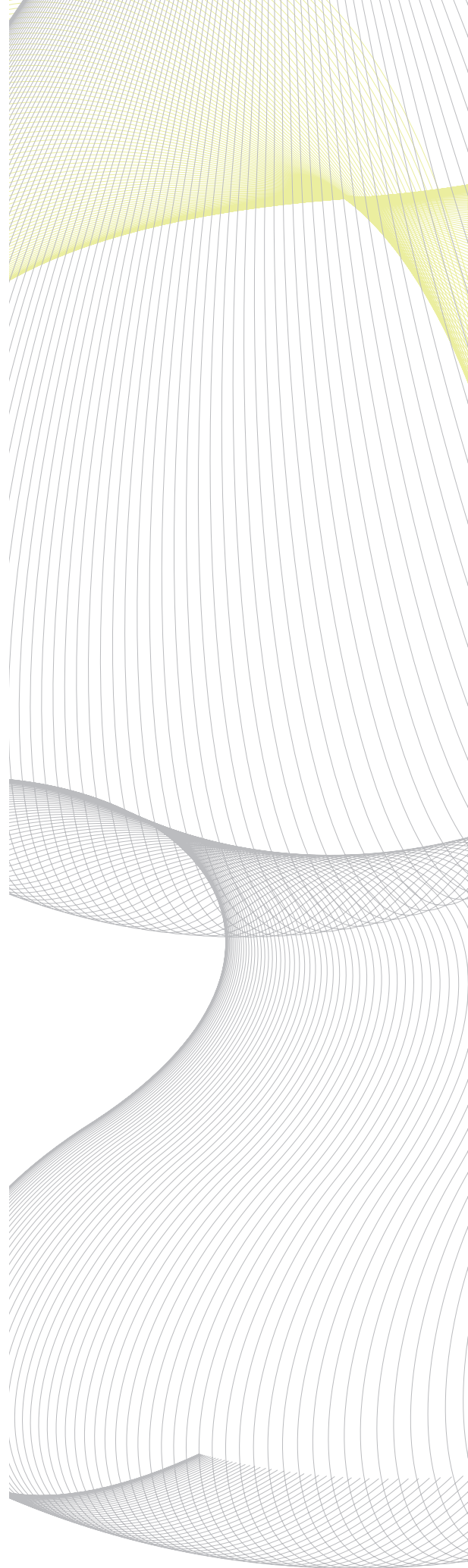




Inventor's Guide

A guide for individuals and small businesses new to the product development process.

Edition 1.03 - May 2011



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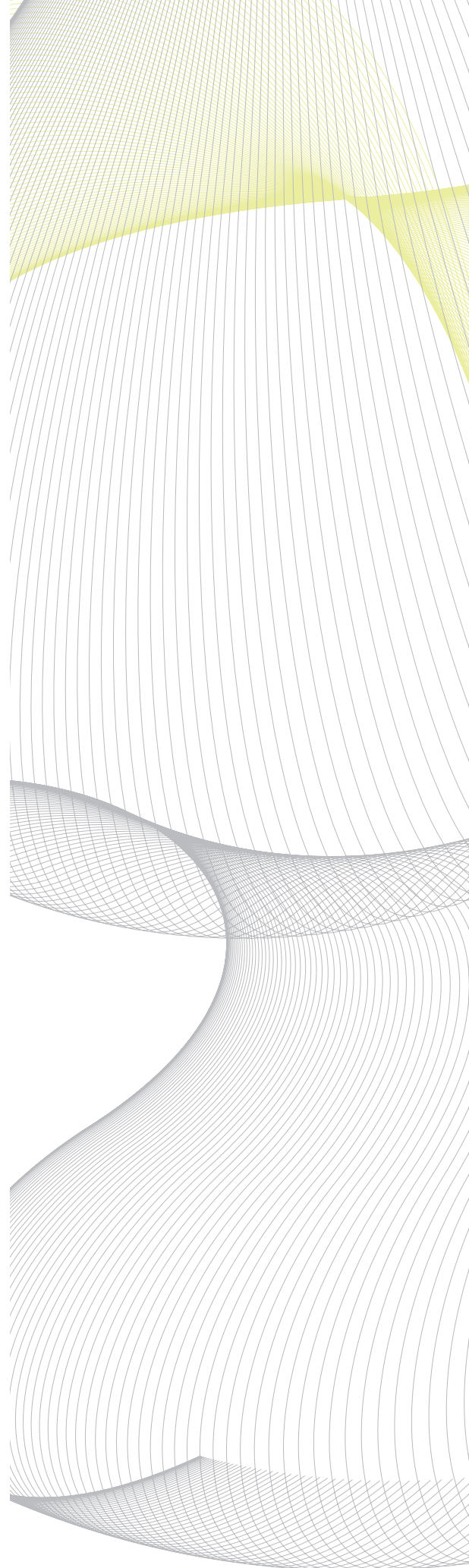
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Introduction

