CRAFTSMANSHIP+

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The Art of Fretwork

ESPAÑA

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CRAFTSMANSHIP+

THE ART OF FRETWORK

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TOOLS AND MATERIALS

Tools and materials used in making a silver necklace

Silver:
can be found in sheets of different gauges (thicknesses). This is the base of the pendant made in the case seen in the video (0.6 mm thick).

Jewellery rolling mill:
in this case study a mill is used to flatten the silver sheet to the desired thickness.

Torch:
used to heat the silver after its manipulation (lamination in this case), returning it to its natural state.

Firing bricks:
these supports help create an even heat distribution when using the torch.
Prepared salt bath: using a mixture of salts and water, this bath will clean the silver sheet once it has been fired and help cool the piece down.

Glue:
used to transfer the design on paper to the metal. Even though the jeweller doesn't say what kind of glue he uses, we can assume that it is some sort of carpenter's glue or other strong glue that dissolves in water.

Drill bits:
used in combination with the drill motor to cut designs into the metal.

Jeweller's drill:
a small motor that is combined with the drill bits to make a jewellers drill that is able to create delicate perforations in the interior of the initial sheet of metal.

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Jeweller's saw – frame:
this saw is especially made for jewellery, although many different kinds can be found (varying in size, shape, etc.). Each artist should find one that works best for him or her.

Jeweller's saw – blades:
this blade is made of metal and can be found in many different sizes and weights. A jeweller can use different blades in a single frame, and should find what blades work best for the work that he or she is doing.

Jeweller's bench:
the bench can be a piece of wood attached to a table with a vice or an entire table that allows for a jeweller to saw his or her pieces of work.

Water:
is used to remove the initial drawing from the metal sheet after the shape has been cut out.

File:
used to eliminate burrs and imperfections on the edges and along the cuts of the piece.

Sandpaper:
used to eliminate burrs and imperfections when finishing the final piece.

Jeweller's screwdrivers:
in the video, the small screwdriver is used to push out the feet used to hold the enamel disc that will adorn the silver piece.

Jeweller's mandrel:
a circular form used in the video to form the upper part of the silver piece, creating a circle where the cord can be inserted.

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CHARACTERISTICS

Why do we use silver?

The art of fretwork in jewellery making, or cutting out designs in metal (or wood), is most frequently done using bronze, copper, nickel, gold, and silver. In the video we learn that silver is chosen from this list due to its workability, its usefulness, and the way it shines once the piece has been finished.

Working with silver is simpler than other metals because it is a relatively soft metal. In addition, within the list of precious metals, silver is one of the most inexpensive and easy to find. Even so, for beginners, it might be cheaper to practice with bronze or copper (which are cheaper still) and graduate to silver once you have the technique down.

Why do we flatten the silver sheet with the rolling mill? 1

Even though silver sheets can be purchased in many different sizes and thicknesses, sometimes it is not possible to find a sheet the exact size that the jeweller desires. Therefore, using the rolling mill allows the artist to flatten the metal to the exact size that he or she would like to work with.

Why do we heat the silver sheet after flattening it? 2

Once the silver has reached the desired thickness it is necessary to heat the metal so that it can return to its natural state. Silver, and the majority of metals, get harder when then are hit or stretched, making it more difficult to work with this metal.

Heating the silver should be done in a slow, uniform way. This allows for the crystal structure of the metal to rearrange itself into their natural state, transforming the metal back to its original characteristics of being soft and easy to work with.

After heating the sheet, it is necessary to cool it down before you can work with it. In the video, the artist uses a bath of different salts to quickly cool the piece down. This specific type of cooling means that the metal obtains certain characteristics, and using other types of cooling means that different properties could be achieved (for example, leaving the piece to slowly cool at room temperature means that metal will have different characteristics that might be useful in other projects).

Why do we perforate the piece before sawing? 3

Drilling small holes into the metal sheet allow the artist to insert the saw blade directly into the inner part of the sheet, allowing the artists to cut out shapes that do not reach the edges of the piece. This means that everywhere a cut-out must be made within the piece, a hole should be drilled.

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Why do we use feet to hold the enamel disc that adorns the silver piece?

In the video we can see how the artist uses little feet to hold the enamel disc, which adorns the necklace, in place. These feet serve two main functions: a practical one and a visual one.

