

# **The Cost Equation**

## *Understanding Cheap Sex Machines*

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## Part 1: Introduction

If your interest in machine sex is sincere, you've probably searched the web and found a number of web sites offering relevant products, across a wide range of prices and saying rather similar things. Several recent entries to the sex machine market have an obvious focus on "cheap," fighting for the niche of "cheapest sex machine". You may be wondering if there really is a meaningful difference between Orgasm Alley and these other folks.

I feel quite strongly that there are pervasive differences between my offerings and those of a number of competitors. With newbies focusing so strongly on cost as a selling point, I felt "The Cost Equation" a reasonable framework for this little article, although it's real purpose is to explain the advantages of Orgasm Alley products.

Please note that this article doesn't mention names, nor do I believe it provides enough information for the average browser to immediately identify anyone's specific product or marketing. This is quite intentional. My objective is to educate you -- the prospective buyer -- not to slam the competition.

I freely admit that my perspective is biased: I make and sell sex machines, and am not a neutral observer of this marketplace. However, I am also a brutally honest man. As with everything I write, I stand behind this article as accurate and complete to the best of my ability.

### ***You Know Cheap***

Who hasn't owned a typical \$10 sex shop vibrator, expected useful life of roughly one month? Why do those things break so easily? ***Because they're cheap.*** If you're paying \$10 retail, it's a reasonable guess that someone in China made it for \$1-2. It's poorly designed, uses inferior components, and simply isn't built to last. While an inconvenience, no one really minds that much... it's only a few bucks to replace, after all.

I'm not saying cheap sex machines are ***that*** bad, of course. It's simply an example I think many people can relate to. However, a machine that retails for less than the cost of a good sex machine motor has cut more than just corners!

### ***The Examination***

In preparing to write this piece, I looked around at a range of sex machines currently offered... every one I could find, in fact. I blew up pictures, ran perspective calculations, read marketing text. This examination made painfully clear the first hurdle facing a prospective buyer trying to make an intelligent decision: ***poor information.***

Even the very cheapest sex machine I found (at about \$200) represents a meaningful amount of money to send to a stranger based on a web site. Yet some vendors don't really provide much information, and most have a definite lack of pictures. The pictures that *are* available tend to be poor and of small format. Even having designed and built over 150 different sex machine models over the last nine years or so, I found it difficult to assess these machines... how is someone less familiar with this stuff supposed to do so?!?

The "lack of information" problem wasn't limited to one site. It's rampant! Personally, I'm proud to display and discuss my creations in exacting detail. Despite this challenge, quite a number of cost cutting measures and "marketing" tactics became abundantly clear.

In the end, I have an excellent idea of how other folks are making their machines, and where relevant how they're making them cheaply. If you're in the market for a sex machine, this information is worth the time to read. The remainder of this article is broken into two major sections: technical and marketing. Each is important, since you're buying one based on the other ;) Part 4 wraps things up.

## Part 2: Technical

Part 1 of this little article provided a brief introduction and background information. If you arrived here directly, I do highly recommend you back up for a quick read.

As an experienced sex machine (among other things) designer and craftsman, I know what works, and what works even better. Years of experience and experimentation feed into countless little improvements in my machines, and several big leaps. With this experience, I feel qualified to discuss some of the technical shortcomings of cheap sex machines the average shopper might be unaware of, and compare them to the offerings of Orgasm Alley.

### ***The Heart of a Sex Machine***

It should be obvious that the motor is a sex machine's heart, and the most critical factor in a unit's performance. It's also the most expensive component, and the first thing you have to cut to build cheap.

I assume someone investing in a sex machine is going to use it quite a bit, and going to push both the machine and themselves in pursuit of new sexual heights. Their machine should perform wonderfully at any speed, any stroke length, with any dildo they might prefer. It has to last... both for an individual session of any duration and over time, for the rest of their lives.

The motor does the work in a sex machine, and is vital to achieving these objectives. To this end, I use only high quality, American-made industrial gearmotors. These motors are designed to run factory conveyors and similar equipment 24/7 for years on end, with little or no maintenance. They're heavily constructed and powerful.

An average OA machine's motor costs considerably more than \$200... obviously you can't put such a motor into a machine you'll sell for \$200! With that retail constraint, ***you have no more than \$50 to put towards a motor, at most!*** If you want to wholesale to other retailers, cut back some more.

