THE ENGINEER'S CHECKLIST

FOR YOUR DEVICE'S FLEX ARM

moffatt

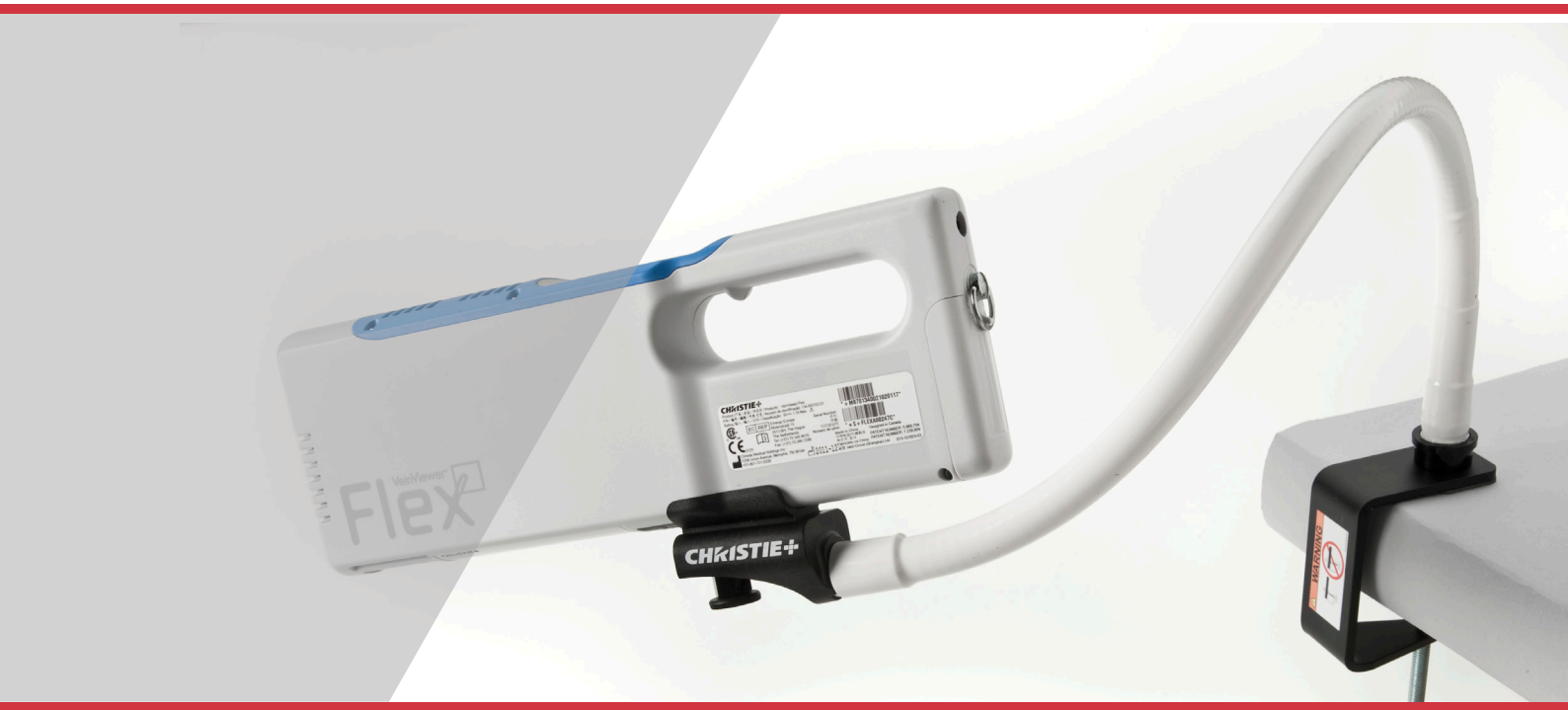
YOU'RE ONLY AS STRONG AS YOUR WEAKEST LINKS.

HERE'S HOW TO SPOT THEM.

Medical devices need to be great.

They need to work every single time, because, let's face it, lives are at stake. And while a flex arm is a crucial component of many medical devices -- it's certainly not limited to the medical field. More and more we've found clients in a variety of industries, from law enforcement to mobile devices, finding themselves in need of a quality flex arm. Trusting the components of your device is a must to ensure a long, productive lifetime for your product.

Moffatt produces flex arms for all of these varied industries. In doing so we've seen good product designs and we've seen great product designs. If there's one thing we've learned, it's that great only happens when you pay attention to the details. The problem is that paying attention to the details only works when you know what you're looking for. For the first time, we're letting you in on the secrets we've learned in three generations of working with some of the best engineers and product designers in the business. Here are the seven items you need to check off your list to make sure that your device takes the leap from good to great.



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1.

RELIABILITY

BECAUSE A FLEX ARM CAN'T HAVE A BAD DAY

Of course everyone wants their device to work every single time -- no one purposefully creates a dud. The key here is to ask the question: how do we find what makes a flex arm reliable? Well, by looking for weak points. Your flex arm is only as strong as its weakest component. Here's where you can look when you don't know where to look.

