Needlejig Tattoo Supply, Inc. Presents

What's The Point?

Introduction

- My name is Marc Lescarbeau and I have been tattooing since late 1992.
- I spent a lot of my earlier career modifying the majority of the products that were available for purchase in an effort to make them work more efficiently.
- My best known accomplishment is that I am the creator of the "Round Magnum Theory" and the round magnum jigs that I started producing in the late 1990's.
- This makes me somewhat responsible for the prevalent use of "round", "curved" or "soft edge" magnums being used today.
- In addition, I believe that I was also the first to bring to market textured stainless steel tattoo needles.
    - I fell in love with textured needles after attending Guy Aitchison seminars in the mid 1990's but working with the carbon steel textured needles was a major pain in the butt and never 100% corrosion free.
- I also believe that I was the first to bring #08 size needles to the tattoo marketplace.
    - After I was introduced to "bug pin", #10, liners by some old timers. I was hooked on the bug pin liners and eventually wanted to take that one step further just to see if there was any more room for improvement.
- Please know that I am very blunt and literal in what I say so please do not get offended or take anything too personal. It is just who I am.
- I am hoping to share Everything that I know about tattoo needles with you so that you can understand your tools better and therefore produce better results for your business and your clients.

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Tattoo Needles

Today's tattoo needles are simply small stainless steel pins that are arranged in various configurations that come in direct contact with the skin and are used for depositing pigment into the dermis layer of the skin. It is quite possible that the needles are the most important part of your tattoo setup. The ink is quite important because it stays with the client forever but without quality needles it can be difficult to get the ink into the skin. The various configurations each achieve different results but we can discuss that more thoroughly later.

You do not need to completely understand this topic in order to do great work. If you are continually monitoring how the skin is reacting during the tattoo and can adapt in the various situations that you find yourself in then you will be fine. On the other hand if you are truly able to comprehend what we talk about here today it will be one more tool in your box that may help you to understand some things that may have held you back and or allow you to get to that next level.

Tattoo needles are not one size fits all. Sure, a skilled artist can get the tattoo done with just about any needle group but once you understand what each of the needle variables does in the real world then you will be able to pick the correct needles for whatever type of work you are doing. At that point you can focus more on the art that you are creating and less on what might not be going right with the application.

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Round Magnum Theory

Figure 1

Figure 2

In the illustrations enclosed the horizontal wavy line represents the skin and the way that it depresses when the tattoo needle hits the surface. A square needle grouping has all of the pressure on the outside needles and very little resistance on the center needles. This means that the outside needles penetrate first and deeper than the center needles. In order to get solid color from the center needles then the outside needles are going deeper than really necessary. This can lead to chewing up the skin along the needle grouping edges. If you only go deep enough for the outside needles to color in a solid manner you will most likely end up too light in the center which leads to holidays in some areas. With a round nose needle grouping the needle penetrates a far more uniform depth when the skin depresses around the shape of the grouping because there is a more equal resistance on each needle. My results and the artists that work for me as well as a number of friends in the business have had outstanding results with these needle groupings. Round nosed needle groupings have been around for years but artists have had to make their own jigs out of things around the shop. I have spent a good deal of time trying different curves for different sizes and believe that I have come up with a solid product to help tattoo artists make needles that will allow them to perform more solid work with less effort.

