_Checks: staged coupon and fixture geometry.

STEP is the nominal geometry. STL is a mesh alternative for the same part, not an additional part or quantity. Millimetres throughout; import at 1:1. Quote quantities come from the brief and part schedule. Assembly, hardware, artwork and compliant installed envelopes are not rigid print instructions.

U1 centered USB mouth and A1 sculpted surround are separate studies, excluded from the base quote. U1 does not relocate the actual socket. A1 has an unqualified thin silicone edge.

The original engineering package, source code and historical alternatives remain available under Supporting engineering and archive on the concept page. The supplier brief controls scope; technical values remain unchanged. Resolve any conflict before the affected operation.

Required stages: One PA12 rigid fit set, one complete guided play coupon, one curved skin/core bond coupon, a woven cloth/W sample and a split PMMA optical sample. Quote the full silicone appearance article after these pass review.

For exact tolerances, assembly order and inspection criteria, use the technical appendix and the corresponding records in 03_Assembly_and_Drawings.

Parts and processes

Fabrication parts with individual files are listed below. Parts_and_Process.csv also contains every purchased item, reference, consumable and complete source note. Quantities describe the source assembly; the quote quantity is agreed separately.

Part / quantity	Material / process	Delivered filenames
01_front_structural_tub / 1	EOS PA 2200, unfilled PA12; requested grade, RPS availability to confirm SLS; finish critical fits; tap M2.5 x 0.45 pilots	01_front_structural_tub.step 01_front_structural_tub.stl
02_rear_structural_cover / 1	EOS PA 2200, unfilled PA12; requested grade, RPS availability to confirm SLS	02_rear_structural_cover.step 02_rear_structural_cover.stl
03_front_silicone_skin / 1	Addition-cure silicone, 40 +/-5 Shore A; exact end-use casting grade to be approved by RPS/Jacob Cast silicone from finished master; bond to core	03_front_silicone_skin.step
04_rear_silicone_skin / 1	Addition-cure silicone, 40 +/-5 Shore A; exact end-use casting grade to be approved by RPS/Jacob Cast silicone; bond separately to removable cover	04_rear_silicone_skin.step
05_grille_backing / 1	EOS PA 2200, unfilled PA12; requested grade, RPS availability to confirm SLS	05_grille_backing.step 05_grille_backing.stl
06_woven_acoustic_insert / 1	Woven polyester acoustic grille cloth, 0.6 mm installed target; exact SKU/sample approval required Cut fabric; NOT a printed solid	06_woven_acoustic_insert.step
07_speaker_cradle / 1	EOS PA 2200, unfilled PA12; requested grade, RPS availability to confirm SLS; bond ears to grille rear flange	07_speaker_cradle.step 07_speaker_cradle.stl
08_speaker_gasket / 1	Closed-cell silicone foam; sheet grade and compression to be qualified Cut foam	08_speaker_gasket.step
09_battery_tray / 1	EOS PA 2200, unfilled PA12; requested grade, RPS availability to confirm SLS; bond lateral tabs to tub after dry-fit	09_battery_tray.step 09_battery_tray.stl
10_ptt_plunger / 1	EOS PA 2200, unfilled PA12; requested grade, RPS availability to confirm SLS; finish guides	10_ptt_plunger.step 10_ptt_plunger.stl
11_ptt_silicone_cap / 1	Addition-cure silicone, 40 +/-5 Shore A; exact end-use casting grade to be approved by RPS/Jacob Cast silicone; bond to plunger	11_ptt_silicone_cap.step
12_ptt_switch_cradle / 1	EOS PA 2200, unfilled PA12; requested grade, RPS availability to confirm SLS; bond after switch setup	12_ptt_switch_cradle.step 12_ptt_switch_cradle.stl
10_volume_plus_plunger / 1	EOS PA 2200, unfilled PA12; requested grade, RPS availability to confirm SLS; finish guides	10_volume_plus_plunger.step 10_volume_plus_plunger.stl
11_volume_plus_silicone_cap / 1	Addition-cure silicone, 40 +/-5 Shore A; exact end-use casting grade to be approved by RPS/Jacob Cast silicone; bond to plunger	11_volume_plus_silicone_cap.step
12_volume_plus_switch_cradle / 1	EOS PA 2200, unfilled PA12; requested grade, RPS availability to confirm SLS; bond after switch setup	12_volume_plus_switch_cradle.step 12_volume_plus_switch_cradle.stl

