

How to select a Tarp Canopy

Information provided by CreativeShelters.com

This document is supplied as is to provide information about tarp canopies. We are still making changes and additions to make this information as accurate as possible. If you find errors, topics that are unclear or missing information please let us know at admin@creativeshelters.com.

Introduction:	2
Tarp and Frame Canopy	2
Frame	2
Fittings	2
Sizes	2
Gauge steel	2
Weld	2
Finish	2
Eye Screws	3
Roof Options	3
Flat Roof	3
Low Gable Peak	3
Medium Gable Peak	3
High Gable Peak	3
Party Canopy	3
Gambrel	3
Tubing Options	3
3/4 inch EMT	4
1 inch EMT	4
1 3/8 inch chain link fence	4
1 5/8 inch chain link fence tubing	5
1 7/8 inch chain link fence tubing	6
Tarps	6
Leg and Rafter spacing	7
Tarp Attachment	7
Canopy Setup	7
Tarp Attachment	8
Weather warning	8
Anchoring	8
To Cement	8
To Wood	8
On Ground	8
Foot pads	9
Pop Up Canopies	9

Introduction:

Canopies are shelters made with tarps covering some type of frame structure. Canopies are used for a wide variety of things including carports (for RVs, boats, cars and motor homes), camp dining tents, wedding receptions and pool covers just to name a few. If you are storing items outdoors or planning an outdoor event canopies may provide the outdoor protection you need.

Canopies are grouped into two main categories:

- 1) Tarp and frame canopies are assembled by first building a frame made with tubing joined with fittings at all joints and then covered with a tarp. Frame canopies are great for storage, temporary work shelters, carports and outdoor events. Frame canopies are easy to assemble and can be custom designed for size and shape.
- 2) Pop up canopies are easy to set up, light weight and portable. Pop up canopies are designed for light weight use and intended for day use applications such as picnics and tailgating.

This document will show the features of canopies and provide guidelines for the best choices.

Tarp and Frame Canopy: These canopies are sturdy can be made in a large number of configurations and sizes.

- **Frame** – The frame of a tarp and frame canopy can be built with either metal tubing and steel fittings or PVC pipe and plastic fittings. PVC pipe tends to be more flexible than metal tubing of equal sizes and plastic fitting are prone to break much easier than steel fittings. Select frame materials that are made of steel.
- **Fittings** – Fittings are used at joints and corners of a canopy frame. The canopy frame tubing is inserted into the fitting to form a strong joint. There are many different shapes of fittings that can be used to construct many different canopy designs; the www.CreativeShelters.com web site has many [canopy examples](#). As noted before fittings can be found in plastic or steel but steel fittings are the strongest and provide the most options in shapes and sizes. The follow is a list of steel fitting features.
 - **Sizes** – Canopy fittings come in 5 different sizes designed to be used with tubing having outside dimensions of the designated sizes. The 3/4 and 1 inch fittings are designed for use with EMT tubing. The 1 3/8, 1 5/8 and 1 7/8 inch fittings are designed for use with chain link fence tubing. For more information about the actually tubing sizes and fitting sizes see www.CreativeShelters.com/FittingDiameters.asp .
 - **Gauge steel** -
 - **Weld** – Chose fittings that are machine welded for maximum strength and highest quality.
 - **Finish** – Steel fittings come in galvanized and chrome. The largest selection of shapes and sizes are available in galvanized fittings. While chrome fittings may provide a dressier look on some canopies, especially

party canopies, they offer no other advantages. Galvanized fittings can be easily painted or powder coated if desired.