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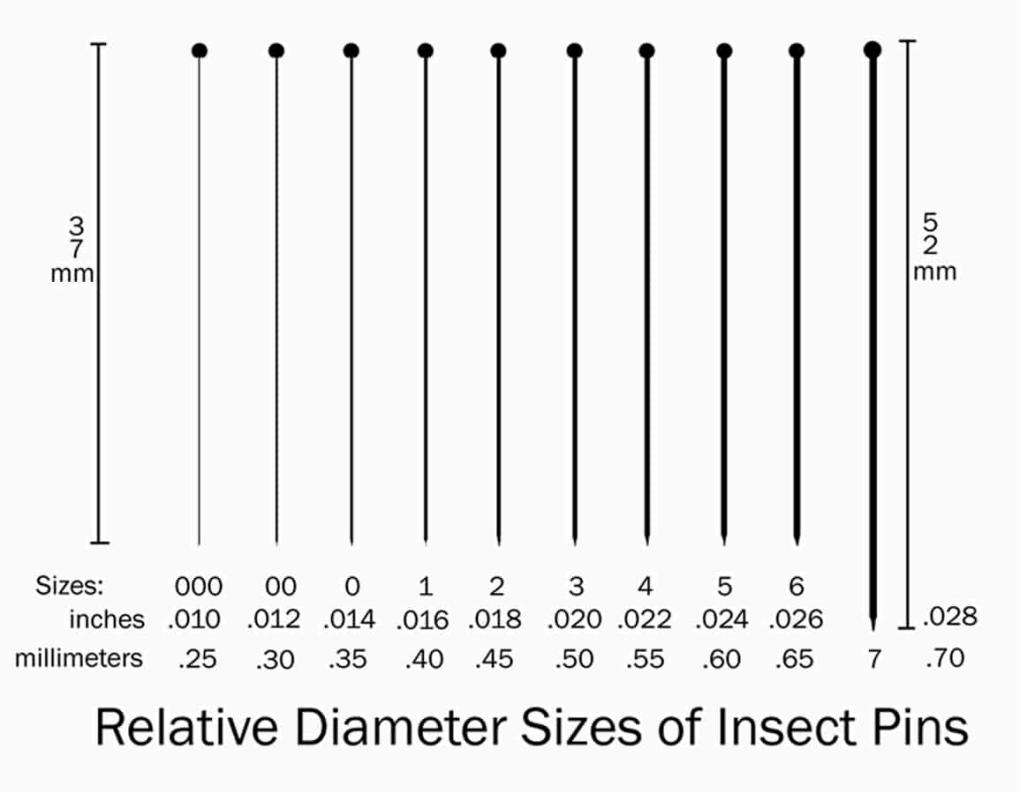
Pin Basics

Pin Diameter

- Tattoo needles are all based on bug pins. We do not refer to them that way but that is where they originated from. Actual headless "insect pins" because they did not have the eye in the needle that was required for sewing.
- The standard sizing of the pins used today are based on the diameter of the pin.
    - What we refer to as #12 standard needle is based on an English #0 bug pin and 0.35mm in diameter.
    - The #10 is actually a 00 bug pin and 0.30mm in diameter.
    - Finally the #08 is a 000 bug pin and 0.25mm in diameter.
    - There are other sizes like #06 (0.20mm) mostly cosmetics, and #14 (0.40mm) for those who want to think that traditional tattoo lines were fat to start with but that is a very different discussion.



Relative Diameter Sizes of Insect Pins

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- The pin size will dictate the natural spacing of the needles. Fixtures can be created to increase spacing but two pin points can not naturally be any closer than the diameter of the pins.
- Another thing to consider when choosing pin diameter is that it takes more force for a larger diameter pin to penetrate the skin. You are in fact making a larger hole and more trauma per puncture.
- There are other reasons for choosing different diameter pins for specific tasks and they are all related to pigment load. How much pigment can the pins carry into the skin per stroke. In order to understand this better you need to take into consideration the pin taper.

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Pin Taper

Remember when I said that I was very literal? One of my biggest peeves when it comes to tattooers asking questions is when they use the terms "long", "medium" or "short taper". I own an absolute ton of precision measuring equipment that can measure all the way down to 0.0001". That is one tenth of one one thousandth of an inch and not one of them has designated marks for long, medium or short. Those descriptions are simply a matter of perspective and opinion. What I consider to be medium you might very well see as long or short based on your own experiences. I like to stick with real measurements whenever possible.

The pin taper serves a few different purposes. It is the somewhat conical shape of the pin as it reduces from the full diameter to the point. This taper does not need to be a straight line. There are some pins that use more of an arched taper that create a bullet like shape.

- The longer the taper is then less force is needed to penetrate the skin due to the sharper point.
- With a longer taper there is less surface area per any given length than a shorter taper pin.
- The longer the taper is then less pigment is deposited into the dermis per stroke.