Most cheap machine makers select an automobile wiper motor, identifiable by its small size, shape, slow speed, and reliance on 12VDC power. Since these motors are usually multi-tapped -- meaning you can power just part of the motor's winding for a lower power/speed -- machines with these motors also often have specific running speeds. 40 or 80 strokes per minute, for example, instead of a variable range. The other favored options are low-end or small gearmotors. These typically show up as a slow stroke speed, perhaps accompanied by low output power.

The disadvantages of cheap motors compared to good ones are difficult to overstate. It's simple to make a machine that creates a fucking motion... but hopefully you're shopping for a sex machine that delivers great fucking!

The biggest issue is performance, notably speed and power. Many very cheap sex machines top out between 60 and 100 strokes per minute. One in-and-out stroke each second... you can squat on a dildo that fast! As a frequent and long-time user, I'll just say that something that

slow isn't worth owning (in my opinion, of course). For more on power, please read the addendum to this paper, [Understanding Horsepower and Torque](#).

You might read a pretty decent torque figure quoted by some wiper motor builders. However, auto wiper motors are generally rated on *peak* torque, which can't be compared to the continuous duty torque rating on industrial gearmotors. Peak rating can be as much as four times the continuous duty rating on some motors.

The other major consideration is longevity. These cheap motors generally use bushings on the output shafts instead of bearings, have lighter and weaker gears, smaller windings... in brief, they're not built to last like a higher quality motor. Many will overheat under load, and offer no thermal protection. Some even have an unsealed enclosure, leaving them open to damage from dust and debris.

A final note on the motor front. You will find a maker or two citing the safety of 12 volts as the factor driving their motor choice... *nonsense*. A quick glance around your home will reveal a significant pile of equipment -- from hand mixers to blow dryers -- that runs on wall power (100 to 240 volts, depending on your location). Using a cheap transformer delivering 12 volts from wall power to a machine wired for 12 volts is actually more dangerous than delivering wall power to a properly grounded system designed for it. The *only* reasons to prefer the 12 volt solution are 1) for use from an automobile's electrical system or 2) to cut cost. All OA machines, by the way, may be run from your car with an inexpensive step-up transformer delivering 120 volts.

For anything more than very infrequent and brief use, take a good look at the heart powering a sex machine. Understand what you're buying, and the compromises that entails.

### ***The Second Big Target***

The next place cheap machines cut cost is the linear drive system, the parts that make the in-and-out motion. This aspect of machine design proved most difficult to assess, since those using inferior components choose to say nothing about them or speak in the most general of terms! These parts are next in line for both cost and performance impact.

After a great deal of experimentation, I settled on two different solutions for OA machines: a ball bearing slide and precision shaft/bushings. Both linear solutions are extremely durable, quiet, and reliable. A machine running at 200 SPM for an hour has ripped off 12,000 repetitions, so they'd better be! There should only be two reasonable options: balls or high-end bushings. There is too much friction and wear on anything else. It just won't last.

However, you'll find all sort of less expensive parts in use among cheap machine folks. "Oil-lite" style impregnated bronze bushings, which are a very poor choice for this much linear travel. "Steel pipe" thrust arms with plastic pipe for bearings (in at least one case, literally a piece of galvanized water pipe). Aluminum, used both as thrust arms and bushings... a material can quickly erode with wear.

Of all the parts that can degrade or completely fail over time, the linear components take the most friction, heat, and wear. Without them, your machine will be useless. ***If these parts can't take hundreds of hours of use, you're buying a disposable sex toy.***

## **Boxing It In**

One of my favorite challenges in fine sex machine design is taking a set of components -- or a performance goal -- and making it fit into the smallest possible space. The result is a more portable, more easily stored machine. Basically, it's more user-friendly! You'll find this philosophy pervasive among OA sex machines.

I built the first commercial sex machine inside a toolbox, the first in an attache case, and so on. The Toolbox in particular has been a target for copying... apparently, that was a really good idea ;). But are the cheap knock-offs the same as the OA Toolbox? Check the dimensions, and what's inside. Mine is the smallest I could find: 16" x 7" x 7". It has an extremely powerful (and fast!) 1/8 horsepower industrial gearmotor. The copies? An auto wiper motor (perhaps 1/20th peak horsepower), and the box itself is much larger! Size matters, folks.

