Comprehensive Guide to Roll Forming Costs

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Roll forming is a highly durable and repeatable metal fabrication process that pulls metal through a sequence of roll dies, gradually manipulating it into the desired cross-sectional shape.

Depending on your project, the roll forming process could be a smart investment ... or an inefficient money dump.

Here’s the rundown:
What Affects Roll Forming Cost?

When done correctly, under the guidance of an experienced partner, roll forming can be one of the most efficient and cost-effective methods of metal shaping.

Sorry, but it still isn’t free. But we have identified for you the major factors affecting the cost of roll forming:

1. Setup Time

Setup time refers to the amount of time it takes to put the roll tools into the machine and then take them out.

This time will vary based on the complexity of the shapes you’re producing, which relates directly to the number of steps required for tool assembly.
OK, let’s start the clock:

1. First, you retrieve the roll dies from storage. Facility organization is the most important factor in retrieval speed -- if there’s a repeatable method and clear working space, retrieving roll dies is simple. However, if the plant is cluttered and the workers are disorganized, time will most certainly be wasted.

2. Inserting the roll dies into the machine is the next hurdle. This time varies depending on the availability of mechanical aids (cranes, hoists) or the number of people used to move the process along.

3. Lastly, roll form machine components such as pre-punch die design, product shape definition, and cutoff die design can affect setup time.

To fully minimize setup time, we recommend deploying multiperson “pit crews” to assemble and disassemble each machine. You should also use a consistent assembly technique and keep your facilities strictly organized.
2. Materials

Not surprisingly, materials make up the bulk of roll forming costs. Raw materials can be anywhere from 40% to 80% of the final cost.

The cost of a material depends on its thickness, market cost, and scrap factor.

A thin, inexpensive material (like thin carbon steel) can take up 40% to 50% of the cost. If the material is heavy and expensive (i.e. copper, bronze, stainless steel), it reaches up to 80% of the total price.

The great thing about roll forming is that it produces little scrap – on average, only 0.5% to 3% scrap is produced. So, there won’t be as much monetary or material waste once you buy the materials.

Knowing how critical raw material cost is, we suggest a roll forming company constantly watches the world metal markets to ensure it takes the optimal action for any customer’s supply pipeline.
3. Run Speed

Run speed is the rate at which you can feed a strip of metal through the machine.

Once you have the roll dies in place and the steel loaded up, a roll form machine will run at a consistent, rapid pace. The faster it runs, the cheaper the components.

There are several different factors that influence run speed:

1. **Machine speed limitations** -- just like cars, some roll form machines are initially built to run faster than others.

2. **Number of roll dies in sequence** -- If a machine only has 10 roll die stations, each station is taking 1/10 of the work.

   In that case, each station is doing more work than a machine with 20 stations, which would only take 1/20 of the work.

   The less work each station has to do, the faster the metal can run through the machine.
3. **Roll die diameter** -- Larger diameters result in faster run speeds. Think *tangential velocity*.

4. **Length of final product** -- Very short parts take longer to run through a roll form machine. This relates to the time it takes the flying cutoff die carriage to return to the start position before it must accelerate and cut off the next part.

   Every time the die cuts off a piece of metal, it has to retract back and accelerate to punch the next one.

5. **Pre-punch strokes** -- Since the metal strip needs to stop momentarily to receive its punched features, the more features that can be punched per stop, the faster the parts will run.

   Good die designers make sure punched parts stop for the least amount of time. “Slack loops” in the coil strip between the pre-punch press and the roll forming line allow the roll tools to run continuously … but the loops can only take up so much slack!

6. **Unloading time** -- If a part is extremely heavy or long, it will require mechanical assistance to move from the machine, meaning the machinist must wait to continue.
Compared to fabrication techniques like turret punching and press braking, roll forming offers the advantage of combining multiple operations in the formation of a single part.

This capability eliminates the need for multiple workstations or transporting materials across the shop floor. It also allows for the addition of holes, notches, and secondary bends without interrupting the production flow.

All of these attributes merge to greatly reduce the overall manufacturing costs for complex, tight-tolerance metal components.

Remember, the number-one rule of tolerances for affordable, efficient parts is to make them as loose as possible without sacrificing quality.
Other tips for engineering efficiently:

- Use common metals that are easy to obtain
- Avoid tight corners less than 1.5 times the material’s thickness. These will increase tool wear and breakage, not to mention burn out a low-horsepower roll forming machine. Tight corners can also cause stress cracking in harder materials.

The ideal rolled form part involves no extra costs or considerations. Here’s more on how to create a great roll formed part at a palatable cost.
Bringing roll forming processes into your plant is more than just buying a machine that you can turn on when you need it.

There are additional costs and risks that many non-roll former facilities don’t understand until it’s too late.

You may have seen used roll forming machines online and thought, “Seems simple enough. I can do this.”

You may be considering having a new equipment manufacturer design and install a turnkey custom machine.

Or, you may be weighing the pros and cons of roll forming in-house versus outsourcing to an experienced roll former.

All of these options can bring success -- the level of success just depends on your specific operations, needs, and goals.

Let’s take a closer look at those influencing factors.
1. **In-House Inventory Control vs. Vendor Deliveries**

Control over inventory and quantities is a major reason companies bring roll forming in-house. But how does inventory control stack up against the cost of roll forming operations?

- Will there be a full-time line operator?
- High-volumes require full-time roll forming line teams. Will your company be able to balance the cost and other aspects of full-time roll forming?

Roll formers already have balanced systems to provide full-time roll forming capabilities at a reasonable cost.

A roll former can also manage your inventory for you. Inventory costs are one of those factors that can sneak up on you.

