



From Idea to Product

- The complete guide to bringing your product to market

From Idea to Product

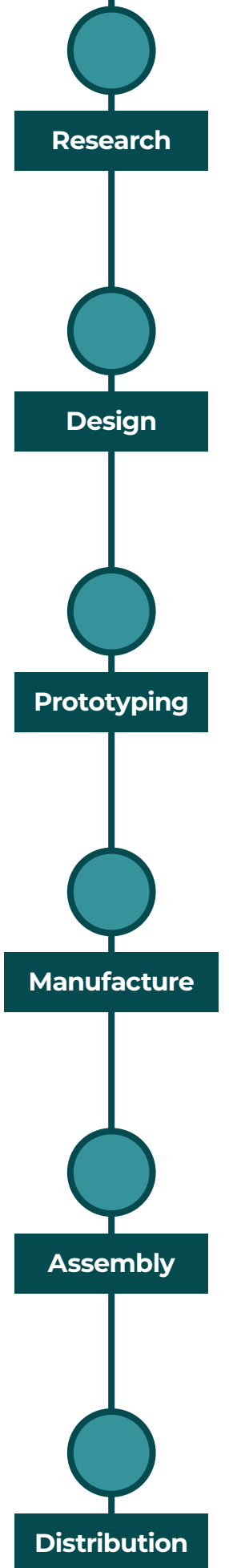
The complete guide to bringing your product to market

So, you have an idea.

You've come up with something that you think might change the world, make life easier and be really successful but you've got no clue what to do about it. How do you take this idea that's in your brain all the way through to a finished product that you might see on someone's website or on a store's shelf?

It's important to remember that taking a product from concept through to final production and sale can be a long process. It doesn't have to be, but it often is. There is a lot of research, calculations and waiting that needs to be done in order to get that final product perfect.

Here you'll find a complete guide to extracting the half-baked, napkin scribbles of an idea from your brain and developing it into the fully fledged, world-changing, money making product that you dream it can be. We're MRT Castings, UK based die casting, machining and finishing specialists and we specialise in turning concepts into final products.



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Before We Begin

Before we get into the flow of developing your idea into a fully-fledged and finished product ready to send to market, let's get a few rules out of the way.

1

Write down everything

Whenever you learn something new, do any kind of research or speak to anyone about your product, write it down. The notes you make at this stage in your product's development will be hugely beneficial down the line. Being able to refer back to original research and feedback will pay dividends.

2

Don't be afraid to start again

Just because you've spent time on something, doesn't mean it's worth anything. If you find that what you're doing isn't quite working for you, there's no shame in taking it back to the drawing board and starting again. Better to get it right than to continue incorrectly.

This counts for prototyping and development too. It doesn't have to be a 'write-off' for you to start again, you shouldn't be afraid to take a step back, redevelop and re-research.

3

We assume you have an idea

This guide makes the assumption that you have an idea in mind and isn't here to help you come up with the next big invention. This guide is designed to help you bring your idea to life.

4

This guide is not the final say

This guide will give you everything you need to take your idea from idea to final product, but it may not cover everything nor in the exact order necessary for you to do it. Keep an open mind to extra speed-bumps and avenues that you may come across that require exploring. Don't be afraid to re-visit steps when required (like prototyping) until it's perfect.

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From Idea to Product: Research



Research

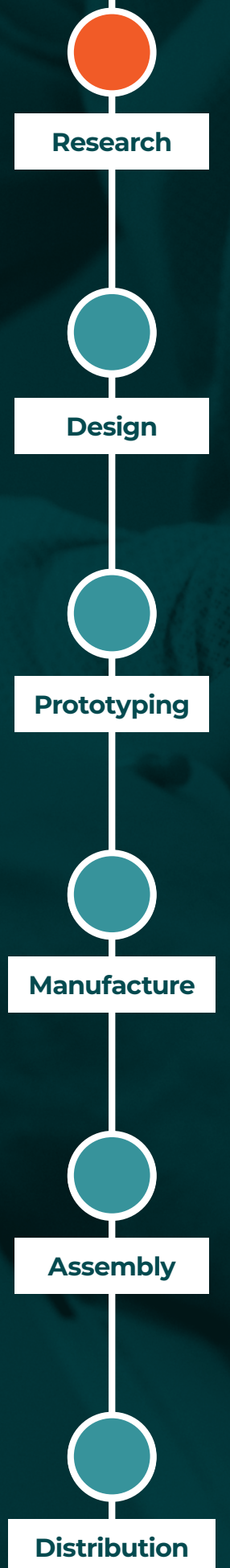
Research is one of the most important aspects of product development. It can be so easy to rush, or ignore and it may spell disaster for your product if not done properly. It's tempting to get ahead of yourself and jump straight into the product development and prototyping phase, but stay on track.