Usable Portion

Keep in mind that there is a limited usable portion of the needle. I hope that you are all aware that skin thickness depends greatly on the body part. I know that sounds obvious but let's look at it a little deeper than most consider.

- The dermis is where we want the pigment to be deposited.
    - Depending on the location the Dermis averages between 1 mm and 4 mm thick. It is thinnest around the eyelids (maybe .5mm) and can be up to a full 1cm thick on the back. For a generalization I am going to use 2.5mm for our examples.
- The epidermis is quite thin comparatively ranging from 0.1mm-1.5mm but let's consider an average of .5mm for this experiment.
- For our discussion we are going to be using a 3mm total usable portion of the pin. This is approximately 1/8" if that is easier to visualize.

Taking into consideration what we have already discussed it makes sense that the deeper the needle penetrates the skin that the amount of pigment deposited increases substantially with each additional 0.1mm depth. A fatter part of the pin is penetrating with more surface area than the previous 0.1mm depth. I am using 0.1mm as an example because it is approximately the thickness of a sheet of paper and that is something that we can all visualize pretty easily.

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We also know that the epidermis is constantly regenerating so the pigment deposited there will not stand any test of time at all. It is only the pigment that makes it to the dermis that will stay permanently.

Needle design

I can not speak for other needle manufacturers but we typically use between a 3mm, and 5.5mm tapers to create the majority of our groupings. Would I call these short, medium and long? Absolutely not, in my opinion we do not use anything I would call a short taper but again that is just my opinion.

If you look at the illustration called Taper Length Comparison you can get a visual reference as to how the pins are different. You can also notice that there are a few pins where the shape or angle of the cone is very close on a few of them.

- #12 4.5mm taper pin is very close to a #08 3mm taper pin.
- #12 5.5mm pin is very close to a #10 4.5mm pin.
- #10 5.5mm pin is very close to the #08 4.5mm pin.

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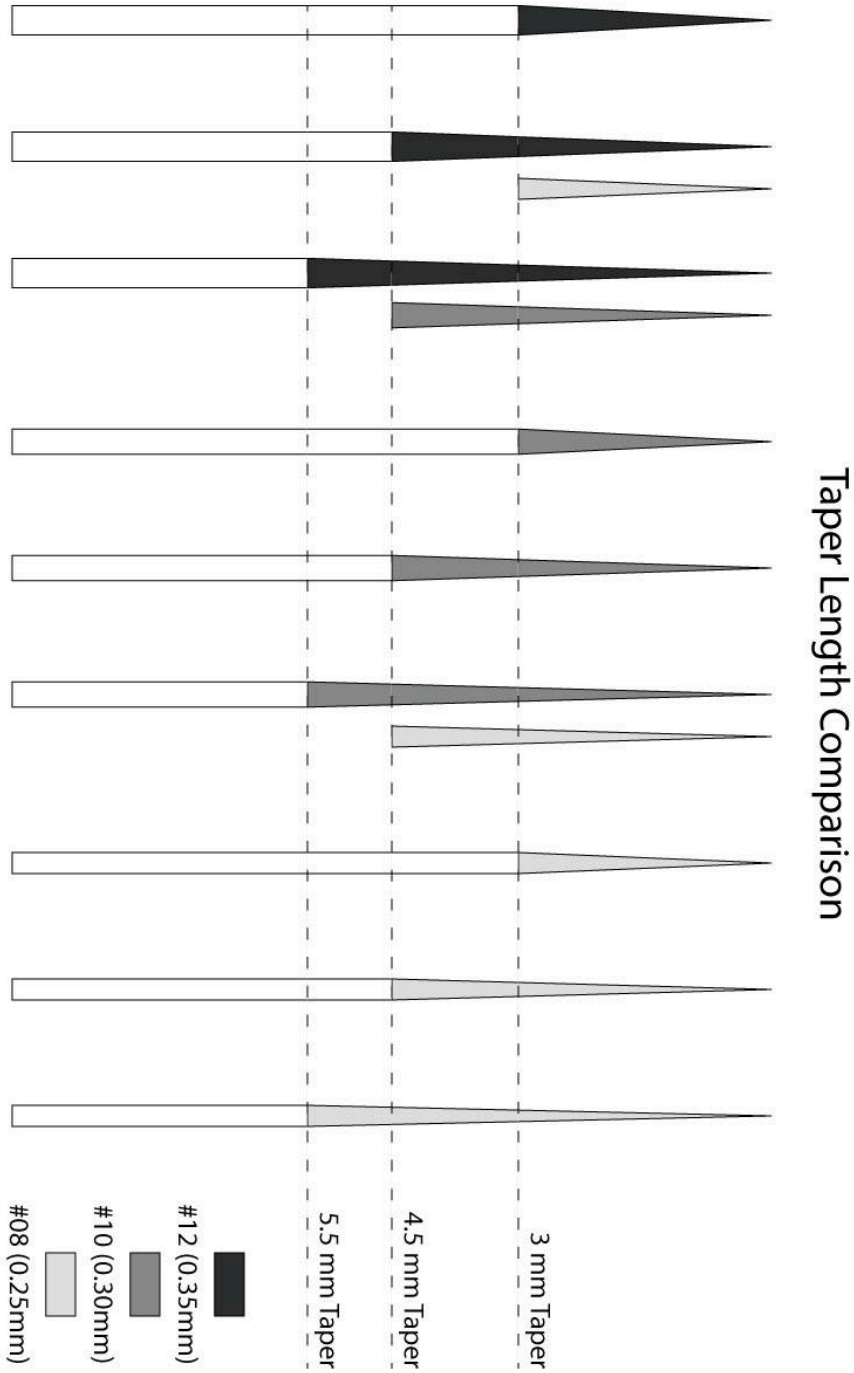