Stock should be minimized to reduce costs while providing a buffer for changes in demand. Inexperienced inventory management can cause costly supply chain disruptions.
Roll forming equipment is more than just the forming machine itself. Here’s a full overview of a standard roll forming line. This includes:

- Materials handling equipment
- Loading crane
- Uncoiling system
- Pre-punch press (if your part has holes, slots, or tabs)
- Accurate feeder/control system
- Flying die cutoff accelerator with controls
- Appropriately sized cutoff press

2. Cost of Equipment vs. ROI

All of these components must match your forming tools, pre-punch die, and cutoff die.

The cost of a complete roll forming system can range from $200,000 to $2 million, depending on the complexity of your part family.

Most in-house systems can only produce one part profile. A typical line can produce about 1.5 million linear feet per year in a single-shift operation.

If you’re planning on purchasing your own roll forming system, you definitely need high volumes to get a decent return on investment (ROI).
Unlike press brake machinery, roll forming lines require operators with years of experience to ensure high-quality outputs.

Can your in-house operators do it all? You’d better hope so.

On the other hand, an experienced roll forming manufacturer is guaranteed to understand and account for variables like inconsistent commercial metal thickness, how to account for part stretching, and how to avoid metal crashing into dies.

Furthermore, operators can run **multiple profiles and metals on a single line**. That means equipment investment costs stay as low as possible.

Experts are very expensive to hire full-time for your own operations. And, if you need service contractors, they very likely will not have schedules that meet your urgent needs. That puts your supply chain and your customers at risk.
Although in-house roll forming is appropriate for some companies, it’s definitely not a cost-effective alternative for everyone. For many, a contract roll former will produce higher ROI.

To recap, here are the costs that go into a comprehensive in-house roll forming system:

- Basic roll forming machine
- Equipment components
- Experienced niche labor
- Maintenance, troubleshooting, and repairs
- Inventory management
- Materials
- Quality control
- Secondary operations
Now let’s look at the **total cost of ownership**, not just the price of your parts.

By working with a company that optimizes every step of the roll forming process, you cut costs in ways that aren’t directly related to the per-part cost. So, what are the major contributors to the indirect cost savings of a comprehensive supply system?
Inventory Management

Dahlstrom has found that the most cost-effective style of inventory management is one of Kanban-based trigger response.

You give us the trigger information directly from the point of use (ideally from the people using the parts), and we respond based on our replenishment system design.

This management style works for both raw materials on our own production floor as well as your finished product inventories.

The cycle starts with an estimation of yearly consumption (this estimation gets more precise and seasonal the longer we manage your inventory) divided by an economic order run quantity to figure out how many “bundles” should be in your system.

Then, we ship and track amounts of those bundles depending on trigger points indicated by the client.

A typical scenario plays out like this:
1. You consume 1,000 pieces a year, and we run the pieces four times per year -- so, each run produces 250 pieces. We organize the pieces into bundles of 50 pieces each, which means there are always five bundles in the system.

2. We ship you three bundles to start. Shipping only a portion of the product at a time helps you keep inventory at a minimum, and assists us in our tracking and distribution of the product.

3. As soon as you indicate you have only one unopened bundle left, that’s our trigger. We immediately release two more bundles so you have three again.

If for some reason you indicate that your inventory is dwindling more quickly than usual, or you’re not using as much as expected, we can adjust our output to meet your needs.

This point-of-use feedback system is the best way to manage inventory and gauge costs accurately.

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**Periodic Reviews**

To make sure you’re getting the most out of our supply system, Dahlstrom sits down with you quarterly and discusses the results.

Agenda items typically include:

- Inventory levels
- Raw material market overview and purchase decisions for the next period
- Cost-saving ideas
- Any pending changes (design, freight use, personnel, etc.)
Raw Material Inventories

Dahlstrom uses the same system of triggers and responses to make sure our coil inventories are correct. Wide master coils are slit into smaller run coils; when we hit the run coil trigger at our steel supplier’s warehouse, we order another master.

This system allows a company to be more flexible when buying materials for clients. We don’t hoard inventory, so we can quickly change gears if a client no longer needs a certain product.

Roll forming companies should stay close to market pricing as well, rather than gambling with your raw material dollars.

Quality Systems

At Dahlstrom, our cross-training system gets employees ready for different machines and client jobs.

If something were to happen to the primary employee who runs your product, there is guaranteed to be another person who understands your tooling and part quality requirements.

That means your project will be on time, and you’ll have no unexpected costs or delays for idle time.
What Other Systems Lack

With an enterprise resource planning -- more commonly known as ERP -- system, you might have a note that says you will use no more than three pieces of material for each unit manufactured.

This sounds perfect in theory, but human error quickly gets in the way. All the time, people:

- Drop stuff
- Scratch stuff
- Otherwise damage stuff

Even worse, those instances often go unreported due to forgetfulness or fear of repercussions.

So, more inventory is being used up without any documentation.

In these situations, it’s very common for the manufacturer’s personnel to go to a shelf in search of an item, only to find the inventory has been emptied.

This misunderstanding of true consumption is an unnecessary waste of time and reliability for suppliers and customers alike.

With the trigger-response system, it doesn’t matter if the personnel use a little more (or less) than expected -- the only thing that matters for the consumption-replenishment cycle is how many unopened bundles are left on the shelf and communicating that back to the source of supply frequently.
To Recap,

When you work with a vendor who provides all of these systems, you get:

- Reduced waste and optimized materials costs
- Involvement and complete transparency in the buying process and other processes
- No wasted or idle manufacturing time
- Confidence in on-time delivery and part quality

Not all of these translate directly into monetary savings, but they can be **just as valuable**.

*If you want to utilize Dahlstrom's technical expertise and harness the cost benefits of a streamlined roll form process, contact us at (716) 664-2555 or info@dahlstromrollform.com, or submit a Request for Quote.*