There are 3 key areas of research to focus on before you begin with your journey.

- 1 Idea Validation**
- 2 Market Research**
- 3 Cost Research**

Put simply, you need to work out if your idea works, whether there's a similar product on the market and whether it's profitable to create and sell.

At this stage, you need to be doing both secondary and primary research. Secondary research (second hand information) is researching online and in books etc. Primary research is speaking to people, doing polls and surveys etc. Both are equally valuable during the research phase, so do not neglect one or the other.



1 Idea Validation

The first and most important thing to do is to validate your idea. There is no use in continuing down this path if your invention or product doesn't do what you hope it will. It doesn't have to be a fully-fledged perfect prototype (and it shouldn't be at this stage), it simply needs to demonstrate that your concept works.



EXAMPLE

You've come up with an idea for a new kind of coffee press. Instead of pressing the coffee like in a traditional Cafetière, you pour everything into a cocktail-shaker-style device, and shake it to brew the coffee.

Here, idea validation is needed to tell you whether brewing by "shaking" is possible (and is it better than traditional pressing?). You'll also need to go through idea validation to determine any downsides to your invention. What happens to hot water in a sealed container when it's agitated? (...not good things).

This idea can easily be validated by attempting to brew hot coffee in a sealed container by shaking it and testing the results. (Providing you go through the necessary safety precautions)

Naturally, sometimes an idea doesn't need a huge amount of validation. If the product you plan on bringing to market is relatively simple, then use your judgement here to determine whether it's worth putting time into Idea validation. A newly designed wall-mounted coat hanger, for example probably doesn't need huge amounts of idea validation, unless it's radically changing the way we hang our coats.



Before Moving On

Before moving onto the next stage, you need to be able to answer yes to these questions:

- Is it possible to create a fully functioning product with your idea?



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2 Market Research

Understanding the market is the next important step in the research phase for your product. This is the part where you determine whether there's anyone out there that is interested in buying your product.

Your first step is to find out if there are any products on the market that are the same (or similar) to the product that you are creating.

It does not matter whether there are similar products or if you're the first in the market, so do not get too excited if you're the first, or too defeated if you're not.

Just because you're the only one selling what you're selling, doesn't mean it's a brilliant business opportunity and you'll be successful. You could go to the North Pole and be the first person selling ice cream; it doesn't mean you'll be rich from it.

Conversely, turning up late to the party doesn't mean there's no chance to be successful. Volkswagen was founded over 30 years later than Ford and they're doing just fine.

What you're looking to understand here is what sells and what does not sell. If you're not the first in the market then you need to understand the companies you're potentially up against. Here are some questions you're going to need to ask:

What are they selling?

Here you need to work out if what is on sale is the same as what you're producing. It's not the end of the world if it is, but even the slightest of differences will give you a unique selling opportunity.

Is it patented?

This is a detail that can make or break your idea. Are the products currently on the market patented to an extent that would inhibit your ability to manufacture a similar product? You can search the Gov.uk website for patents, as well as using google's built in patent search. At this stage, you simply need to ensure that you're not stepping on any patented toes, but down the line you may need to contact a patent lawyer to ensure your idea is safe.

How are they selling it?

Do your competitors have any unique selling points? How is the brand positioning itself? Does the brand establish itself as a luxury product or on the lower end? This is important because understanding how to position your product from the beginning helps you make manufacturing and design decisions later on. This is where you're looking for a gap in the market to fill.

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Can you improve on it?

This is where understanding the current market and how to fit into it comes in. Improving on what's available with a better product at a similar or better price point is a tried and tested business strategy, providing you can back up the product's claims.

How many are being sold?

This is not an easy metric to get, but it's important to find out in one way or another. A rough guess is fine at this stage in the game. What you need to work out here is whether there will be enough sales of your product to support itself.

Hopefully you'll find that the reason your product is the only one on the market is because you're an innovator that's come up with something truly unique. Not because your idea is a lemon that has failed in the market already. How do you find this out? Research.

