Estimating Guide Book

A step-by-step guide to planning and estimating with aquatherm
At Aquatherm, we are continually moving forward with programs and processes to better serve the needs of the contractors, building owners, engineers and architects that use our products. Whether it’s providing hands-on installation training and certification, engineering documentation, product life-cycle data or information on how to do a better job, we are dedicated to supporting the needs of you, our clients.

This Estimating Guide Book has been created to help estimators use our new Quick Check Estimate (QCE) Tool on our website, as well as provide guidelines for your own estimation templates. Understanding how to create accurate estimates with Aquatherm projects is key to winning projects and providing your clients with the best possible products and installations.

This book and the QCE Tool program will help you better represent the entire picture of Aquatherm costs when you include all the aspects of materials, labor, equipment, and means and methods of the projects you are estimating.

This book and program will assist you in being confident that your estimates will make you money while winning you more projects. Just as polypropylene is newer to North America than other traditional piping materials, the estimating approach is new as well.

We are always ready to assist you, answer questions, and be your partner in your piping ventures. Your success will be our success.

Sincerely,

J. Hardy
CEO Aquatherm North America
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The purpose of this Estimating Guide Book is to provide an estimator with the needed information to produce an accurate and well-planned job cost using Aquatherm pipe. You can then compare your estimate against the Quick Check Estimator (QCE) tool posted at Aquatherm.com/QCE. This book is intended for use by plumbing, mechanical, and piping contractors, and does not address costs at the General Contractor level.

This guide book will help you understand the variables of estimating the total installed cost of an Aquatherm project. You can then compare it against other piping systems, based on your own experience and data. Knowing how to use the advantages of Aquatherm will give you an edge over your competition and can make your company more profitable.

For contractors who are new to Aquatherm, we recommend following the guidelines in this book in order to mitigate risk and increase profits. Over time, you will develop an estimating model that works for you and your company. Your ideal bid should make the total installed cost competitive against other piping systems but retain some additional margin to cover possible unforeseen circumstances.

Each company and each project is unique, and it is up to you to adapt the estimate for accurate bidding. With experience, you will be able to accurately and safely make your bids even more competitive if the need arises.

For the purposes of this guide book, we’ve broken down the estimating process into eight steps, focusing on the greatest variations from estimating other piping systems. These steps are as follows:

1. **Set up your estimating platform to include Aquatherm pipes and fittings.** Using a familiar system will help make the estimation process faster.

2. **Build a bill of Aquatherm materials using a take-off of the system drawings.** You will use this list to get material pricing and estimate labor and tool costs.

3. **Determine what types of labor and machines will be needed to fuse your list of materials together.** Fusion types affect your overall labor estimate and tool cost.

4. **Plan out the methods that will be used to assemble the pipe and fittings.** Build strategy affects the speed of installation and, in turn, labor and tooling costs.

5. **Decide the appropriate labor factor for the job.** The labor factor is affected by the difficulty of the work, the sizes of pipe being assembled, the build strategy, and the experience of the crew.

6. **Estimate the tooling costs for the job.** Tooling is dependent on the estimated labor, as material assembly requires fusion tools.

7. **Calculate the variations in the ancillary costs.** Changes in the costs of hangers, insulation, firestops, and other non-system components need to be considered.

8. **Explore savings through Aquatherm fabrication.** Costs on large or complicated sections can be reduced by ordering them pre-assembled from Aquatherm.
Estimating Aquatherm PP-R is not very different from estimating other materials, such as copper or steel. Modifying your own estimating template will make it easier for you to compare differences in the total installed costs. Plan the build strategy with your project manager to build in cost-saving processes.

Using an estimating template or software that is compatible with Aquatherm PP-R materials will make the process faster and more accurate.

If you use a popular estimating software such as QuickPen or Estimation, you can download an update that includes Aquatherm (pressure PP-R) parts as well as labor units for those parts. A list of softwares that are Aquatherm-compatible can be found at Aquatherm.com/estimating.