Part / quantity	Material / process	Delivered filenames
10_volume_minus_plunger / 1	EOS PA 2200, unfilled PA12; requested grade, RPS availability to confirm SLS; finish guides	10_volume_minus_plunger.step 10_volume_minus_plunger.stl
11_volume_minus_silicone_cap / 1	Addition-cure silicone, 40 +/-5 Shore A; exact end-use casting grade to be approved by RPS/Jacob Cast silicone; bond to plunger	11_volume_minus_silicone_cap.step
12_volume_minus_switch_cradle / 1	EOS PA 2200, unfilled PA12; requested grade, RPS availability to confirm SLS; bond after switch setup	12_volume_minus_switch_cradle.step 12_volume_minus_switch_cradle.stl
13_play_plunger / 1	Machined POM-C natural; grade and creep/fit sample to approve CNC, match-machine guide stems and datum flange	13_play_plunger.step
14_play_silicone_face / 1	Addition-cure silicone, 40 +/-5 Shore A; exact end-use casting grade to be approved by RPS/Jacob Cast silicone	14_play_silicone_face.step
15_play_switch_cradle / 1	Machined POM-C natural CNC, ream/match-fit; 2 rear M2 screws	15_play_switch_cradle.step
16_LED_support / 1	EOS PA 2200, unfilled PA12; requested grade, RPS availability to confirm SLS; bond support arm to wall	16_LED_support.step 16_LED_support.stl
18_microphone_cradle / 1	EOS PA 2200, unfilled PA12; requested grade, RPS availability to confirm SLS; bond ears to tub; retain module at bare-edge lands after dry-fit	18_microphone_cradle.step 18_microphone_cradle.stl
19_microphone_gasket / 1	Closed-cell silicone foam; sheet grade and compression to be qualified Cut foam	19_microphone_gasket.step
20_LTE_bond_film / 1	3M 467MP acrylic transfer adhesive, nominal 0.05 mm; 0.10 mm assembly allowance Die cut adhesive; do not print	20_LTE_bond_film.step
21_W_textile_mark_REFERENCE / 1	Color region in woven polyester; no rigid badge or continuous film Woven contrasting yarn or textile ink; SVG supplied	21_W_textile_mark_REFERENCE.step
22_rear_wordmark_REFERENCE / 1	Silicone-compatible pad-print ink, Carbon #171716 Pad print after silicone cure; qualify ink and primer	22_rear_wordmark_REFERENCE.step
23_rear_Designed_in_Los_Angeles_REFERENCE / 1	Silicone-compatible pad-print ink, Carbon #171716 Pad print after silicone cure; qualify ink and primer	23_rear_Designed_in_Los_Angeles_REFERENCE.step
24_play_calibration_shim / 1	PET precision shim stack, measured finished Die cut/select 0.05-0.85 mm total	24_play_calibration_shim.step
28_play_stop_shims / 1	Precision PET shim stack including adhesive Cut and select each assembly	28_play_stop_shims.step
29_play_return_cushions / 1	Soft closed-cell silicone foam; supplier force curve required Die cut diameter3.0, free2.0; installed1.8	29_play_return_cushions.step
25_textile_perimeter_bond / 1	Flexible textile-compatible adhesive, sample qualification Dispense masked perimeter track only	25_textile_perimeter_bond.step
17a_status_transport / 1	Clear PMMA sheet 0.60 +/-0.05 CNC outline from sheet on sacrificial backing; polish edges	17a_status_transport.step

Part / quantity	Material / process	Delivered filenames
17b_status_output / 1	Optical PMMA rod Turn diameter3.10; lap bottom; diffuse output	17b_status_output.step
26_front_skin_bond / 1	Silicone-compatible adhesive/primer system, TBD sample Meter into core reservoirs	26_front_skin_bond.step
27_rear_skin_bond / 1	Silicone-compatible adhesive/primer system, TBD sample Meter into core reservoirs	27_rear_skin_bond.step

Walkie One 1.2

REVISION R8 | 6 SEPTEMBER 2026 | BUILD / RELEASE SHEET

Build first: one rigid fit set, one guided play coupon, one curved skin/core coupon and one real woven textile sample. Engineering fit package for quotation and evaluation. No finished production release, physical test result or supplier approval is claimed.

Controlling item	Instruction / accountable owner
CAD revision	R8 assembly and individual STEP in step/. Units mm. Python in code/ is editable, executable source; preserved R7 in baseline_R7/.
Preserve	88 x 136 x 24.5 body; current raised 30.8 play face, W, centered microphone, rear branding, volume and PTT placement. Purchased hardware is unscaled.
ME / supplier	Inspect finished guides, stop datums, 0.90 tray floor, adhesive tracks and assembly access. Record every adjustment and nonconformance.
Electrical owner	Supply cable/receptacle data and PCB retention limits; approve actual microphone leads, battery limits, charging and harness.
Design owner + supplier	Approve cream/sage/orange silicone, woven cloth, W textile treatment, rear ink/primer and optical sample before full finish.
Before finished article	Close play force/stop qualification and actual cable seating. U1 USB and A1 appearance are separate proposals, not main R8 fabrication.

Appearance: front

Soft transitions, with approved geometry preserved

Feature	R7 to R8 decision
Front shape	Retain planar broad face, R22 plan corners and R5 outer edge. Inspiration has a sculpted crown; reproducing it throughout would require a new wall/optical/cloth depth study. No thickness increase hidden in this revision.
Textile boundary	R0.20 skin entrance blend softens the cloth reveal. Recessed 2 mm perimeter adhesive track controls the edge without coating the acoustic field.
Play transition	Retain approved 30.8 mm face and original location. R0.20 surrounding entrance blend and controlled rear capture land. No substitution with a smaller inspiration button.
Optional A1	Separate CAD demonstrates a shallow R250 surround dish while keeping the current cap. It leaves about 0.44 mm local silicone near the rim: appearance study only, requires thin-edge coupon. Not main design.

CAD views share one exact camera. The inspiration uses the closest supplied angle; its lens and camera are unknown. Curvature is assessed visually, not measured from the photograph.

Appearance: rear and side

Seam, branding and control placement

Rear wordmark remains 42 mm wide at (0,-42); inscription remains 32 mm at (0,-50.5). Use unchanged outlined artwork; no added relief. Rear seam stays Z-7.50/-7.80, 0.30 mm nominal. Silicone bond strips stop within each separate cover; screws and seam remain accessible.

PTT stays at Y7/Z0, 54 x 13 mm. Volume centers remain Y24 and Y0, Z0, diameter 16. Main R8 charging opening is unchanged. U1 separately centers the visible mouth at Z0 while retaining the lower actual socket axis; do not describe that as a relocated connector.