You may have run into old, defunct products of future's past in your research for any products similar to your idea. Take these products and begin your search for reviews, forum posts and questions about that product. This will give you information and insight into potentially how it failed and mistakes to avoid in future.



Before Moving On

Before moving onto the next stage, you need to be able to answer yes to these questions:

- Can you create your product without violating any patents?
- Have you established that there is a market for your product? Is there significant sales volume to support the business?
- Have you established where your product sits in the market?

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3 Cost

This next stage of research takes your previous stages into account. Can you create the product that you want to create, to a necessary standard and sell it for a price that the market will support?

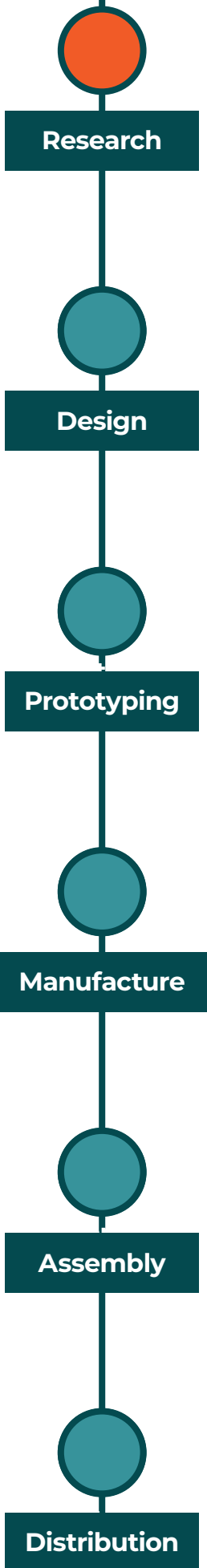


The first thing you need to work out is what selling price will the market support? A lot of research, questioning and polls can be done here to get the answer you need. Do people feel like they're paying too much for similar products and would prefer something cheaper? Are people happy to pay more for a product that has more features? This is where market research is important in telling you what customers are looking for from your product.

Why should you research the end retail cost of the product before you even begin looking at manufacture and distribution? Surely, retail cost is one of the last things to look at? Not at all. Knowing at what price the market will purchase your product means that you can plan profit margins and production costs accordingly and work out how profitable the product may be from the start. If you decide on retail price last, you're can very easily lose your entire profit margin to manufacturing costs or price yourself out of the market.

You will also want to work out a rough cost of manufacture at this point. Once again, it doesn't need to be perfectly accurate, but it needs to give you an idea. At MRT, we get enquiries like this on a daily basis and we're always happy to offer a helping hand. We're often asked for a rough cost per unit based on quantity, size and rough material requirements. We for obvious reasons can't offer exact numbers, but we can give you a number that's close enough for these early calculations. We might even be able to give you a little more information on start-up costs and logistics.

Plug your numbers into the above formula and multiply it by your estimated yearly sales volume to give you a (very rough) estimate as to whether you've got something worth pursuing on your hands.





EXAMPLE

The Coffee Shaker is a great coffee maker and we're happy to proceed to the next steps. We've established that people are happy with the cost of coffee makers, and we think that the added extra taste that our coffee making gives warrants an extra cost. We've researched that the market pays up to £25 for the higher end coffee presses, so that's where we're going to price it.

After speaking to MRT Castings, we know that each unit will cost roughly £6 to produce and we'll need to produce 1500 units to stay just ahead of what we think demand will be.

£6 + Profit Margin = £25

If we re-order the equation to calculate profit margin...

Profit Margin = £25 - £6

We can see roughly, that each unit will have a profit margin of £19 or 76%.

If we multiply this by our estimated annual sales volume of 1500 units, we get annual profit of £28500. Using this, we can estimate whether the business can handle additional costs of manufacture, running the business or price drops. It also allows us to work out how long it might take to be profitable, based on established tooling and other business costs.

Whilst at this stage, these estimates won't give you definite answers; they will give you enough information to act on. If in your research you find that the retail value is £25 but it costs you £30 to manufacture each unit, you know that it's not looking to be profitable and you should re-evaluate the product to try and make it cheaper.



Before Moving On

Before moving onto the next stage, you need to be able to answer yes to these questions:

- Do you know what price you can reasonably sell the product for?
- Have you researched what it can roughly be manufactured for?
- Is the retail value of the product more than your projected estimated manufacture costs?

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From Idea to Product: Design



Design

Once you're happy that your product can be brought into the market of today and sell well, it's time to design it.