The practical function is based on the ability that the piece has to 'hold onto' the disc without having to use any other materials or glue. Without the introduction of other materials, the piece is visually uniform, adding to its visual appeal. Because all artists have their own visual preferences, it is important to recognize that the choice to finish the piece in this way is individual and other artists may prefer to work in other ways.

In the case that an artist decides to use little feet as a way of uniting two pieces (in this case, the silver base and the enamel disc), these feet must be incorporated into the initial design of the piece, and it is important to cut out these details.

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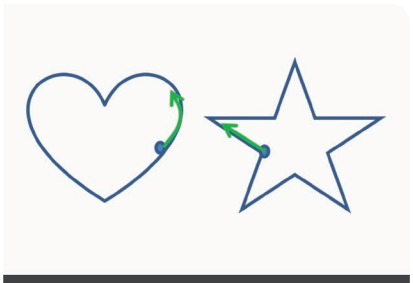

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EL ARTE DEL CALADO

TECHNICS

Drilling the piece:

Drilling into the interior of the piece is a necessary step to prepare for removing the cut-outs of the design which do not reach the edges of the piece. In the video we can see that the artist uses a jeweller's drill with a small bit. The holes that the artist creates in the piece are where the saw blade will be introduced later.
It is necessary to put a hole for all the interior cuts that will be made. 1
This hole should be made to the left of where we want to put the saw blade if we are right-handed and to the right if we are left-handed. This is to help maintain the cutting line of the design (see below for a visual explanation – the drawing on the left is for right-handed people and the drawing on the right for left-handed people). 2

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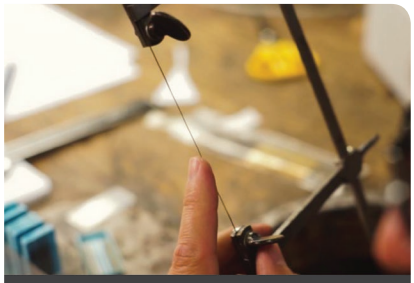

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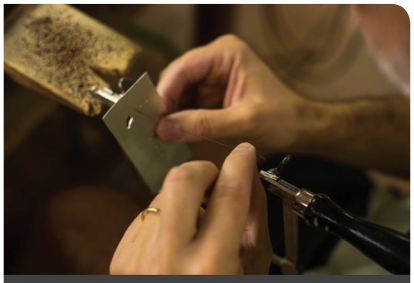

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Putting the saw blade into the frame:

Introducing the saw blade into the frame is a complicated process that takes time to learn. The blade should be tense enough, but not too tense, allowing for a better cut without breaking the blade.
In the video we can see how the artist passes the blade through the holes made in an earlier phase to be able to make cuts in the interior part of the sheet. The following steps show how this process could be done. In the case that you wish to make a cut starting at the edge of the piece, the same steps would apply, skipping the 5th one.

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The main steps for inserting the blade into the frame:

1. The teeth of the blade should face outwards and down. That is, holding the blade in your hand, the teeth should face you. In addition, once the blade is placed into the frame, the teeth should be orientated towards the handle (when holding the saw upright, they should have the shape of half a Christmas tree).

2. The blade should be parallel to the back of the frame, but not quite reaching the upper or lower parts of the frame. The saw should be slightly bigger than the blade.

3. The blade should be placed first in the upper part of the frame, making sure that the teeth are facing outwards. Tighten this screw in the upper part of the saw frame, securing the blade in the frame. The other end of the blade should graze the screw on the other end of the frame.

4. To place the lower part of the blade into the saw, the upper part of the frame should be placed on a table or your jeweller's bench (or other fixed surface), and the handle should be placed on your shoulder (or other place where you can put pressure on it). This allows for the artist to put pressure on the saw handle, closing the gap between the ends of the frame and allowing the blade to be introduced into the lower section of the saw.

5. Insert the blade for one of the previously created holes, making sure that the part of the sheet where the design is glued is facing upwards (away from the handle).

6. Placing the upper part of the saw frame on your fixed surface (table or bench), put pressure on the saw's handle until the lower part of the frame reaches the blade. Once the blade is in position, tighten the screw, securing it in place.

7. Slowly remove the pressure from the saw handle. The blade should be taut, but not too tight.

8. To test if the blade has been placed correctly, see if it will ping. If it doesn't make a clear sound, it will most likely need to be readjusted because a loose string will not saw well.