Skin and textile interfaces

Finished geometry controls the assembly

Interface	Finished instruction
Skin/core	Main wall 1.60; silicone 0.80 nominal. Front: two 3 x 78 x 0.10 reservoirs at X+/-32/Y5. Rear: two 4 x 86 x 0.10 at X+/-24/Y0. Local wall residual 1.50. Dry core lands locate the skin, so adhesive is not added outside the 24.5 mm body budget.
Bond allowance	Reservoir depth 0.10 +/-0.03, filled flush with dry lands. Qualify PA12 preparation, silicone primer and adhesive as a complete recipe. No uncontrolled full-face extra bond film. Dry peripheral contact is intentional; edge peel testing determines whether a later retention revision is necessary.
Keepouts	Mask closure faces and 1 mm each side of seam; screw counterbores plus 1 mm annulus; every sliding guide/stop; acoustic field; mic bore/seal; optical transport/coupling surfaces. Do not bridge the removable rear.
Skin registration	Use two core dry lands and removable nest referencing body center and rear seam. Align ports before cure. No extra visible ridge or snap undercut. Hold with a nonmarking fixture, inspect before releasing.
Textile	54.2 x 69.2, R15.6 outline.0.60 +/-0.05 installed above backing surface Z10.65; top Z11.25 +/-0.05. Adhesive 0.10 lives below this in track Z10.55..10.65. Use real breathable woven polyester; SKU required.
Weave and W	Warp parallel Y within 2 degrees; choose oat/cream swatch against silicone. W26.6 x 23.24 centered(0,26), registration +/-0.4, size +/-0.2. Textile ink or contrasting yarn only. Preserve original artwork and permeability.
Cloth application	Cut cleanly without a hard melted bead on the visible edge. Trial 0-1% biaxial installation extension; choose lowest tension removing wrinkles. Verify weave scale, W distortion and speaker shadow with device off/on. Bond 2 mm perimeter track only.
Curved coupon	Use supplied 20 x 30 mm actual-edge crop with 0.8 skin, core, full bond stripe and curved perimeter. Same PA12 finish, pigment, mold surface and primer as device. Include a 10 mm peel-start tab in tooling, outside finished coupon envelope.

Play mechanism

A controlled stack replaces nominal-travel assurance

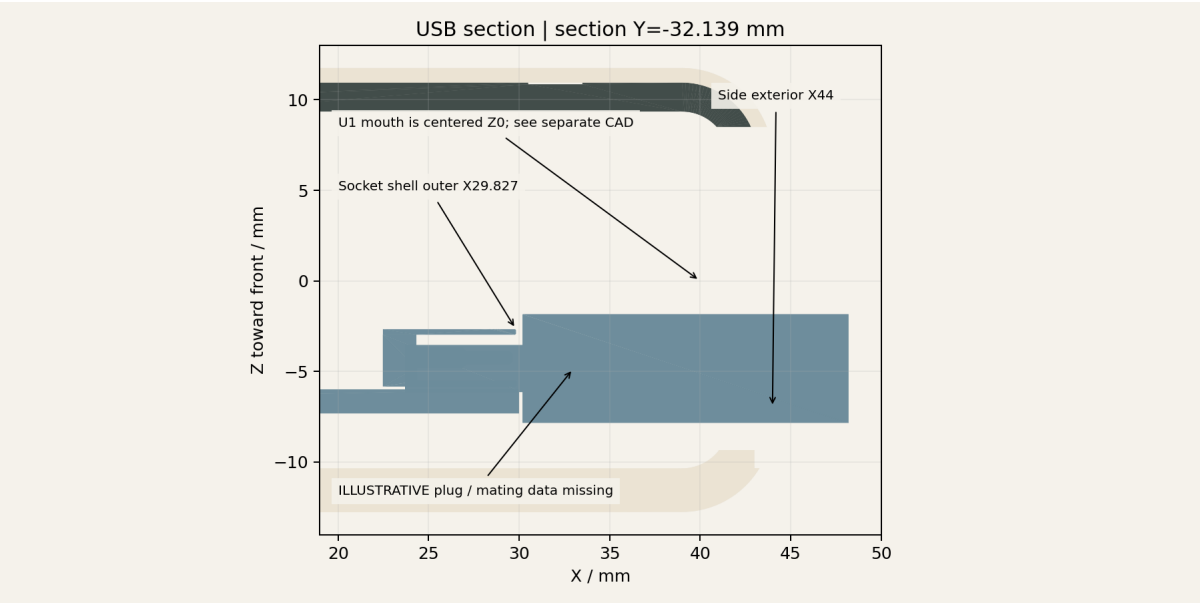
The current manufacturer B3F table specifies 0.20-0.50 mm pretravel for the B3F-4000. It does not specify permissible overtravel. R7 raw arithmetic was 0.65-0.10=0.55 mm, leaving only 0.05 at maximum pretravel before tolerances. R8 retains 0.65 raw travel but controls rest, guide tilt and individual stop setting.