- **Eye Screws** – Most fittings will have eye screws used to secure the tubing in the fitting once the assembly is completed. Making sure the eye screws are securely tightened will improve stability and strength of the canopy. Make sure the eye screws are kept tight to help keep the frame intact during light wind conditions. Look for fittings with strong eye screws typically 1/4 or 5/16 inch in diameter.
- **Roof Options** – Canopy fittings are divided into 6 main roof styles; flat roof, low peak, medium peak, high peak, party canopy and gambrel. Many different configurations can be designed by combining different roof styles or by using some of the specialty fittings available for each fitting group. [Click here](#) to check out just a few of the options
 - **Flat Roof** – The flat roof canopy fittings are used for canopies with no peak and includes fitting that have a 90 degree bends for the top to leg connections. This group also includes all the sleeves and straight tubing connection pieces.
 - **Low Gable Peak** – The low gable peak canopy fittings have a 2.5 inch rise per foot. The side angle on the fittings is 102 degrees and the peak fittings have an angle of 156 degrees. The low peak fittings are also used for lean-to and slant roof canopies.
 - **Medium Gable Peak** – The medium gable peak canopy fittings have a 4 inch rise per foot. The side angle on the fittings is 110 degrees and the peak fittings have an angle of 140 degrees.
 - **High Gable Peak** - The high gable peak canopy fittings have a 7 inch rise per foot. The side angle on the fittings is 120 degrees and the peak fittings have an angle of 120 degrees.
 - **Party Canopy** – These specialty fittings provide slopes on all four sides of the canopy. They are intended for use with Party Canopy Tarps which are cut to specific sizes. The side fittings have angles of 112 degrees and the top piece has an angle of 132 degrees. Available only in 1 inch fittings.
 - **Gambrel** – These fittings are used to construct a semi-circle style of canopy similar to a Quonset hut. Fitting angles are 145 degrees. Available in 1 and 1 5/8 inch fittings only.
- **Tubing Options** – EMT (Electrical Metal Tubing) sometimes called thin-wall conduit or electrical conduit is used for 3/4 inch and 1 inch canopy fittings. EMT can be used for light and medium weight canopies. There are other types of electrical conduit such as ridge, IMC and Aluminum which have different outside diameters than EMT and may not fit into canopy fittings. Chain link fence tubing is used for 1 3/8, 1 5/8, and 1 7/8 inch canopy fittings. Chain link fence tubing is used for medium and heavy duty canopies.

Many Do-It-Yourself sites do not ship the tubing with the canopy. It is expensive to ship tubing which is readily available at local dealers. If you select a canopy

which ships with tubing be sure to check the tubing wall thickness and material. Tubing shipped with a canopy may be lower grade to cut down on shipping cost.

- **3/4 inch EMT** (Electrical Conduit) is ideal for light weight potable canopies.
 - **Tubing specification** – 3/4 inch conduit actually has an outside tubing diameter of .922 inches with a tubing side wall thickness of .049 inches.
 - **Maximum tubing length** - 10 foot.
 - **Material** – Galvanized steel.
 - **Maximum canopy size** - This tubing should not be used for structures larger than 10 ft. wide and 20 ft long.
 - **Maximum side height** - Structures with side legs longer than 8 feet should use chain link fence inch tubing.
 - **Uses** - Light weight canopies made with 3/4 inch EMT are good for hunting, camping, arts and craft shows, tailgate parties and many other light weight canopy shelters.
 - **Availability** - Hardware store such as Home Depot or Lowe's or electrical supply stores.

- **1 inch EMT** (Electrical Conduit) is used for medium weight canopies.
 - **Tubing specification** – 1 inch conduit actually has an outside tubing diameter of 1.163 inches with a tubing side wall thickness of .057 inches.
 - **Maximum tubing length** - 10 foot.
 - **Material and Finish** – Galvanized steel.
 - **Maximum side height** - Structures with side legs longer than 8 feet should use chain link fence inch tubing.
 - **Uses** - Medium weight canopies made with 1 inch EMT are good for temporary storage, hot tube covers, greenhouse frames, camping canopies, hunting tent frames, construction work area shelters.
 - **Availability** - Hardware store such as Home Depot or Lowe's or electrical supply stores.

- **1 3/8 inch chain link fence tubing** used for medium weight canopies.
 - **Tubing specification** – 1 3/8 inch chain link fence tubing is manufactured to an outside diameter of 1 3/8 inches. Chain link fence tubing can be purchased in different side wall thicknesses. Side wall thickness is specified as gauge. The most common residential tubing is 16 gauge (.065 inch sidewall). Thinner sidewall tubing is available in 17 and 18 gauge but choose the thickest sidewall available, the lower the gauge number the thicker the side wall. Commercial grade tubing with thicker sidewalls is

available but before purchasing be sure this tubing will fit the 1 3/8 inch maximum diameter for the fittings.