If the download does not contain Aquatherm parts or labor units, a CSV file of the parts can be found at Aquatherm.com/parts. This CSV file also contains the Aquatherm-produced labor units for the parts. Other labor units (such as MCAA) must be obtained from their respective publishers.

If you are using a BIM software solution in conjunction with an estimating software, such as TSI, you can download a Revit family of Aquatherm components at Aquatherm.com/estimating. This family is regularly updated to improve accuracy and functionality.

If you choose, you can also create a check estimate using Aquatherm’s Quick Check Estimator (QCE) tool. The QCE only contains parts produced by Aquatherm and does not create a bid-ready document. You will need to price hangers, insulation and other accessories for other sources. The QCE can be found at Aquatherm.com/QCE.

If you use an estimating system based on productivity rates rather than labor units, you can invert the labor unit numbers to create a productivity rate.

Once you’ve set up your template to include Aquatherm parts and PP-R labor units, you can begin your estimate. For accuracy, you can compare your estimated total installed costs against Aquatherm’s QCE. Instructions can be found at the end of this guide book.

As the total installed cost of an Aquatherm piping system depends very heavily on the strategy being employed, it is best to plan your build strategy with your PM. Decisions about how the pipe is assembled will affect material choices, labor times and tooling costs.

Strategies for improving productivity are discussed later in this book.

Switching to Aquatherm changes almost everything about your company’s past building strategies. A methodical approach to estimating will help keep everything clear and trackable for future projects.

What: Get Aquatherm parts, list prices and labor units added into your estimation template.

How:
• Update your software if an update exists
• Add Aquatherm parts and labor units into your database if you use a custom solution
• Use the Aquatherm QCE to check your estimate
SELECTING THE RIGHT PIPE

Aquatherm engineers its pipes for specific applications. Using the right pipe for the job will produce better results and saves money. In some cases, the proper pipe will already be in the specification. If not, contact your local Aquatherm rep or the engineer of record. You can follow the flow chart below to pick the right system, but your selection should be verified by application, temperature and pressure rating in the Aquatherm Product Catalog:

Unlike steel or copper, you will need to distinguish between hot water pipe and cold water pipe in your take-off. This will save you roughly 30% of the piping cost for the cold water system. The thickness of the pipe wall is a primary factor in determining cost, and will affect labor. From an overall cost standpoint, you will want to use the thinnest-walled pipe that meets the specifications for the system whenever possible.

If you’re not sure about your bill of materials, ask your wholesaler or local area rep to go over it with you. The right parts make all the difference.
PICK THE RIGHT FITTINGS
Aquatherm fittings are designed around a traditional system layout, so it is easy to switch over from other rigid piping materials. Aquatherm has also developed a number of innovative fittings that can reduce material and labor costs for your estimate. Double-check for conditions that softwares won’t always catch.

½” - 4” FITTINGS
Socket fittings go over the outside of the pipe and work with all the different pipe types and wall thicknesses. Choosing socket fittings is very similar to choosing fittings for copper or CPVC.

6” - 24” FITTINGS
Butt welded fittings fuse in-line with the pipe, so they need to match the pipe type and wall thickness. There are no couplings in these larger sizes, as the pipe ends and fitting ends butt fuse directly to each other.

FUSION OUTLETS
As an alternative to reducing tees and weld o-lets, Aquatherm offers fusion outlets. Fusion outlets have a low material cost and are fast to install. Outlets have a “main” dimension and a “branch” dimension. If you can’t find the exact outlet you need, you can substitute a smaller “main” size, as long as it has the right branch dimension.

TRANSITIONS
Aquatherm provides the most options for safely transitioning from PP-R to other components. This includes flanges, threads (in brass and SS), compression (for copper and PEX), and crimping (for PEX). These parts convert their nominal OD into an actual imperial OD for ease of use.

Double-check: Straight sections of 4” SDR 11 and SDR 176 pipe can be assembled without couplings, using a butt fusion method. This will have similar labor costs, but will save you the cost of the couplings. You will still need to use socket elbows, tees, flanges, and other fittings throughout the system.

