

# The 5 Golden Rules of Gear Buying

## Industry Experts Share Their Tips on Making a Successful Purchase

Erik Schmidt, Assistant Editor

Let's be clear about something up front here: Delta Gear does not make parts for lawnmowers.

This is a fairly flippanant point that falls under the timeless, clichéd designation of “goes without saying.” Yet, not all that long ago, Tony Werschky had to say it.

“I’m the person who fields calls from people visiting our website,” said Werschky, Delta’s vice president of sales. “I’ve literally had people calling me asking to replace a gear from a lawnmower. Really just not the targeted customer we’re looking for.”

You think?

Delta (Livonia, MI), a leading supplier of high-precision aerospace gears that makes thousands of transactions a year totaling in the tens of millions of dollars, isn’t exactly in the business of fixing broken down Toro TimeMasters.

Of course, it wasn’t the first time Werschky received a call from someone who wouldn’t know an involute tooth from a tooth ache if hit them straight in the mouth. This buyer, the one living in blissful ignorance of all things gears, exists out there in the world. In fact, there are more of them out there than you’d think. It’s not quite an infestation, but it’s a persistent problem nonetheless.

Werschky’s sage advice: Don’t be that guy.

Here’s how.



### Educate Yourself

OK, so maybe that’s a bit too simplistically ambiguous to be of any help to gear-buying newbies, but the general gist is that before conversing with any supplier, you should actually *know what you’re talking about*.

Now, you don’t have to possess an encyclopedic knowledge on the subject dating back to 150 B.C. when the Antikythera mechanism’s bronze gears first churned. No one is expecting you to be Heron of Alexandria.

But some basic working knowledge goes a long way.

“You have to educate yourself about what you need your gears to do,” said Chuck Schultz, owner of engineering consulting firm Beyta Gear Service. “In my book [‘Introduction to Gear Design’] I ask basic questions: ‘What kind of gears am I getting? What do they have to be made of? How should they be inspected?’ Those kinds of things.”

“For most gear companies, an educated customer is what they want. They don’t want a guy who’s going to be surprised later that there are tool marks here or there.”

Acquiring vast knowledge can take decades, which is how Schultz – a member of the gear industry since 1971 when he worked for The Falk Corporation in Milwaukee, WI – built up his gear mastery to robust levels. His book is a good place to start for those lacking in gear comprehension in desperate need of a quick crash course.

“About 30 years ago I joked that we needed a ‘Gears for Complete Idiots’ book,” Schultz said. “This was long before any of the books were out. I ended up writing one and it’s on my website [[www.beytagear.com](http://www.beytagear.com)] for free download.

“I encourage all gear buyers to become as educated as possible on what’s going on in gears. That’s why my book is available.”

For those not willing or able to thumb through Schultz’s gear buying bible, there’s another way to obtain information looking you right in the face. According to Werschky, company executives dealing in the buying of gears should confer with their engineers before delving into any serious negotiations.

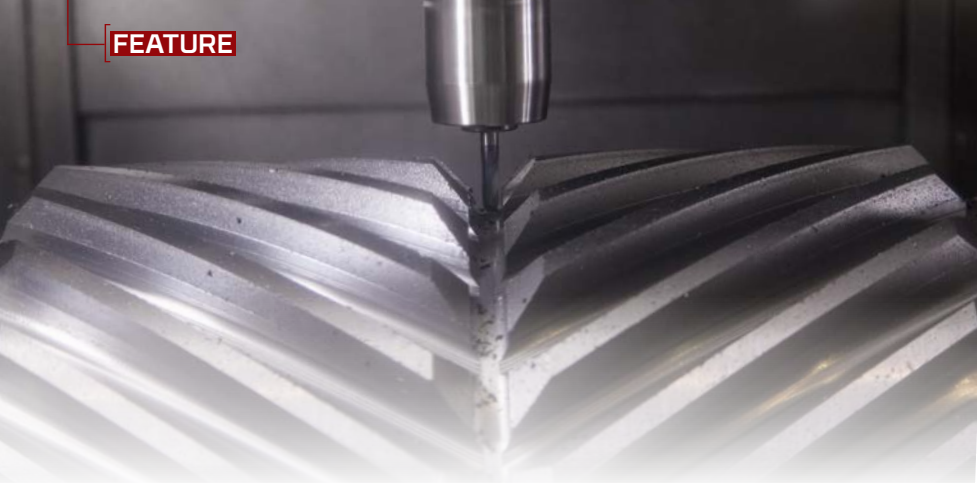
“One of the key things a buyer should do is be willing to partner with his engineering staff, because the engineers are going to be able to provide insight as to what kind of quality you’re going to get from a particular supplier,” Werschky said. “Not all suppliers are designed the same way, obviously.”