RELIABILITY

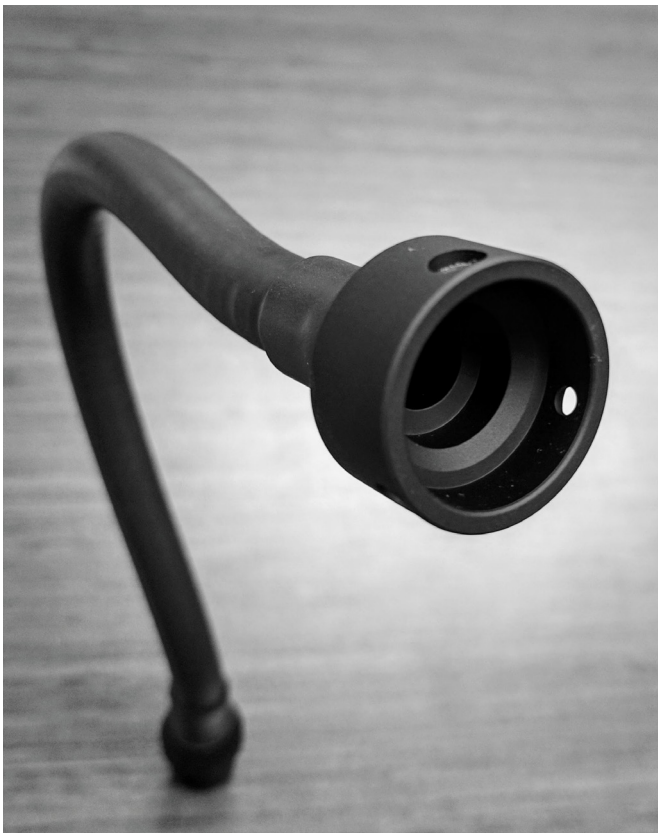
COVERING

Many folks think that a covering is a "finish" or decorative feature. It's not. Your covering is one of the most vital components of your flex arm because it seals the arm from lubricants. Something to think about: Your flex arm is fundamentally a friction device. That means that lubricants are the enemy of consistency and reliability.

If your flex arm isn't properly sealed, you'll end up paying for it in the long run. When talking to potential flex arm sources, we recommend our customers ask about their covering, strain relief, and fitting technologies. If they can't answer those questions it either means that they haven't thought about it or worse -- that they don't have a solution for you. Conversely, if they can speak about these items with some degree of authority, you know that they've considered the problem before you have. That's a vital component in a design partnership. You want someone who's been there and done that, not someone who is using your device to test out the kinks in their process.

"Your flex arm is fundamentally a friction device. That means that lubricants are the enemy of consistency and reliability."

Full disclosure: We used to not talk about coverings because our competitors seemed to not realize how important it was to seal their flex arm properly. Here's the thing: we've realized that even if they DID realize this, they'd never be able to replicate our designs for a few proprietary reasons (HEY, we have to keep some things in house.) Send us an email though, and we might be able to spill a few more beans on why this is so important and how we ensure your flex arm has a proper covering.



RELIABILITY

MATERIAL CHOICES AND THE MANUFACTURING PROCESS

Obviously you need great material and a great manufacturing process. The problem comes in identifying what you should look for in this process. There are two factors that come into play here, the material you use and the way your device is coiled. Without getting too wordy, here's a bit on the lesser known qualities you should look for.

Material

Most flex arm companies keep their material sources under lock and key. It's proprietary info that is vital to their business. That said, they should always be able to communicate exactly why a material is right for your project. They'll be able to recommend dry, high-grade materials and be able to explain from experience which materials are best for your application. If your flex arm company is being TOO vague about this process, it could be that they don't HAVE great material options, or their materials are chosen more for price than performance.

"Coiling is performed by people with decades of experience and is extremely important when you talk about the strength of your flex arm."

Coiling

One thing you need to know: coiling is extremely important when you talk about the strength of a flex arm. Coiling is also an exacting and precise process. It's performed by people with decades of experience and craftsmanship. Those people have a keen understanding of the interplay of wire geometry. A round spring wire works as the muscle of the flex arm, while a triangular shaped wire provides the adjustable friction element to hold it in place with each bend and adjustment. These are simple, elegant solutions that require tons of testing and studying.

Any flex arm business worth their weight will be able to give you this data with specifics you need for your device. They'll also be able to make meaningful specific recommendations based on experience. We've spent literally decades studying, testing, and documenting the many combinations of diameters and wire strengths needed to offer our customers a full spectrum of options. It's because we care, but it's also because that's the only way to make sure you've got the right materials and coiling. That's how you get a great end product. It's a journey, but the end user will appreciate that dedication and care.

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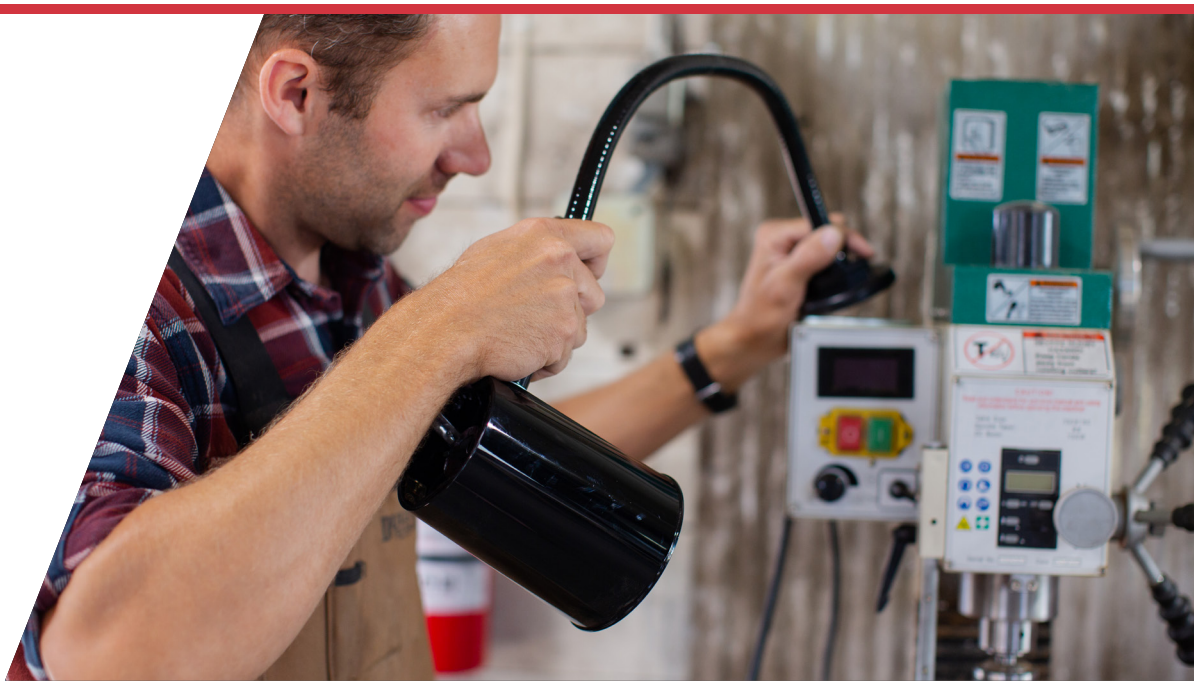