Designing a product is broken down into 3 separate design phases:

- 1 Aesthetic Design**
- 2 Mechanical Design**
- 3 Design for Manufacture**

Each area of design will fight for control over the look of your product. Aesthetic design is generally what most people consider first, how their design will look. However, this is often dramatically changed by the mechanical design limitations, and changed even further by manufacturing considerations. At this stage, it's incredibly important to begin talking to and hiring professionals that can help you with this process.

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1 Aesthetic Design

From a sales point of view, aesthetic design is one of the most important aspects. The aesthetics of the product are the most obvious part of the design process and it's ultimately the first thing that customers (and co-workers and clients) will notice about the way the product has been designed. Before people look at the specifications of the product, the way it feels to use or the way it performs its task, they will notice how it looks. This is quite often the deciding factor in a purchase.

Stay up to date with design trends in your industry, as well as other industries. Understanding what customers want their products to look like is an important consideration. Take a look at your research and focus on the competitors in your market. Focus on the products from the companies, the brand styles and ethos of the businesses. Use these to capitalise on what works and what doesn't to produce something unique, but that resonates with your market.

Hire a product designer that can 3D model your preliminary drawings and create a design that looks like the product that you imagined in your mind from the start (and that resonates with your research).

However, don't put aesthetic design ahead of everything else. Nothing will put a customer off faster than when it's clear to a company that "form" is more important than "function". This is where mechanical design comes in.

2 Mechanical Design

This is where it's important to put "function" first. Customers are very quick to forget about the beautiful aesthetic of a product if the product is painful and irritating to use.

Ensure that the product is as comfortable and as intuitive to use as possible. You want the product to be as enjoyable to use for as long as possible. If ergonomics come at the cost of some aesthetics, it's better to have a comfortable, easy to use but less than perfect looking product than one that looks amazing but is horrible to use.

Mechanical design also encompasses the inner workings of the product. Your mechanical designer should be able to meticulously design and model how your product should work.

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EXAMPLE

We want our Coffee Shaker to look amazing. We want it to be a monolith to coffee lovers everywhere. However, our original monolithic design was prohibitive to the internal shaking matrix, so we had to redesign the aesthetics so that mechanics of the shaking mechanism were still operation.

Mechanical design also encompasses the design of the internal coffee shaking matrix to ensure optimal coffee brewing. We take into account our "Idea Validation" phase, and make it as perfect as possible through rounds of prototyping and R&D.

Mechanical design encompasses everything from how it works, through to what it's made from and what it's held together with. Your mechanical designer will pay attention to the material of everything, from the 'shell' of the product, down to the materials of the hardware such as screws, nuts and bolts. Hardware of the incorrect spec can cause a product to fail years before the product's expected lifecycle.

Additionally, they'll ensure that mixed materials – either used in the product or ones that the product is like to come in contact with – are compatible. Materials such as steel and aluminium, when used together, can cause galvanic corrosion and corrode prematurely. Certain plastics and rubbers will be degraded quickly in oily and greasy environments.

3 Design for Manufacture

This is where a company like MRT Castings comes in. You know the functionality and the aesthetics you need but unless your product can be manufactured economically, repeatably, reliably and within the correct timeframes then it will never achieve its full potential.

MRT's technical team have been designing successful cast components for many decades and what it boils down to for us is partnership. We like to work in partnership with your product designers to develop and adapt your product concept or design to optimise it for manufacture. We use our experience, expert knowledge, and the latest Solidworks CAD modelling software to help us achieve innovative designs which can be manufactured within the controlled parameters required.

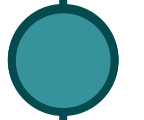
Designing castings is a specialist skill. Die cast components require specific features such as draft taper, even wall thicknesses, and the avoidance of undercuts and isolated heavy sections. All of these issues can be easily overcome if you work directly with our team before you freeze your design. Costs of machining, surface finishing and assembly can also be dramatically reduced if we are consulted early in the design process.



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EXAMPLE

The Coffee Shaker is fully designed and 3D modelled. It then gets sent to a potential manufacturer (MRT Castings), who look over the designs. They make a few design alterations to make it suitable for aluminium die-casting and offer a few additional changes based on their manufacturing experience that reduces the cost of manufacture by 5% and the manufacturing time by 10%. These savings mean that the Coffee Shaker could be Powder Coated within budget for a more premium feeling product.