“For [Delta Gear], we’re working with larger OEMs or large assembly companies, so they often have a large staff of buyers who are buying anything from widgets to gears to shafts. There may be a dozen different buyers for the whole project.

“Granted, we may only work with one or two of those buyers, but many times these buyers are untrained. They don’t know the difference between a bearing and a gear. To them it’s just a thing that they have to purchase.

“Some are very educated and were engineers at one point, but others just get promoted from fresh out of college and are very new and green, if you will. That’s why it would be good for them





to lean on the knowledge and expertise of other people in their facility to make sure that they're quoting the right companies, as opposed to, 'Hey, I found these three companies on the Internet and their website looks pretty cool.'"



### Know Your Supplier

That brings us back to lawnmowers.

Remember, Delta doesn't make that kind of gears. Not even close. It would seem impossible to confuse a manufacturer of high-end prototype gears with someone who could help get your Kentucky bluegrass a much needed haircut, but it's happened.

If you search "gear suppliers," there are 29,500,000 results (yeah, the old Google trick isn't a terribly creative way to deliver a point but the effects remain poignant), and out of those nearly 30 million hits only a handful will link you to a company that can provide you with exactly what you need.

As a buyer, you don't have many chances to get it right. There's a million ways to get it wrong.

"There are companies out there who are a wholesaler of parts and they call us out of the blue for a part that we've never made before," Werschky said. "They don't have the drawings for it,

and it's not a part that's our forte, so it's a situation where they probably don't have an engineer on staff, nor have they ever tried to procure the part in the past.

"Maybe it comes down to these companies just needing to get another quote before they buy from someone else, but it happens quite a bit where someone will call us looking for something that we can't really provide, or at least don't usually provide."

As someone who has been on the wrong end of nonsensical inquiries many times, Werschky said that while there are no *dumb* questions, there are *unnecessary* ones – and it's often better to burden yourself with answering those questions before picking up the phone.

"You need to ask, 'Where is the raw material coming from?'" added Schultz. "Are you doing all the work yourself? Where are you getting the heat treating?"

"That opens up a whole line of questioning to your heat treat vendors, because there are a lot of good heat treaters and there are a lot of guys I wouldn't ask to heat up a shovel. I mean seriously, there are gear heat treaters and others who aren't gear heat treaters – and they don't pretend to be. But if you send it to them they'll put in the furnace and heat it up and cool it down."

The moral of the story is that not all gears are created equally. Manufacturers service a multitude of industries, from aerospace to automotive to mining to oil and gas, and each industry requires precise specifications. Delta, for instance, manufactures custom gears, shafts and gearboxes for the aerospace and automotive industries. Could they make a part for the Dubuque Mining

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Company? Sure. Is it what they possess an astute expertise in? Not exactly.

Finding the proper gear supplier may take time, but it's an investment with a continuous payout, because partnering with the perfect manufacturer is essential to achieving smooth, long-lasting success.

Buyers must know their own products, yes. But knowing what the seller's *selling* should never be overlooked.



### Draw it Up Right

So you've read "Introduction to Gear Design" a half dozen times and conducted a caffeine-powered search of the World Wide Web until you've located the one gear manufacturer that makes you swoon.

It's time to open that corporate bank account and coat the sky with leafy green rectangles, right?

Whoa, easy there Gordon Gekko. Step away from the ATM machine. Take a deep breath. Let the parameters of the deal swirl around in the old noggin for a while. Then get a pencil and paper.

Before you can run, you have to draw.

"Having clear and concise, understandable drawings is important as well," Werschky said. "We're building to print. Someone sends us a request for a quote (RFQ) along with a drawing, and the drawing has all the information in order to make that part. It

has everything from material to heat treatment to any special coatings. The gear geometry is on there.

"It's important that the information you're providing is as complete as possible so that the supplier can quote it as competitively as they can. When there's lack of information, inside sales people have to be conservative with what they quote in order to protect themselves from the worst case scenario."

For custom gear suppliers, such as Delta, the drawing is everything. Each and every part they make is specially crafted to fit *your machine*. Not his. Not hers. Not that guy over there – *yours*. So make sure your drawing does your machine justice.

Spending the necessary time to create a thorough, detailed drawing can save you weeks or even months down the line.