- **Maximum tubing length** - 21 feet long. Tubing is available with and without flared end used to couple multiple peaces together. If the tubing you select has a flared end you will loose about 6 inches in length.
 - **Material and Finish** – Galvanized steel. Note: powder coated tubing can be purchased but be sure to make sure the outside diameter does not exceed 1 3/8 inches before purchasing.
 - **Uses** - Medium weight canopies made with 1 3/8 inch chain link fence tubing are good for temporary storage, hot tube covers, wood sheds, greenhouse frames, hunting tent frames, construction work area shelters and patio or deck covers.
 - **Availability** – Purchase at most chain link fence stores. Most chain link fence stores will cut to length for free or charge a minimal amount for custom cutting. Prices vary for the same quality tubing so shop around for the best deals. Most hardware stores do not carry full lengths of tubing so your best bet is to look for a fencing company.
- **1 5/8 inch chain link fence tubing** used for heavy duty canopies.
- **Tubing specification** – 1 5/8 inch chain link fence tubing is manufactured to an outside diameter of 1 5/8 inches. Chain link fence tubing can be purchased in different side wall thicknesses. Side wall thickness is specified as gauge. The most common residential tubing is 16 gauge (.065 inch sidewall). Thinner sidewall tubing is available in 17 and 18 gauge but choose the thickest sidewall available, the lower the gauge number the thicker the side wall. Commercial grade tubing with thicker sidewalls is available but before purchasing be sure this tubing will fit the 1 5/8 inch maximum diameter for the fittings.
 - **Maximum tubing length** - 21 and 24 feet long sections are available. Tubing is available with and without flared end used to couple multiple peaces together. If the tubing you select has a flared end you will loose about 6 inches in length.
 - **Material and Finish** – Galvanized steel. Note: powder coated tubing can be purchased but be sure to make sure the outside diameter does not exceed 1 5/8 inches before purchasing.
 - **Uses** – Heavy duty canopies made with 1 5/8 inch chain link fence tubing are good for carport canopies, storage areas, construction work areas, hot tub shelters,
 - **Availability** – Purchase at most chain link fence stores. Most chain link fence stores will cut to length for free or charge a minimal amount for custom cutting. Prices vary for the same quality tubing so shop around for the best deals. Most hardware stores do not

carry full lengths of tubing so your best bet is to look for a fencing company.

- **1 7/8 inch chain link fence tubing** used for heavy duty canopies.
 - **Tubing specification** – 1 7/8 inch chain link fence tubing is manufactured to an outside diameter of 1 7/8 inches. Chain link fence tubing can be purchased in different side wall thicknesses. Side wall thickness is specified as gauge. The most common residential tubing is 16 gauge (.065 inch sidewall). Thinner sidewall tubing is available in 17 and 18 gauge but choose the thickest sidewall available, the lower the gauge number the thicker the side wall. Commercial grade tubing with thicker sidewalls is available but before purchasing be sure this tubing will fit the 1 7/8 inch maximum diameter for the fittings.
 - **Maximum tubing length** – 21 and 24 feet long sections are available. Tubing is available with and without flared end used to couple multiple peaces together. If the tubing you select has a flared end you will loose about 6 inches in length.
 - **Material and Finish** – Galvanized steel. Note: powder coated tubing can be purchased but be sure to make sure the outside diameter does not exceed 1 7/8 inches before purchasing.
 - **Uses** - Heavy duty canopies made with 1 7/8 inch chain link fence tubing are good for canopies used for RV's, motor homes, car ports, boats, construction work areas, dog run covers and kennel covers.
 - **Availability** – Purchase at most chain link fence stores. Most chain link fence stores will cut to length for free or charge a minimal amount for custom cutting. Prices vary for the same quality tubing so shop around for the best deals. Most hardware stores do not carry full lengths of tubing so your best bet is to look for a fencing company.
- **Tarps** – Canopies tarps are available in either rectangular shapes or as fitted canopy covers such as valance or party canopy covers.
 - Rectangular tarps allow custom design of size and shape of canopies for many applications.
 - For shelter such as dinning canopies or construction work covers most users will build a canopy where the tarp is the same size as the roof area. This allows for using the eye grommets and ball ties to fasten the tarp to the perimeter of the frame.
 - For carports and storage most users will design a canopy with the tarp overlapping two sides of the canopy. The amount of overlap can vary from a few inches to almost touching the ground.
 - Fitted canopy covers (valance or party canopy covers) need to have the frame constructed to meet the size of the cover. This is typically about 2 inches less in length and width than the order size.

- Tarps are available in many different sizes, colors and material. Poly tarps are the most popular for residential frame canopies. Check out [how to choose a poly tarp](#) for more details on poly tarps. Other popular options for frame canopy covers are sun screen mesh tarps and canvas tarps.

- **Leg and Rafter spacing** – Most general purpose canopies are designed with legs and rafters at least every 10 feet. A 20 foot long canopy would have legs at each corner and one in the middle of the canopy making the spacing 10 feet. A 16 foot long canopy would have legs at each corner and one in the middle making the spacing 8 feet. A 10 foot long canopy would only have legs in each corner. Just like in a house, the roof structure can be made stronger by adding additional roof rafters. You may want to do this if you are expecting the canopy to be used with any light snow. Additional legs can also be added to strengthen the canopy. The canopy design tool at <http://www.creativeshelters.com/CanopyDesignTool.asp> can be used to design your own design including additional rafters and legs.