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From Idea to Product: Prototyping



Prototyping

Before, during and after product design, you'll be doing plenty of prototyping. It's an on-going task that will last the whole length of the product development process. Prototyping will validate your research and ideas and allow you to have a real product to test and evaluate. Whilst 3D modelling on a computer is effective, there's no substitute for physically holding the product in your hand and evaluating everything about it with a critical eye. Here are some of the prototyping steps you can expect to experience during your product development:

1 Idea Validation Prototype

Idea validation prototyping is the simplest form. It's a rough and ready "proof of concept" that merely represents that the idea you have works, and doesn't necessarily reflect how the product will look, the quality of it, or how well it does its job. You will have done this already if you're at this stage in the guide.

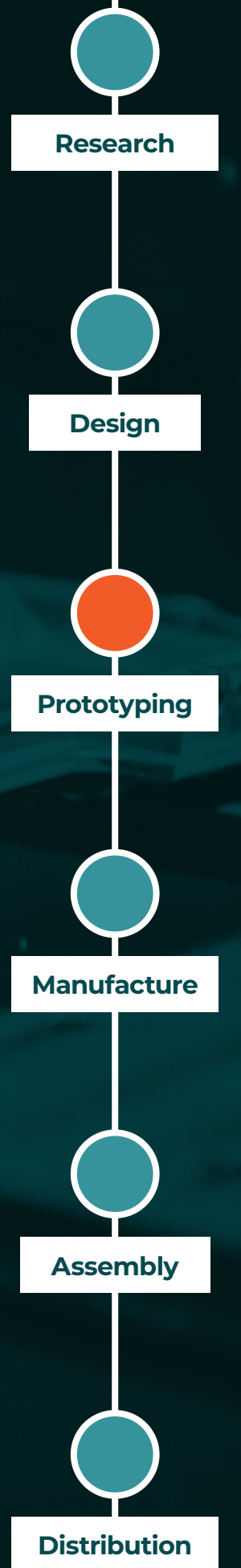
2 Design Prototype

This is the first prototype that might slightly resemble the product you want to sell. After the design for manufacture phase, we often produce prototypes using the intended manufacture methods to ensure that dimensions and tolerances are perfect. Often, we'll do this before making customers commit to tooling, so they can see exactly what they're will be paying for first. At this stage, prototypes are used for further market research – how do potential buyers like the product? Does it work as intended? Can it be improved? etc.

3 Iterative Prototyping

Next comes iterative prototyping. It's the same as design prototyping, but the prototype will vary slightly to accommodate research and insights from the previous prototype. Perhaps the mechanical design can be varied to be more efficient, smaller or needs to be stronger; perhaps the design needs to be altered for easier manufacture. This process repeats until you end up with the final prototype that will represent the final product – this is known as the "Pre-Production Prototype".

Your pre-production prototype should be as close as possible to what you're planning on producing. You can then use this pre-production model for a number of different tasks such as marketing collateral, market testing, investor onboarding, talking to manufacturers etc. Having a "finished" product that works is a big step in getting people to take you seriously.





From Idea to Product: Manufacture



Manufacture

At this stage, you should have a pre-production prototype that can go to manufacture as well as designs that can be followed for manufacture.

Choosing who to manufacture your product can be a difficult decision. Every manufacturer offers different benefits and it's not always as simple as choosing the cheapest option.

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Domestic or Overseas?

To narrow down your search for a manufacturer, you'll first want to work out whether you want to manufacture in the UK or overseas. There are a number of benefits and negatives to each approach. You will want to find a balance between cost, speed and quality. Cheap manufacturing may be available overseas, but quality may not be as good, and the cost of shipping it to the UK may put the overall unit cost higher than what's available domestically.

Here are your key considerations when deciding the manufacture overseas or domestic:

Cost

Cost is naturally your key consideration. Economies and currencies play a huge part here. If the UK is planning on leaving the EU, is it a smart idea to put your manufacturing outside of the UK without knowing potential future importing costs.

Intellectual Property

Intellectual property becomes difficult to protect when you take your product overseas. However, in the UK you're protected by UK laws. For example, we're always happy to sign an NDA before working with you.

Communication

Manufacturing overseas can be riddled with language barriers. If there is a vital piece of information that needs to be transferred between the two parties, can you rely on their ability to communicate efficiently?