Developing your own product is can be an exciting and very rewarding experience. Most great ideas come from individuals who encounter a problem regularly in their work, home or leisure time, and they stop to think, why is this so difficult, how about doing it like this. These little gems of insight can eventually grow and develop into fantastically successful products. Depending on the idea, however, it can be a long and costly process. It's worth doing as much research as you can on the product development process and routes to market before you spend too much money on things like patent agent fees, so you get a real sense of the journey ahead. It will help you make the right decisions at the right time.

We are frequently contacted by individuals and budding inventors who are at various stages along the path to launching a product, from that early seed stage right through to, in some cases, where people have invested a lot of money with another product design consultancy only to find that some fundamentals have been missed due to a lack of skills and the whole thing needs re-designing (it's rare, but it does happen).

In this guide, we hope to pass on some of the advice that we often find ourselves giving people. Some of it will be useful, some of it you may know already. Some of the guide refers specifically to the process of the development of a predominantly plastic, moulded product, since that's essentially what we do most of the time.





The Basics

Identifying a Need

Identifying a need is different to having a tangible product concept. For example, you may have identified the need for something that one can attach to car tyres to make them grip better in snow and ice; or something to attach to an iPod to stop your headphone cable getting tangled up. That doesn't mean that you have a product idea. It's a need, not a tangible solution, and as such you don't yet have any 'Intellectual Property' or anything to patent.

Needs to Solutions

If you've identified a need but don't yet have a product idea, it doesn't mean that you shouldn't necessarily talk to a product design consultancy. Product design consultancies are experts in turning needs into products (and identifying needs in the first place) – it's something they do day-in day-out. But it does complicate things a little, because even if you're paying them to come up with tangible product ideas, if the end product is solely based on the intellectual property they conceptualise and develop, they may require recompense over and above just design fees. For instance they may ask for a royalty or even a share in the company that will own the intellectual property, be it the client's existing company or in a new company set up specifically.

Patents

The information on patents and registered designs in this guide is provided as general information only, and without warranty.

If you've got this far in the process, the chances are that you've already done a fairly exhaustive search on the Internet to see whether your product idea already exists. What one should be aware of, however, is that there are thousands upon thousands of patents and patent applications that are published but never make it to commercial reality. So you won't know for sure until you've had a patent search done by a patent attorney.

Patentability criteria vary from country to country, but in general, in determining the patentability of a patent application, novelty and inventive step (or non-obviousness) are considered, as are usefulness or if it can be made or used in some kind of industry.

There are two ways in which current or expired patents and patent applications may affect the viability of commercialising your product. One is patent infringement, and the other is prior art.

Patent infringement occurs if you use or sell a patented invention without the patent holder's permission. Even if you are able to patent some aspect of your product, you may still infringe with other aspects. In many countries 'use' would have to be commercial to constitute infringement. Patents are also territorial, so you can only infringe another patent if you are commercially using or selling products or services that include that patented invention in a region where the patents that relate to it are published.

Prior art is any publication (written, verbal, electronic) that has been made available to the public before the date of filing a patent application. Prior art can take many forms and is not always written and is not always a prior patent application – for example text books, magazine articles, lectures and conferences all constitute prior art. The term “prior art” is used generally to mean all information available before the date of filing a patent application and is not limited to prior art that is relevant to the validity of a patent for an invention.

Prior art will affect patentability if it cannot be demonstrated that your invention shows no inventive step or novelty from the prior art.

Registered Designs

Registering your finished design is also a very useful tool to protect your product from being copied. Design Registration is quick and cheap compared to patent protection, but it is more limited in its scope of protection since it serves only to protect the shape, the look and feel of a product and not how it works. So whether or not your idea is patentable, you can still get a level of protection against copying in this way, and most companies will do this as a matter of course. Design Registration can be termed differently in other regions or countries (such as ‘Design Patent’ in the U.S.). In the same way as patents are region-specific, a UK Design Registration will only offer protection in the UK.

