INDOOR COOLER CONSTRUCTION GUIDE

DIY ECONOMY 8’ X 8’ WALK-IN COOLER
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BEFORE YOU START
This indoor Cooler construction guide is intended for an Indoor application only. Please ensure that a flat level and structurally sound surface is available. A concrete slab is the best alternative. If you are building on an elevated surface such as a deck, a second floor, above a crawling space, or your cooler needs to be below 37°F, insulating the floor is highly recommended in order to get the best performance and efficiency out of your DIY Walk-In Cooler.

SAFETY TIP

At all times wear appropriate personal protective equipment to ensure a safe and enjoyable construction experience.

THRIFTY TIP

Repurpose lumber from a shed or building that is being torn down or purchase reclaimed lumber from a local resale lumber supplier.
# Materials List

The materials listed below were purchased for less than $1,100 in March of 2017 at our local Denver area home improvement store. In addition to these materials you will need to purchase a CoolBot and a digital window air conditioner. The dimensions in the guide are for an LG 15,000 BTU Model: LW1516ER.

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<td>92-5/8”</td>
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<tr>
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<td>DOOR SHIM PACK</td>
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TOOLS YOU WILL NEED

- Safety glasses
- Ear plugs
- Gloves
- Pencil
- Tape measure
- Claw hammer
- Combination or framing square
- 4’ level
- Circular saw or table saw
- #2 Phillips screwdriver
- Caulk gun
- Snap-off blade knife with minimum 2-1/2” of extended blade
- Chalk line
BUILDING THE BACK WALL

Construction of the Cooler starts with the back wall. This wall is opposite to the door and is where the A/C unit will be installed in.

The dimensions in the diagram are for an LG 15,000 BTU Model: LW1516ER. Take extra care to ensure that the air conditioner cutout dimensions are correct for the air conditioner you have selected. Leave a 1/4” gap all around the air conditioner - make the cutout 1/2” taller and 1/2” wider than your air conditioner.

Treated lumber is used for the BOTTOM PLATE since the BOTTOM PLATE may be mounted to the concrete and on occasion get wet. White wood is not treated and used for all other boards in construction of the cooler.

- For the BOTTOM PLATE cut an 8’ long treated 2 x 4 to 89” long.
- Mark the location of each wall stud on the 2 x 4.
- Do the same for the TOP PLATE by cutting an 8’ long white wood 2 x 4 to 89” long.
- Mark all 2 x 4s with a pencil and straight edge to identify the edge of the mating 2 x 4s.
- Mark an "X" on the side of the line that will be covered by the mating 2 x 4.
• On a flat surface with a backstop that will not move layout four 92-5/8" long 2 x 4s.
• Also cut to length and layout the 2 x 4s for the air conditioner opening.
All nails used with treated lumber must be galvanized to prevent corrosion of the nails. Galvanized nails have a rough dull silvery appearance.

**PRO TIP**

Starting nails in a board is much easier if the board is lying flat on a rigid surface than if you are trying to hold it in position. Start the nails and pound them until they just break through the backside of the board.

- Nail the treated BOTTOM PLATE to the four 92-5/8" and one 61" STUDS using two 16 penny galvanized nails into each stud.
- Use two 16 penny vinyl-coated sinker nails per joint for the remaining nailing of the back wall frame.
• Nail together the four boards that make up the AIR CONDITIONER FRAME and then nail the frame to the adjacent STUDS.

• Rotate the entire back wall frame 180° and place the BOTTOM PLATE against the backstop.
• Nail the TOP PLATE to the STUDS using two nails into each STUD.
• Align the TOP DOUBLE PLATE centered on the TOP PLATE which will leave 3-1/2" overhang on each side.
• Nail the TOP DOUBLE PLATE to the TOP PLATE with nails approximately every 12" staggered side to side.

The back wall is now complete.
BUILDING THE FRONT WALL

The second wall frame on the process is the front wall frame. This wall has the doorway. **Take extra care to ensure that the doorframe dimensions are correct for the door you have selected.**

- Cut and layout the 2 x 4s for the front wall in a similar manner to the back wall.
- Nail together the two pairs of doubles STUDS for the doorway using 16 penny vinyl-coated sinker nails staggered every 12". Nailing from the shorter 81" STUD through the taller 92-5/8" stud will ensure that the protruding nail tips do not face into the doorway.
• Nail the treated BOTTOM PLATE to the six 92-5/8" STUDS using two 16 penny galvanized nails in each STUD.