STRENGTH

HOW MUCH WEIGHT WILL YOUR ARM NEED TO HOLD?

We run into customers all the time that never considered flex arms because traditionally flex arms haven't been able to perform well enough. It's a limit of the imagination and not the flex arm that has closed off their design to these devices. We have customers who literally put tens of thousands of arms in situations where they are adjusted every day for years with essentially no field failures. We have high confidence in the potential of flex arms for device supports, born from years of successful applications and we're ready to help you discover these possibilities.

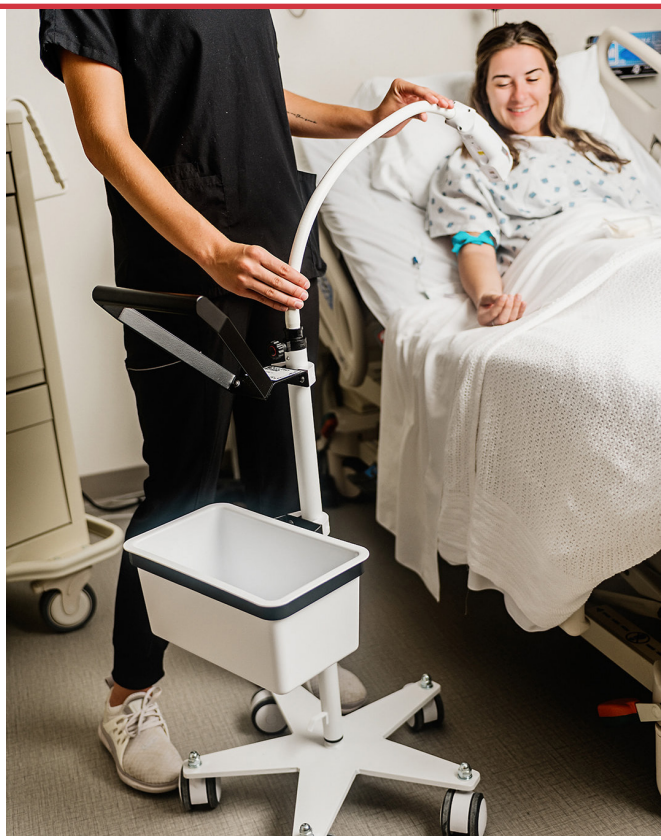
STRENGTH

INFORMATION IS KING, CHOICE IS KEY, COOPERATION IS A MUST.

To pick the right arm, your flex arm supplier needs to know everything about what you'll need it for. Yes, they're looking for load data (how much weight the arm will need to support) but they'll also be looking for additional info. Here are some definite items you'll need to know going into your meeting with a flex arm supplier.

- The device's exact total weight
- Arm positioning requirements
- If there will be vibration from the device or the environment
- Where the device's center of gravity lies
- How often the arm will need to be adjusted

These all play crucial factors in determining how strong your arm needs to be. If it's a possibility, giving your supplier a sample of the device to be supported can be a great way to bracket the recommendation. They'll be able to build samples that are slightly softer or slightly stronger -- giving you options so you can make the ideal choice with your product and make the final call. This is why picking a flex arm supplier with a ton of knowledge and options is so important. You're the expert in your device, you need someone who's an expert in flex arms as well. Teamwork, as they say, makes the dream work.



STORAGE IS IMPORTANT. PICK THE RIGHT ARM, TREAT IT WELL, SEE RESULTS.

This is tangentially related, but it's definitely worth mentioning as it's something that a lot of our clients just don't think about. You can pick the perfect arm, but how you package it, or the storage position you put the arm in can be a big deal. If flex arms are stored in an extreme position or with a severe bend, it might compromise reliability and strength. Ask your supplier for specificity in how your arms should be treated to make sure they retain what made them great in the first place. You want it as strong on day 1000 as it is on day one.

