

Electrical Installation

Arxx™ Form Sizes

The Arxx™ High Performance Wallsystem is manufactured in four concrete core widths. Each core width has a different foam thickness. Knowing the available foam thickness in which to run wiring will lead an electrician to the appropriate box, conduit, and sleeve selection. (See Table 2.)

Through Wall Penetrations

Before concrete is placed in the Arxx™ forms, insert 3/4" or larger PVC sleeves in the foam forms. Locate the sleeves approximately 6" offset from the exterior box location; this permits the wire to enter the box on a side. The sleeve length can be the same as the form width, though many electricians make it shorter so that, after wire installation, expanding foam can be squirted in around the sleeve ends to provide a thermal break. To make the hole for the sleeve, use the sleeve as a template and mark out the circumference on the foam. A keyhole saw is often easier than a drill to cut the hole. A snug fit is preferred by most, but some installers will make oversized holes and fill the annular space with expanding foam. After the pour, when cutting the wire chase up to the sleeve, simply cut and break out the sleeve wall back to the face of concrete to enable the wire to bend over into the foam chase and run to the box. In lieu of a sleeve, a hole can be drilled through the concrete after the pour, or a wire chase can be cut down the exterior foam panel from the eave. After the wire is pulled through the sleeve or hole, expanding foam should be squirted in around the wire to seal the opening.

Wire Chases

After the Arxx™ walls are poured, wire chases are cut into the foam. Of the many tools used to cut a wire chase, the three fastest and cleanest are an electric chainsaw, hot knife, and side grinder.

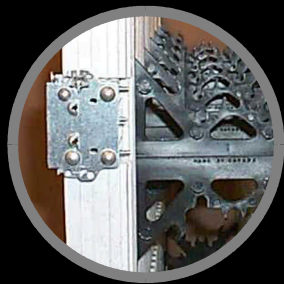
- **Chainsaw:** To make a depth stop on a small electric chain saw, measure the depth of chase required back from the tip of the chain, drill a hole in the bar and install a 3/8"Ø x 3" long all thread rod, and nut each side of bar.
- **Hot knives:** often come with a depth stop clamping plate.
- **Side Grinders:** simply grind into the foam and nick the concrete.

It is easier for some chases to be cut prior to installation of interior walls and floors, which will eliminate the task of carving chases behind intersecting stud walls, or floor rim joists. A chase to feed all the low wall outlets around the inside perimeter is a good example. In the case of a triple box where many wires enter and exit, a series of single wire chases is better than one wide chase, because it is easier to retain each wire in its own snug chase. In extreme climates, expanding foam is sometimes used to replace lost insulation in the wire chases. A horizontal chase is best cut at the horizontal joint between courses of forms so as to miss the plastic webs. Turn up or down between webs to run to a box. When returning to the main panel, run wires in the floor or ceiling cavities whenever possible.

Boxes

Both metal and plastic boxes can be used in Arxx™ walls. The cleanest cut out is accomplished after the pour with a hot knife box attachment, or using a heated metal box as a branding iron. Run wires into the box prior to anchoring the box into the wall. Boxes with a stud flange can be screwed to the black plastic webs, other box types can be anchored through the back of the box to the concrete with a concrete screw or powder actuated nail. Given the quantity and size of wires, your electrical code will dictate the volume required within a box. Occasionally, due to the depth of the foam, wider shallow boxes with plaster rings are required to obtain the required volume inside the box. For instance, in the reduced foam thickness of a 4" form (see Table 2).

An alternate method that requires good planning, is to make room for deeper boxes by simply



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making a plunge cut into the foam with a key hole saw and cut a slightly larger outline of the box, then push the slug of foam deeper into the core and glue the slug in place with expanding foam. This alternate method is more often used where double and triple gangs are required in the 4" and 8" form size that have a thinner foam wall thickness (see Detail E-1).

Wiring

Tucking Romex / Lomex type wire into a snug fitting chase is the easiest method of keeping a wire in place. Wider chases require small chunks of scrap foam to be wedged into the chase to hold the wire back, or spots of expanding foam. Some codes require a secure anchor on the wire within 8" of a box. As staples won't work in foam or concrete, use a small nylon cable zip tie or cable clamp with a manufactured eyelet to accept a short concrete screw, or simply use a spot of expanding foam. (See Technical Bulletin #99.7 for recommended foams and applicator guns).

Conduit

Metal or plastic conduit can be installed in the same manner as Romex / Lomex™ in cut chases after the pour. When electricians are on the job every day, plastic conduit can be embedded directly in the wall cavity and encased in concrete. Embedding conduit in the cavity requires a 90° ell and the box to be installed prior to the pour. The box is typically mounted to a shimmed out plywood patch which is screwed to the face of the plastic webs to allow the box to extend beyond the face of the foam. It is faster and less expensive to run conduit in the foam, after the concrete pour (if conduit is necessary).

Main Panel

To gain easy wiring access to the main circuit breaker panel through the floor or ceiling, it's best to install the panel on an interior wall. If mounting a main panel on an Arxx™ wall it works best to mount the panel on a larger plywood base which enables the wires to be stapled to the plywood in a neat series of lines for easy tracing. If concealing the wires is a requirement, furr out around the plywood base mount with 2x4 studs. Some contractors prefer mounting the circuit breaker panel flush in an Arxx™ wall by embedding a 2x4 & plywood backed window buck in the wall, which still allows some concrete behind the partial depth buck. Most contractors prefer a 4 to 6" PVC wall sleeve for the service entry. To mount the meter enclosure panel on the exterior of an Arxx™ wall, first install 5/8" or 3/4" exterior grade plywood, slightly smaller than the size of the panel, anchored back through wood shims to the concrete with galvanized concrete screws, (see Detail E-2). Make a circular cut out in the plywood to fit the wall sleeve, and mount the meter panel to the plywood with galvanized screws.

TABLE 1 –SOURCES – BOXES AND TOOLS

Manufacturer	Location	Telephone	Model Numbers
Thomas & Betts / Steel City	USA	800.888.0211	E01-712, 52151-3/4, A410, A411, A420
Hubbell – Raco, Inc.	USA	219-234-7151	7220, 7070, 7071, 7075, 7076
Thomas & Betts / Iberville	Canada	450-347-5318	52151K, C1-52-C49-1/2, C1-52-C52-1/2
Hubbell Canada Inc.	Canada	905-839-1138	2016
Temco Inc.	Canada	514-322-3543	52151-K-2, 52-C-13, 52-C-17
Avalon Concepts Corp. (Hot Knives and Blades)	Canada and USA	800-636-8864	or www.avalonconcepts.com

Tips!

“Knowing the available foam thickness in which to run wiring will lead an electrician to the appropriate box, conduit, and sleeve selection.” (See TABLE 2.)

TABLE 2

Core Width	Available Foam Thickness	Total Thickness of Form
10"	2 3/8"	15 1/2"
8"	2 1/4"	12 1/2"
6 1/4"	2 3/8"	11 1/2"
4"	1 3/4"	8"