Double-check: Aquatherm provides two styles of elbows: long-radius and short-radius. The short-radius elbows are based on ANSI steel dimensions and can cost 30% less than long-radius elbows. Aquatherm recommends using short-turn elbows whenever possible. A table comparing the pressure loss can be found at Aquatherm.com/elbows

Double-check: Fusion outlets will always be more cost effective than using a reducing tee. As a rule of thumb, outlets are available when the branch is one half or less the size of the main. The Aquatherm product catalog contains a full chart of the available fusion outlets.

Double-check: Transition fittings can be expensive, so it is best to minimize the numbers of transitions in a system. If several valves, sensors, or other equipment can be connected in close sequence, it may be best to connect as many parts as possible between transitions.
Determine connections types needed

**What:**
Decide what types of connections and crews are needed to join the pipe.

**How:**
- Determine which connections will be joined using socket fusion
- Determine which connections will be joined using butt fusion
- Determine which connections will be joined using electrofusion
- Determine which connections will be joined using non-fusion processes

There are four main ways to assemble Aquatherm pipe: socket fusion, butt fusion, electrofusion, and mechanical connections. Each of these options requires different tooling and different tasks from the crew installing the pipe. Understanding the differences will harness the advantages of each connection style, maximizing your team’s productivity.

Socket fusion is used from ½” through 4”. Butt fusion is for 6” through 24”. Electrofusion is used from ½” through 10” and mechanical connections are used on all sizes as needed.

**SOCKET FUSION (½” - 4”)**

**TOOLS**
All socket fusion connections require an appropriate heating iron and size-specific welding heads. The heads are interchangeable, so multiple heads can be used with a single iron. Smaller irons can use heads up to 2”, while larger irons can use heads up to 4”.

Socket fusion is mostly active labor with short cooling times, so each installer performing socket fusions will need their own heating iron and welding heads. While ½” - 1½” connections can be done by hand quickly and easily without additional help, 2” - 4” connections generally require either a socket fusion machine or a second installer to perform the fusion. Socket fusion machines act as a second set of hands to align and insert the pipe. It is almost always more cost effective to use a socket fusion machine instead of a second installer.

- **Socket fusion machine** $4-10/hour*
  - **VS.**
  - **Second installer cost** $60-80/hour*

*Rental and labor prices vary by market.

All heat fusion equipment and tools can either be rented or purchased from your local distributors. There are several manufacturers and each has its own strengths. Please feel free to consult with your area rep or distributor as to which types of tools will be most effective on a particular project.
CREW
Everyone installing Aquatherm pipe should be qualified by an Aquatherm trainer, even if they are not fusing the pipe. Most installers should have fusion irons, but this is dependent on how much prefabrication is being done. Pipe sections are lighter than metal pipes and usually require fewer installers and less equipment to move them around and lift them into position. Crews without socket fusion machines may require additional laborers to help with the larger connections.

BUTT FUSION (6” - 24”)

TOOLS
When performing butt fusions, all connections must be mechanically assisted. A machine is used to align, face, heat, compress, and support the pipe during the connection cycle. Choose machines based on the needs of the job and the size of the pipe. It is best to rent and test butt fusion machines before purchasing them.

All butt fusion machines use the same fusion process, but have different design elements depending on their manufacturer and model. Machines with four jaws and/or thicker clamps will generally require less alignment time, but may require extra labor to move around the jobsite. Lighter machines offer more mobility, but may offer less support for alignment. The controls will also vary by manufacturer. You will want to use machines that your crew has been trained on and is familiar with.

Larger machines have available inserts that allow them to do connections on smaller sizes, while smaller machines cannot fuse pipe that is larger than the machine’s jaws. However, larger machines require more handling and cost more per day to rent. You can decide when to rent a larger machine for multiple sizes, or when to use size-specific machines.

CREW
Butt fusion requires special training in addition to the Aquatherm Installer course. Anyone doing butt fusions will need this training.