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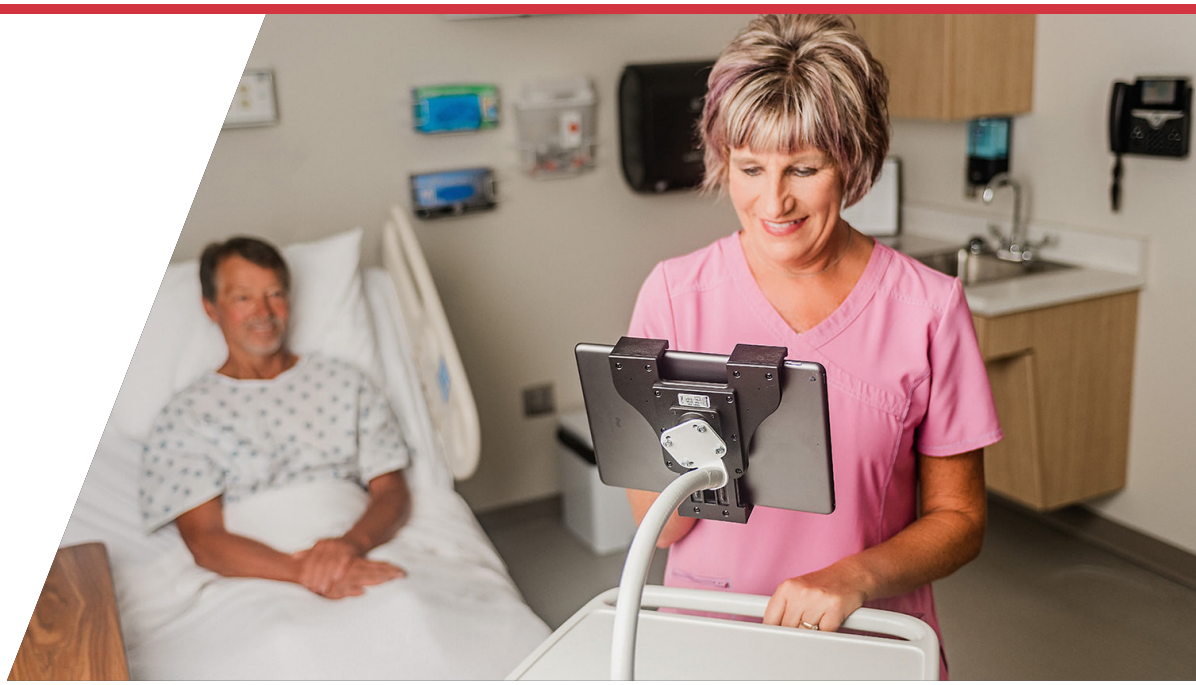


FLEXIBILITY

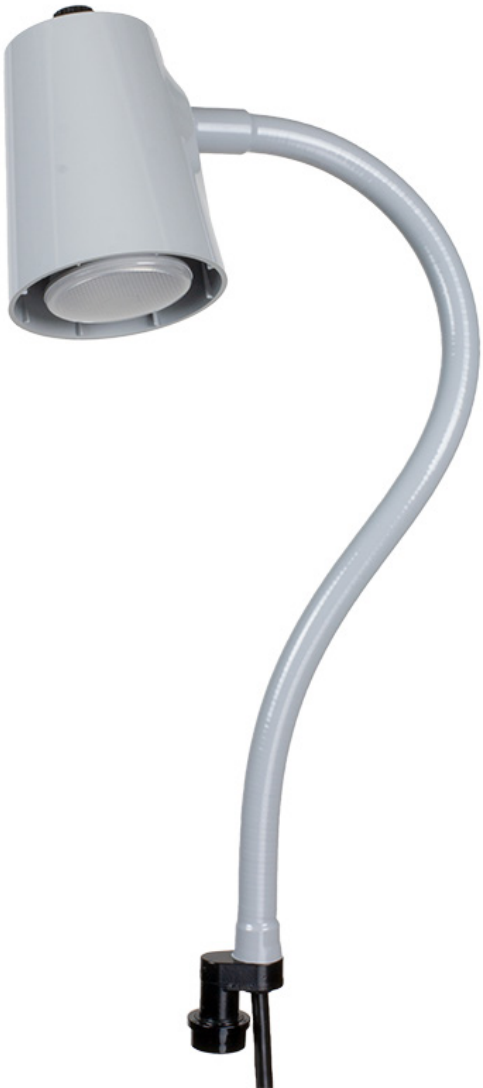
GET IT RIGHT THE FIRST TIME. YOGA ISN'T AN OPTION FOR FLEX ARMS.

Life is a series of tradeoffs, right? You can get the fast car, but the insurance will be through the roof (as will your spouse's blood pressure). You can have a giant lawn, but someone is going to have to mow it. Flex arms are no different. You want a strong arm to support your load well, but you're going to need arm adjustments to be as easy as possible. Just because there's a trade-off though, doesn't mean you should settle for an arm that doesn't work the way you want it to. Here are a few tricks to ensure flexibility without sacrificing the other items on our checklist.

FLEXIBILITY

SINGLE SECTION ARMS

There are a few tricks of the trade flex arm providers can use to make sure that you keep the strength required of your flex arm while preserving much-needed flexibility. This can include employing stiffeners or reinforcing agents that retain the arm's pliancy. These treatments often come into play after your provider knows the prerequisites covered in the previous section. Items like positions your product and flex arm will see, center of gravity, etc.



MULTI-SECTION ARMS

Sometimes a sweet spot can be reached with some of the implementations listed above, but sometimes even that won't get us exactly where we need to be. In those cases, we recommend designers employ multi-section arms. It allows arms with softer upper sections (for maximized flexibility) without sacrificing the strength needed for load capacity by the lower arm at the mounting base.

SILENT AND EFFECTIVE: THE BRASS SOLUTION

In the end, you're looking for a smooth, fluid adjustability that won't pop or creak when you use it. That's what flexibility ultimately means. In some instances, like for medical or other high-end applications, designers need those arms to be totally silent. In that case we recommend using brass triangular wires. They're the ultimate in performance and ensure that your device will have supreme flexibility without sacrificing its strength or reliability. It may be a bit pricier than other options, but if silence is an advantage or an outright requirement, the flex arm triangular wire can, and should, be brass.