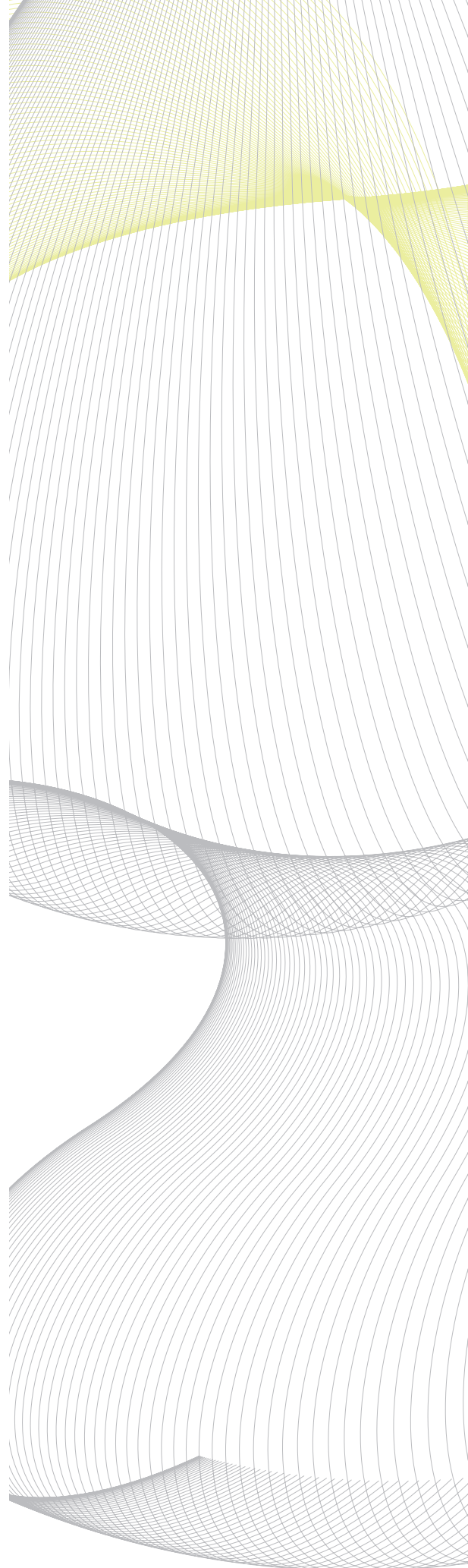
Your target market

It sounds obvious, but you need to have a clear idea of who’s going to buy your product. It’s amazing how many people, when asked this question, say, Everyone. It’s never true, and the clearer you are about who will, the more focused and successful your product will be.

Do your research on what you think people will pay for your product. Even if it is a brand new product that nobody’s ever seen before, there will nearly always be similar products that your target consumer buys, to give you an idea of what to expect people to pay for yours. Your designers will need to know this, as target retail prices drive manufactured cost. You don’t want to end up with a product that you just can’t sell because it’s cost you more to make than you can sell it for. What’s more, if a distributor or retailer thinks you’re asking more for your product than they believe the consumer will pay for it, they won’t take it on.

Numbers

A successful product is all about numbers. If it’s too much of a niche product, you may never sell enough to have made it worth all the money and effort you’ve put in to get there. If your head is brimming with lots of product ideas, focus down on the ones that you think there’s the biggest market for.





Sell the idea, or make it yourself

As an inventor, you have two main options for getting your product or invention onto the market. You either go the whole distance and invest in the complete product design and development process, manufacturing, branding, marketing etc, or, once you have a patent granted, you find a company that are interested in either purchasing or licensing your Intellectual Property (the patent or patents). A license deal is the more common one, and would usually involve an agreement whereby the licensee agrees to pay you a royalty per unit. You also have the flexibility to limit the length of the license agreement, and to put in clauses stipulating minimum sales etc.

However, there are some things to consider if you think that licensing or selling your IP is the best route for you. The scenario that will offer you the best return in the long run is one whereby you are offering a license to manufacture a fully developed and tested product, as this will pose the least risk and minimum upfront investment for a licensee. There are plenty of stages in between at which point a licensing agreement might be reached, but it is very rare for a license agreement to be reached for a product based purely on unproven and undeveloped Intellectual Property.

If you are considering looking for a licensee, it's important to present your product or idea in the best possible light, and embodied in a form that potential licensees can easily grasp and imagine in the market. So, even if you are going to try and license the IP without having a fully developed product, it might be worth investing in design and development to the point where you have a great looking working prototype and some really eye-catching images of what the product might look like as a mass-produced item.

Outside investment

Because the product development process requires significant investment, you might need to seek capital investment from outside. Again, though, as in licensing, the less proven the concept is, the more risk you are asking your investors to take on, and therefore the bigger slice of the pie they will want.

If you do seek outside investment make sure you have all your research in place, such as target market, size of that market, projected sales, estimated manufacturing costs etc - we've all cringed at the inventors who go on to Dragon's Den ill-prepared only to get shredded by the Dragons. Again, consider investing in a working prototype and some images before taking this step.

