

Waterproof Design Checklist

Design review points for sealed membrane switches, graphic overlays and outdoor HMI panels.

Use this before requesting IP-rated, washdown, outdoor or cleaning-resistant interface parts.



Waterproof design must be validated as part of the final housing assembly

Engineering source notes

- IEC 60529/IP ratings are enclosure-level protection concepts; the final switch plus housing assembly must be reviewed together.
- Waterproof membrane switch failure paths often include edges, windows, tail exits, connector areas, housing gaps and adhesive land width.
- Peer waterproof designs frequently use perimeter/frame sealing, suitable circuit construction and high-performance adhesives; sample validation must match the real enclosure.

Sealing target

Application/device	Target IP rating
Water exposure type	Cleaning method
Housing material	Test method or customer standard

Interface sealing details

- [] Target condition is defined: splash, wipe-down, washdown, rain, immersion or customer-specific test.
- [] Overlay and back adhesive create a continuous sealing land around openings.
- [] Tail exit direction, bend area and cable routing do not create a water path.
- [] Connector location, mating connector and cable strain relief are reviewed.
- [] Housing surface flatness, texture and cleanliness support adhesive bonding.
- [] Screw holes, display windows, LEDs and cut-outs have separate sealing details.

Material and construction

- [] Overlay film and ink can tolerate water, cleaning chemical and UV exposure if applicable.
- [] Adhesive is matched to housing material, temperature range, humidity and cleaning method.
- [] Spacer/circuit design avoids water paths into active switch areas.
- [] Frame seal, gasket, tail reinforcement or protected circuit option is considered for higher exposure.
- [] Edge distance from circuit trace to outer profile is sufficient.
- [] Samples are tested after bonding to the real housing, not only as loose switch parts.

Information to send to JASPER

- Target IP rating and the exact test method or customer standard.
- Housing drawing, surface material and mounting pressure.
- Photos of mounting area, cable path and connector location.
- Cleaning chemicals, temperature range and outdoor/UV exposure details.
- Required sample test quantity and acceptance criteria.
- Historical failure photos from the current design if available.

Avoid these common failure points

- [] Open tail slots without strain relief or sealing plan.
- [] Adhesive frame too narrow around windows, screws or cut-outs.
- [] Rough, oily or powder-coated housing surface without adhesive test.
- [] Assuming a loose switch part is waterproof before final assembly testing.
- [] Changing connector, tail route or housing after sample approval without retesting.

Waterproof review result

Approved sealing method

Tests required before production

Material risk

Housing risk

Connector/tail risk

Action owner

Technical references reviewed

- IEC IP ratings / IEC 60529: <https://iec.ch/ip-ratings>
- 3M 467MP / 468MP adhesive technical data sheets:
<https://multimedia.3m.com/mws/media/2366204O/3m-adhesive-transfer-tape-467mp.pdf>
- JASPER factory engineering review practice and public product/resource pages: <https://www.jasperеле.com/>

Send drawings and requirements to JASPER

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