• Rotate the entire front wall frame 180˚ and place the BOTTOM PLATE against the backstop.
• Use two 16 penny vinyl-coated sinker nails per joint for the remaining nailing of the front wall frame.
• Nail the TOP PLATE to the studs.
• Nail the DOORWAY HEADER 2 x 4s on edge to the adjacent STUDS with the faces of the DOORWAY HEADERS flush with the outside of the STUDS.
• Nail the short STUDS above the doorway in place.
• Nail the TOP DOUBLE PLATE to the TOP PLATE with nails approximately every 12" staggered side to side.

The front wall is now complete.
BUILDING THE RIGHT AND LEFT WALLS

Repeat the process for the left and right walls in a similar manner to that done for the back and front walls.
CONNECTING THE WALLS TO THE FLOOR

Please ensure that a flat level and structurally sound surface is available. A concrete slab is the best alternative. If you are building on an elevated surface such as a deck, a second floor, above a crawling space, or your cooler needs to be below 38°F, insulating the floor is highly recommended in order to get the best performance and efficiency out of your DIY Walk In Cooler. A non-insulated wood building floor will not suffice.

- The next step is to layout a "perfect" 96" by 96" square on the floor you will be placing your cooler.
- Mark and "X" where you would like the front left corner of the cooler.

- Mark another "X" 96" away for the front right corner.
- Swing an arc 96" from the front left corner for the back left corner.
• Swing an arc 135-3/4" from the front left corner for the back right corner.

• Swing an arc 96" from the front right corner for the back right corner.
- Swing an arc 135-3/4" from the front right corner for the back left corner.

- Snap chalk lines from the arc intersections to mark the perimeter walls of your cooler.
• Starting with the back wall move each wall into place by laying the outside of each wall along the chalk lines.

• Note that the top double plates on the back and front wall overlap the top plates on the left and right walls.
• Screw the walls together using #10 x 3” long polymer coated exterior screws staggered every 12”.

Ensure that the exterior of the walls align with the chalk lines.

Finally, anchor the bottom plates to the concrete or asphalt using an appropriate anchor. We recommend anchors spaced 16” apart or closer along each wall.
BUILDING THE CEILING

Now that the walls are fastened together and the cooler is mounted to the floor we can install the ceiling joists.

We used two double ceiling joists to allow for the hanging of items from the ceiling of your cooler.

- Make two double ceiling joists by nailing together two 89 inches long white wood 2 by 6 boards with two pieces of 5-1/2" x 5-1/2" x 1/2" thick plywood spacers – one spacer on each end.
• Nail four joist hangers to the back and front walls to accept the double ceiling joists.

• Place the double joists into the double joist hangers.
• Nail the double joists in place with two 16 penny vinyl-coated sinker nails per joist hanger.

• In order to support the ceiling light, we will install a 2 by 4 support. Measure the distance between the double joists and cut a 2 by 4 to this length. Nail the 2 by 4 between the double joists center from front to back of the cooler.
EXTERIOR SHEETING

Before installing the door and in order to provide structural rigidity to your cooler we recommend sheeting the outside of the cooler with 4’ x 8’ x 7/16” sheets of OSB. The outside sheathing also creates an air gap between the insulation in effect increasing the R-factor of your cooler.

Cut and fit each OSB board as necessary depending on the wall (cutting around A/C and door openings) and screw them or nail them to the walls at the top, bottom and along the studs every 9 - 12 inches.

INSTALLING THE DOOR

Prior to insulating your Cooler, it is best to install the door frame and door.

It is important to use an exterior door as it will be insulated reducing the cooling loss through the door area of your cooler.

If you purchase a pre-hung insulated door it is important that the door is an outward swing door.

You can also use an insulated door without a frame and either build your own frame or purchase a door frame kit.

If you purchase a new exterior door frame and door they should come with weather sealing.

Be careful to not damage the weather sealing during installation.

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**THRIFTY TIP**

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You can repurpose an exterior insulated door or make your own by building a frame and sandwiching between 2 - 4” of insulation between sheets of plywood or OSB.

If you repurpose a door or make your own it is important to have good weather sealing in order to maintain cold temperatures within your cooler.