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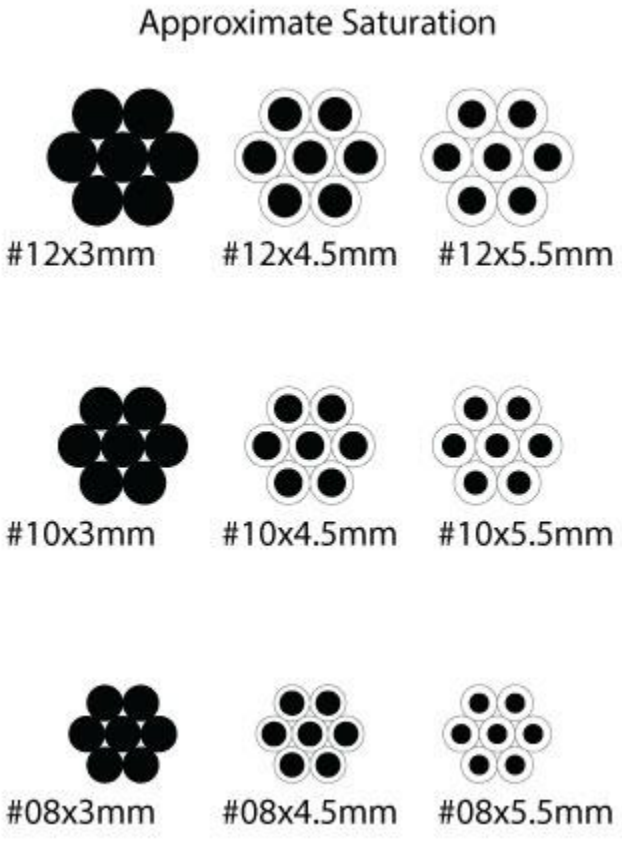
So why do we make some pins that are almost identical? Even though these pins will make virtually the same identical hole in the skin and deposit the same amount of pigment they will be naturally spaced differently because of the larger or smaller diameters in the non tapered pin body. For instance a grouping made with the #12 4.5mm pin will have the holes 0.35mm apart where as the same grouping made with the #08 3mm pins will have the holes only 0.25mm apart. This is where some people start to get confused because they automatically think that the larger pins deposit more pigment so there is always stronger saturation. That would be the case if the tapers were the same but in this case we would theoretically get better saturation with the smaller diameter pins. I say theoretical because the actual pigment comes into play at a point but we can talk about that later. So in this particular case we have the same size and depth holes but closer together with the smaller pins resulting in better saturation with no more trauma to the skin.



