LIPHATECH®

TECHNICAL BULLETIN

Liphatech Testing Unveils Best Practice in Adhering Bait Stations to Concrete

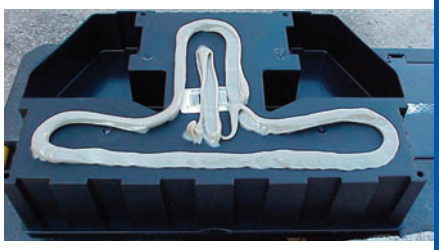
Can't get that bait station to stay in one place? It's not a figment of your imagination — it's a real problem.

The chemistry of most plastic bait stations makes it difficult to get glue or other adhesives to stick to them. Of course, this makes it difficult to secure the station to other surfaces like concrete pavers so they can be anchored and made tamper resistant.

For this project, adhesion is defined as the bond of an adhesive to a surface. In this case there are two dissimilar surfaces involved, plastic and concrete. Cohesion is the internal strength of an adhesive.

A Standardized Test

All tests were conducted using Liphtech's Aegis-RP® bait station. Adhesive was applied in a simple T-shaped pattern. Another pattern, three two-inch diameter circles of adhesive applied around holes drilled in the bottom of the station to form rivet-like heads, also was tested. Neither method performed well, regardless of the adhesive issued. Applying adhesive in a 3/8 inch to 1/2 inch bead in an oval T-shaped pattern performed the best in the testing (Figure A). About two ounces of adhesive were applied per station.



Adhesive holding power was determined by securing the concrete paver in place and using a winch to pull on the bait station while measuring the force necessary to break the station free from the concrete. The chart provided (Figure B) shows holding power in pounds. The stations were cured indoors at about 70°F using PL 200® Construction Adhesive. Note the importance of proper curing to the holding power of the adhesive.

For the test comparing the holding power of all six products, the adhesive was allowed to cure for three days, as advised by label directions. Then the stations were used in ways that simulated real-world handling and conditions, which included being loaded and unloaded from a vehicle, being stacked in a warehouse for a week and weathering outdoors for two months. During this time the samples were subjected to temperatures ranging from 75°F to minus 5°F, as well as sun, rain, snow and ice. The holding power of the various products is shown here (Figure C):

Figure B

Brand	Holding Power – Pounds
PL® Polyurethane Premium Construction Adhesive — Recommended for adhesion to wood, metal, masonry, drywall and plastics	<15
PL® Plus Super Duty Construction Adhesive — Recommended for adhesion to wood, metal and masonry	37
Liquid Nails® Heavy Duty Construction Adhesive — Recommended for adhesion to wood, metal studs, drywall and brick veneer (specifically not for plastics)	81
PL 200® Construction Adhesive — Recommended for adhesion to wood, metal studs, drywall to drywall and drywall to concrete	122
PL 400® Construction Adhesive — Recommended for adhesion to wood, metal and masonry	140
PL 500® Outdoor Project Adhesive — Recommended for adhesion to wood	195

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Figure C

Cured Holding Power Measured in Pounds (several days, one adhesive)				
PL 200® Cured	1 day	3 days	5 days	7 days
Repetition 1	190	245	250	340
Repetition 2	110	335	345	440

After the initial testing phase using the adhesives and measuring holding power, new methods were explored for Pest Control Professionals in the field to improve quick and easy adhesion.

Both of these tests were conducted with PL 200® Construction Adhesive (Figure D):

Figure D

Technique	Improvement
Wipe the bottom of station lightly with acetone	32%
Sand the bottom of the station (10 seconds, 40-grit sandpaper, firm pressure)	>36% *

*The improvement in the holding power of the adhesive combined with the sanded bottom of the bait station exceeded the measuring capability (500 pounds) of the test device.

Test Results, Roughened Versus Smooth			
One week, smooth 320	One week, rough >450	Two weeks,smooth 325	Two weeks, rough >450

In addition to learning the holding power of various adhesives and the tips that make adhesion even stronger, additional findings were reported:

- It takes a week or more for the adhesive bond to reach full strength
- The bond deteriorates with age and exposure to weather
- Sanding and cleaning the plastic increased the holding power and slowed the deterioration of the bond significantly
- Price is not an accurate indicator of holding power
- There is no difference in the holding power comparing gray and black stations
- At various stages of the curing process the adhesive may create a bulge in the bottom of the bait station
- Although PL 500® Outdoor Project Adhesive does not list plastic as a recommended use, it had the strongest bond

Summary

Based on a recent visit to a hardware store, PL 200® Construction Adhesive is priced from $1.30 to $3 for a 10.2 ounce tube. That works out to a modest cost of 25 to 60 cents per station.

In the end, simply sanding the bottom of the plastic bait station improved adhesion markedly, regardless of the adhesive used. Maintaining bait station security, including adhesion to various surfaces, is key to ensuring effective, efficient rodent abatement. So don't forget the sandpaper (or acetone) when you plan to use adhesives.