While PP-R is lighter than metal pipe, the larger sizes and machines can exceed the handling limits of a single installer, so you may need designated handling labor and equipment. If part of the crew focuses strictly on handling, other parts of the crew can focus on cutting and/or fusion.

You will need at least one machine for each installer performing butt fusion. You may want to use multiple machines per installer if you are “leapfrogging” the machines (described in step 4). This technique saves time and labor by allowing the installer to continuously fuse pipe, rather than waiting for cooldown cycles.

ELECTROFUSION (½” - 10”)

TOOLS
Electrofusion uses electrical resistance heat at the point of fusion to make a connection. This requires specially designed couplings with electrical contacts and copper coils within the fitting. The installer will also need peeling tools to dry-fit the coupling and an electrofusion machine. These machines are available for rent, but few locations carry them in-house, so scheduling electrofusion in advance is critical.

CREW
Electrofusion requires additional training beyond the Aquatherm Installer course. Anyone preparing the pipe or performing fusions will need to take this training.

You can use an “everything” crew, which cuts, peels, preps, aligns, and fuses the connection before moving on. You can also use a “split” crew, where one crew gets the fitting ready for fusion and the second crew follows behind performing the connections. Electrofusion should be limited to areas where socket or butt fusion is difficult or not possible.

MECHANICAL

TOOLS
Mechanical connections are used to transition to or from non-Aquatherm pipes and equipment. The PP-R side will require either a socket fusion or butt weld connection. The mechanical side will depend on the type of connection being performed.

CREW
Mechanical connections are more likely to leak than fused connections and rely heavily on the installer’s craftsmanship. It is best to use your most experienced crews to assemble these connections.

FURTHER INFORMATION
Please visit www.aquatherm.com/aquatherm-installer-manual for tool descriptions and usages. More information regarding tooling and fusion is available through the Aquatherm Installer Course.
4 Decide how the pipe is installed

What:
Decide on a build strategy for the project.

How:
• Determine how much of the job can be prefabricated in a shop or on the ground
• Determine the most cost-effective way to place and join the pre-fabbed spools
• Identify and incorporate tactics for improving socket fusion productivity
• Identify and incorporate tactics for improving butt fusion productivity
• Determine a work sequence that minimizes tooling rental costs

Work with your Project Manager to plan out a usable build strategy while preparing your bid. This will help make the bid more accurate and start the project planning earlier. Having an estimate that matches the build strategy is crucial.

Aquatherm pipe is not a commodity product, so the long-term material pricing is incredibly stable. The fusion connections themselves are very quick and consistent. Therefore, the largest variation in the “total installed cost” comes from the planning and execution of the job.

PREFABRICATION
Simply stated, the more fusions you can perform at your shop or on the ground at the jobsite, the higher your overall productivity will be. Aquatherm pipe is up to 85% lighter than comparable metal pipes and can easily be pre-assembled and lifted into place. Most connections do not need to be made in the air.

With the correct fusion equipment, fusions can be performed in the air on scaffolding or man lifts. These in-place fusions require additional setup, are more difficult and time-consuming to process, and have longer cooling times compared to connections on the ground or a bench. Planning the parts and assemblies that can be fused prior to putting them in place boosts productivity significantly. Your build strategy should avoid in-air connections wherever possible.

A profitable Aquatherm installation will employ as much prefabrication as possible. For an example of how much prefabrication can reduce labor time, watch our video posted at Aquatherm.com/productivity.

SPOOL ASSEMBLY
Equally critical to prefabrication are the methods used to join the spools once they are completed. The most cost effective method will generally depend on the available space around the connection and how much lateral movement is available. If there is sufficient room for movement, socket or butt fusion connections will generally be the most economical. If the connection is hard to reach, inaccessible to fusion equipment, or allows for no lateral movement, an electrofusion connection can be used as a slip coupling. Alternatively, an Aquatherm union or a flange connection can be used.

IMPROVED SOCKET FUSION METHODS
Socket fusion is used on smaller Aquatherm pipe sizes (½” - 4”). These assemblies are lightweight and somewhat flexible. This flexibility allows for larger prefabricated assemblies to be built on the ground and then raised or fed into position. The installer should also start at the more confined locations of the build and work out toward areas with more room. This will help the installer avoid difficult connections.