Another big no-no, to me, is building a machine that requires tools to change the stroke length. I frequently change the stroke during a session, and none of my machines require tools or more than 10 seconds to do so. Even fully enclosed models like the Marauder... it's as simple as building in a hinged access hatch. Nonetheless, some cheap machines require wrenches, screwdrivers... on at least one, you have to physically remove a panel held on by four screws just to get at the adjustment!

Construction quality also shows up as a differentiating factor during even a brief look at some cheap machines. I guess to build as cheaply as possible, you can't put in much build time. Tacked together plywood won't hold up to an average user's handling. Floppy carpeting just shows a lack of attention... there's no reason for it. Failing to paint or powdercoat (or apply another protective finish) wood or metal is also poor. One will warp, the other rust.

In making your decision, consider the machine's size and the provisions for moving it around. Examine what it takes to change the stroke length. Look at the construction quality. These factors can make the difference between a machine you're proud to own and one you're embarrassed to be seen with.

## **Shorting the Strokes**

Not everyone has the same needs. Everyone doesn't use the same dildos, nor have the same physical build. *Why would a sex machine have a single stroke length?!?* Every Orgasm Alley sex machine (except, as I say so many times, the Hole Saw) has a number of stroke lengths to choose from, to better meet the needs of different people, and the same person at different times.

It's surprising the amount of variety you give up if you cut a machine back to one or two stroke lengths. Worth thinking about. Buy a sex machine for fabulous and varied sex, not for the same 3" sex all of the time ;)

## **Shafting the Speed**

I've already noted above that cheaper machine makers sacrifice maximum thrusting speed as part of their motor selection. It doesn't end there. some sacrifice control of speed entirely.

Orgasm Alley uses a relatively expensive speed control, and my machines provide continuously variable control over speed. Turn the knob up a hair, the machine speeds up a hair. If the motor slows down under heavy load, it gets more power to maintain the user-set speed. There are cheaper options, of course, and the cheapest option of all: none. The wiper motor guys are big

culprits here, using the multi-tapped wiper motor to deliver two (or occasionally three) running speeds. They don't mention the tremendous loss of power at the slower setting -- but have no intelligent control to compensate for it -- nor the disadvantages of a couple fixed running speeds.

## Part 3: Marketing

This article was originally going to touch solely on the technical differences between Orgasm Alley machines and cheap copies. As I researched, though, I noted a number of "marketing" approaches and statements of questionable accuracy. From these come the third part of this article.

### ***Missing Information***

It's obvious not everyone agrees that complete information is required when describing a sex machine for someone's consideration. The worst example is one widely resold unit that -- as far as I've found -- never discloses its speed range or stroke length! Since it runs from a wall wart, a distinctly limited source of power, it can't be very fast nor move very far. If it is in fact "*a great fuck*," surely this information is positive enough to disclose? It's not. As these two factors are the best description of a machine's ability to satisfy, make sure you know the stroke speed and length ranges of whichever machine you decide to buy.

There are other areas of missing information, of course. Failing to describe the process by which stroke length is changed, particularly when doing so requires major surgery and a small toolkit. Never describing or depicting key aspects of a machine... its hand control, the inside construction, overall size, and so on.

Overall, a lack of images seems to be the biggest part of missing information. Perhaps it's simply a lack of photography skills, but whether plunking down \$200 or \$5,000 I think a prospective buyer has a right to expect complete and detailed depictions of the sex machines they're considering.

***Rule of thumb: if a person trying to sell you something does not provide information about any important aspect or factor of their item, they believe doing so will make you less likely to buy the item.***

### ***Partial Information***

As you might suspect if you've read this far from the start, some cheap sex machines using less than ideal components are not fully described in their marketing text. The linear motion parts -- a key factor in a machine's longevity -- are a primary target. Is the stroking shaft running through ball bearings, a low-end bushing, a simple hole through an aluminum block? If it doesn't say, it probably isn't good.

More onerous is the provision of partial information leading to a false conclusion. For example, if you only know that a machine plugs into a wall outlet and that its motor is rated for a certain draw (in amps), you can easily be misled about the motor's size and power. Amperage alone doesn't really describe a motor very well. Amperage plus voltage is much better, but that's only input power. A motor's output may be much less if the geartrain is inefficient.