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Tattoo Pigment

It is hard to talk about needles without giving consideration to the ink. Using pigments that work best with the needles you have chosen can improve your work quality significantly. When I hear people talking crap on any major brand of anything I normally chuckle to myself because it is more than likely a solid product and the bad experience is user error. That may not be the fault of the artist though. The manufacturer may not have marketed properly for the consumer to get the most out of the products that they sell. There was a time when I think that I produced 144 different needle on bar configurations. This was in an effort to try and accommodate as many artists using as many inks and techniques as possible. I did not have the resources to get enough information out there for people to understand why there were so many and that resulted in people trying the wrong needles or simply not trying the right needles. I literally was a one man show back then so promotional material was not high on my list because I could hardly keep up with the sales as it was.

There are a lot of ingredients in tattoo inks and to be honest most artists have zero clue what they are and what purpose they serve. There are pigments, water, wetting agents, surfactants, biocides, solvents, sterilants, fillers, thinners and many more with no two brands being identical. Pigment grind plays a huge part in ease of application and the resulting saturation. Larger pigment particles are more difficult to get into the skin but the larger particle faces result in reflecting more light and therefore more color. I strongly recommend using larger needles for more coarse ground pigments. The larger surface area of those needles can carry the larger pigment particles a bit easier. These inks can be hand mixed powders that were more widely used in the past but are still available if you look hard enough. Most pre dispersed pigment is milled a bit finer and I should say mixed more thoroughly with the use of higher grade equipment where hand shaking or even a kitchen blender will not get you the same results as the expensive high shear mixers or homogenizers that we use when producing larger batches. Even if the particles were ground smaller they have a tendency to clump together and it takes a lot of force to separate them. If you are more into color realism and layering your colors then you should strongly consider the pre dispersed inks and smaller pins in your needles. This will result in smoother blends and what could be equated to a finer resolution. I personally do not go all the way down to the #08 pins with color. We have some awesome artists using them successfully but you really need to be paying attention to what you are doing at that point. It is just harder to push the larger pigment particles with the smaller pins so some artists end up overworking the skin while trying. I highly recommend the #08 pins for black and grey though and if you haven't tried them you will be in for a huge surprise.

Traditionally black pigment is ground much finer than color pigment. This makes sense because black absorbs light rather than requiring larger surfaces to reflect it. The smaller particles can be packed closer together resulting in a denser or more saturated appearance. Pin size is less important when it comes to black and it simply depends on how much pigment you want deposited and how fast.

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Choosing Your Needles

Liner Needles

I can not remember what old timer first got me using the smaller bug pin liners but that was probably in the mid 90's and I never looked back. Especially with lining coil machines because I was able to get the needles to penetrate with less resistance which allowed the machine to maintain the higher cycles per second speed without hitting like jack hammers. The results were less trauma to the skin and faster healing so why would I go back to the larger pins? If a larger pin is used then you may want to consider a longer taper pin for less resistance penetrating the skin but remember that the thicker pins will space the dots farther apart in the skin resulting in a slightly less dense line.

Lining machines run 40%-60% faster than color packers and the reason is simply because we want more ink holes closer together for a denser appearance. What a lot of people do not know is that the smaller needle grouping penetrates the skin more rapidly and at a higher velocity resulting in a precise wall of scar tissue. This is what helps keep pigment deposits from shifting into areas where they are not wanted. Whis is also why traditionally done tattoos will stand up better over time than tattoos that do not have outlines. I am not trying to open a debate because I love what modern artists are doing in the skin but I think that we are still in the beginning stages of these styles and there is a lot to learn about the limitations that should be worked within to allow the art to look better for longer. There will have to be compromise unless there are some major developments in the inks which is more likely than in the application process.

