



Aluminum Tamper Evident Caps

Aluminum tamper evident caps are made of high quality aluminum alloy, which is widely used in wine and oil products. Aluminum tamper resistant caps are a sealing device that ensures the integrity of the package and prevents unauthorized opening by means of physical or intelligent technology. It can be optionally matched with plastic components such as gaskets and inner plugs.

Aluminum tamper-evident caps are widely used in the packaging industry, particularly for food and beverage products, pharmaceuticals, and cosmetics.

Specification of Aluminum Tamper Evident Caps:

Aluminium Alloys	1050, 1070, 3105, 8011
Liner Options	PE Foam, Composite Material, Pulp and Aluminium, Pulp and Polymer, Heat Seal, Pressure Sensitive, Plastic Sol
Surface Finishes	Brushed Aluminium, Polished, Anodized, Lacquer Coating, Color Coating (Silver, Gold, Blue, Black, White, Red, etc.)
Diameter Range	18 mm – 53 mm
Common Sizes	28x15 mm, 30x21 mm, 30x35 mm, 30x60 mm, 53-400, 24x400, 18x400mm, 20x400mm
Thread Type	Continuous Thread (CT), Roll-On Pilfer Proof (ROPP), Push & Turn
Customizations	Embossing, Debossing, Laser Engraving, Custom Logos
Certifications	FDA Approval, EU Food-Grade Compliance, ISO Standards
Cap Height Range	Short, Medium, Tall
Compatibility	Glass Bottles, Plastic Bottles, Jars, Metal Containers
Applications	Beverages, Wine, Food Products, Pharmaceuticals, Cosmetics, Personal Care, Olive Oils, Chemical Products
Sample	Free
MOQ	10000 Pieces

Common Sizes of Aluminum Tamper Evident Caps:

1. Wine Bottle Caps

25.6mm x 17.0mm: suitable for traditional glass wine bottles, such as white wine and yellow wine.

28.6mm x 21.0mm: commonly used for red wine and spirits bottle top design, emphasizing sealing and decoration.

30.6mm x 21.0mm: used for large-capacity wine bottles (e.g. above 1L), requiring stronger pressure resistance.



2. Soft Drinks Bottle Caps

PCO 1881: international common standard, suitable for bottle necks with a diameter of about 26mm, for carbonated drinks (e.g. cola, beer).

28mm/30mm: Commonly used for non-carbonated beverages such as mineral water, fruit juice, etc., adjusted according to the bottle capacity.

3. Pharmaceutical and Cosmetic Bottle Caps

Small caliber design: 20mm-25mm: suitable for oral liquid bottles, essential oil bottles and other small capacity packaging.

Special sealing requirements: some pharmaceutical bottle caps are designed with CR (child-resistant) design, and the diameter and height need to match specific safety standards.

Tamper Evident Design:

Physical anti-theft design	Anti-theft ring (Tamper Evident Ring)	Structure	A ring-shaped mark is set under the aluminum cap, which breaks off and stays at the mouth of the bottle when it is opened, indicating that the bottle has been opened.
		Material	Aluminum thickness needs to be $\geq 0.25\text{mm}$, and the depth of the indentation is precisely controlled (e.g. 0.1mm) to ensure the breaking effect.
	Anti-reverse thread	Reverse thread design, can not be opened in the reverse direction after screwing, need to destroy the bottle cap to open.	
Intelligent anti-theft technology	RFID/NFC chip	Embedded in the bottle cap, scanning code to verify product information and circulation path.	
	Blockchain traceability	the unique code of the cap is bound to the blockchain database, realizing the whole chain anti-counterfeiting.	
	Temperature-sensitive color-changing coating	displays warning signs in case of abnormal temperatures (e.g. high-temperature distillation).	

International Standards:

ISO 9001: Dimensional tolerances and sealing tests.

FDA 21 CFR: Food Contact Material Safety Certification.

ASTM D5486: Anti-theft ring integrity testing.

**Key Test Items:**

Air tightness: Pressurized to 0.8MPa, hold pressure for 1 minute without leakage.

Torque test: Opening torque 1.2-2.5N-m, balancing ease of use and sealing.

Corrosion resistance: Salt spray test 48 hours without rust (ISO 9227).

Advantages of Aluminum Tamper Evident Caps:**- Security**

Anti-theft ring breakage rate $\geq 99.9\%$ (ASTM D5486 test standard), ensuring that tampering marks are irreversible.

- Environmentally Friendly

Aluminum is 100% recyclable and the recycled aluminum process reduces carbon emissions by 40% (in compliance with EU EPR regulations).

- Compatibility:

Compatible with glass, PET, metal and many other bottle types (diameter range 26-66mm).

- Cost Effectiveness

Low unit price (basic to smart models), scale production further reduces costs.

Applications of Aluminum Tamper-Evident Caps:**1. Food and beverage industry**

Alcohol: high-end whisky, wine (e.g. Macallan using anti-theft ring + NFC double anti-counterfeiting).

Edible oil: anti-secondary filling design for olive oil, sesame oil.

Carbonated beverages: withstand high pressure in the bottle (≥ 5 bar) to prevent cap bursting.

2. Pharmaceuticals and health care products

Pharmaceutical bottles: child-resistant opening (CR design) with anti-pollution sealing (e.g. vitamin tablets).

Nutraceuticals: integrated temperature-sensitive coating to indicate abnormal storage conditions.

3. Cosmetics & Chemicals

Perfumes/serums: anti-theft ring + QR code traceability to prevent counterfeit luxury goods.

Industrial chemicals: corrosion-resistant aluminum caps to prevent leakage and illegal dispensing.