Control	R8 finished requirement
Rest datum A	Front flange capture underside Z10.15; key flange upper face Z10.15. Return cushions seat the flange against A. Key actuator tip Z8.15; actual switch set to Z8.09 nominal, leaving 0.060 +/-0.010 positive rest gap.
Guides	Two 3.000-3.002 stems, X+/-12/Y-50, bottom Z2.15; cassette bores 3.010-3.012. Left round; right X-relieved slot avoids center-spacing bind. Guide Y-axis alignment/coplanarity within 0.005 in one fixture; verify smooth slide after assembly.
Worst-case tilt	Diametral gap 0.008-0.012 / minimum engagement 6.85 gives about 0.10 degrees. Using the largest stop-to-actuator lever (12.17 mm), relative Z error <=0.0213. Cap-edge height spread across 30.8 is about 0.054. This is a geometric bound, not force or friction validation.
Travel stack	Raw stop 0.650 +/-0.010; freeplay 0.050-0.070; relative stop-to-actuator tilt contribution+/-0.0213. Available drive 0.5487-0.6313 before switch variation. At the calibrated 0.040 +/-0.010 contact-to-stop setting, worst tilt leaves 0.0087 mm minimum contact margin; maximum 0.0713 mm after contact must be qualified for load/travel. Minimum raw geometric margin over 0.50 pretravel is 0.0487; arbitrary full raw travel is not permitted on a short-pretravel switch.
Carrier setting	Support switch body on measured PET shim 0.05-0.85 total; nominal 0.44. Nominal source switch is translated+0.04 Z without scaling. Set freeplay after finishing, then secure body sides with removable nonconductive retention for fit article. Final clamp/lead detail remains a release item.
Stops / calibration	Three hard stops supported by cassette, bolted to shell with two M2 x 5 screws. Select matched 0-0.40 stop shims. CAD shows 0.25, nominal stroke 0.40 for a 0.30-pretravel switch. Provisional contact-to-stop target 0.040 +/-0.010 requires component/force qualification; it is not a manufacturer-approved overtravel.
Return	Two diameter 3 foam cushions, free 2.0, installed 1.8, act on flange independently of switch. Combined trial force 0.04-0.20N at rest, <=0.60N at stop; verify positive return margin over guide friction. Material force curve, creep and feel remain unqualified.

Reject any unit without positive rest gap, switch closure before every supported stop, repeatable return at center/eight rim positions, or a qualified contact-to-stop force/displacement trace. Do not fix a failed stack by preloading the switch.

Charging: U1 proposal

Centered visible opening; original electrical socket



Recovered instruction: align charging port with volume buttons. Earlier task measured 4.84 mm setback in thickness direction and left socket relocation vs. control movement unresolved. U1 retains later control placement and all purchased electronics. Its visible 17.5(Y) x 17(Z) mouth is centered Z0; the inner 14.5 x 9 passage remains centeredZ-4.8396. The stepped well starts X39. This changes opening alignment, not the actual mating axis.

Evidence / interface	U1 instruction and limitation
Connector geometry	PCB metal shell index 215: X22.4773..29.8273. Exterior X44 gives 14.1727 nominal inset. Shell extremity is not a certified mating datum.
Mating depth	Illustrative neck 8.4 x 2.6, X23.7..30.2;6.5 long. Overmold 12 x 6, X30.2..48.2. These are parameterized trial envelopes, not a purchased cable. Full depth is shown for review but cannot establish seating.
Overmold / access	Six axial extraction positions checked against four U1 shell/skin parts with no overlap over 0.005 mm^3 for that assumed overmold. Opening provides 0.5 mm or more nominal transverse margin at inner tunnel. Test actual plug both orientations and cable grip/removal.
Retention / integration	Existing connector solder joints and PCB ledges are retained. Their cable-load capacity is not qualified; no new wiring is introduced. Record original PCB retention and socket-side loads during cable test. If inadequate, electrical owner must supply allowable shell/PCB restraint zones before adding a clamp.
Exact missing inputs	Cable SKU with toleranced mating/overmold CAD; receptacle part number/mating datum; PCB BOM/schematic and required USB modes/current; allowable plug forces and connector support; real dressed harness. U1 is kept outside main fabrication until these establish seating and retention.

Compact internal details

Tray, microphone and optics

Item	Revision / inspection
Tray	Floor grows rearward 0.25:0.65 to 0.90. Upper surfaceZ-0.98, bottomZ-1.88. Cell baseZ-0.78 and 0.20 seating pad unchanged. Outer arms unchanged. Check flatness and cell-edge protection; no sanding against pouch.
PCB gap	Exact current CAD: complete tray to PCB 0.749 mm; central region 0.919 mm. These distances do not include undocumented wires, finishing or physical distortion.
Microphone	Acoustic center(0,-23), aperture 1.8; manufacturer board bore 1.025. PCB7.95..8.75; package minimum 6.97; nominal cell body top 6.22 leaves 0.75. Formula for finished gap:0.75 minus actual cell-height, module-height, mount and solder excursions. Cell maximum/aging data is missing; gap is not qualified swelling space.
Solder / leads	Six manufacturer pads transform toY-17.718, X+/-6.35,+/-3.81,+/-1.27. New 18.5 x 1.8 channel Z7.45..8.00 through cradle. Allocated solder/lead height 0.50 below PCB. No pin headers. Route laterally and strain relieve away from cell/port; actual wire gauge and solder profile must fit the coupon.
PMMA construction	Split original thin L-shaped guide into 0.60 sheet transport and turned 3.10 output post. Output post Z9.65..11.55. Bond joint must be lapped into height; max 0.02 cement is not added to device depth. CNC sheet on sacrificial backing; edge-polish, avoid solvent crazing.
Attachment / light control	Trial two small edge retention bonds at(-26,10) and(-10,-16), each <=1 mm along path, with temporary locating fixture. Keep transport broad faces air separated. Test opaque nonconductive shielding on adjacent PA12, with 0.10 minimum separation from optic; do not paint guide to conceal leakage.
Output / tests	Diffuse output face only; polish LED coupling and transport faces. The L bend and long thin route remain unproven optically. Test RGB separately, off-axis brightness, hotspot, ambient visibility and leakage through cream skin. Do not commit tooling before sample acceptance.