Before you talk to anyone...

Get a Confidentiality Agreement (or Non-Disclosure Agreement) in place between you and anyone you want to talk to about your idea. This is basically an agreement to keep any disclosed information confidential.

Any critical information you divulge to anyone outside of such an agreement may prevent you from being able to get a patent, and there's also nothing to stop that company or person going off with your idea. However, if a third party tried to patent an invention that they had stolen the law does provide for an entitlement dispute where the genuine inventor reclaim the patent application if he can show that he genuinely was the inventor and that the third party stole it from him (as opposed to independently created the same thing).

Some people may refuse to sign one – if they do, our advice would be to walk away, no matter who they are.

If you'd like to contact us about an invention or product idea, we can provide you with our standard Confidentiality Agreement though we are advised to provide it without warrant.

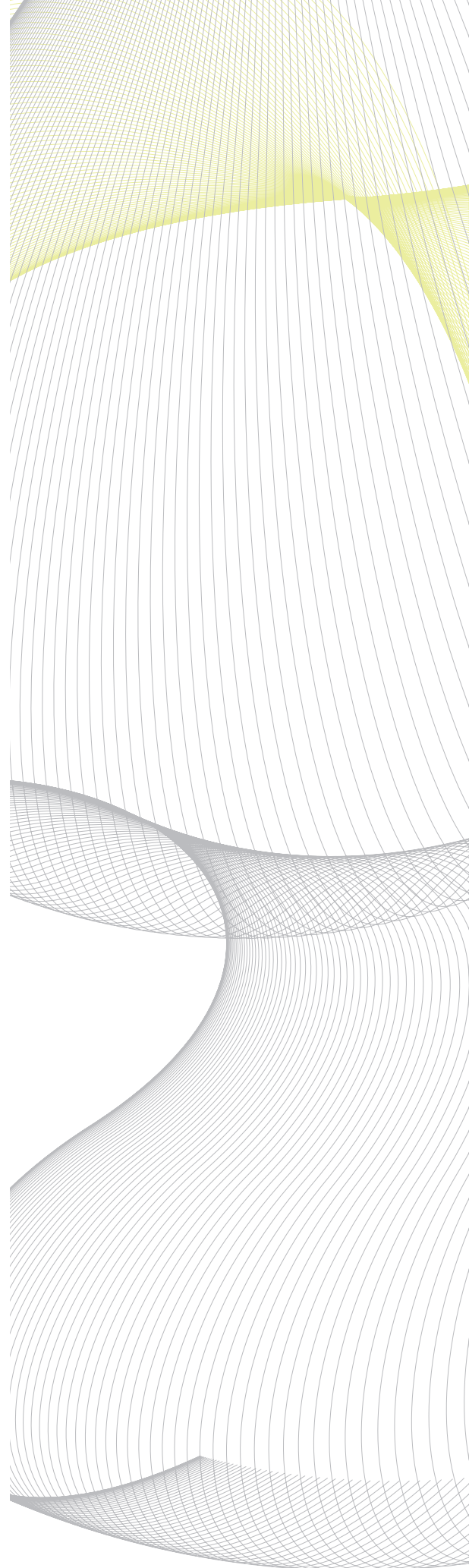
Beware

There are many unscrupulous “invention promoters” or “invention marketing” agencies out there who will hoodwink you into parting with your money.

If you're not sure what you're getting yourself into, don't be afraid to ask for references and details of trade association membership etc. If you do hand over any money, make sure you're clear about what to expect in return, and get it in writing.

If anyone's offering a patent search to you, it's worth checking whether or not they are registered with the Chartered Institute of Patent Attorneys. There are many reputable patent searchers who are not actually patent attorneys or patent agents, but it can be difficult to establish their credibility.

We are in contact with a number of patent attorneys, and would be glad to pass on their details.





Selecting a Consultancy

Every product design consultancy will differ in some way to the next. It's important to get the right fit, both on skills and experience, and personality.

Skills and experience

You should find a consultancy that you can be confident has the right set of core skills necessary to design and develop the product in question.

Ask yourself what you are looking for in a design consultancy. Are you looking for product innovation expertise or are you essentially just looking for product styling.

Some consultancies, for instance, will be better and more experienced than others at taking a product design all the way through to manufacture, and will have the material selection and engineering skills in-house to back that up. There are other consultancies that will look to take a project up to a certain point and then hand it over to someone else who has such skills to do what is often referred to as the design engineering or production engineering to take the design to a manufacture-able point.