"If you need your flex arm to be totally silent, like for a medical device, we recommend using brass triangle wires."

4.

CUSTOMIZABILITY

FREEDOM IS REALIZING YOU HAVE A CHOICE.

We love working with designers and engineers. We're not just saying that, they are truly amazing people. They dream something that wasn't previously in existence, then act on those dreams to make sure they come to fruition. That's amazing. It's our job to make sure our customers can get there, not tell them why it isn't possible. Customizability allows engineers true freedom by not limiting the ways a flex arm can integrate with its product.

CUSTOMIZABILITY

BRING FLEXIBILITY TO LIFE

When we say "We Bring Flexibility to Life" we mean more than just the flex arm -- a good flex arm provider needs to be able to work with their client to produce a physical product that can match the design process. That can take a lot of different turns, which is why we believe rapid prototyping is so important to the process -- especially for products that need things like elaborate end fittings.

Your customizations should only be limited by your imagination. Here are a few customizations to think about before you talk to a flex arm provider.

"Your customizations should only be limited by your imagination."

FLEXIBLE MOUNTING

C-clamps, magnets, quick-couplers, and weighted bases can each have their own strengths and weaknesses depending on what you need your device to do. Thinking about these options may help you decide on what you need while still in the design phase, but often telling your flex arm provider what sort of functionality you'll need will allow them to guide you through the options. Collaborating on this process can lead to true innovation for mounting your flex arm.

COVERINGS

We've seen it all. Better doesn't always mean more expensive. We've seen great coverings that are as simple as PVC or polyolefin, or as complex as fluoropolymers, neoprene, or even autoclavacable silicones. Boy, that's a mouthful. Try saying saying "autoclavacable silicones" five times fast. We dare you.

Remember when we said how important coverings are? This is where customizability can really be your friend. No matter your need, there's a material out there that will protect your flex arm and get the job done. Remember, your arm is only as strong as its weakest link.

OPTIONS ARE ENDLESS

Look, there's an almost limitless variety of ways your flex arm can be customized. A good flex arm provider should be able to provide the capability to utilize CNC fittings, die castings, or stamped components. They should be able to give you the option for plated or powder-coated finishes. That said, the most important part of customization is communication. That's right. Speaking to your flex arm expert will allow them the opportunity to create what you need to reach your goals and excite your customers. Hence checklist item number five...

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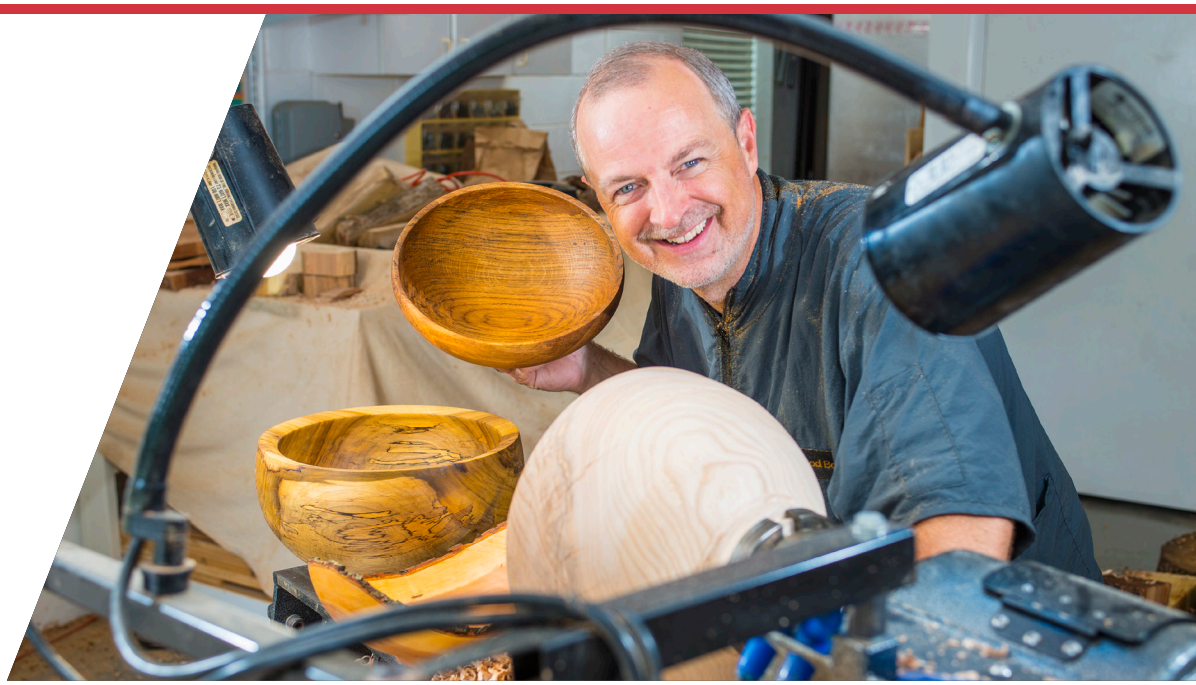


THE HUMAN ELEMENT OF DESIGN

WHO ARE YOU GOING TO CALL?

No, this isn't a veiled ghostbusters reference (OK, you got us. Yes, it is.) This item is important enough that we do include it in our checklist because we've found it to be a crucial component in the design process. You should be thinking about collaboration from day one. Why?

Great products take time to develop. If you don't have someone with the stamina and patience to stay with you through the design process, you risk disaster later on. You need someone who not only understands flex arms, but who also designs and produces their own proprietary products. Why? Because they'll be better able to walk you through the design process -- they've done it themselves.