Installers should use socket fusion machines to help them on connections from 2” to 4”, although these connections can be done with a second installer if the situation does not allow for the use of a socket fusion machine.

Installers should plan out the final connection of prefabricated assemblies before they are installed, as some movement is required to...
**LEAPFROG TECHNIQUE**

**Active user time:** includes loading, alignment, facing, and heating the pipe.

**Supported cooling time:** the absolute minimum time the pipe must remain in the machine.

**Unsupported cooling time:** the additional cooling time required if the joint is not fully supported during cooldown.

**Productivity rate (30 min. cycles)**

1 butt fusion machine, 1 installer, unsupported pipe: 2 fusions per hour

2 butt fusion machines, 1 installer, unsupported pipe: 4 fusions per hour

2 butt fusion machines, 1 installer, supported pipe: 6 fusions per hour

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**IMPROVED BUTT FUSION METHODS**

Having the right tools and crew when butt fusing pipe will make the installation much faster and more cost effective. Each connection only requires 30-50% active user time, while the rest of the time is spent waiting for the connection to cool. Using multiple machines allows the installer to perform another fusion while the first connection is cooling (called leapfrogging). In areas where socket fusion is difficult or impossible, a union, flange, or electrofusion connection may be substituted instead.

But in practice using multiple machines per crew increases productivity up to 200%. (See above graphic.)

You will want to have enough machines to keep your crew actively working without idle time, but not more machines than your crew can effectively manage. Choosing the proper ratio of machines-to-laborers, based on the experience of the crew and the scope of the work being performed, will produce higher productivity and lower costs.

Please consult with your local area rep or distributor to assist in purchasing and renting the right tools for a particular project.

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**WORK SEQUENCING WITH RENTALS**

When renting machines, it is most economical to do all the same-size connections on the machine sequentially rather than switching sizes. For example, when renting a 12” butt fusion machine, do all of the 12” connections that can be done at that time and return the machine rather than doing the connections over several weeks and having the machine sit idle. This will help reduce your rental costs.
Once you’ve created your bill of materials (see step 2) and understand your labor and build strategy (see steps 3 and 4), you can select a factor for component-based labor units. If you use a different format of estimating, you can compare it against the factored labor units.

The table below provides a range of labor factors based on the type of pipe being installed and the build strategy of the contractor. There are significant differences between the Aquatherm and MCAA tables in smaller sizes, so the factors given are intended to balance these numbers against real installation durations. The beginning level provides a safe and profitable starting point for a first-time installation, while the intermediate and advanced levels show what is attainable over time.

### Select your appropriate labor factor

**What:**
Choose a labor factor for this project, based on difficulty and experience.

**How:**
- Determine your experience level and build strategy
- Adjust your labor factor based on job-specific conditions, if needed

<table>
<thead>
<tr>
<th>Experience</th>
<th>Blended systems ⅛” - 24” &amp; primarily butt fusion 6” - 14”</th>
<th>Primarily socket fusion ½” - 4”</th>
<th>Primarily butt fusion 16” - 24”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginner</td>
<td>MCAA: 0.70, 1.00</td>
<td>MCAA: 0.60, 1.00</td>
<td>MCAA: 0.85, 1.00</td>
</tr>
<tr>
<td>Intermediate</td>
<td>MCAA: 0.50 - 0.65, 0.75 - 0.95</td>
<td>MCAA: 0.45 - 0.55, 0.75 - 0.95</td>
<td>MCAA: 0.60 - 0.75, 0.70 - 0.90</td>
</tr>
<tr>
<td>Advanced</td>
<td>MCAA: 0.35 - 0.45, 0.50 - 0.70</td>
<td>MCAA: 0.30 - 0.40, 0.50 - 0.70</td>
<td>MCAA: 0.45 - 0.55, 0.50 - 0.65</td>
</tr>
</tbody>
</table>

**ASSESS YOUR EXPERIENCE**

**BEGINNER:** Crew and supervisors have little to no experience installing Aquatherm, but all installers are Aquatherm qualified. The minimum numbers of required tools are being used. Crew is not employing any of the improved methods discussed in this book.