* If you are using an adjustable saw frame, you may use different sized saw blades (including broken ones). If you are using a non-adjustable saw frame, you will only be able to use unbroken blades.

* It might take multiple tries before you understand how to place the blades in the saw in a way that works best for you. 3 4 5

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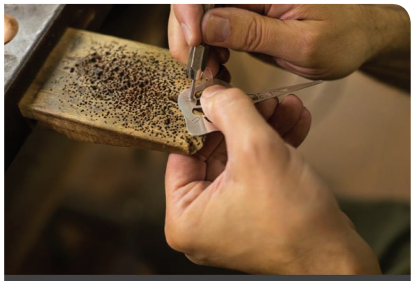

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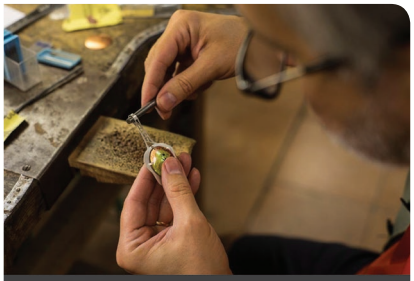

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Sawing:

The process of sawing will take practice. It is important that you learn how to concentrate on what you are doing, but in a calm, not nervous way. If you are stressed, it is more likely to break saw blades, and every broken blade means that you will have place the blade into the frame again, losing time and materials. At the same time, when you are just starting out, it is important to understand that making mistakes will make you a better artisan in the long run, and that breaking blades is normal in this process.

The sawing process should be done in a way that the sheet that you are sawing and the blade are perpendicular. When the saw is inclined at other angles it puts a lot a pressure on the blade and can cause it to break.

Another tip to reduce the pressure placed on blade is the way you hold the frame: don't grasp the handle too tightly. Like everything else, the way to use the saw frame will take practice until you are able to find a way that works best for you.

To begin sawing, place the piece on the jeweller's bench and move the saw up and down, within a small range of motion, until the blade 'catches' onto the metal. Once you are able to saw, you can use the entire extension of the blade to saw. However, the frame should be moved up and down slowly, without pushing the saw forward. With your non-dominant hand, you should move the piece according to the design instead of moving the frame. Focus on avoiding twisting the blade (which would cause it to break).

Instead of starting with complicated or interior cuts, it is a good idea to practice starting with different types of cuts and shapes that are less complicated until you are confident to try the more difficult ones. Straight lines and slightly curved are considered to be the easiest. Harder cuts would be tightly curved lines and directional changes. Interior cuts may not be as difficult as the initially appear, but practice is necessary to be able to make them correctly. 6

Setting the ornamental disc:

In the original design of the piece seen in the video we can see how little feet are used to place the enamel disc within the work. These feet will also be cut out during the sawing process mentioned above.

To make the feet 'hold onto' the disc, the artist carefully pushes them away from the base of the piece, and then places the enamel design underneath them. Using a small screwdriver, the artist then presses the feet back down so that they are touching the enamel disc. Because the feet are distributed in a calculated way, they are able to hold the disc in place. 7

Creating a bail for the piece:

The last step we see in the video is the creation of a bail, or the loop where the cord or chain will be placed to use the pendent. This part of the piece is formed by pressuring the upper part of the piece around a jeweller's mandrel. 8

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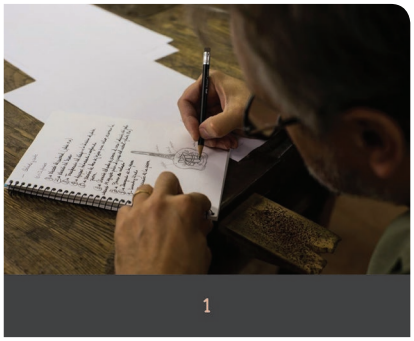

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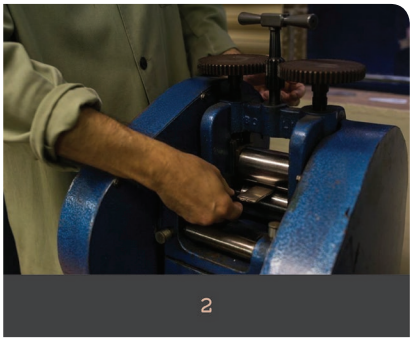

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DESIGN AND PREPARATION

The first step to the process of creating a fretwork necklace is the sketching of the idea that you want to create and deciding which materials to use.

