PlastiLynx

Instructions for Use

*PlastiLynx is a ground-breaking polymer crosslinker that can act either as a **primer** or used directly as an **adhesive**, offering solutions for a wide range of adhesion and material strengthening applications involving low-surface-energy, hard-to-bond polymers.*

Check out our PlastiLynx video instructions at xlynxmaterials.com/xlynx-product-line/

What's Included:

- Amber glass vial containing **PlastiLynx** sample

At room temperature, PlastiLynx is a colourless viscous liquid. For long term stability, keep sample refrigerated or stored in a cool dark location

What You'll Need:

- Solvent (Acetone, Ethanol, Methanol, etc.). Purified water may also be used as a solvent but requires extra attention for proper evaporation.
- A small vial or container for mixing solvent with PlastiLynx (amber glass recommended)
- Liquid dispenser (pipette, mister, dropper, etc.)
- 365nm UV light or curing oven
- Adhesive, if using PlastiLynx as a Primer:
    - Polyurethanes recommended, but cyanoacrylates and epoxies also effective

Prior to Use: Prepare PlastiLynx Solution:

Whether using PlastiLynx as a **primer** or an **adhesive**, only a thin application is required to create covalent crosslinking bonds between polymers. This can be achieved by dissolving PlastiLynx in solvent which, when applied, will be allowed to evaporate, leaving behind a thin layer of PlastiLynx on the surface.

Immediately prior to use, prepare an application solution by mixing a small amount of PlastiLynx with solvent as follows:

- Combine using a 50:1 ratio of desired solvent to PlastiLynx.
- Mix thoroughly to ensure PlastiLynx completely dissolves.
- Acetone-based solutions should be used within an hour of preparation; Methanol/Ethanol-based solutions are more stable but should still be used within a few hours of preparation.
- Once prepared, limit the solution's exposure to light as much as possible.

Application #1: Using PlastiLynx as a Primer

Hard-to-bond polymers can now be bonded using commercial adhesives when primed with PlastiLynx. Polymer materials and textiles may also be treated in this manner to functionalize surfaces or accept dyes and coatings.
IMPORTANT: Before proceeding, ensure you have prepared a PlastiLynx solution (outlined on Page 1)

Step 1: Apply PlastiLynx Solution

- For best results, ensure surfaces to be treated are clean of dust and debris, and are as smooth as possible. PlastiLynx is a molecular surface bonder, so any residue left on surfaces will reduce overall bond strength.
- Apply a small amount of the prepared PlastiLynx solution to the surface(s) of the material(s) you wish to prime or functionalize, spreading thinly and evenly. This can be achieved by using a pipette, dropper or spray mister.
- For reference, ~0.05 ml of solution (containing approx. 1 mg of PlastiLynx) is sufficient for priming a 0.5” x 1” area.

Step 2: Allow Solvent to Completely Evaporate

- Allow solvent to completely evaporate before proceeding to the next step. This is critical to ensuring that PlastiLynx does not crosslink with any trace amounts of solvent remaining on the surface.
- Evaporation times vary according to the solvent applied. 30-to-45 minutes is sufficient for solvents like Methanol or Ethanol, while water requires longer (4+ hours or use of a lyophilizer / freeze dryer to accelerate drying).

Step 3: Cure Treated Materials

- Once solvent has evaporated, PlastiLynx can be cured by either UV light (photocuring) or heat (thermal curing).
- XlynX photocuring trials use high-intensity UV light operating as follows:

Wavelength:	365 nm
Intensity / Irradiance:	13 W/cm^2 (manufacturer’s LED bulb when combined w/ focus adapter) 65 W/m^2 (measured at the surface)
Duration:	~10 minutes, depending on intensity
Distance:	Approximately 5” or 13 cm above treated material

- When using lower intensity UV lamps or UV LED light strips, longer exposure duration may be required to achieve a similar result. Focused UV LED light strips in a UV curing chamber can take five minutes, while other less intense UV lights may require an hour or more to fully cure.
- If unable to cure by UV light, PlastiLynx can also be thermally cured using an oven. Place treated materials in an oven heated to between 110°C to 120°C for approximately 2 hours. Note, this method may result in some discolouration or degradation, depending on material tolerances.

Next Steps:

- Once cured, treated surfaces are now receptive for bonding with traditional commercial adhesives such as polyurethanes, cyanoacrylates or epoxies, or treatment with dyes and other coatings.
- When bonding with commercial adhesives, spread a thin layer of the adhesive across the primed areas of the materials. Evenly apply pressure by pressing or clamping the two materials together tightly, ensuring materials are aligned and in contact across their treated surfaces.
- Allow to cure according to the directions prescribed by the commercial adhesive manufacturer.

Application #2: Using PlastiLynx as an Adhesive

PlastiLynx can also be used directly as an adhesive without the additional use of commercial bonding agents, creating rigid chemical bonds between polymer materials. As only a thin layer of PlastiLynx is applied, the surfaces of materials bonded in this manner must be flat and smooth to ensure covalent bonds can form between the two surfaces.
IMPORTANT: Before proceeding, ensure you have prepared a PlastiLynx solution (outlined on Page 1)

Step 1: Apply PlastiLynx Solution

- For best results, materials should be cleaned and smoothed to reduce gaps that may occur between surfaces involved in the bond. PlastiLynx is a molecular surface bonder, so any residue / imperfections on surfaces will reduce overall bond strength.
- Apply a small amount of the prepared PlastiLynx solution to one of the surfaces you wish to bond, spreading evenly across any section that will make contact with the other untreated bonding surface. This can be achieved by using a pipette, dropper or spray mister.

Step 2: Allow Solvent to Completely Evaporate

- Allow solvent to completely evaporate before proceeding to the next step. This is critical to ensuring that PlastiLynx does not crosslink with any trace amounts of solvent remaining on the surface.
- Evaporation times vary according to the solvent applied. 30-to-45 minutes is sufficient for solvents like Methanol or Ethanol, while water requires longer (4+ hours or use of a lyophilizer / freeze dryer to accelerate drying).

Step 3: Secure Bonding Materials Together

- Press or clamp treated surfaces together to avoid movement and maintain a tight connection while curing, ensuring materials are aligned and pressure is evenly applied.

Step 4: Cure the Bond

- When bonding UV transparent materials or polymer fabrics, photocuring may be possible with UV light. If so, follow the instructions provided in Step 3 of the "Using PlastiLynx as a Primer" section (found on Page 2).
- Where photocuring is not possible, thermal curing will be required as follows:
    - Place clamped / secured bonding "sandwich" in an oven heated to 110°C to 120°C and allow to cure for approximately 2 - 4 hours. Ensure materials are aligned and pressure is evenly applied for best results.
    - Polymers with higher melting temperatures may be cured at higher temperatures for shorter durations.

We thank you for your interest in ***PlastiLynx***!

We at XlynX believe we're on to something big with the suite of diazirine-based chemicals we are developing, opening the door to exciting new applications involving notoriously hard-to-bond materials. We look forward to hearing about your experience with ***PlastiLynx*** and welcome any feedback you're able to provide.

Contact us at info@xlynxmaterials.com