**INTERMEDIATE:** Crew and supervisors have some experience installing Aquatherm and/or are being directly assisted by an experienced Aquatherm trainer or installer. Multiple tools are provided to the crew with a focus on increased productivity. Prefabrication and other improved methods are being used throughout the job.

**ADVANCED:** Crew and supervisors are all experienced with installing Aquatherm. Crew uses an optimized set of tools that they are familiar with and are in good repair. Crew is knowledgeable in planning prefabrication and in-air assemblies, and has the ability to avoid problematic situations. They apply best methods and practices in all aspects of the job.

**ADJUST YOUR FACTOR**
You can adjust your factor up or down, based on the job. Some examples include:

- Abnormally difficult conditions (add 0.05–0.10)
- Frequent schedule interruptions (add 0.05–0.10)
- High degree of prefabrication (subtract 0.10–0.20)

On your first job, it is best to estimate using the beginner guidelines, even if you intend to employ improved fusion methods that will make the job go faster. Contact your local area rep for additional information and planning assistance.

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*Don’t set your labor factor too low until you have some experience bidding and installing Aquatherm. The beginner-level factors already include a significant pad to help you through the learning curve. Watch the video at aquatherm.com/productivity to see the comparison.*
There are two methods to calculate required machine time: man hours and connection times.

**MAN HOURS METHOD:** You can treat the machine time as man hours, so every man hour on a size of connection equates to a required machine hour. This method is intended for beginners and is more conservative. It is not intended to reflect improved fusion methods.

**CONNECTION TIMES METHOD:** Each connection has a minimum fusion time, independent of man hours. You can add up these connection times to calculate required machine time. Connection times assume the pipe is pre-cut and waiting at the machine, so you will need to include additional time for moving and setting up the butt fusion machines (unproductive machine time). This method is most accurate when the installer is using improved installation methods such as prefabrication and leapfrogging. The connection times can be found at Aquatherm.com/connection-times

**CATEGORIZE YOUR LABOR**

**MAN HOURS:** Add up the labor hours of the connections for each type of machine. For example:

<table>
<thead>
<tr>
<th>Material</th>
<th>Labor hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1” pipe</td>
<td>15.40</td>
</tr>
<tr>
<td>1” elbows</td>
<td>8.30</td>
</tr>
<tr>
<td>1” tees</td>
<td>2.35</td>
</tr>
<tr>
<td>2” x 1” outlets</td>
<td>3.42</td>
</tr>
<tr>
<td>2” pipe</td>
<td>22.67</td>
</tr>
<tr>
<td>2” elbows</td>
<td>5.80</td>
</tr>
<tr>
<td><strong>Total 2” iron</strong></td>
<td><strong>66.94</strong></td>
</tr>
</tbody>
</table>

This will give you an approximate number of hours for the selected machine. You will need to total the labor for each size of machine on the job.

**CONNECTION TIMES:** Add up the number of connections in each size and multiply them by the connection time. Increase the total to account for unproductive time.

**GET RENTAL RATES**

Once you know how many hours of each machine type you’ll need, get daily/weekly rental rates from your distributor. You can use those rates to calculate your fusion equipment costs.

**RENTING VS. BUYING**

Once you have a cost, you can decide if it is more cost effective to rent or purchase machines. It is usually worth purchasing the irons and heads for socket fusion. For larger equipment, it is best to test-rent the machines to confirm that they suit your crew’s work style before purchasing them.

**OPTIMIZE THE SCHEDULE**

You can minimize costs with efficient rental planning. For example, 120 hours of machine time equals 1 machine for 3 weeks or 3 machines for 1 week. The machine cost will be the same and saves on labor and other equipment costs by finishing sooner.

You can also save money by completing all the work of a particular machine size or type and returning it, rather than paying for the machine to sit idle. A build strategy that keeps the fusion machines actively working avoids wasted costs.