I find it a bit amusing that traditional artists these days are out there looking for the biggest liner needle groupings available to emulate the fat lines that they see in old tattoos. In reality those lines did not start out fat. They were most likely made with a 3 needle grouping that was hammered into the skin a little too deep resulting in blow outs. Tattoo needles were not as plentiful as they are today and Tattooers of the past were generally very thrifty with their materials. Best case scenario would be that time has simply had its way with the tattoo considering that our canvases are living, growing organisms. Things move and pigment deposits can get relocated slightly.

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Shading Needles

When it comes to shading needles surface area is more important than taper length. The more surface area that there is on the taper of the pin the more ink can be carried and deposited into the dermis. Shorter tapers have more surface area and therefore are the better choice when you want heavily saturated tattoos. In contrast, using longer taper needles will allow you to make multiple passes in the same area with less trauma to the skin. If you like to blend and layer your colors then these are for you. Similar to stepping the pin diameter down in size you can vary the taper of the pin to get a specific effect. Take into consideration that when using #12 pin needles that the point will always be .35mm apart. Now if we stick to our 3mm example depth from before the puncture hole size will be smaller proportionately to the length of the taper. (see diagrams) So where a #12 pin with a 5.5mm taper leaves about the same size dot as a #10 pin with a 4.5mm taper the dots will be farther apart when using the #12 pins. I specifically targeted this scenario with my B&G (Black and Grey) needles on bars. I wanted to make that "bug pin" softness even softer. These needles have some dedicated followers whom I was able to convey the design to directly but I never took the time to explain it on a larger scale until now when putting the presentation together.

I remember using what I think were called National's standard taper which was an almost pencil tipped taper. I don't think that they were anywhere near 3mm, probably closer to 2mm. Those needles would pack color like crazy and I loved them for quite a while but once I learned more about the technical science behind needles and started using a taper that equaled or exceeded the typical tattoo depth then my work started healing a whole lot faster and I was able to get back into larger pieces quicker and be more productive.

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People that insist on straight

I recently met with a very well known artist who uses nothing but huge magnum needles and insisted that they could not get good results with round/curved magnums. I always struggle a little when I hear this because the science doesn’t lie. We talked for a while and it was really bugging me that he was able to achieve better results with the straight magnums. Especially considering that we are talking about 49 and 65 needle wide groupings. I can definitely see where smaller groupings can be made to work but the need for the round/curved magnums is amplified with the larger sizes. Deep into our conversation I think that I came up with the answer. It is something that I was aware of but had not really considered. If you think about straight magnums putting all the tension on the corner needles vs. a round/curved magnum distributing the tension somewhat equally over all the needles it will take a stronger machine to push the round/curved magnums into the skin seeing how there is very little initial tension along the center needles in a straight magnum. For instance, let's simply give the required tension to break the skin a value of 2 power for these examples. Let’s compare 7, 15 and 35 groupings.

Required power to penetrate the skin properly:

7 needles	=	14 power
15 needles	=	30 power
35 needles	=	70 power

These power ratings are imaginary but you get an idea on what would be required as the needle quantity is scaled up.

Now let's say the average machine can generate 40 power and therefore easily be enough for most common sizes of needles. This same machine would not have enough power to push the 35 needle (70 power) round/curved magnum to a proper depth repeatedly.

That very same machine might be capable of pushing a 45 needle straight magnum because only the outer needles are building tension so maybe only 8-10 needles on each end are penetrating the skin at the same time (16-20 needles = 32-40 power) and then after those needles have penetrated the skin the remaining 15-19 center needles are within the 40 power rating of the machine.

My argument would be that if they had a machine set up properly with enough power the round magnum theory benefits them even more than those who use smaller groupings.

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Skill above all

So there is also the argument that a highly skilled Tattooer can do excellent work with mediocre tools. They can be creative enough to work around the obstacles that they are presented with. They have to work harder than necessary to achieve quality work but will eventually prevail. The same tools given to an average artist will result in sub par results and frustration on the part of the artist and client. WIll the average artist be able to compete with the highly skilled Tattooer with the better tools? Most likely not but they will definitely do better work that will be more than acceptable overall.

