

EVERGREEN RESOURCES, INC.

A Guide to UN Certification for Packaging

What UN certification means, how to read a UN marking, and how Evergreen supports customers through the testing and certification process.

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A Guide to UN Certification for Packaging

Evergreen Resources, Inc.

This guide provides a practical overview of UN-rated packaging for chemical cans. It explains what UN certification means, how to read a UN marking, why testing is tied to the complete package configuration, and how Evergreen supports customers through product review, sample preparation, lab testing coordination, and certification review. The goal is to help customers understand when an existing certification may apply and when additional testing may be needed.



What Is UN-Rated Packaging?

UN certification under 49 CFR Part 178 (and the corresponding UN Model Regulations basis) is issued at the packaging-system level, not for a container in isolation. The rated combination includes the container, the closure system, and the product being packaged.

**The specific
packaging container
used**

**The specific product
and formula being
packaged**

**The specific
closure system
selected**

Change any one of those three, and technically the UN mark no longer applies without re-testing or a documented equivalency/waiver from the testing facility. That's why a UN rating earned for Customer

A's formula in Can X with Closure Y can't be assumed to carry over to Customer B using the same can and closure but a different formula — even a “similar” one.

When evaluating whether a chemical can package is suitable for UN certification, several factors must be considered:

Factor	Why It Matters
Product Hazard Classification	Determines whether the product is regulated as dangerous goods and what transportation requirements apply.
Packing Group Level	Indicates the degree of danger. Packing Group I, II, or III affects the required performance level of the package.
Specific Gravity or Filled Weight	Heavier products increase impact force during drop testing and may affect package performance.
Internal Pressure or Hydrostatic Pressure Requirement	Liquid products may create internal pressure during transportation, especially under temperature changes.
Can Construction and Material	Can thickness, material, coating, seams, and opening design all influence package strength and containment performance.
Closure Type and Closing Method	Caps, plugs, nozzles, gaskets, torque, crimping, or sealing method can directly affect leakage resistance.
Liner, Gasket, and Product Compatibility	Product chemistry may interact with coating, liner, gasket, or closure materials and affect long-term sealing performance.
Intended Transport Conditions	Handling, stacking, vibration, temperature, and transport mode may influence package performance requirements.

A UN mark on a package means that a specific package design has been tested under defined conditions. It does not mean that the same empty chemical can is automatically approved for every product, closure, filling condition, or transportation scenario.

For this reason, Evergreen conducts UN certification on a per-customer, per-project basis — testing the specific can, formula, and closure system together as a single qualified combination, rather than certifying the container alone.

How to Read a UN Marking

A typical UN marking for a liquid chemical package may look like this:

UN 1A2 / Y1.4 / 150 / 24 / USA / M1234

Each section provides specific information about the tested package design.

Marking Section	Meaning	Example Explanation
UN	United Nations packaging symbol	Indicates that the package has been tested as UN performance packaging. The UN symbol may appear as the UN letters or the approved UN symbol format.
1A2	Packaging identification code	Identifies the package type, material, and subcategory/head style. In 1A2, 1 = drum/pail, A = steel, and 2 = removable head/open-head style. Common type codes include 1 = drum/pail, 2 = wooden barrel, 3 = jerrican, 4 = box, 5 = bag, 6 = composite packaging, and 7 = pressure receptacle. Common material codes include A = steel, B = aluminum, G = fiberboard, H = plastic, and N = other metal. For drums/pails and jerricans, the final number typically means 1 = non-removable head / tight-head / closed-head and 2 = removable head / open-head.
Y	Packing group performance level	Shows the hazard level the package was tested to. X = suitable for Packing Group I, II, and III; Y = suitable for Packing Group II and III; Z = suitable for Packing Group III only. In this example, Y means the package was tested to Packing Group II performance level.
1.4	Maximum specific gravity for liquids, or maximum gross mass for solids	For liquid packaging, this indicates the maximum specific gravity allowed under the tested package design. In this example, the package was tested for liquid products up to SG 1.4 . For solid packaging or combination packaging, this section may show the maximum gross mass in kilograms instead.
150	Hydrostatic test pressure or "S" marking	For liquid packaging, this indicates the internal pressure level that the package was tested to, expressed in kPa . In this example, 150 means the package was tested to 150 kPa . For solid hazardous materials or combination packaging, this section is typically marked with "S" instead of a pressure value.
24	Year of manufacture	Indicates the year the package was manufactured. In this example, 24 means the package was manufactured in 2024 .
USA	Country of manufacture or certification	Indicates the country shown on the UN mark. In this example, USA identifies the country associated with the marking.

Marking Section	Meaning	Example Explanation
M1234	Manufacturer or certification code	Identifies the manufacturer, approval agency, or party certifying that the package meets the required testing.

The packaging identification code describes the package type and material. For example, 1A2 refers to a steel drum or pail with a removable head. The marking also shows the tested performance level, maximum specific gravity or gross mass, hydrostatic pressure for liquids, year of manufacture, country, and manufacturer or certification code.

Packing Group Level

UN markings commonly use **X**, **Y**, or **Z** to show the tested Packing Group performance level:

Marking Letter	Performance Level	Suitable Packing Groups
X	Highest performance level	Packing Group I, II, and III
Y	Medium performance level	Packing Group II and III
Z	Lowest performance level	Packing Group III only

Packing Group levels are generally understood as **Packing Group I = high danger**, **Packing Group II = medium danger**, and **Packing Group III = low danger**. For example, in the marking **UN 1A2 / Y1.4 / 150 / 24 / USA / M1234**, the letter **Y** means the package was tested to a Packing Group II performance level. In general, this means the package may be used for Packing Group II and Packing Group III materials, provided the product and package configuration remain within the tested conditions.