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**What:**

Estimate the cost of the fusion tools for the job.

**How:**

- Calculate your required machine time
- Categorize your labor
- Get rental rates
- Decide if you are buying or renting
- Optimize your rental schedule

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Fusion equipment normally represents 4-10% of the total cost of the job. That may seem high, but proper fusion equipment can save up to 50% of the labor, which is a much bigger part of the total installed cost.
Evaluate cost changes in ancillary products

In addition to the pipe material, labor, and equipment costs of installing Aquatherm pipe, you will also need to add in the accessory costs of the systems. This includes components such as insulation, hangers and supports, paint, firestop, specialty valves, pumps, sensors, and other non-Aquatherm components in the system. Prices for these components can be obtained from your local area distributor.

INSULATION
Aquatherm pipes are metric and don’t always match standard copper tube and iron pipe insulation sizes. Using the wrong size of pipe insulation or asking the insulation subcontractor for a last-minute change order can result in increased insulation costs. Contact your local area rep for information on metric-sized insulation, and consult your insulation subcontractor early to avoid potentially expensive change orders.

PUMPS, VALVES, SENSORS, ETC.
Most standard mechanical equipment is compatible with Aquatherm pipe. Aquatherm produces a wide range of transitions to accommodate other components. Pricing for non-Aquatherm parts should be obtained from your local distributor. Contact your local Aquatherm rep if you are uncertain about the compatibility of Aquatherm with any mechanical component.

CONSUMABLES
Heat fusion does not use any consumables such as flux, rods, propane, glue or primer. However, heat fusion requires a steady electrical supply. Remember to budget for temporary power or generators.
**FIRESTOP**

Aquatherm-compatible firestops are available from several major manufacturers in North America. A list of manufacturers can be found at [Aquatherm.com/ancillary-products](http://Aquatherm.com/ancillary-products). Notify the firestop subcontractor early in the process and have them provide pricing for the appropriate firestops.

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**PAINT**

If the pipe is being installed outside where it will be exposed to direct sunlight, it will need to be protected from UV radiation. This is most economically achieved by painting the pipe, although the paint will require some maintenance over time. Cost-wise, this is comparable to painting steel pipe to protect it from rusting. Aquatherm recommends using an elastomeric paint that expands and contracts rather than aging and flaking off. Contact your local industrial coating supplier for recommendations and pricing.

Aquatherm also offers its pipe with an extruded UV protection layer. It costs more than painting, but lasts the life of the pipe. Contact your Aquatherm distributor for pricing.

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**HANGERS AND SUPPORTS**

Aquatherm pipe has different hanger spacing requirements than metal pipes. These requirements can be found in chapter 4 of the Aquatherm Product Catalog. Normally, the hanger spacing is only an issue on straight runs and doesn’t affect areas with frequent direction changes, such as mechanical rooms.

To meet these support requirements, you can either use closer hanger spacing or use in-line supports to increase the spacing requirements (see Aquatherm Product Catalog for details).

This is an especially cost-effective solution in retrofit situations where the hangers are already in place. You will need to decide where additional support is needed and what the most cost-effective solution will be.

As with insulation, you will need metric-sized clamps to attach directly to the pipe. Contact your local area distributor to obtain metric-sized clamping. If the pipe has been insulated to have a standard imperial OD, use matching imperial-sized hangers.

This is an especially cost-effective solution in retrofit situations where the hangers are already in place. You will need to decide where additional support is needed and what the most cost-effective solution will be.
Explore savings through Aquatherm fabrication

Aquatherm’s Utah-based headquarters boasts the most experienced team of PP-R fabricators in North America. They operate at expert-level labor numbers, which can result in big savings for you on complicated or tool-intensive spools.

What:
Get quotes on pre-assembled fittings and spools from Aquatherm.