Coordinated material master

Samples control appearance and touch

Material / finish	Sample requirement
PA12	Requested EOS PA2200, supplier confirmation required. SLS rigid fit set; depowder and finish only controlled lands/guides. Maintain wall and pocket geometry. No general paint over functional interfaces.
Silicone benchmark	WACKER ELASTOSIL LR3003/40 A/B is a heat-cured LSR benchmark, target 40 +/-5 Shore A. Quote LSR molding separately from RTV prototype casting. Never cure over assembled electronics.
RTV substitute	Supplier must name addition-cure formulation, pigment, cure, shrinkage and primer/bond recipe. A coupon may qualify a prototype substitution; it does not establish equivalence to LSR or approve polyurethane/hard resin.
Color palette	Cream body/play #EBE3D3; orange PTT #B76642; sage volume #87927B; oat textile #C8BBA2. Screen values are intent only. Match adjacent samples under agreed daylight and indoor light, with dry/damp handling.
Silicone finish	Fine matte texture, dry grip, no tack, pinholes, flash or visible glue print-through. Put mold seam/gates on hidden bond face; no gate at cloth reveal, button contact face or front broad face. Record master surface and cure orientation.
Textile / W	Approve actual SKU, warp/weft scale, installed tension, edge treatment, W ink/yarn, acoustic permeability and backing visibility together. No solid panel, continuous film, embroidered stiff badge or paint flooding weave.
Rear ink / primer	Carbon #171716; actual outlined 42 mm wordmark and 32 mm inscription. Approve silicone-compatible ink and primer on cured pigmented skin. Registration +/-0.5; size +/-0.2. Check flex, rub and cleaning.
Signoff record	Assign real sample IDs for cream, orange, sage, cloth/W, rear ink/primer, skin bond and optic. Supplier retains matching set; owner approves one assembled master. All IDs are currently pending, not implied approvals.

Assembly and service

Use the sequence before committing finish

01 Inspect and depowder PA12. Finish capture datum A, boss faces, adhesive reservoirs and guides. Tap M2 cassette bosses and original M2.5 closure pilots; gauge thread depth before using screws.

02 With PCB, battery and optical hardware absent, insert the play key from rear. Match-fit cassette over its stems, rear-to-front; install two M2 x 5 screws through 0.8 ears. Keep two driver columns diameter 3.8 at X+/-21/Y-50 clear. Do not force a bind.

03 Install selected switch support shim and actual switch; route/solder leads with access from rear. Set 0.060 +/-0.010 rest gap with flange seated against A. Record indicator readings. Secure switch for fit trial with removable body-side retention, never adhesive on actuator or terminals.

04 Fit return cushions and measure seating/return without switch preload. Measure first contact. Select matched stop shims within 0-0.40; provisional calibrated stop is contact+0.040 +/-0.010 only after allowed force/travel is confirmed. Repeat center/eight edge presses.

05 Fit original side plungers, cradles and switches; preserve 0.20 nominal freeplay and 0.65 raw source stroke. These unchanged mechanisms also need physical actuation/return and stop qualification; R8 is not a certification of their feel.

06 Bond grille backing, speaker cradle and real foam seal after dry fit. Use perimeter-only textile bond; keep speaker field open. Install PMMA sheet/post and qualify light with final cream skin sample.

07 Fit microphone gasket and breakout with bare face forward. Inspect actual low-profile lateral solder/lead envelope in new channel. Install populated PCB on its bare-edge lands, then tray, pad and PET straps; no cell preload. Record retention method and real harness routes.

08 Trial actual cable and rear antenna routing before skin finishing. Check connector/PCB movement during insertion/removal. Close with four rear screws, verifying engagement and no bottoming. Install front/rear skins separately with masked reservoirs.

09 Service trial: disconnect power; remove rear screws/cover without tearing skin; disconnect and remove cell and PCB before servicing cassette. Remove stop shims/cushions as needed. Reverse the tested path; inspect guides, threads and bonds after reassembly. Final dressed harness access requires physical demonstration.

Physical verification traveler

All results below are required; none are reported as performed

Test / owner	Proposed method and acceptance record
Skin bond / supplier	Coupon in actual chemistry: inspect cross-section thickness and edge registration, then comparative peel, flex, warm storage and cleaning. Record preparation/cure, peel mode/force and photos. Agree numeric peel/environment targets from selected adhesive requirements before full skins.
Cloth / design + acoustic	Photograph installed swatch front/oblique under daylight and indoor light; no wrinkles, ragged edge, distorted W or visible glue. Compare speaker with/without final cloth/backing, same drive/distance; owner sets acoustic acceptance before choosing SKU.
Play / ME + electrical	Record force-displacement and electrical closure for center and 8 rim locations. Measure rest, contact and stop, freeplay, tilt and return in six device orientations. Reject sticking, preload or missed closure. Screening 1000 cycles, inspect/recalibrate; endurance target still to be selected.
Optics / electrical + design	RGB individually at intended current, darkness and ambient light. Measure front brightness/angle consistency and skin leakage; approve master. Check bond whitening, crazing and drift after handling.
Cable / electrical + ME	Actual approved cable both orientations: show full seating against specified datum, continuity/data/charging, insertion and withdrawal forces, overmold clearance and strain relief. No PCB flex, solder loading beyond connector limits or case rubbing. U1 may require revision.
Battery / electrical	Use actual cell maximum dimensions, protection and lead exits. Obtain allowable aged/expanded envelope and retention loads; verify charging/thermal behavior in final insulating enclosure. Do not use 0.75 nominal mic gap as swelling qualification.
Service / supplier	Three complete open/remove/refit cycles for cover, cell, PCB and cassette. No torn skin, blocked screw, trapped lead or damaged thread. Log hand fitting and transfer accepted changes back to CAD.
Finish / design	Approve actual silicone, fabric, ink and primer plaques together. Record material/SKU, master sample IDs, lighting, tactile observations and supplier/owner signatures. Blank IDs mean not approved.