A 4 amp motor... how much power is that? If the motor draws 4 amps at 120 volts, that's a very substantial 480 watts: well over 1/2 horsepower input power! On the other hand, at least one vendor describing their machine this way uses 12 volt motors (although this is never disclosed). At 12 volts, 4 amps is only 48 watts... a bit over 1/20 horsepower, and relatively little input power. The actual output of such a motor will be even less. Wiper motors -- with their greaseless gearbox and bushings -- are very inefficient motors. Yet it's a "powerful 4 amp motor" in this sex machine... the marketing text says so!

If a machine you're interested in is described this way, ask the vendor for better information. Output torque is ideal, with horsepower and RPM a distant second in desirability. At the very least, you should have the draw in amps and supply voltage in volts. Amps times Volts equals Watts, and that result divided by 746 gives you horsepower. While this doesn't tell you much about output power, it will give a general idea of big vs. small.

***Rule of thumb: 1/15<sup>th</sup> output horsepower is very minimal on a machine with reasonable stroke length (at least 5" maximum length) and speed (150 strokes per minute or better).***

## **Word Art**

The final big marketing problem that struck me -- particularly but not exclusively with the cheap machine folks -- is that of carefully crafted statements that seem to say one thing but actually don't.

The most common word art is something like "the power to penetrate any hole." Sounds good, right? Loads of power, penetrate any hole. Unfortunately, there's a big piece of the power/penetration equation missing... penetrate any hole with what? Almost any machine that makes a fucking motion can penetrate any hole with something the size of a pencil. Can such a machine penetrate the "tightest of holes" with something the size of an average dong? What about a bigger dildos? In reality, this statement doesn't say much at all, and certainly provides no guarantee of performance. Look for **facts** about power: horsepower, speed, rated torque (or peak torque, if that's all there is, but know that it's a peak rating).

What about this cute claim? "This is the quietest [or smoothest, or most powerful, or whatever] machine we know of." That's an easy claim to make if you don't "know" of many other machines. There aren't many people in a position to compare every machine on the market, and without a broad in-person exposure to such a wide range of different units statements phrased like this are devoid of value.

Describing a machine on a stand as "fully adjustable" when it is actually adjustable for height but not angle. Claiming your machine is "vibrating" when in fact you include a vibrating dildo or bullet with a purchase. Saying you can "select any stroke length" when you really can select any of the two stroke lengths the machine provides. Using phrases like "hand crafted" to describe something that looks tacked together by a 10-year-old, or would if you could see anything in the pictures. All of these things are word art... marketing text that sounds good without saying what it seems to say.

## Part 4: Summary

### ***The Import You See Everywhere***

It was inevitable that the country shipping millions of vibrators a month to the States would eventually come up with a sex machine. As you may know, China has an entry in the sex machine market. Imported under the TOPCO brand, this machine beautifully illustrates the main points of this article, and makes a great start to the summary. After emailing quite a few resellers about this product -- most of whom couldn't answer the simplest of questions, and one of whom asked me to forward anything I find out! -- I've collected a few facts, but by no means a complete picture. Given its widespread availability, I find them worth sharing.

Read about this machine in as many places as possible and you are still unlikely to have any real information. The descriptions (most of which are identical and obviously provided by the importer) are pure marketing-speak, with little or no factual content. The stroke length is occasionally noted as 3", although one vendor who actually measured the movement reported 2-1/2". It comes with "6 attachments," although only three of them actually go on the machine. The others are plug-in vibrators, made in China of course.

No information about speed or power is available. It's clearly lacking in power, since it is very light and runs from a small, lower voltage power source (cited as a "electrical adapter" but never pictured). The attachments that connect to the machine are all quite small, which is also indicative of low power. Providing dedicated attachments that the user has to employ probably arose as a sneaky way to conceal a lack of power. The linear motion system appears to be plastic on plastic, although that is never mentioned or pictured well.

It's definitely cheap for what you get. Although many people selling it claim something like "normally retails for \$400" (or something similar, the highest I've seen is \$595), the high end of actual pricing is around \$330 as of this writing. I've seen it for a little as \$219. Assuming that vendor is making something reasonable on the deal, that implies it costs him \$175 at most. Which means it was made in China for something less than \$40, vibrators and plastic dildos included.

If you have any additional accurate information about this machine, I'd certainly be interested to hear from you. It's probably the best cheap unit available, but realize that it's cheap from end-to-end. You can't use your own dildos, and no attachments are available other than those provided with it. I wouldn't expect a long life, or a particularly thrilling ride. Shop around if this is the unit you'd like to buy, since pricing varies tremendously.

