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Relay Moisture Sensitivity Classification

Our Surface Mount (SMD) ranges are rated **MSL 1** in accordance with **JEDEC J-STD-020**.

Components classified as MSL 1 are considered **not moisture-sensitive** under standard factory environmental conditions.

Packaging and Storage Requirements

- **Packaging:** MSL 1 components do **not** require sealing in a Moisture Barrier Bag (MBB), nor the inclusion of desiccant or a Humidity Indicator Card (HIC). Ensure reels, trays, and boxes remain intact and free from physical damage. Broken packaging can expose components to uncontrolled humidity
- **Unlimited floor life:** Components may remain outside their original packaging indefinitely when stored at $\leq 30^{\circ}\text{C}$ / **85 % RH**. No exposure tracking is required.
- **Pre-baking:** Pre-baking prior to reflow or vapour phase is **not necessary**, regardless of exposure duration, as MSL 1 devices are not susceptible to moisture-induced damage (“popcorning”) under standard conditions.

Operational Implications

- Standard cleanliness controls remain applicable.
- No special moisture-handling precautions are required during assembly, storage, or WIP
- **Prevent condensation events.** Do not move components from cold storage to warm environments without allowing them to acclimatize. Condensation can introduce surface moisture that affects insulation resistance / leakage currents and accelerates absorption.
- **Protect packaging integrity.** Ensure it remains intact and free from physical damage. Broken packaging can result in component damage which in turn may compromise the package seal.
- **Washing:** Refer to our washing guidelines QMS235

MSL Applicability to Through-Hole Relays

Moisture Sensitivity Level ratings are defined for **Surface Mount Devices** that undergo **reflow or vapour phase soldering**, where rapid heating can cause moisture-induced package damage. These ratings generally **do not apply** to traditional **Through-Hole Technology (THT)** components.

Why MSL Does Not Apply to THT

- **Different soldering process:** THT components are soldered using **wave soldering** or **manual soldering**, both of which may expose components to **lower thermal stress** compared to reflow profiles defined in **J-STD-020**.
- **Package construction:** THT components generally have **larger, more robust plastic encapsulation** and are less susceptible to moisture-induced internal stress or “popcorning.”



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- **No moisture-control requirements:** THT components do not typically experience the same high-temperature reflow conditions, they are **not classified under MSL** and are **typically considered moisture-insensitive**.

Operational Implications

- No MBB (Moisture Barrier Bag), desiccant, or HIC required.
- No floor-life tracking or exposure control needed.
- Standard storage and handling practices are sufficient.
- **Prevent condensation events.** Do not move components from cold storage to warm environments without allowing them to acclimatize. Condensation can introduce surface moisture that accelerates absorption.
- **Minimise pre-assembly dwell time** Keep components in controlled areas prior to soldering. Long dwell times in uncontrolled zones (e.g., staging areas near wash stations) can increase moisture exposure
- **Protect packaging integrity.** Ensure it remains intact and free from physical damage. Broken packaging can result in component damage which in turn may compromise the package seal.
- **Prevent contamination.** Ensure components are kept free from flux residues, cleaning agents, or other contaminants that can retain moisture on the package surface.
- **Washing:** Refer to our washing guidelines QMS235

Footnote:

Although our THT relays are **generally considered moisture-insensitive** and are **not classified under MSL**, some applications may still present moisture-related risks. Some applications may for example expose components to elevated humidity, (exceeding 55%RH typ.), extended storage, or unusually high soldering temperatures.

The insulation resistance for most variants of our THT relay range (whilst applying 1 kV across switch to coil) is 1E12 ohms typically (or 1 nano amp leakage current). Some variants are only rated to 1E9 ohms typically (or 1 micro amp leakage current) @ 1 kV.

For specific relays and applications that require very low leakage currents, contact techsales@pickeringrelay.com