Digital verification

Geometry evidence is separate from physical performance

Check	Result / scope
Integrity	36 per-part models: 36 valid BReps; 36 watertight meshes. Artwork, cut films and cushions can contain disconnected solids; counts are not fabrication quantities.
Static intersections	0 pairs above 0.005 mm^3. See intersections.json; intended compliant interfaces are identified separately if present.
Hardware screen	0 conservative source-hardware overlaps above 0.02 mm^3. Full PCB STEP; rigid mesh-piece convex hulls for remaining references. LED degenerate fragments excluded, original retained.
Play movement	0 reported overlaps in raw-envelope axial/contact-limited tilt samples.0.10 degrees,8 azimuths,14 displacement positions. Calibrated shims and compressible return pads are excluded from raw 0.65 travel sweep intentionally; verify 0.40 nominal stops separately.
Battery swept gap	Minimum conservative battery-envelope distance in those samples: 1.380 mm. Rigid geometry only; no swelling, force, compliance or harness model.
Assembly access	Rear-to-front key and cassette paths sampled every 0.5 mm, electronics removed in stated sequence. Driver columns screened. Results in R8_validation.json; real wiring and flexible skin removal still require physical trial.
Finished budget	Body nominal 88 x 136 x 24.5. Core depth 22.90 +/-0.10 plus two skins 0.80 +/-0.05 =24.50 +/-0.20. Bond recesses consume existing core volume. Side-control/ink-inclusive envelope is 88.40 x 136.00 x 24.52 (including 0.02 rear ink reference). Actual completed dimensions must be measured.
Source preservation	All R7 package files hashed against baseline_R7 snapshot. Other concepts, shared website and Git branch untouched by this revision. R8 is a new package; no R7 validation is relabeled as a new test.

Evidence includes build log, independent reopened STEP checks, mesh integrity, static/hardware results, motion/path sampling and source hashes. No native Fusion reopen is claimed for R8: the deliverable is editable CadQuery source plus neutral STEP; the preserved R7 F3D remains historical only.

Changes and file guide

Use the R8 files for this revision

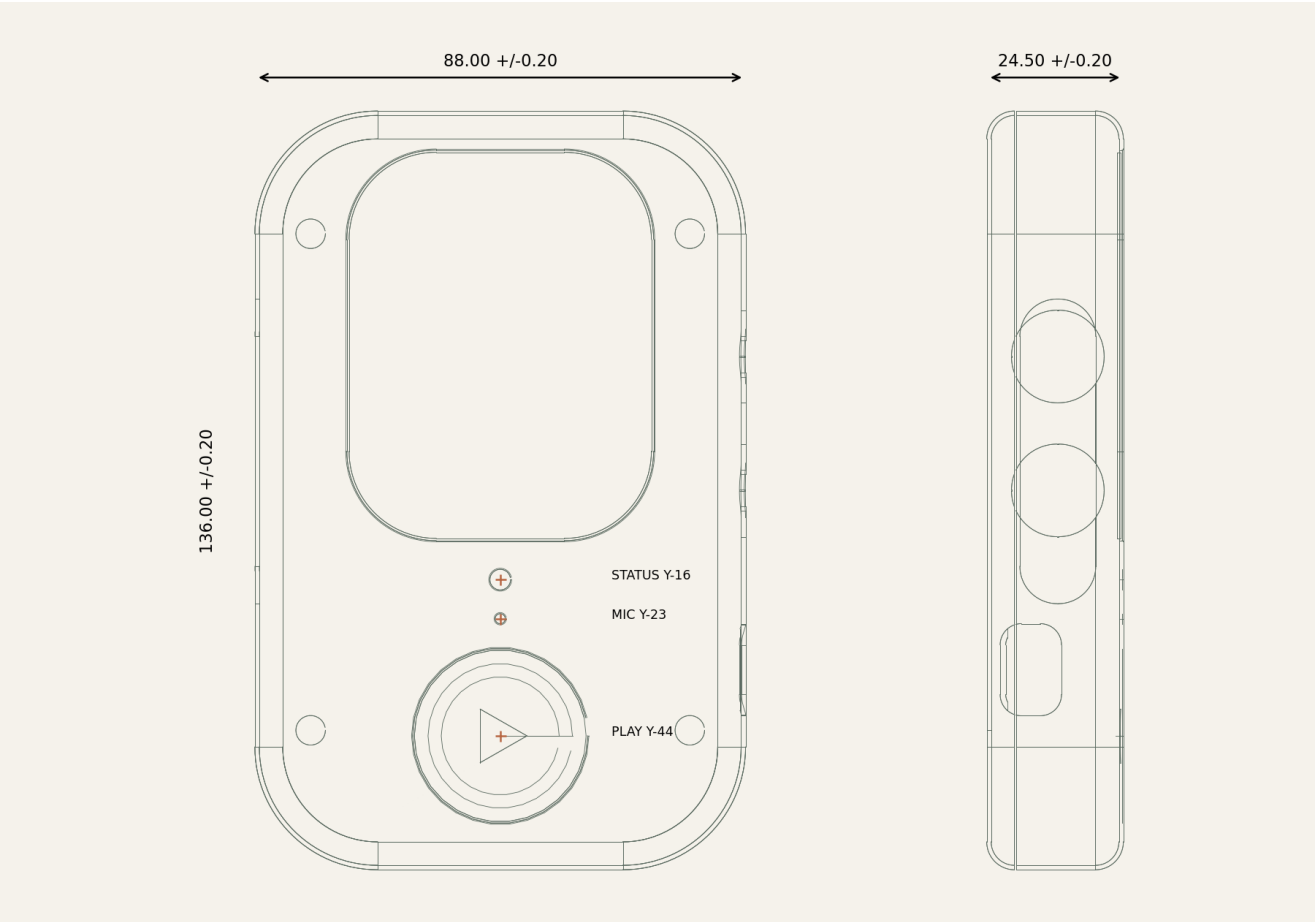
Before	After
Sharp aperture entrances / unspecified skin bond	R0.20 blends; modeled 0.10 reservoirs with dry registration lands and explicit local wall budget.
0.65 tray floor	0.90 floor, thickened toward PCB while keeping cell position/body size.
Broad key, unbounded shim instruction	Controlled capture datum; round/slot guides; bolted cassette; support/stop shim ranges and return cushions. Actual switch force/overtravel still a qualification gate.
Unmodeled microphone leads	Manufacturer pad-row relief and 0.50 allocated keepout. Actual solder/lead sample still required.
Single thin PMMA solid	Sheet transport plus turned post, controlled joint height, retention/masking and optical trial requirements.
Unresolved charging alignment	Recovered thickness centerline target; separate U1 centered-mouth/offset-inner-passage CAD with conditional cable envelopes. Main PCB/socket unchanged.