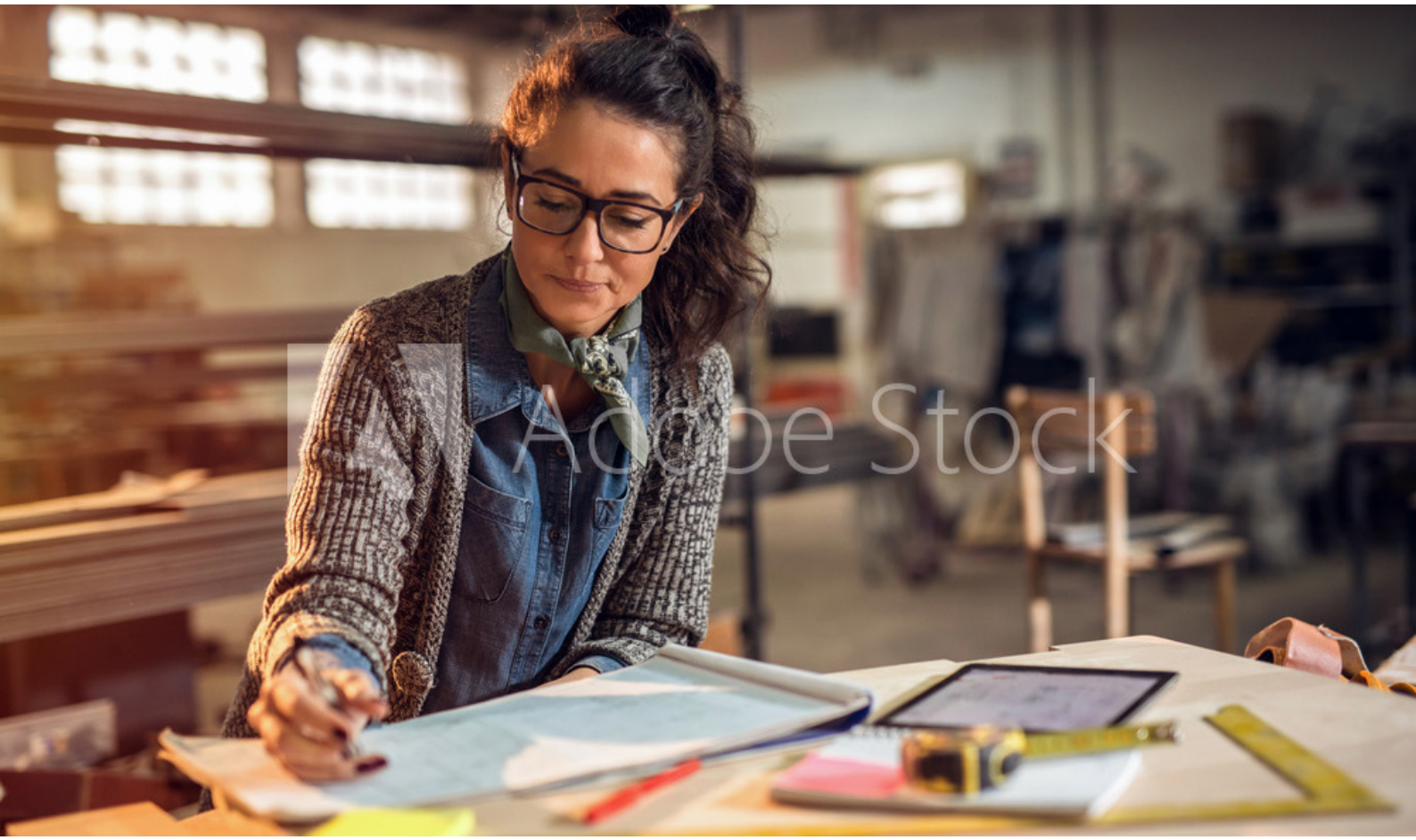
THE HUMAN ELEMENT OF DESIGN

DESIGN ISN'T STATIC. COMMUNICATION IS KEY.

Most folks think about the pre-production phase of design, but neglect to think about how this design can be changed over future generations of the product. You need a partner that will be there over the lifetime of your product and can work with you as adjustments are made. That includes things like how potential improvements are addressed and how quality is monitored to ensure the best result for your product.

Find a flex arm provider that you can communicate with, but who also inspires and sparks ideas. Potential future iterations of the product and more wide-spread applications are easy to see when you're coming at it from a different angle. Finding a partner that is invested in the outcome is key to making sure a good product makes the leap to great.

"Find a flex arm provider who inspires and sparks ideas. They should be invested in making sure a good product makes the leap to great."