How:
• Determine which sections of the build will be costly or time consuming
• Submit drawings to Aquatherm for quotes
• Compare against your own estimated costs for these parts

As you review your build strategy and costs, you may find pipe sections that are labor intensive or will incur excessive tooling costs. Rather than letting these sections throw off your estimate, you can submit a drawing to Aquatherm through your local area rep and get a quote within 48 hours. Our high productivity rate and low tooling overhead allows us to offer considerable savings on an otherwise costly part of the job.

Our goal is to help you have an efficient and profitable install. Our prefabrication services are a great way to help make that happen. Contact us any time for clarification or suggestions.

At the Aquatherm North American Logistics Center, we can fabricate and assemble specialized spools and ship the units to your shop or jobsite. We will provide you with an estimate of materials, labor and shipping. You can insert this proposal into your estimate just as you would with any subcontractor or materials provided. This can be especially valuable to you if your crew is inexperienced, overextended, or short on tools.
Creating a check estimate

To help make sure your estimate is on track, Aquatherm has created a Quick Check Estimator (QCE) tool that will estimate materials, labor and tool costs for the piping portion of the estimate (steps 2 through 6 ONLY). You can insert the QCE output into your project estimate, or use the QCE to check your own calculations. The QCE has a built-in tutorial to help you use all the available features. This guide book provides the basic steps.

MATERIALS
The Materials tab lets you build a list of Aquatherm parts even if you don’t know the part numbers. You can search for parts, select quantities and add them to your “Selected Parts” sheet. The selected parts are your bill of materials (see step 2).

LABOR
The Labor tab allows you to estimate labor costs for the project. The labor table lets you choose which published labor units to use. The labor factor lets you adjust the labor units based on planning and experience (steps 3-5). The labor rate lets you enter the average hourly cost of labor in your market. The total is the piping labor cost estimate.

TOOLS
The tools tab lets you add an approximate cost for fusion equipment. It contains default hourly tool costs and uses the “man hours” approach discussed in step 6. As you increase or decrease your labor factor, your tool costs will automatically adjust. If you own your tools or have pricing that differs from the defaults, you can change the rental costs to create a more accurate estimate.
Creating a check estimate

**PROJECT INFO**
The QCE lets you export your materials list in several formats, such as a quote or submittal. You can fill out the fields on this tab and it will automatically fill in your exported documents.

You can also save your materials list to your Aquatherm.com account (if you have one) so that you can work on your project from any number of devices. If you don’t have an Aquatherm.com account, you can create one by registering on the site.

**IMPORT/EXPORT**
This tab lets you export your project, import a saved project, or add an entire list of Aquatherm parts at once.

**PROJECTS**
If you are logged into your Aquatherm.com account, you can save your current project, import a saved project, or manage the projects that are saved to your accounts.

**EXCEL FILES**
This part of the page lets you export your project in an Excel (CSV) format. The export will include the parts, multiplier, labor factor, labor rate, and tool estimate. It does not include additional costs, overhead, or profit, so you should be careful about with whom you share this data.

You can also import an exported file back into the tool if you want to make modifications to it. The import feature only works with the exported QCE files.

**TEXT IMPORT**
This function allows you to paste in a list of parts from any source. You will need to follow the instructions posted on the page.
Summary

USING YOUR ESTIMATE
The total cost of parts, labor, and tools, combined with any adjustments in accessory costs, will provide you with a solid comparison for substituting Aquatherm against another piping choice. Many contractors are surprised to see how competitive Aquatherm is when you look at total installed costs. If the estimate isn’t quite where you want it to be, have your local Aquatherm representative go through it with you. You may be able to find additional savings or more accurately predict certain costs.

VALUE OVER TIME
While your early jobs may not offer a significant cost advantage, continued use will result in faster labor and reduced tooling costs. With experience and planning, you will find that Aquatherm is your most consistent and profitable product to install.

Aquatherm’s heat-fused PP-R represents an increase in customer value, so you can increase your bottom line while providing your clients with a product they will love. Giving your customers a better product helps build their loyalty and your company’s reputation.

The North American market has already begun shifting towards PP-R with heat fusion connections. Being prepared for the changing market will help your company lead and grow for decades to come.