File / folder	Use
step/	R8 CASE_ONLY and APPEARANCE assemblies; parts/ contains every named component. Import millimeters.
code/	Rebuildable CadQuery modifications and validation/render/document scripts. baseline_R7/ contains original generation source and neutral inputs.
manufacturing/	Process-specific release routing. Only SLS_PA12 is the rigid print set. Silicone STL is master/reference geometry, not end-use print resin. Textile/foam/adhesive follow cut/dispense instructions.
docs/	This PDF, independent dimensional drawing extract, BOM.csv, change log, manifest and validation records.
previews/ / coupons/	Matching-camera comparison renders, sections, actual-edge coupon and guided play coupon CAD.
proposals/	U1 USB and A1 sculpted surround are explicitly outside main R8 release. Original component and artwork records remain preserved.

Primary current component source: Omron B3F datasheet, operating characteristics, checked 6 September 2026. Historical manufacturer microphone CAD and material references are preserved in baseline_R7/references and the R7 handoff. No new supplier capability is assumed.

D01 | Overall and datums

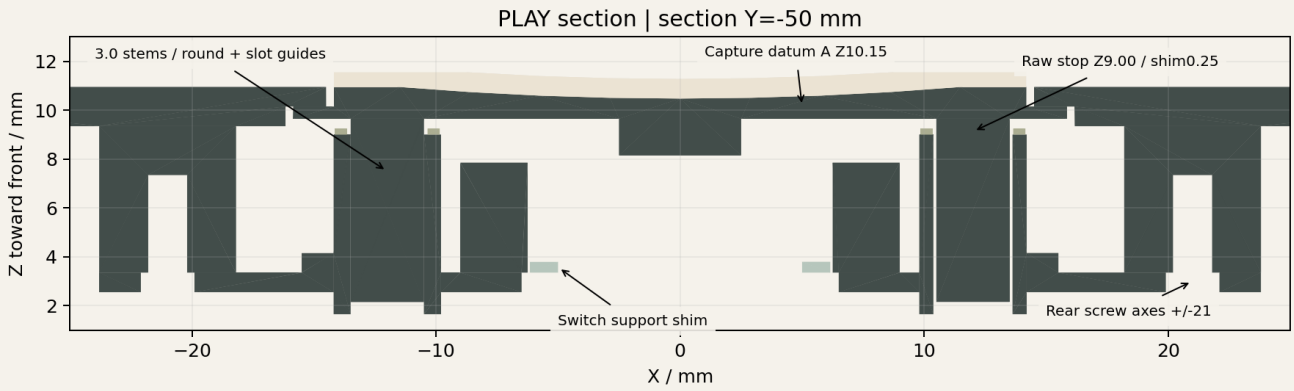
R8 finished-interface drawing | mm | do not scale printed images



Dimension / datum	Finished requirement
Body and axes	88.00 +/-0.20 W;136.00 +/-0.20 H;24.50 +/-0.20 D. X0/Y0 body center. Exterior rearZ-12.75, front Z11.75. Edge R5 / plan R22 retained.
Play / front marks	Face 30.80 +/-0.05 at X0/Y-44. Mic 1.80 +/-0.05 at X0/Y-23; status opening 3.70 at X0/Y-16. W26.6 x 23.24 at(0,26).
Closure	FacesZ-7.50/-7.80: gap 0.30 +/-0.10 after finish. ScrewsX+/-34,Y-43/+46. Preserve 2.8 clearance and 5.3 counterbore. No bond across joint.
Control clearances	Side cap/opening nominal 0.30 per side, inspect minimum 0.15 after finish and position error. Play face/opening nominal 0.30 per side; with +/-0.05 diameters and 0.05 eccentricity minimum 0.20 per side.