Quality Assurance

It's an almost trivial task to be able to travel to a domestic factory and inspect the products that are being manufactured. You're able to see first-hand the quality of the components. When working with overseas manufacturers, it's not that simple. Whilst you can always employ a third party quality checker, it's another step to the process that adds time and cost.

Import Process

What will the import process be like for your product? How long will it take and how much will it cost? Do you need to insure it? Ensuring that all of this is possible, within budget is important to not losing money simply on getting your product into the country.

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Factory Capabilities

It's also important to ensure that the factory can handle the kind of manufacturing needed to produce your product. For instance, we at MRT are aluminium and zinc casting specialists. However, we don't only offer this service, we also offer CNC machining, heat treating, finishing and assembly services.



EXAMPLE

Our coffee shaker can be cast from aluminium, so we're searching for a manufacturer that can produce high quality aluminium castings. We've narrowed down the possible manufacturers to these 2 factories, MRT Castings and 123 Metal Castings.

Both companies can produce high quality aluminium castings which we need. However, we also need the surfaces to be CNC machined for a perfect seal and the outside should be powder coated to look high quality. Since MRT offers all of these processes in house, we can save money on logistics and tooling by keeping it under one roof.

Other Clients

Who else does the manufacturer work with? Have you heard of them and are they reputable? If you're not aware of the companies your potential manufacturers works with, attempt to find a unit of theirs on sale and inspect it yourself for quality purposes.

Working with big names isn't always a sign of producing high quality. Likewise, a manufacturer with "no-name" brands on their portfolio may still be producing amazing products. Don't take the fact that they work with a huge brand as a sure-fire sign they'll produce great quality.

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NDA

Is the manufacturer willing to sign an NDA (non-disclosure agreement) before seeing your product and working with you? At this stage in the game, you've done a huge amount of leg-work and if you've not patented and trademarked it (and even if you have), there's always someone out there who will happily take that work and run with it.

Ensure that you're putting the measures in place to protect your intellectual property. If a company you're working with is not willing to sign an NDA, don't instantly be put off, there's often a good reason. However, it's a conversation worth having and it's important to remember to protect yourself and your company.

Tooling

Manufacturing processes, including metal casting, are complicated operations. Each product is different to the last and there are no two products that are manufactured in exactly the same way. This means that each and every manufacturing process needs to be tailored for that specific product.

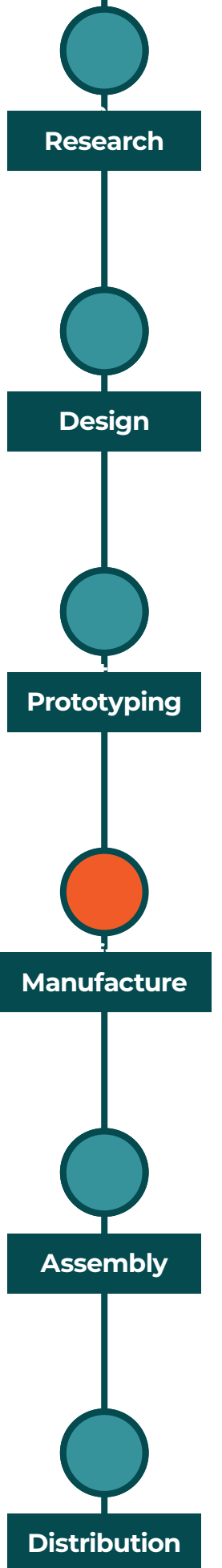
However, not every machine is equipped to hold, cut, clamp or stamp every possible intricate shape. This means that adapters, jigs and tools need to be crafted to allow the product to be manufactured.

This is where tool making comes in. Tool making is the creation of bespoke and specific tools that are used during the manufacture of an item. This can be anything from the tools needed to produce the item through to tools required for testing methods.

MOQ

Does the manufacturer have a Minimum Order Quantity (MOQ)? Most manufacturers won't turn their machinery on unless it's to manufacture a minimum of a few thousand units. How many units does your potential manufacturer require you to commit to before they'll do a deal with you?

There are plenty of manufacturers that will deal in limited runs of products, some specialise in just this. It all depends on the size of your operation and how much money you want tied up in products. As always, remember that there are humans at the end of the line and these things are always negotiable.



Which Tools Need Making?

Depending on your chosen production process, materials, and the complexity of your design, you will probably need some bespoke tooling.