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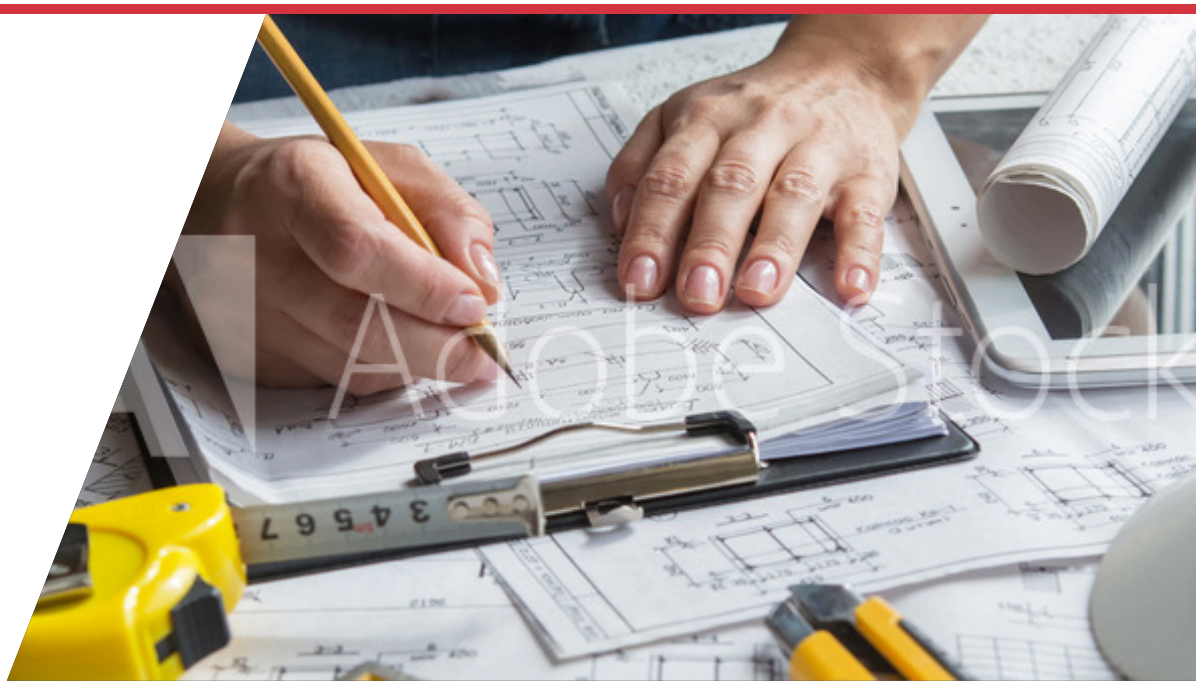


PRICE POINT

HOW YOU CAN ENSURE QUALITY WHILE KEEPING COSTS REASONABLE.

No matter how lofty our ideals are, the cost of a component is always a crucial part of the development process. Having specific pricing goals are important, but as your design evolves, your price point may differ from where you set that initial price point. In some cases, it can mean a more expensive price per unit, but it doesn't have to -- if you have a partner who's willing to work with you to find an alternative. Here are some tips on how to accurately gauge where your price point will be and how to keep costs down where you can.

PRICE POINT

PLAN AHEAD FOR VOLUME

Work with your flex arm specialist to estimate usage volume. With that detailed picture, they'll be able to quote a range of production quantities which can keep costs down. Often, they can do things like blanket orders and purchasing agreements to increase the run size and drive costs down.

STANDARD PIECES FOR CUSTOM DESIGNS

Obviously a custom piece will run the cost per item up a bit. Here's the thing, often standard components will work well even in custom designs. It's important to find a flex arm vendor that has a large array of components to choose from. They can keep costs down by buying in larger volumes for multiple customers. While your device is custom, it doesn't mean that your flex arm has to be.

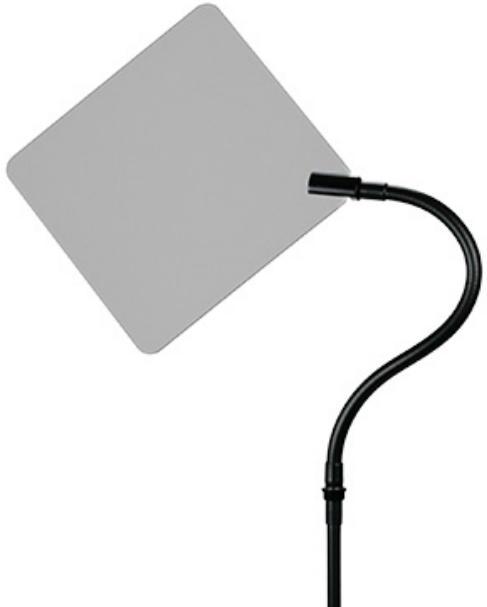
"A custom piece will run the cost per item up a bit. However, while your device is custom, it doesn't mean your flex arm has to be."

FLEX ARMS CAN BE THE CHEAPER OPTION

For the money, flex arms are often a less expensive option than a lot of their alternatives. A properly selected and designed flex arm can often replace more expensive support systems like counter-balanced arms. Integrating them into your designs can help keep that price point closer to where you need it to be.

A GOOD FLEX ARM IS WORTH MORE THAN A BAD ONE

Buying a cheap flex arm might help you in the beginning, but often there's a huge hidden cost if they can't perform or don't survive in the field. Be realistic with your expectations and what you need your flex arm to do. It's better to spend a little more up front then have your design compromised by shoddy work.



