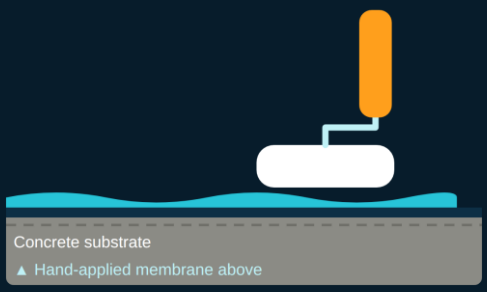
Hand-Applied Polyurea Waterproofing: a technical guide

A polyurea membrane you can put down with a roller, brush or trowel. There's no spray rig to haul in, so it works well for details, repairs and small to medium jobs.

Roller applied | Seamless | 100% solids | Flexible



15–45 min	0.5–1 mm	2–24 h	1–2 mm
Typical pot life at 20–25 °C	Typical film per coat	Typical recoat window	Common total dry film

The basics

What is hand-applied polyurea?

Hand-applied polyurea is a two-component membrane built to react more slowly than the spray grades. That slower reaction gives you minutes rather than seconds to mix and work the material, so you can put it down with a roller, brush, squeegee or trowel.

Once cured, it forms a tough, stretchy, seamless film that bonds well to concrete, screed, steel and plenty of existing coatings. Don't think of it as a cheaper cousin of spray polyurea. It's simply the better tool when a spray rig is impractical or overkill.

Where it fits

When to choose hand-applied

Details and junctions

Upstands, corners, drains, pipe penetrations and expansion joints. It's often used as groundwork before spraying the main field.

Small to medium areas

Balconies, terraces, bathrooms, plant rooms and small roofs, where bringing in a rig isn't worth the effort.

Repairs and retrofits

Patching and extending existing membranes, and recoating worn areas.

Overspray-sensitive sites

Occupied buildings, windy roofs and tight spaces where spray mist would be a problem.

Chemistry

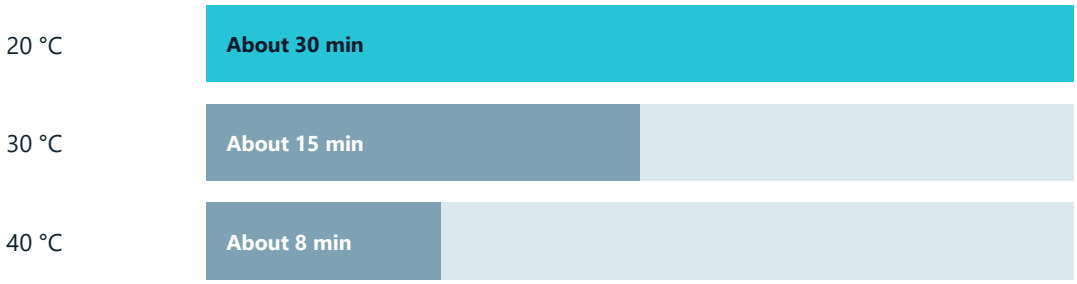
How it cures, and why you get a work window

The chemistry is the same basic reaction as spray polyurea: an isocyanate (Part A) reacts with an amine component (Part B) to form urea linkages. In hand-applied grades the amine side is deliberately slowed down, usually with sterically hindered amines or polyaspartic technology, and the system often comes in pre-measured kits.



Pot life depends heavily on temperature

Once mixed, the material starts reacting and gives off heat. As a rule of thumb, pot life roughly halves for every 10 °C rise in temperature, so plan your batch size and crew around the hottest part of the day.



Illustrative only. Pot life is different for every product, so go by the data sheet.

Practical tip
Mixed material left sitting in the bucket heats up and gels faster than material spread thin on the surface. Pour it out and spread it promptly instead of letting it stand.

Performance

Key properties

Tensile strength · ASTM D412
8–20 MPa
Handles structural movement and traffic.

Elongation · ASTM D412
150–400%
Bridges hairline and dynamic cracks.

Hardness · ASTM D2240
Shore A 60 – D 50
Soft enough for roofs, firmer for walk-on decks.

Adhesion to concrete · ASTM D4541
≥ 2 MPa
The concrete should fail before the bond does.

Tack-free time
1–4 hours
Depends on temperature and humidity.

Full cure
5–7 days
Light traffic is often fine much sooner, around 4–12 hours.

These are typical ranges only, and values vary by product and formulation. Always design from the manufacturer's technical data sheet. The bars are indicative, not to scale.

Comparison

Hand-applied vs spray-applied polyurea

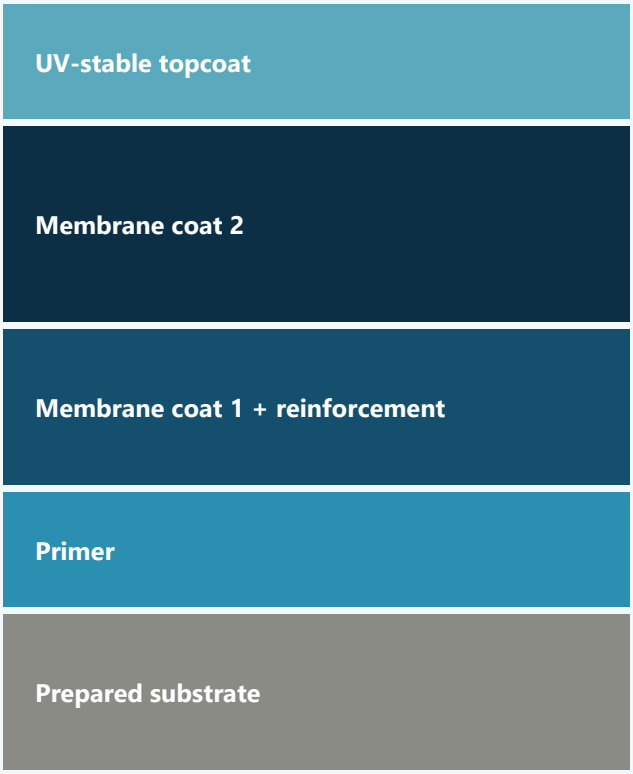
	Hand-applied	Spray-applied
Equipment	**Drill mixer, roller, brush, trowel**	Heated plural-component rig and generator
Cure speed	**Hours**	Seconds to minutes
Work window	**Minutes of pot life**	None, since it mixes at the gun
Film per pass	**0.5–1 mm**	1.5–3 mm in one pass
Best for	**Details, repairs, small and medium areas**	Large areas and fast return to service
Overspray control	**Excellent**	Needs masking and wind control
Skill dependence	**Mixing and rolling discipline**	Highly trained spray crew
Cost on large areas	**More labour**	Lower per m^2 at scale