To make this easier to understand, the table below shows common product-type examples that may fall under each Packing Group. The actual Packing Group must always be confirmed based on the product SDS, UN number, formulation, concentration, and dangerous goods classification.

Packing Group	General Hazard Level	Product-Type Examples
Packing Group I	High danger	Highly toxic pesticide formulations, highly dangerous industrial solvents, strong corrosive chemicals that can cause rapid damage, or highly reactive specialty chemicals.
Packing Group II	Medium danger	Common flammable solvent products such as acetone-based products, lacquer thinner, certain paint thinners, solvent-based adhesives, alcohol-based products, or gasoline-type products.

Packing Group	General Hazard Level	Product-Type Examples
Packing Group III	Low danger	Lower-hazard combustible liquids such as some oil-based paints, wood stains, mineral spirits, kerosene, diesel-type products, or certain cleaning/maintenance chemicals.

These examples are only for general understanding. A product name alone does not determine the Packing Group. The same general product category — such as paint thinner, adhesive, cleaner, or coating — may fall into a different Packing Group depending on its formula, flash point, toxicity, corrosivity, concentration, and other hazard properties.

Why Testing Is Project-Specific

A common question is: **"If the can already passed UN testing, why can't we use the existing certification?"**

The reason is that UN testing is based on a defined package design and a defined set of conditions. Changing the product, closure, or content may change the performance of the package.

Key factors include:

- **Product weight / specific gravity:** A heavier product increases drop impact force and can affect pressure performance.
- **Product chemistry:** The formulation may interact differently with the can coating, liner, gasket, cap, or closure system.
- **Packing Group classification:** Packing Group I, II, or III determines the required performance level. Higher hazard products require more severe test conditions.
- **Closure selection:** Different caps, plugs, nozzles, gaskets, or torque conditions can affect sealing and leakage performance.
- **Fill volume and headspace:** Overfilling, insufficient headspace, or product expansion during transport can affect internal pressure.
- **Transportation conditions:** Air, ocean, truck, and warehouse handling conditions may create different packaging risks.

Because of these variables, UN testing should be reviewed by project. However, this does not always mean testing must be repeated for every order.

When a package has already been certified for a heavier product, higher specific gravity, higher pressure, or higher Packing Group level, it may cover lighter or lower-risk products under the same package design and closure conditions. Evergreen can help review the existing certification and determine whether additional sample testing is needed.

Evergreen UN Certification Process

For customers requiring UN-rated packaging, Evergreen supports a standard sample testing process to confirm whether the selected package is suitable for the customer's product and transportation requirements. The overall process takes approximately 3–4 months.

Step 1: Product and Packaging Review (1–2 weeks)

Evergreen reviews the customer's product and packaging requirements, including:

- Product name and application
- SDS or product hazard information
- UN number and proper shipping name, if available
- Hazard class and packing group
- Specific gravity or product density
- Fill volume or net weight
- Required can size and opening
- Selected closure, cap, plug, nozzle, gasket, or liner
- Intended transportation mode and destination market

Step 2: Sample Preparation (3–5 weeks)

Evergreen provides can samples according to the requested specification. The final sample quantity depends on the package type and lab testing requirements. The samples should represent the actual package configuration as closely as possible, including:

- Production-equivalent can
- Selected closure system
- Correct gasket or liner
- Intended fill level
- Required closing method or torque condition

Step 3: Customer Product Filling (1–2 weeks)

The customer fills the samples with the actual product or an approved test substitute, depending on lab and regulatory requirements. This step is critical because product weight, chemistry, and headspace can affect test results. For many projects, the customer is responsible for confirming product classification, product compatibility, and safe sample handling.

Step 4: Submission to Accredited Lab (5–7 weeks)

Evergreen can coordinate sample submission to an accredited third-party laboratory for UN package testing. Labs we partner with include TEN-E, Advanced Labs, and other qualified professional testing laboratories. Depending on the package type and product classification, testing may include performance evaluations such as:

- Drop test
- Leakproof test
- Hydrostatic pressure test
- Stacking or compression test
- Other required tests based on the applicable packaging type and regulation

Step 5: Test Report and Certification Review (1–2 weeks)

After testing is completed, the lab provides a report or certification document showing the tested package configuration and performance level. Evergreen reviews the report with the customer to confirm:

- Approved package type
- Approved Packing Group level
- Maximum specific gravity or gross mass
- Hydrostatic pressure rating, if applicable
- Required closure instructions
- Any limitations or special conditions

Step 6: Future Order Support (Ongoing)

Once a package configuration is tested and approved, the same certification may be used for future orders when the product, can, closure, fill condition, and transportation requirements remain within the tested scope. If the customer changes the product, closure, fill weight, or hazard classification, Evergreen can help determine whether the existing certification still applies or whether additional testing is recommended.

Bringing It All Together

UN certification is built around the performance of a complete packaging system rather than an individual container. Product classification, package construction, closure selection, filling conditions, and transportation requirements all influence whether an existing certification applies or whether additional testing is required. Understanding how these elements work together helps simplify project planning and supports more consistent compliance across regulated shipments.

At Evergreen Resources, we support customers throughout the UN certification process — from reviewing package configurations and coordinating accredited laboratory testing to interpreting certification results and evaluating future packaging changes. Our goal is to help ensure each packaging system is aligned with the specific product, transportation requirements, and regulatory standards for the application.