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**IMPORTANT TIP**

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Whichever method you choose for your door frame and door it is important that the door is installed plumb and square in order to ensure easy opening and closing of your door as well as achieving a good seal.
INSULATING YOUR ROOM

Now that you have your cooler built and the door installed you are ready for insulation.

We recommend that the walls and ceilings of the cooler have two layers of 2" Rmax Thermasheath-3.

This is a polyisocyanurate rigid foam insulation that when two 2" layers and a 3-1/2" air space are combined yields a system R-factor great than R-30.

THRIFTY TIP

Do not skimp on insulations. The quality, thickness, and tightness of your insulations will impact your electricity bill. Spending a few extra dollars on quality insulation to achieve a higher R-value will help reduce your electricity bills for years to come.

- Measure and cut a 2" sheet of Rmax to fit between the outer wall top plate and double ceiling joist.
- Install the insulation and use spray foam to fill any gaps form both the inside and outside of the cooler.
• Spray insulation in the gap between the double joists also.

**PRO TIP**

If the insulation is loose and falls out drive a few nails or screws on an angle to temporarily hold the insulation in place. Once the spray foam cures the nails can be removed and the insulation will remain in place.
• Measure and cut a 2" sheet of Rmax to fit between the double ceiling joists.
• Measure, cut, and place a 2" piece of Rmax above the light support that is at least 8" longer than the gap and center this piece over the gap.

• From the outside of the cooler drive two #12 x 4" long plastic cap nails through this small piece of Rmax and into the light support 2 by 4.
• Do not drive the nails all of the way - allow for the Rmax to rise 1/2" above the 2 x 4 as shown by the finger gap in the photo.
• Use spray foam insulation to fill the 1/2" gap cementing this piece to the main ceiling insulation.
**PRO TIP**

Mark the wall stud locations on the floor at least 6” out to make location of the studs easier when installing the insulation.

- Measure and cut two 2" sheets of Rmax to fit over the studs of the back wall covering the air conditioner opening. **NOTE THAT THE INSULATION GOES OVER THE STUDS AND DOES NOT FIT IN BETWEEN THE STUDS. THIS IS IMPORTANT TO ENSURE MAXIMUM R-VALUE.**

- Flush the edge of the insulation with the exterior of the left and right cooler walls.
- Put the sheets of Rmax in place and fasten to the studs with #12 x 3" long plastic cap nails.
• Use spray foam to fill any gaps and wipe excess spray foam off the insulation face and corners.
• Repeat for the front wall.

• Repeat for the left and right wall.
• Take another look at all joints and fill any gaps with spray foam insulation.
• To reduce any air leakage, we will tape all joints with 2-1/2" wide foil HVAC tape.
• The butt joints between sheets are the easiest to tape.
• Cut the tape to match the length of the joint being taped and apply from top to bottom by slowly pulling off the backing paper and firmly pressing the tape in place.
• Take care to center the tape on the joint.
• Taping the corners is a bit trickier yet with proper technique is easily achieved.
• Cut the tape to match the length of the joint and remove the first 12” of backing paper.
• Cup the tape inward toward the wall and apply the tape to only one wall.

• Remove another 24” of backing paper and pull tight and again apply to only one wall.
• Repeat until the entire strip is attached to one wall.
• Go back to the top and with your fingers on the side of the tape that is taped to the wall slide your finger towards but not all of the way to the corner.
• If the tape contacts the opposite wall gently unstick it from the opposite wall and roll it away from the opposite wall.
• Go back to the top and firmly slide a board from the taped side to the un-taped side allowing the tape to now contact the second side.

• Firmly press the tape in place with the board and your fingers from top to bottom.

Now that we have the first 2" layer of insulation on the entire inside of the cooler we will put on the second 2" layer.

• Measure and cut two 2" sheets of Rmax for both the left and right walls.
• Apply Heavy Duty Liquid Nails generously in a thick bead to the installed sheets of insulation on the left and right walls.
• One to one and a half 10 oz. tubes per 4' x 8' sheet is about right.
• Move the second layer Rmax in place and push tightly against the first layer of Rmax to ensure adhesion.
• Gently pound each sheet with the flat of your fist up and down and across for several minutes in order to help ensure adhesion.
• Do not pound so hard as to leave marks on the Rmax.

PRO TIP

Cut each piece of Rmax 1/4" smaller than the measured dimension to take into account any out of square construction of the cooler and out of square cutting of the Rmax. Then dry fit each sheet of Rmax prior to applying the liquid nails and trim if necessary.