The problem with this separation is that if the technical and engineering aspects of a design are not considered from the concept stage, not only is it likely that re-design work will be required once the product is being engineered, but early engineering input can add considerable creative input on driving a successful design. Not considering technical and engineering aspects from the start can also often lead to product failure, either in testing or out in the market place.

One easy way to spot a consultancy's track record in designing successful products is to look at their portfolio on their website. If the portfolio contains a large number of computer generated images, and few photographs of real products, it may be an indicator that they lack the skills to see a product all the way through.

Rapport

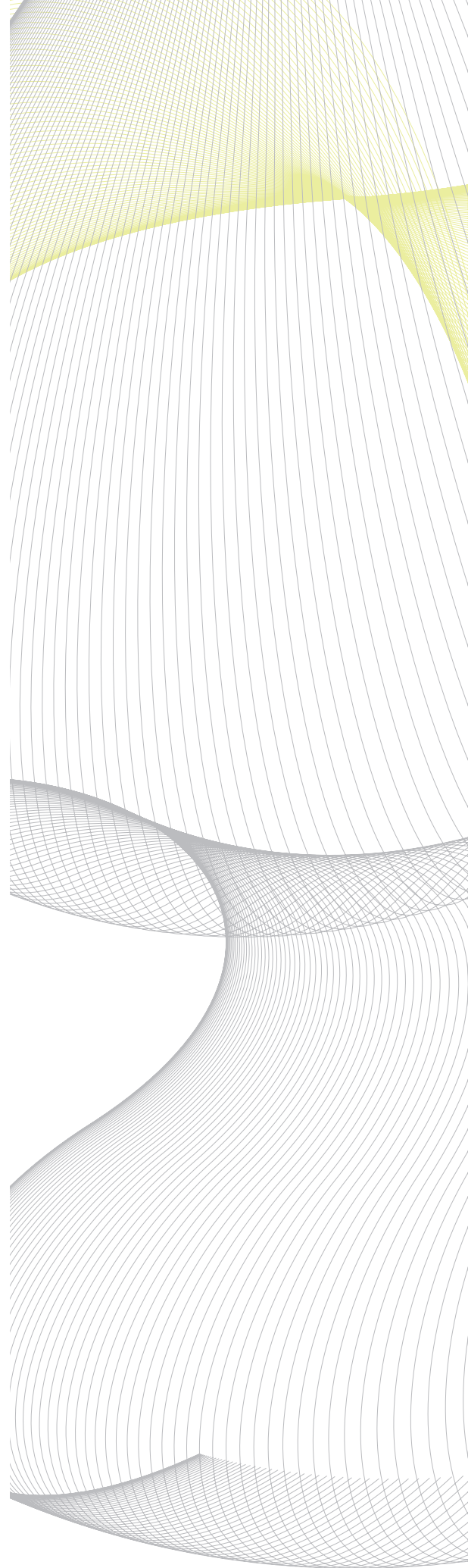
Having a good rapport with your designers is essential to a successful outcome for all, and is possibly even more important than having a perfect match on skills. From the word go, you need to be able to trust what they're telling you, and vice versa. A good rapport it will also mean getting the very best out of your designers. They will be more likely to buy into your vision and give their all to make it a success, over and above what they might be expected to.

Fees

Design fees and day rates will vary considerably from one consultancy to another. Generally speaking, design companies will be reluctant to give you their day rates, as they are far from an accurate way of judging how much the project will cost you. Five days work from a junior designer will give very different results from five days work from a senior designer, for instance. The best way to evaluate one consultancy against another, on cost, is to ask for a work proposal. You'll need to prepare a brief first, however.

Once again, track record is important. You may pay more in design fees to a company who have great deal of experience, but the chances are they will save you money in the long run, by designing you a product that is fit for manufacture, cheaper to make and is styled more appropriately for the market. So not only will your sales margins be better, but more people will be attracted to buying it in the first place.

Apple did not get where they are today by scrimping on design. Being prepared to spend a bit more on design will elevate your product considerably. It might make the difference between your product being seen as a cheap gadget or product from China, to one that people aspire to owning. Good design should be the backbone of your brand.





Developing a Product

The product development process is usually split into a number of distinct stages of work, each with their own specific aims and objectives. Not only do these provide a useful structure but they should also act as a means of risk management, by providing a set of hurdles that must be jumped before the next stage of work can begin.

The Process

While every project is different, and a development process should be tailored specifically for each, most will follow a general path something like the following. Some aspects may not be relevant, and others may require a more in-depth approach:

Research and Brainstorming

In this stage, we would look to familiarise ourselves with the product sector and the target market to be able to tune in to the mindset of the prospective user and the specific scenarios of product usage.