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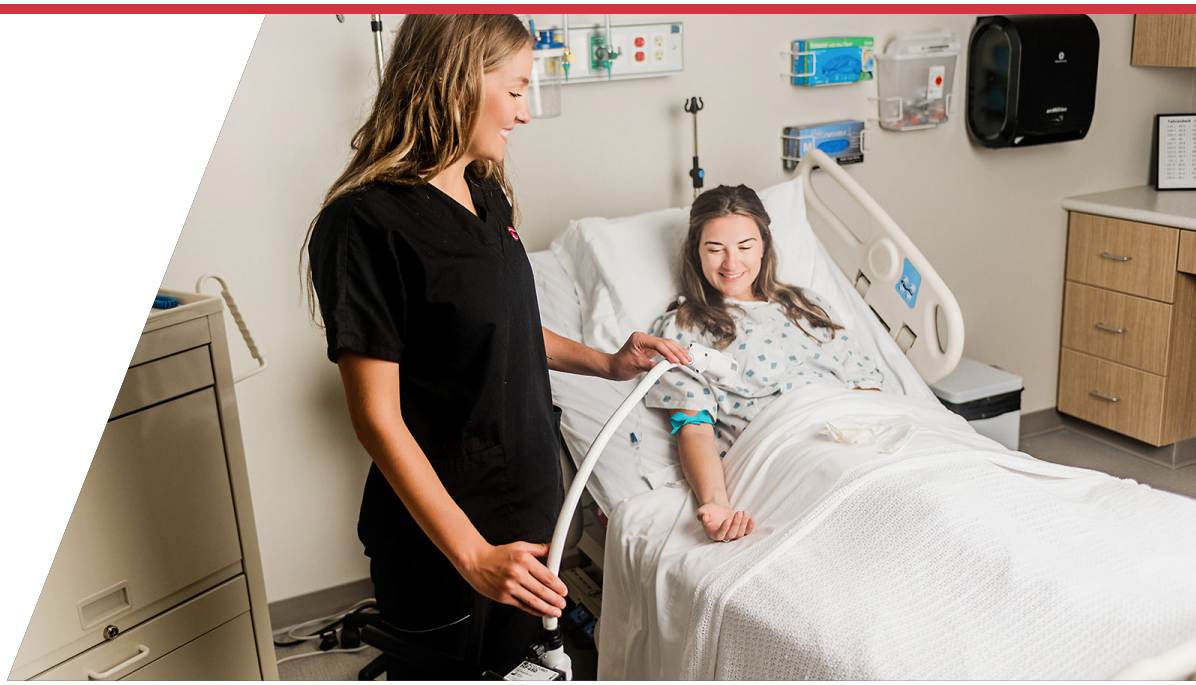

TRACK RECORD

DON'T BE AFRAID TO SHOP AROUND AND ASK FOR REFERENCES.

Flex arms are only as good as the company that makes them. It's important to do your research into the company that you work with. You need to make sure that you're starting on the same page with whoever makes your flex arms. Working together long term on projects like this isn't the same as a marriage -- but it's close. You want to know as much as possible beforehand.

TRACK RECORD

ASK THE RIGHT QUESTIONS

We're always happy to find that customers have done the research on us. It means that they care enough to check and our credibility always shoots up when they find out about our track record. Here are a few of the questions that customers have asked us that we've found helpful when starting a design relationship.

WHO DO THEY WORK WITH?

Medical flex arms need different functionality than ones used in auto repair, which are different from the ones that you'll find in consumer products. Choosing a company can be as simple as looking at a list of their former clients and seeing if they match up with your industry. We've had clients who've worked with us because they've recognized work we've done in the past.

DO THEIR FLEX ARMS LAST?

You can tell a good flex arm company by how long their products last in the field. Look for flex arm producers who build sound, well reviewed products. You'll inherently know that they work well during the design phase, have access to better materials and processes, and will be "in it for the long haul." Design is a marathon, not a sprint.

WHAT'S THEIR DESIGN PROCESS LIKE?

We enjoy the process of design, so we're always surprised when we hear horror stories about other flex arm companies that don't. If you have a way that you like to work, it's important to communicate those preferences early so that the design process goes as smoothly as possible. We've found some of our best clients love the design process with us because of how open we are to their ideas. That seems like a no brainer! As the saying goes, teamwork makes the dream work. It may be trite, but boy oh boy is it true.

WHO ARE THEIR VENDORS?

This can be tricky as many companies don't necessarily want to reveal proprietary information about where they get their components from. That said, they should be able to speak to questions about quality, durability, and anything else you'd like to know. If they're being shady before they work with you, there's no reason to think that will stop when you start working together. Conversely, being open, honest, and informative is always a good sign. They may not give you the total specifics of where they're getting every piece, but they should be able to answer your questions with confidence and honesty.

THE SEARCH FOR THE PERFECT FLEX ARM ENDS WITH MOFFATT

WE CHECK THE BOXES

As a three generation, family-owned business, Moffatt takes pride in making the best flex arms on the planet. From our humble beginnings in our own garage to working with multi-million dollar medical technology companies, there's one common theme in our story -- quality and reliability. Like we said, we're not satisfied with making a good product, we want to make the best product.

Today our flex arms are used in hundreds of applications from ventilators and surgical lights to devices used for mobile devices, in law enforcement, and the auto industry. We work tirelessly with our clients to make sure that every single aspect of their interaction with us goes above and beyond. When you're trying to design the best product, you need to make sure you have a partner who's on the same page -- from design to production.

We understand that a seemingly mundane component part can be used to create amazing products in the hands of a capable engineer. There's literally no end to the amount of ideas a well-designed part can spark in their imagination. We're here to provide you the expertise and flex arm options that you'll need to make sure that your device becomes the best possible version of itself. That doesn't stop after production. We're here for the lifetime of your device.

"Our flex arms are used in hundreds of applications from ventilators and surgical lights to devices used in law enforcement. We're not satisfied until we make the best product."

WE WANT TO WORK WITH YOU

WE KEEP THE CONVERSATION LOW PRESSURE AND WILL JUST ASK QUESTIONS TO UNDERSTAND WHAT YOU NEED.

1. **TALK TO A PRODUCT EXPERT**
   Fill out the form on this page to schedule a video conference meeting.

2. **IDENTIFY CHALLENGES & POSSIBLE SOLUTIONS**
   We will connect you to one of our engineers so you can dig deep into your specific needs.

3. **GET SAMPLES INTO YOUR HANDS**
   We will get a functional sample shipped to you to test with your prototype as quickly as possible.

> Browse our online catalogue

> Talk to an expert

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