### ***So Just What is the Bottom Line?***

You've made it this far. Perhaps you're wondering just what I conclude from all of this information... that everyone should buy from me? I'd love that, but no. I continue to believe that no machine and no machine maker has the ideal solution for every person.

What's your budget for a sex machine? If your financial position dictates a cheap machine or none at all -- or you plan to use your machine quite sparingly -- a low-cost solution might be just right for you. If, on the other hand, you want to invest in a sex machine that you'll use regularly throughout your life, I think Orgasm Alley offers outstanding solutions to your needs.

"Cheap" is sometimes considered a dirty word... a bad thing. But hey, I'm cheap about a number of things. I shop at Harbor Freight for tools I use lightly or infrequently, because they're cheap. On the other hand, I buy high-end power tools and important hand tools because I use them a lot, and I need to know they'll perform. Likewise, I'm not cheap about sex machines. I hold outstanding performance and incredible satisfaction as the reasons to buy a sex machine, and strive to deliver exactly those things. Cheap isn't a bad thing. You simply need to be cheap, wisely!

Ultimately, I hope this article has made you a more informed sex machine shopper. I firmly believe that the more aware you are about sex machines and the relevant technology, the more likely you are to select my products over the competition. One way or the other, I think you're more likely to find the right machine for your needs.

### **Parting Thoughts**

I'll close with a topic that doesn't really fit in the body of this article, but is extremely important when selecting a sex machine. Don't skip over the vendor's policies. You'll find that pretty much everyone guarantees your privacy. That doesn't cost a thing. What about returns, satisfaction, warrantee, and so on? Does this vendor stand behind their products, believe in them?

Orgasm Alley and another couple vendors guarantee your satisfaction. Buy it, try it, and if it's not for you... return it. To me, this is a critical policy for a buyer who hasn't ever used a sex machine before and hasn't ever seen the one they're paying for. If you're not sure you'll like what you buy, shouldn't you be able to return it?

Other vendors, however, have a no return policy, or a "return unopened only" policy which is basically the same thing. You may read something about health/safety reasons for such a policy... baloney. A very small portion of a sex machine is subject to possible contamination: any dildo (which should never be returned), dildo holder, linear arm, front of the machine. These parts/areas are readily replaced or sanitized. A returned machine should, of course, be sterilized and sold as used if it's been used... that's a reduction in value that a smart businessperson will want you to cover with a "restocking" fee. However, asking you to plunk down good money for something over the Internet with no recourse if you don't like it doesn't speak well for a vendor's confidence in their offering.

What about warrantee? How long is this machine covered? Is any warrantee "limited" and in what way? Who pays shipping if the machine is faulty and requires repair? It seems ridiculous to say "if I ship you a busted unit, I'll fix it but you have to ship it back to me."

Finally, and perhaps most telling, does a vendor stand behind what they say? A reasonable Internet policy -- and one you should require -- is to guarantee that one's product offerings are described accurately and completely. Orgasm Alley makes this guarantee. If a vendor won't, what are they saying (or *not* saying) that they refuse to stand behind financially?

### **Addendum: Understanding Horsepower and Torque**

Horsepower and torque are two widely misunderstood characteristics of motors. They're also critical in the design and selection of an excellent sex machine! Briefly:

- **Horsepower** describes how much work a motor can do. It incorporates both torque and RPM (revolutions per minute, or speed). With a gearmotor, the relationship between horsepower and torque also depends on the efficiency of the geartrain.
- **Torque** describes how much force -- *pushing power* -- a motor can provide.

Of the two, torque is more important in assessing sex machine performance. If the resistance exceeds the motor's ability to push, it will "stall" or stop. Obviously not something you want to happen in the middle of a hot session! Based on extensive experience as a designer and user, I feel a decent sex machine must provide at least 20 in-lbs (inch-pounds) of torque on an average (5") stroke. More is definitely better than less, and there's no upper limit... until you consider a motor's size and weight.