- **Tarp Attachment** – When attaching the tarp to the frame use ball tie bungees. These are specially design short bungee cords which hold the tarp taunt but also have some give when the wind blows which relieves the stress on the grommets and the tarp. Ball tie bungees are a loop of bungee material connected to a plastic ball. To use you push the bungee through the grommet on the tarp then rap it around the frame tubing, finishing off by putting the loop over the ball. A diagram of this can be seen at www.CreativeShelters.com/Setup_instructions.asp . Fastening with rope can lead to premature failure of the tarp since the rope has very little give.
 - Suggested sizes:
 - 6" Ball ties for 3/4" and 1" frames
 - 9" Ball ties for 1 3/8" and 1 5/8" frames
 - 12" Ball ties for 1 7/8" frames

- **Canopy Setup** – Setting up a tarp and frame canopy is easy. The only tool required to set up a canopy is a wrench or pliers to securely tighten the eyebolts. The follow are the general steps in setting up a canopy, a more detailed description with pictures can be found at www.CreativeShelters.com/Setup_instructions.asp.
 - Place All roof pipes on the ground next to corresponding fittings.
 - Connect all roof pipes and fittings.
 - Drape tarp over assembled roof frame, fastening corners onto the frame using ball ties.
 - Once corners are fastened use ball ties to attach all grommets to the frame.
 - Lift one side of the roof and insert leg poles into the fittings. Attaching the legs should be done with at least two people (or more for large canopies). Lift the opposite side of the roof and insert remaining leg poles.

- To improve canopy stability spread the legs by 6 to 12 inches giving a slight slope to the side of the canopy. This will decrease the side to side movement of the canopy under wind conditions.
 - Anchor securely.
- **Tarp Attachment** – When attaching the tarp to the frame use ball tie bungees. These are specially design short bungee cords which hold the tarp taut but also have some give when the wind blows which relieves the stress on the grommets and the tarp. Ball tie bungees are a loop of bungee material connected to a plastic ball. To use you push the bungee through the grommet on the tarp then rap it around the frame tubing, finishing off by putting the loop over the ball. A diagram of this can be seen at www.CreativeShelters.com/Setup_instructions.asp . Fastening with rope can lead to premature failure of the tarp since the rope has very little give.
- Suggested sizes:
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 - 12" Ball ties for 1 7/8" frames
- **Weather warning** –  **All canopy shelters should be considered temporary structures and are not designed to withstand acts of nature such as heavy wind and snow. Anchoring of canopies is strongly recommended. Failure to anchor is unsafe and can lead to property damage.** If heavy snow or wind is expected the tarp should be removed from the canopy frame.
- **Wind** – Tarps will catch updraft winds which can lift the canopy. The wind lifting on canopy can put a lot of stress on the tarp, frame structure, fittings and the anchor system. Too much wind will eventually destroy the frame or will relocate the canopy to a new location, usually somewhere undesirable.
 - **Snow** – While canopies are made of heavy duty material too much snow will cause the tarps to tear or frame to collapse.
- **Anchoring** –Methods of securing will vary depending on where the canopy is located. Set up canopy before to verify leg placement before installing anchors or footpads to ensure proper placement.
- **To Cement** – For cement surfaces use:
 - Foot pads which can be attached to the bottom of the canopy legs and bolted using lead cement anchors and lag bolts.
 - Concrete anchor sleeves cemented directly into the concrete.
 - **To Wood** – surfaces foot pads can be secured using lag bolts.
 - **On Ground** – When setting up on dirt or grass make sure you select a location which has firm ground and use foot pads with either auger or duckbill anchors should be used for long term use and tent pegs with rope can be used for one day setups. When using anchors a rope should be tied to the fittings at the top of each leg and the other end of the rope should be tied to the anchor. The anchors should be installed 1-3 feet outside the

legs. Place the anchor as far from the leg as possible for best stability. If ground is soft consider cement foot pads or some other means of securely fastening the canopy down.

- **Foot pads** – Foot pads attach to the bottom of the canopy leg keeping the leg from sinking into the ground or to provide a way to secure the leg to a solid surface such as wood or cement. Foot pads have predrilled holes which can be used with bolts for mounting to hard surfaces. When using foot pads make sure all bolts are securely tightened and check them periodically to make sure they have not loosened with use.

Pop Up Canopies: While Creative Shelters does not sell Pop Up canopies you should be aware that they exist. In some applications these canopies are preferable to our tarp and frame canopies.

- Light weight – Pop up canopies are made of light weight frame material.
- Set up – These units do not require any assembly; they fold and unfold with scissor like action. The way these canopies fold up makes them very portable.
- Tops are made of fabrics such as light weight polyester.
- These canopies are good for picnics, sports events, arts and crafts shows.