1. Design the piece that you want to make. In the video, we can see that the artist is inspired by abstract forms, leaving a space in the middle for the insertion of a small enamel disc. 1

2. Choose your materials. The selection of the materials is very important because it will have later implications in the final piece such as: its strength, its shininess, etc.

3. Prepare these materials. In the video we can see that the artist chooses a 0.6mm sheet of silver, based on its utility and shininess. He prepares the silver by flattening it to the thickness he desires, he then heats it so that it returns to a natural state, and, while still hot, cleans the surface of the metal. 2 3

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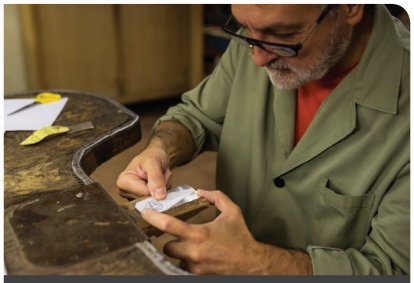

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EL ARTE DEL CALADO

TRANSFERENCE

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Transferring the design to the metal is a very important step because it will allow for the piece to be cut properly.

Transfer the drawing or design to the chosen material, in this case a sheet of silver. 1

Prepare the silver for cutting. In the video we see that this includes putting holes into the sheet. The artist uses a jeweller's drill in short spurts to make these holes that will make it easier to saw the piece later. 2

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FRETWORK

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The third step in the fretwork process is cutting the shape out, using a jeweller's saw.

Choosing your blade size is the first step in this process. Your blade should fit the task you intend to take on and the metal that you will be sawing. When placing the blade into the saw it is important to remember that the blade should be facing outwards and down.

The blade will be placed first in the upper part, and then in the lower part, of the saw frame, with the teeth facing downwards. It is important to adjust the tension (not loose, but not too tight either) in the blade to get good results.

This frame and blade will be used to make the cuts shown in the design, using the holes made earlier as guides for interior cuts.

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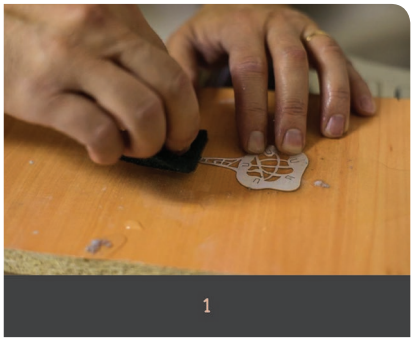
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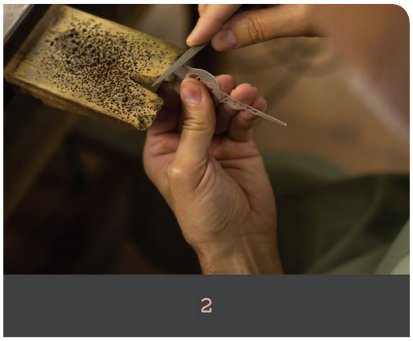
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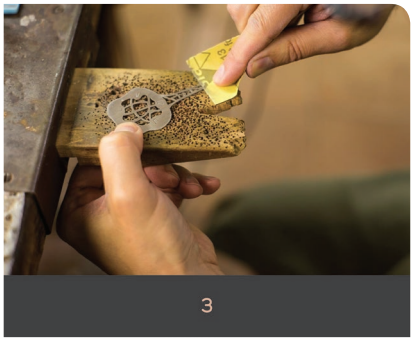
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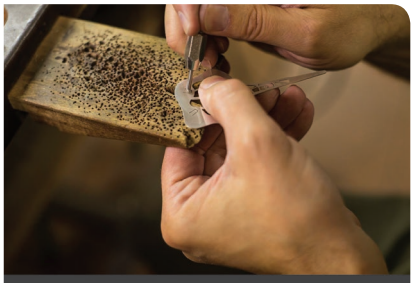
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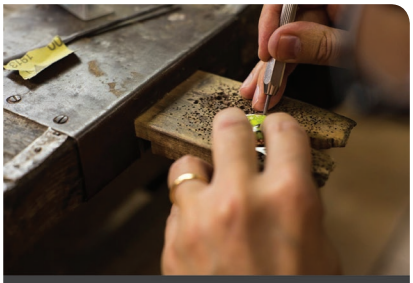
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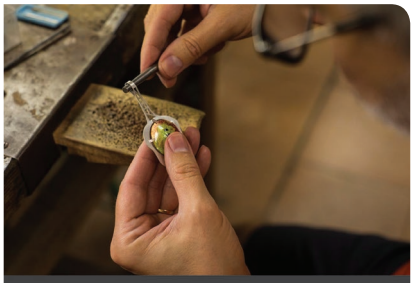
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EL ARTE DEL CALADO

CLEANING

Once the piece has been cut out, it is necessary to prepare it to add the enamel disc (in this case) and finalize the pendant.