Once tuned in, with the contextual research firmly in our minds, we can objectively brainstorm around the need, the scenario and the proposed invention, to see how the invention might be enhanced further, what the best embodiment of the idea might be, and consider any technical, material selection and manufacturing issues.

We would then illustrate the outcomes of the brainstorms and present these to you in order to decide on the best route forward from there for concept design and development.

Concept Design and Concept Development

The objectives for this stage are to create one or more tangible representations of the invention in a computer visualised form, sometimes backed up with physical maquettes or studies, be it mechanical, ergonomic or form studies (or all three). This is to allow careful assessment and evaluation of the concepts, on a number of points, to select the most viable and most attractive concept for further development.

Sometimes an early, concept-proving prototype may also be considered a worthwhile exercise.

The best practice method that we have developed over the years prescribes that the first step of concept design and development be concerned with addressing the fundamental technical and ergonomic issues. This is particularly important with the development of mechanical and functional products, because the solutions to these issues will drive the embodiment of the design and result in the simplest solutions. This is also where the most opportunity for innovation lies.

Our method often differs from our competitors, who will usually look to create a styled product solution in the first instance, and then work out how to achieve it from an engineering or mechanical point of view. Whilst this is considered a more conventional approach to product design, generally, because of our particular specialist knowledge and experience in functional product development we know that this is not the best route to a successful outcome with minimum financial outlay.

Design Development

The objective of the design development stage is to take the concept selected in the previous stage and develop the design to the point whereby a final, pre-production engineering prototype can be made that replicates the intended manufactured design.

The design is developed in 3D CAD, incorporating all the features one would expect to see in the finished product, with any moving parts and mechanical details fully developed. The 3D model data can then be used to create a physical prototype, using whatever methods are deemed most suitable and cost effective. These methods include computer controlled machining of a block of raw material into individual parts; Stereolithography (or SLA) – a process by which a 3D part is formed by a scanning laser that solidifies the part, layer by layer, from a vat of liquid resin; and Selective Laser Sintering (or SLS) – a process by which a laser fuses together a nylon powder, again layer by layer, to create a solid part.

Once the initial prototype is made it can be subjected to thorough assessment and verification. Then, if necessary, any slight tweaks and modifications can be carried out, and replacement parts prototyped to finalise the design.

A key consideration at this stage is to ensure that the concept can be achieved at a production cost that will easily be covered by the realistic potential market price of the finished product. Careful selection of manufacturing techniques and materials can have a big impact.