D02 | Play cassette

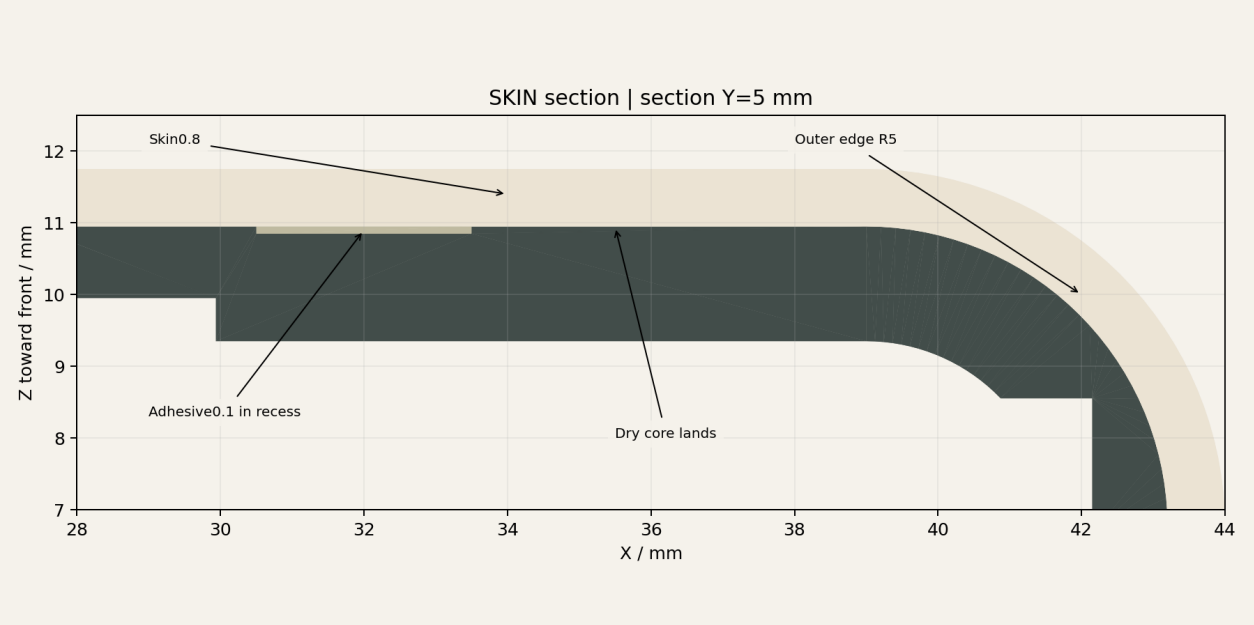
R8 finished-interface drawing | controlled datums and shim setting



Dimension / callout	Finished requirement
A / B / C	A: flange capture underside Z10.15. B: guide axesX+/-12/Y-50. C: cassette stop tops Z9.00. Flange underside Z9.65; raw stroke 0.65 +/-0.01.
Guidance	Stemdiameter 3.000-3.002; borediameter 3.010-3.012; minimum overlap 6.85 at rest. Left round, right slotX +/-0.12. Inspect common guide alignment/coplanarity 0.005; match-machine and measure, not raw SLS.
Switch / shim	Tip key Z8.15; switch tip nominal 8.09. Gap 0.060 +/-0.010. Support shim 0.05-0.85 total, CAD0.44. Stop shims 0-0.40 total, CAD0.25 ->0.40 nominal stroke. Clear locator feet and terminal tails using the supplied shim cutouts. Include PSA and coating in finished measurement.
Mount and return	Two M2 x 5 screw axesX+/-21/Y-50, clearance 2.2 through 0.8 ears. Blind tapped pilot 1.6, depth 4.2. CushionsX+/-15/Y-45, diameter 3, free 2.0/installed 1.8. Verify force and thread engagement before use.

D03 | Skin, cloth and port

R8 finished-interface drawing | U1 remains separate



Interface	Section / acceptance
Broad-face structure	Front main core Z9.35..10.95, skin 10.95..11.75. Reservoir bottom 10.85; finished 0.10 adhesive to dry lands 10.95. At pocket:1.50 residual PA12,0.10 adhesive,0.80 silicone =2.40 total.
Textile section	Backing top 10.65; perimeter reservoir 10.55..10.65,2 mm wide. Cloth 10.65..11.25,0.60 +/-0.05 installed. Do not add another adhesive layer on top. Opening 55 x 70; textile 54.2 x 69.2, nominal 0.40 per side.
Cloth tolerance	Finished opening+/-0.10; cloth cut+/-0.10; registration+/-0.10 -> minimum 0.20 gap on tighter side before cloth distortion. Inspect installed condition and corner smoothness.
U1 mouth / passage	Y center-32.1393. Mouth 17.5Y x 17Z, center Z0, starts X39. Passage 14.5Y x 9Z, centerZ-4.8396, starts X29.5. These are U1 proposal dimensions; main R8 port remains R7.
Mic / optical	Mic sealOD6.2/ID1.8,0.60 installed/0.80 free. PMMA sheet 0.60 +/-0.05; post 3.10,9.65..11.55. Qualified cement <=0.02 included in lapped assembled height.

D04 | Inspection and release

R8 finished-interface drawing | measurements to record per article

Record	Method / limit
Body W / H / D	Calipers or CMM on defined broad-face lands;88/136/24.5 with requested+/-0.20. Exclude separate button projection and 0.02 ink reference.
A / C / key flange	CMM or height fixture, finished and cleaned. Measured raw travel 0.650 +/-0.010. Do not infer from raw print dimensional tolerance.
Rest/contact/stop	Indicator resolution 0.005 or finer plus continuity logger. Positive rest 0.050-0.070. Record first contact and all 3 stop readings; approve contact-to-stop load before repetitive operation.
Guide / tilt / return	Pin gauges/micrometer, matched fixture, rim indicator. Confirm diameters and alignment; no rocking beyond 0.10-degree design bound, no rubbing, positive return in 6 orientations.
Wall / bond / textile	Coupon cross section or suitable nondestructive measurement. Main PA121.60, localpocket 1.50, skin 0.80; pocket adhesive 0.10 +/-0.03. Cloth installed 0.60 +/-0.05. Inspect adhesive keepouts and actual weave.
Thin tray / mic	Floor 0.90, underside-1.88, top-0.98. Confirm measured PCB gap with installed populated board. Mic lead height within 0.50 allocation; electrical owner records actual cell maximum/aging allowance.
Cure and service	Record material lots, cure/primer process, bond sample IDs, torque determined on PA12 pilot coupon, plug seating and repeated service result. No default torque without thread test.
Disposition	Blank results, missing component travel approval, unqualified cable seating, failed return or missing material master prevent release to finished functional article. Fit coupons may proceed to resolve these items.

Drawing tolerances are requested finished targets, not a claim of supplier capability. Supplier must identify process changes needed to achieve them before manufacture. If an adjustment cannot meet the stated range, record a nonconformance and revise CAD; do not grind through the wall or preload the switch.