Repeat for the back and front walls.

PRO TIP

Before putting the second layer of insulation on the ceiling, remember to mark on the side walls the location of your joists (to hang the rack system) as well as the 2 by 4 in between the joists that will hold your Light fixture.

• Repeat for the ceiling using both Heavy Duty Liquid Nails and #12 x 4" long plastic cap nails to hold the ceiling insulation sheets in place. Place 2 x 4 braces from the ceiling to the insulation as
appropriate to ensure that the 2nd insulation layer is tight to the first insulation layer. Take care to not put too much pressure on the insulation as to cause permanent damage.

- As was done for the first layer of insulation, fill all gaps with spray foam insulation and tape all joints with 2-1/2" wide foil HVAC tape.
To trim the excess insulation of the door opening and to cut out the insulation over the A/C opening follow these steps:

- Using a hand saw, carefully insert the tip of the saw flush with the door frame and start cutting the excess insulation from top to bottom. To finish the cut, flip the saw (teeth facing up) and cut flush against the frame going up until you reach the top part of the frame.
- Follow the same procedure on the other side of the door frame and on the top.

- From the outside back wall, use the A/C cut out on the OSB sheeting as a guide for your saw, and follow the same procedure as in the door opening to cut the insulation out for the A/C opening.
ELECTRICAL

IMPORTANT

Once your cooler is built and insulated, have a certified electrician install the electrical for the air conditioner, CoolBot, lights, and any other accessories you may add to your cooler.

On occasion, condensation may drip from the front of your air conditioner so make sure all electrical is mounted to the side of the air conditioner and not directly beneath.

We also recommend surface mounting the electrical boxes inside of the cooler to minimize compromising the insulation integrity and the chance for condensation within the electrical box.

PRO TIP

OPTIONAL: MOTION DETECTOR LIGHT

A motion detector light is an added convenience and may simplify the electrical installation by avoiding the need for a light switch.

We chose a motion activated LED light fixture made by Lithonia that can hang from the ceiling or can be mounted directly on the 2 by 4 that we installed in between the 2 ceiling joists. The model number for the light is: SGLL 24 80CRI 40K PIR M4
To install the light fixture, follow these steps:

- Carefully remove the clear cover of the front of the light and place to the side.

- Remove the Philips center screw holding the lamp assembly and place aside.

- Gently squeeze both ends of the metal section in the center of the fixture and flip the metal cover to expose the wires and the mounting holes.
• Locate the position of the 2 by 4 under the ceiling insulation.
• Position the fixture longways along the direction of the entrance and the back wall. Leave the end with the cord plug towards the back wall (A/C unit wall). This will simplify electrical connections as it can be plugged in in the same outlet as the CoolBot and the A/C without having to run additional outlets.
• Using 4” wood screws anchor the fixture to the ceiling panels. It is very important to make sure that the screws are going in the 2 by 4 and not just through the insulation to ensure that the fixture is properly anchored to the ceiling.

![Image of fixture being installed]

• Screw the metal cover back in place using the Philips screw that was removed at the beginning.
• Replace the clear covering of the light fixture.
• Install the electrical cord supplied with the fixture and plug in the power outlet.

![Image of finished installation]
OPTIONAL: CEILING RACK - SLIDING GAMBREL SYSTEM INSTALLATION

You may ask how do I hang this season’s deer, elk, or wild boar in my cooler? With a pipe style ceiling rack and gambrel hangers of course!

When we constructed the ceiling, we used double 2” x 6” joists - just so we can hang this season’s game meat in our new cooler.

- Materials List for (2) sliding gambrel systems:
  - (4) ½” galvanized floor flanges
  - (4) ½” x 3” galvanized pipe nipples
  - (4) ½” galvanized 90 degree FPT x FPT elbow
  - (2) ½” x 48” long galvanized pipe threaded both ends
  - (6) gambrel hangers that freely slide on ½” galvanized pipe (actual outside diameter of pipe is 0.84”)

- Preassemble the two pipe style ceiling racks with up to three gambrel hangers per side.
- It is important to install the gambrel hangers on the pipes prior to mounting them to the ceiling otherwise you will not be able to install the gambrel hangers.
• Most gambrel hangers will slide on 1/2” galvanized pipe - check your gambrel hangers to ensure a fit prior to construction.
• Center the pipe style ceiling hangers front to back in the cooler and mount them to the double joist hangers using four #14 x 4” long wood screws per pipe floor flange.
AIR CONDITIONER INSTALLATION

It is now time to install the air conditioner into our new cooler.