Many projects use both: hand-applied polyurea on the details and junctions, with spray on the main field for speed.

System build-up

What goes on the substrate

Here’s what each layer does, from the top down.



UV-stable topcoat

An aliphatic polyurea or polyaspartic, applied as a thin coat. You need it wherever sunlight reaches the membrane. It stops chalking and yellowing, and it sets the colour and gloss.

Membrane coat 2

The second coat of polyurea, put on inside the recoat window and in a crossed direction. It brings the film up to full thickness (commonly 1–2 mm in total) and closes any pinholes.

Membrane coat 1 + reinforcement

The first coat of polyurea. Fleece or mesh gets embedded in the wet film at corners, cracks, joints and penetrations, so it can cope with movement and you don’t end up with thin spots at the details.

Primer

Chosen to suit the substrate and its moisture condition. It seals the pores, improves the bond and limits outgassing from the concrete.

Prepared substrate

Concrete, screed, steel or a sound existing coating. It has to be clean, sound, dry enough and profiled. Most failures start here.

Application

How it is installed

1

Prepare

Grind or shot-blast the concrete to open up the surface. Remove laitance, oil, dust and anything loose. Check moisture and substrate temperature against the data sheet.

2

Repair and prime

Fill cracks and voids. Apply the specified primer evenly to seal the pores and cut down outgassing, and keep to the primer’s recoat window.

3

Mix

Use a slow-speed drill (about 300–600 rpm) with a paddle for 2–3 minutes. Scrape the sides and base, and don’t whip air in. Only mix what you can place within the pot life.

4

First coat and reinforcement

Spread the first coat with a roller or squeegee. Press fleece or mesh into the wet film at corners, joints, cracks and penetrations, then roll it flat.

5

Second coat

Apply it within the recoat window and run it in a different direction from the first coat. That evens out the thickness and covers pinholes.

6

Topcoat and cure

Add a UV-stable topcoat on exposed areas. Keep traffic off until the data sheet says it's allowed.

Choosing the tool

Short-nap roller

Best for large flat areas. Use solvent-resistant, low-lint covers so you don't get bubbles or stray fibres.

Brush

For edges, corners, around pipes and tight details.

Squeegee or notched trowel

For controlled thickness. Back-roll afterwards to remove marks.

Ambient conditions

Keep the substrate at least 3 °C above the dew point, and keep rain and condensation off the surface while it cures. Cold slows the cure and heat shortens pot life, so check the temperature range on the data sheet.

Quality control

How to prove the job is right

Consumption check

Compare the kg used with the m^2 covered. For hand application this is the most reliable thickness check.

Wet film gauge

Check thickness while you're applying each coat, not afterwards.

Pull-off adhesion

ASTM D4541 on a test patch, with the failure happening in the concrete.

Visual and pinhole check

Inspect between coats and repair anything you find before recoating.

Flood test

For horizontal areas, commonly 24–48 hours after full cure.

Batch records

Lot numbers, mix times, temperatures and weather.

Troubleshooting

Common failures and fixes

Bubbles or foam in the film

Cause: over-mixing, rolling too fast, or outgassing from the concrete.

Prevent: mix slowly, use the right primer, and apply while temperatures are falling.

Pinholes

Cause: a rough surface, no primer, or contamination.

Prevent: get the profile and primer right, and put on a second coat in a crossed direction.

Poor adhesion between coats

Cause: recoating after the window has closed, or onto a dusty or contaminated film.

Prevent: stick to the recoat times. If you miss the window, clean and lightly abrade the surface, or use a bonding primer.

Sticky or soft film that will not cure

Cause: the wrong mix ratio, poor mixing, or low temperature.

Prevent: use full kits, mix thoroughly, and stay within the temperature limits.

Roller lines or uneven thickness

Cause: working the material after it starts to gel, or an uneven spread rate.

Prevent: work in small bays, keep a wet edge and check your consumption.

Blisters

Cause: moisture in the substrate.

Prevent: test for moisture and use a suitable primer.

FAQ

Quick answers

Can I apply it myself?

Small jobs are possible, but the result depends on getting the mixing, spread rate and recoat timing right. Trained applicators give you a more reliable outcome, especially for waterproofing, where a single defect can leak.

How many coats are needed?

Usually two, to reach the specified thickness and cover pinholes. Some systems need more, so follow the data sheet and the specification.

How long does it last?

With proper preparation, full thickness and a UV-stable topcoat where it's exposed, you can expect a long service life. How long exactly depends on the product, the exposure and how well it's maintained.

Can it go over old waterproofing?

Sometimes, as long as the existing layer is sound, clean and well bonded. Confirm it with a test patch and a pull-off test.

Need polyurea waterproofing for your project?

Talk to the Multichem team for system selection, technical data sheets and site support.

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