Good quality tooling will enable accurate and repeatable production of your components, with maximum production efficiency. Most commonly, you will need either mould tools (for metal casting or plastic moulding), forming tools for sheet metal work, or jigs and fixtures for workholding during machining, assembly and testing operations.

Who Will Own The Tooling?

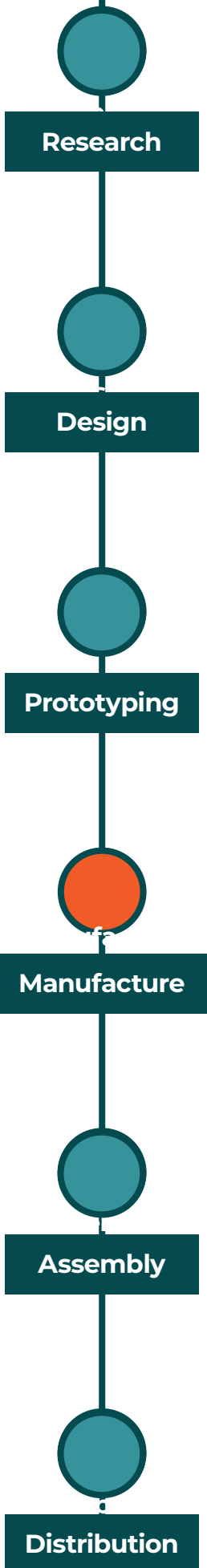
Good quality production tooling is likely to be your largest up-front pre-production investment. Despite the substantial costs involved, try not to be seduced by potential manufacturers who offer part-cost tooling.

If you own the tooling, then you maintain control of how it is used, and ultimately, if things don't work out with your supplier then you have the ability to withdraw it and transfer it to another supplier.

Work With Your Manufacturing Partners

Your chosen manufacturing partners are the best people to work with to design and source your tooling, as they are the people who will have to use it and keep it running.

Whilst they may not necessarily manufacture the tools in house, they will have specialist tool making partners who they work with regularly. Manufacturers such as MRT have a wealth of experience in how to optimise tool designs to achieve maximum production reliability and efficiency.



Full Production

At this stage, your product should be ready to go into full production. You shouldn't need to have much of a hand in this process; however you may wish to keep tabs on production, schedule and any potential problems that may arise.

Finishing

This is where it's important to see what services are offered by your manufacturer. Shipping components between manufacturers, finishers and assemblers can add a large cost to the manufacturing processes. Keeping it all under one roof is a smart way of savings costs and decreasing manufacturing time.

The process of "finishing" covers a wide range of post-casting processes that improve the look, feel or quality of it, known as the "finish". This can be anything from simple paint or powder coat through to shot blasting, silk screen printing, electroplating etc.

Which Finish is Right For You?

Your finishing requirements will be communicated and established before manufacture starts and your manufacturer should be able to guide you towards the finish that is right for the product you're manufacturing.

Not all manufacturing processes or materials allow for all finishes. Anodising, whilst popular, is not ideal for sand casted aluminium for instance. You're not expected to know exactly which process you need for your product, that's our job. However, knowing which properties you need from the product allow us to make an informed decision on which process is best for you. Each finishing process has its benefits and drawbacks. A robust, corrosion resistant finish may require powder coating, for instance.



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Assembly

Not all products are made in one piece. Some may require modules to be assembled, electronics to be inserted or hardware to be attached.

Assembly is all about “building” the final product, putting everything together into that final thing that you pictured and designed at the beginning. MRT offer mechanical and electro-mechanical assembly, testing, kitting, and specialist packaging. Whatever your requirements, we will work with you to create a solution that fits.

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Distribution

For regular customers, we offer stock holding agreements and Kanban supply solutions. For customers with lower volume demands we offer flexible scheduling and supply solutions tailored to your specific needs.

We have 4,000 sq ft. of dedicated warehousing facilities adjacent to our main production site.

For UK based customers we make deliveries using our own fleet of vehicles or using overnight carriers.

For international customers we arrange collections with your preferred shipping partners on an ex-works basis. Over 50% of MRT's customers are based overseas, with shipments leaving our Andover base daily to destinations throughout Europe and North America.

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With over 70 years of experience, MRT Castings are specialists in developing design concepts into die cast reality.

We operate one of the most technically advanced die casting and machining operations in Europe, and supply leading global players in the electronics, medical, marine, aerospace, defence, and lighting industries.

Our friendly and knowledgeable team are available to discuss your project on a no-strings basis, so get in touch today.

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