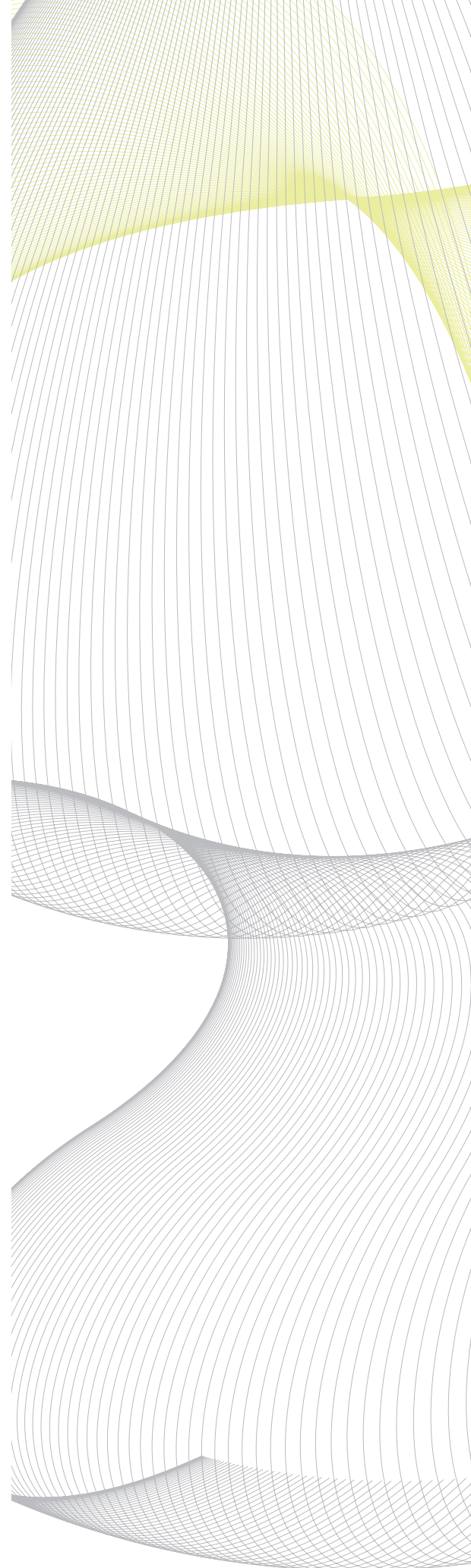
Production Engineering

Production engineering (also called design engineering) is the process by which all the components in the final design are prepared for manufacture. It requires a great deal of knowledge about all the manufacturing processes that may be used, the technical and design engineering criteria that are specific to each one, and what detailing is required on the parts to achieve a manufactured product that is exactly as the finished product is imagined. It also involves final material specification, the output of a Bill of Materials (a full component list with all relevant technical information that can be referred to), and the handling of the data release to the toolmakers and other manufacturing partners.

Once you've embarked on the production engineering process, major design changes can be costly. It's important to be confident that you have made the right decisions and the right selections before you make this next level of investment.

Samples Evaluation and Testing

Once the factory has produced the first production samples (a process that might take around 8-12 weeks, depending on the complexity), it's vitally important to give the designers and design engineers the opportunity to check the parts for design intent and tolerances. It is rare that general fit and function can't be improved by instructing the toolmakers to modify the tools slightly. This is because unless the highest quality (and most expensive) toolmakers and injection moulders are used, the parts will never be exactly to the drawings.





Branding and Marketing

One might think that once you've got the finished product in your hand, the hardest bit is done, and it might be. But generally speaking, product development is only half the battle to a successful product. If you are bringing the product to market yourself, you will need to budget accordingly; and it may even cost you more than to actually design and manufacture it.

Awareness is the key. If people don't know a product exists, they won't know they need it. And with an increasingly design-aware consumer base, the name, the branding, the packaging and the website etc all have to speak to your target consumer.

We don't pretend to be experts in this area. What we're good at is designing the right product in the first place. Talk to the experts in branding etc to get an idea of what you'll need to budget for.

It's a good idea to get advice on branding and marketing from the outset of a project. Their unique expertise can often provide very useful insights into the market you are developing your product for.

Development Costs

The bottom line. What's it going to cost you? Every product is different. Designing and manufacturing a washing up brush is obviously going to be in a very different ballpark to a pushchair, for example. It's difficult for us to answer this question that we probably get asked the most without seeing your idea first. But to make sure you're not wasting your time in the first place, here are some very rough ballparks:

Small, simple product with few parts and few technical challenges:

Design process, up to prototyping level = £2.5k-£10k

Prototyping = £300-£1500

Production Engineering and quality control = £1200-£3000

Tooling Costs = £3k-£15k

Large, complex product with many parts and many challenges:

Design process, up to prototyping level = £15k-£75k

Prototyping = £2.5k-£6k

Production Engineering and quality control = £5k-£15k

Tooling costs = £100k-£300k

Further sources of information

Patents

gb.espacenet.com

Though we'd recommend seeking the professional advice of a patent attorney before investing any significant sums in developing your idea, you can do your own patent searching at the above site.

Try and establish the 'Classification' that your invention falls under by making a note of the cited class or classes of relevant patents you find when searching, or doing a Classification Search.

If you can restrict your searches to that particular classification it will help cut down your search results to a more manageable number.

www.ipo.gov.uk

The Intellectual Property Office has lots of information on the various types of Intellectual Property, such as patents, trademarks registered designs etc.