For an 8' x 8' walk-in cooler we recommend a 15,000 BTU air conditioner for most applications.

We use an LG 15,000 BTU Model: LW1516ER for our cooler. LG is our most preferred brand due to reliability and easiness of installation with the CoolBot. For a list of compatible brands for your cooler please visit our website at: https://www.storeitcold.com/ac-selection/

- Carefully remove the air conditioner from its box and read all instructions.
- Remove the 4 screws holding the unit to the housing. Two on the sides and two on the back.

- Pulling from the handle slide the unit out of the housing.
• Install the housing into the air conditioner cutout so the top bar is resting against the wall.

• Screw the housing to the wall with two wood screws. Make sure the cabinet tilts down at least 1/2" in the back. The weight of the air conditioner is usually sufficient to ensure 1/2" of tilt - if not shim up the front to achieve the recommended tilt.
- Slide the air conditioner into the housing from inside of the cooler.

- Replace the screws that hold the housing and the air conditioner together.
COOLBOT INSTALLATION

Now that your air conditioner is installed we can install the CoolBot and start cooling down the cooler.

- Remove the CoolBot from its box and read all instructions. Familiarize yourself with the device and all its functions and parts.

- Mount the CoolBot with two screws alongside your air conditioner - do not plug into the power source.
• Locate your A/C’s temperature sensor. It is the only thing attached to the front fins of your A/C. If the A/C has a clip holding the sensor into the fins, remove both of them from the fins and then remove the sensor from the clip.

• Install the Heater Cable by laying the red tip and air conditioner temperature sensor alongside of each other. Using the provided aluminum foil wrap both together ensuring that they are in contact.
• Plug the heater cable into the "Heater" jack on the CoolBot.
• Ease the fins apart to make a small gap by gently pushing a pencil between the fins in the center of the A/C and within one inch from the bottom.

• Install one of the temperature sensors with the blue cable and black tip into the small gap by gently sliding the sensor in place ¼” only. Route the cable sensor to allow for replacement of the air conditioner front grill without pinching the cable. Plug the temperature sensor cable into the "Fins" jack on the CoolBot.
• Plug the other temperature sensor into the “Room” jack of the CoolBot and make sure it is freely hanging in the cooler and not touching anything.

• PLEASE PROCEED CAREFULLY IN THIS STEP.
  NOTE: You do not have to replace the front cover of the A/C if you don’t want to. This is for aesthetic purposes only and it won’t affect the functioning or the warranty of your system. An A/C unit with the front cover removed, will give you much easier access to the coil and Fin sensor for troubleshooting purposes and regular maintenance (coil cleaning).

Replace the front cover of the A/C starting with the top and then carefully routing the sensor and heater cables through the small opening that the A/C cover has on the right side near the bottom. The A/C power cable and the Heater-A/C sensor connection will be routed through the small opening at the bottom of the front cover. The Fin Sensor and the Heater Cable will go through the notch on the right side of the cover as they make their way to connect with the CoolBot digital controller. After the cover is in place secure it on the front with the 2 screws that came with your A/C installation package.

IMPORTANT! Ensure that you do not pinch any cables while trying to attach the front of the A/C.

IMPORTANT! After the front cover is in place, visually inspect through the louvres of the cover to ensure that the Fin Sensor end (tip) did not come loose out of the fins.
• Plug your air conditioner in and turn it on.
• Set the air conditioner to the lowest temperature, make sure the air conditioner is set to "COOL" mode and the fan is on "HIGH".
• Plug the power supply cable into the "power" jack on the CoolBot and plug the power supply into the cooler electrical outlet.
• To set the temperature on the CoolBot, press the checkmark button - the current set temperature will blink.
• Use the right and left arrows to set the temperature to the desired value.
• Press the checkmark to save the value.

UPGRADES AND OPTIONS FOR YOUR COOLER

There are many optional upgrades you can make to your cooler such as:

- Sheeting the interior walls and ceiling over the insulation with plywood, OSB, or FRP
- Sheeting the exterior of the cooler with plywood or even a nice siding
- Adding a tap system with your cold keg of beer in the cooler and a tap handle on the outside of the cooler
- Adding metal or wood shelving to store produce, canned goods, or other items