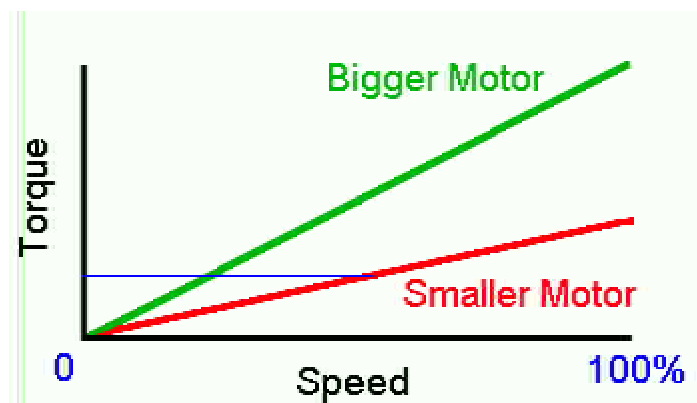
*There is more information below, but it might get pretty dry! The bottom line is that more torque leads to a better performing sex machine, and too little really sucks. If that's all you need to know, you won't gain much by reading the remainder of this addendum!*

Several factors determine how much torque is required from your machine at a particular time:

- **Stroke Length:** The machine's stroke basically acts as a lever against the motor's torque. A longer stroke has more resistance. Another way to put that: a longer stroke needs more torque.
- **Speed Setting:** A DC motor's torque rating is for the "nameplate" speed... the speed listed on the motor plate. When set to a lower speed, the motor receives lower voltage and produces proportionately less torque. The speed controls used in Orgasm Alley machines compensate for this motor characteristic.
- **Attachment and Target Hole:** Bigger dildos and tighter (or clenched) target holes require more torque. Lubrication also plays a part, of course, since well-lubricated things slide with less force.
- **Moving Mass:** The weight of the machine's moving components are the final consideration. At each end of every stroke, the motor must stop and reverse this much weight regardless of the other factors. This -- and reduced machine shaking -- is why OA's machines are carefully designed to minimize moving mass.

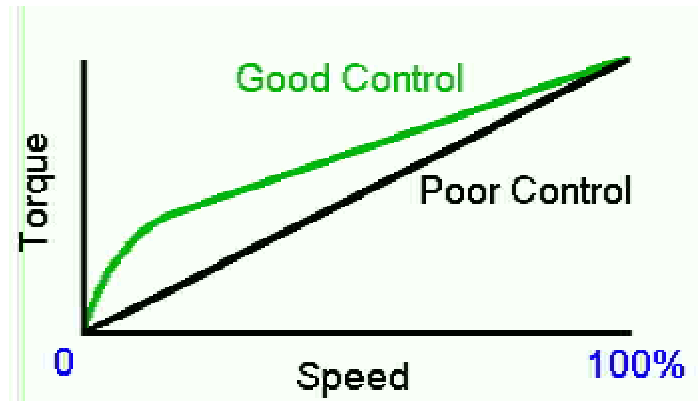
The best machine design for you is one that fits your play style... it has enough torque to keep moving at the speeds you like, with the attachments you use, and so on. As a machine designer, I select motors for each model based on its stroking capabilities and assuming hard use. By a speed setting of 10 strokes per minute or so, OA machines are unstoppable in typical use. I can also offer motor options on many models, so you can closely match your OA machine to your requirements.

The chart below illustrates the difference between two motors with different torque ratings, as speed changes:



For a practical illustration of the difference, note the fine blue line. If the stroke length, dildo, etc indicate this level of torque is required to move the dildo, the smaller motor must be set for about 1/2 its speed while the bigger motor is easily running by a 25% setting. If both motors are rated for 200 RPM, that means the bigger one can operate effectively at 50 strokes per minute, but the smaller motor doesn't even move until set for 100 strokes per minute.

The speed control is also critical. The controls on OA machines intelligently sense the motor's speed and adjust in real-time to stay near the desired stroking speed. The chart below illustrates a motor used with a high quality and low quality speed control:



The compensation of the smart control is most noticeable at the lowest speeds... right where it's needed. By using a better control, a motor that would otherwise stall until 50 strokes per minute can effectively operate at a much slower setting.

There is one final reason to use a more powerful, higher torque motor. A motor can produce more torque than its continuous duty rating, much like a person can sprint faster than they can move in an extended run. However, if that person sprints too long they'll drop. Likewise, operating a motor in excess of the continuous torque rating can shorten its life or fry it completely! By using high quality, correctly rated motors, OA machines can outlast their owners and beyond.

Sex machine builders will always be tempted to use a smaller, less powerful motor. The motor is at the heart of a sex machine, and also the most expensive part. Bigger, better motors simply cost more than smaller ones. You might find sex machines with motors as small as 1/30th horsepower, or even less! Always seek to understand what motor you're getting, how it performs, and why it's right for your needs.