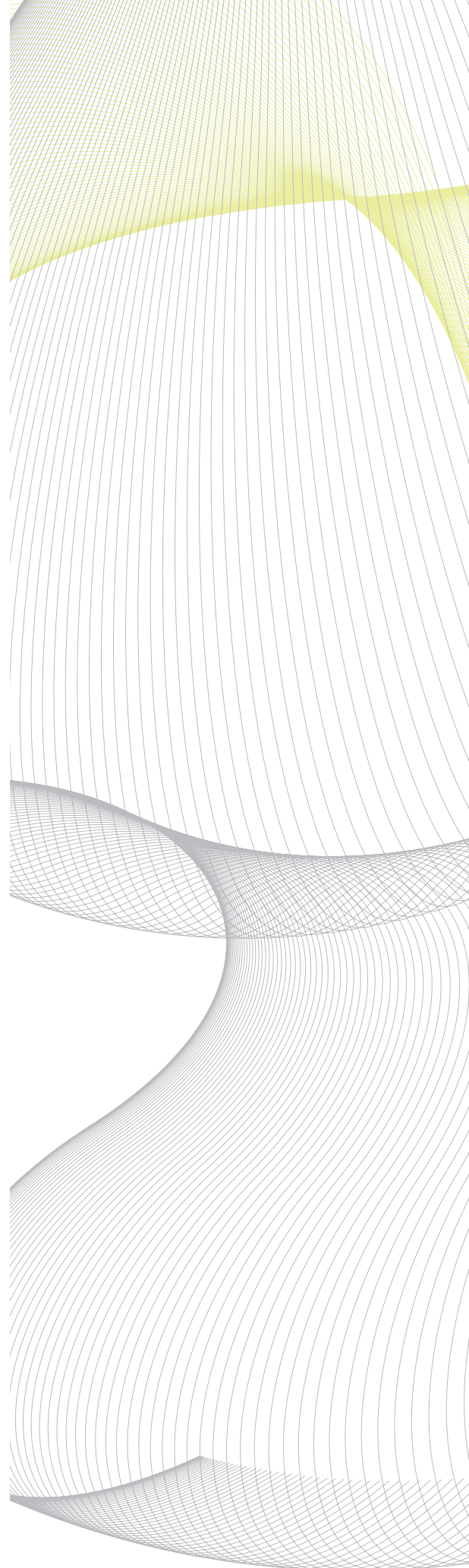
www.invent.org.uk

As a member of the Institute of Patentees and Inventors you can get access to specialist advice from inventors, patent attorneys and marketeers on all issues relating to invention and innovation.

General Advice

www.businesslink.gov.uk

Business Link is a good source for finding general, business related advice. They also have a search facility for things like business development and innovation grants.





Design

www.designcouncil.org.uk

The Design Council website is worth looking at if you want to find out more about the design process. They have case study examples and go into the design process in much more depth than we have chosen to do so here.

www.britishdesigninnovation.org

British Design Innovation is the trade organisation for leading industrial designers, service designers and innovation professionals. We are members, and one of our Directors is on the London board of Directors of the BDI.

www.hyphendesign.com

Visit our website for more information on the services we provide and the kinds of projects we've been involved with in the past.

Investment

www.bbaa.org.uk

From their own website the British Business Angels Association "is the only trade association dedicated to promoting angel investing and supporting early stage investment in the UK. Each year private investors account for between £800 million and £1 billion of early stage investment in the UK: the single largest source of early stage capital in the country"

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Product Design and Development Consultants

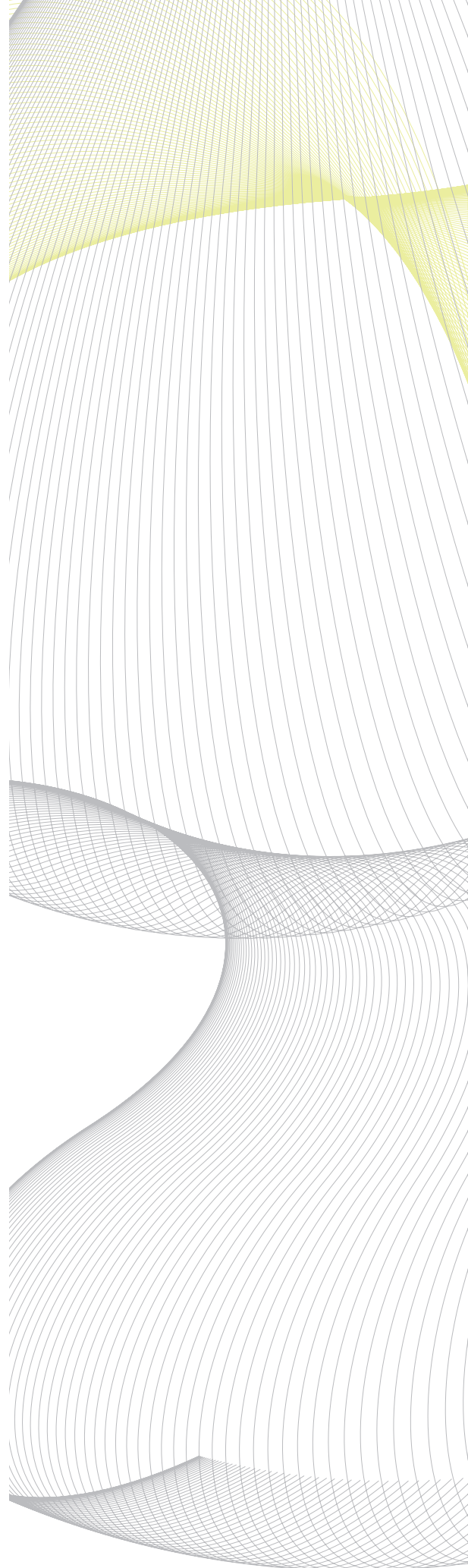
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