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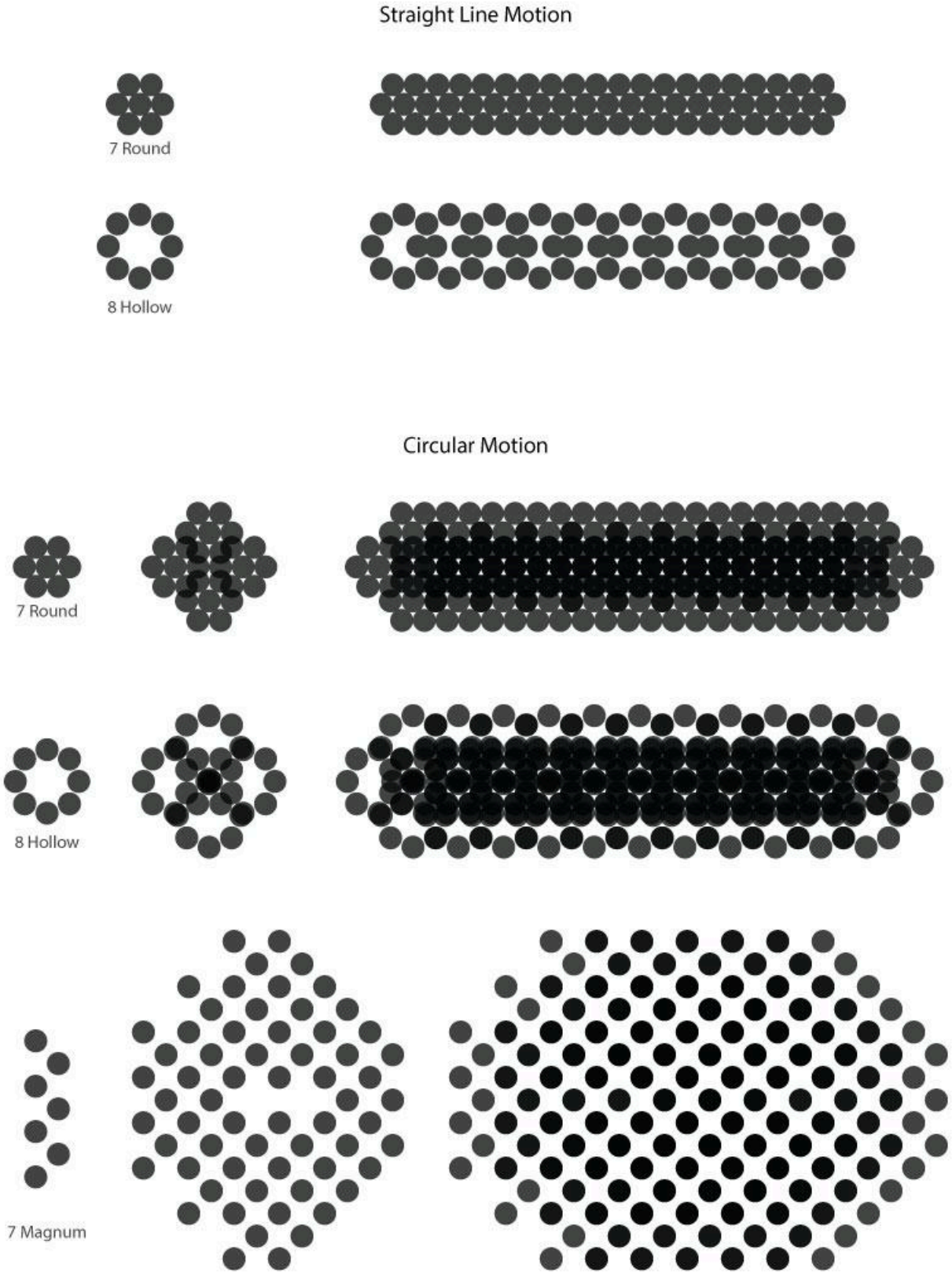

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