

# nail polish

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## Nail Polish

Pigmented lacquer that dries by solvent evaporation. Nail polish is essentially **automotive-style nitrocellulose lacquer adapted for keratin**, and its modern history is best told through the ingredients it has removed rather than the ones it contains.

## What is in it

| Class                   | Doing what                         | Names                                                              |
|-------------------------|------------------------------------|--------------------------------------------------------------------|
| <b>Film former</b>      | The hard shell                     | <b>Nitrocellulose</b>                                              |
| <b>Resin</b>            | Adhesion and gloss                 | Tosylamide/formaldehyde resin, or replacements                     |
| <b>Plasticiser</b>      | Flexibility so it does not shatter | Camphor, acetyl tributyl citrate, trimethyl pentanyl diisobutyrate |
| <b>Solvent</b>          | Keeps it liquid; evaporates        | Ethyl acetate, butyl acetate, isopropyl alcohol                    |
| <b>Pigment</b>          | Colour                             | Iron oxides, titanium dioxide, certified lakes, mica, ultramarines |
| <b>Suspending agent</b> | Stops pigment settling             | Stearalkonium hectorite                                            |

Nothing is absorbed and nothing reacts with the nail. **Polish sits on the nail plate, which is dead keratin,** and comes off with solvent.

## The "free-from" numbers

The counting convention — 3-free, 5-free, 7-free, and upward — began with three ingredients of genuine concern and has since become a marketing ladder with no standard definition. What the original three were:

1. **Dibutyl phthalate (DBP)** — a plasticiser, a reproductive toxicant, and restricted in the EU as a **CMR substance under Article 15** of the Cosmetics Regulation.
2. **Toluene** — a solvent, neurotoxic on inhalation, an occupational concern in salons.
3. **Formaldehyde / tosylamide-formaldehyde resin** — a carcinogen and a significant contact allergen. Note the distinction: the **resin** is a polymer and is not free formaldehyde, but it is a well-documented allergen in its own right.

Beyond those three, the additional "free-from" claims cover camphor, xylene, ethyl tosylamide, parabens, animal-derived ingredients and others, and **there is no rule about which ingredients any given number refers to**. Treat the numbers as a signal of intent rather than a specification.

## Salon air, and where the risk actually is

For a consumer painting their nails occasionally, solvent exposure is trivial. For a **nail technician working eight hours a day in a small room**, cumulative exposure to solvent vapour, acrylic monomer and dust is a genuine occupational health issue, and ventilation and source capture are the controls that matter. This is a workplace safety question, not a cosmetic safety one, and it sits with OSHA rather than FDA.

## Where it sits in the rules

**Cosmetic** in the US — FDA primary category **(10) manicuring preparations**. The binding constraint is **colour additives**: each must be approved by FDA for the intended use, and certified colours must come from **FDA-certified batches**.

Two prohibited-list entries touch this category. **Methylene chloride** is one of the eleven substances FDA specifically prohibits, and it was formerly used as a solvent. **Chloroform** is another.

In the EU, permitted colorants come from the **Annex IV** closed positive list of 153 entries, and **CMR substances of categories 1A, 1B and 2 are banned under Article 15** — which is what removed DBP.

## Shelf life

**Two years unopened, 12–24 months after opening**. The failure mode is **solvent evaporation**: polish thickens, then goes stringy, then gloopy.

**Do not thin it with acetone or polish remover** — that dissolves the film former and produces a polish that chips immediately. Use a proper **nail polish thinner**, which is the correct solvent blend, and only a drop or two. Keep the bottle neck clean so the cap seals, and store upright, cool and out of sunlight.

## Related

- [Nails](#) — the shelf this sits on, and the rest of it.
- [Cosmetics](#) — what the label is legally allowed to say, and the full catalogue.
- The rest of *Colour* — [Gel Polish](#) · [Dip Powder](#) · [Base Coat](#) · [Top Coat](#) · [Quick-Dry Drops](#).
- [Nail Polish Remover](#) — the other half of the cycle.
- Regulatory statements here follow the FDA and EU sources listed on [Cosmetics](#), read 16 August 2026.