"Usually [poor drawings] result in delays," Werschky said. "What happens is we quote a job and if the job is released to us and we start to make it, we go through an engineering stage where we're processing the job to go out on the floor. At that point, if there's missing information we have to go back and contact the customer, they have to get the information to the right person, that person has to provide the information that we need – sometimes, in larger companies, that will take weeks.

"Everybody is in a hurry. They all want parts fast. I don't know anyone who will say, 'No, take your time. I can wait.' They all want parts as fast as they can get them.

"Not having the right information when you initialize an RFQ is going to slow down the process, and that's only going to slow down your ability to get to market with your finished product."

And it's not just time you're going to save by producing pristine drawings – it's money, energy and ever-important peace of mind.

"I have a client who routinely sends people drawings that aren't legible," Schultz said. "Then he's unhappy because the gear shop has to ask a lot of questions.

"[If you don't have good drawings] you're going to get parts that don't fit or don't work. You're going to have delays. If you have tooling that goes with the job, you have to make sure you explain that to them or you're going to pay for tooling twice. If you have spline gauges or bore gauges, you have to identify that.

"Make sure your drawings are readable and understandable for everyone."



### Get the Proper Papers

This one seems pretty simple, but somehow it's a step that some buyers gloss over, according to Werschky.

"You want to make sure you're getting the documented proof of what the quality is you're looking for," he said. "Meaning, you want inspection reports with what you're getting.

"It may sound like a no-brainer, but unless you spell it out, some companies won't provide that information to you. While other companies, like [Delta], always provide it because we're ISO certified and AS9100 certified. It's part of our standard operation procedure to provide those inspection reports.

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### Fight the Lure of the Cheapskate

"It's something that costs money to provide, so it's included in our price. That makes us less competitive against someone who doesn't really inspect parts. But it's crucial [the buyer] gets documented proof and they spell that out in their RFQ."

If things go awry for unbeknownst reasons (maybe your drawings weren't up to snuff, *cough, cough*), it becomes nearly impossible to prove it was the supplier's fault – and get reimbursed those precious greenbacks – without the proper paperwork.

"[Without paperwork] the buyer has no way of proving that the gear was produced correctly," Werschky said. "That leads to noise problems, failures in the field, all kinds of problems they don't want to have. Sometimes it's hard to point the finger after the fact. The cost of quality is so much more expensive when there's a failure in the field as opposed to catching it before the parts are even shipped."

And remember one of gear buying's golden rules: Ask and you shall receive.

"You want a certificate of compliance, but if you need more than that you have to say that and you have to expect that you're going to get charged for it because there is time involved," added Schultz.

"If you don't get the documentation, you're going to end up with a [confrontation] later on why the gears are noisy or why they didn't work. I have some information about chart reading in my book. You can have gears that have really good looking charts but still don't perform well, simply because the design isn't right.

"If you expect to get something, you better ask for it."

As a species, humanity has an abundance of strong natural responses, one of the most prominent of which is the irresistible tug that pulls us from common sense and leads us straight to the lowest bidder.

Just call it the Lure of the Cheapskate.

Now, there's nothing wrong with being frugal. Saving money is certainly a dignified and respectable course of action, but being irrationally cheap at the forefront of negotiations is usually just a harbinger of an excessive money sink looming in the future.

And if "ask and you shall receive" is the golden rule of gear buying, then "you get what you pay for" is probably the platinum one.

"The cost of quality is so much more expensive if you have a problem," Werschky said, "and [problems arise] when you have lack of information, or when you have someone who is trying to produce a part of a certain quality without really having the right equipment to produce that quality. For example, they're trying to cut a gear and heat treat it and have it be finished, when really it needs to be hard finished after heat treatment.

"When there's a problem the cost associated with backtracking and replacing it is so much more – it's 10 times more expensive, I would say – than just spending a little more at the time of procurement to have that knowledge and peace of mind that the part is to the print."

How do you avoid the Lure?

Well, first of all, go ahead and tie yourself tight to the mast of a schooner. You can thank Odysseus for that one. Second – and much more importantly – get multiple quotes.

Be patient.

Weigh the pros and cons of each offer.

Remember that more money up front isn't wasted change but a smart and sound investment for years down the line.

"There's more to buying a gear than just getting a low price," said Schultz. "I encourage people to visit their vendors. I wouldn't place an important order without visiting people.

"People lose their jobs all the time for vendors not providing the right stuff. Don't be one of them."

Then, when all the factors have been accounted for, untie yourself from that infernal mast and sign on the dotted line.

Congratulations.

You just bought some gears. **PTE**

#### For more information:

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