1. Remove the paper design from the silver. The artist in the video uses water to remove the paper. 1
2. File and sand the piece using different grades of abrasiveness to smooth the surface and the edges of the pendant. 2 3
3. In the case seen in the video, the next step is to place the enamel disc into the design. This disc will be held in place by little feet drawn into the original design. 4 5
4. The last step in our case is making it usable as a pendant. The artist creates a bail for the piece where a cord or chain will be added to the upper part of the pendant. 6 7

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GLOSSARY

Jewellery rolling mill:
a machine that is used to change the size and thickness of metals. Depending on the size of the rolling mill, it is possible to create sheets of metal. Rolling mills are made of cylinders that flatten and lengthen the metal using a circular action, leaving the sheets of metal thinner than before. In the video we see how the artist uses a small rolling mill, made specifically for jewellery purposes, changing pieces of metal into the size and shape desired by the artist.

Torch:
a tool which uses a small gas tank to make a very hot flame. There are many different sizes of torches, although normally they are small enough to be portable. In the video we can see how the artist uses a small/medium torch to heat small pieces of metal.

Firing bricks:
these bricks are used to set the pieces of metal on while using the torch to heat them, lifting them up from the ground or table. It is important that they are made of materials that will not melt during the process. Using these brick to lift the piece up means that: 1) the piece will not melt to the bricks, and 2) the air flow around the piece will be more controllable.

Drill bits:
this tool comes in many different shapes and sizes. Normally for jewellery making it is necessary that the bit be small so that the artist can create fine details within the piece.

Jeweller's saw frame:
the frame is the base where the saw blade is placed to create a tool to saw the piece. There are many different brands and types of frames. This means that every artist should choose one that best fits their likes and needs. The main characteristics that can be chosen are: the size of the frame, if it is adjustable (or not), its construction, and the cost. It is possible that one artist decides to have different frames for different projects.
When picking out one's first saw frame, it is important to think about the piece of metal that you will work with, and to find a frame that will work best for this project (the bigger the frame, the larger the piece of metal you can work with, but also the harder it is to use). When using the saw it is important to practice, holding onto the frame tightly, but without squeezing too much.

Saw blades:
in the same way that every artist will choose a saw frame according to their personal preferences and needs, choosing your saw blades is a personal choice. There are many different types, brands, and sizes of saw blades that you can choose from. It is important to make sure that the blade is strong enough to cut the metal that you are working with, but also keep in mind that the finer the blade, the finer the cut will be. Also, the size of the blade will help you make different types of cuts; a straight cut can be made with a thicker blade than the one needed to cut out designs that have lots of curves.
Additionally, it is normal that your blades break, so it important to have more than one blade of the same size just in case your blade breaks in the middle of a project. In order to reduce blade breaking consider the following tips: find a brand and thickness that you like; make sure you do your sawing patiently; insert that blade correctly into the saw; saw in straight, up-and-down lines without twisting the blade too much; use a wax lubricant for your blades.

Jeweller's bench:
this space doesn't necessarily have to be an entire table, but can be made out of a piece of wood that is firmly attached to a table. In the video we can see that the artist uses a

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wedge of wood that is permanently attached to his table, but another option is to attach a wedge with a vice for a short period of time. However you plan on organizing your space, it is very important that it is a stable working area because you will be putting pressure on the bench during the sawing process.

File:

this tool is used to smooth different materials (for example: metal, plastic, or wood). When choosing a file, you should consider three important factors:

1. the type of material you are working with
2. the shape of the file in regards to the piece you are working on
3. the size and quantity of the teeth.

Various types of files can be used in one project, so you might want to have more than one. However, you should try and choose files that are the most fitting to the final product that you wish to achieve.

Sandpaper:

this piece of paper has different adhesive materials stuck to it and is used to smooth the surfaces of other materials, removing small fragments from the surfaces which could come from cutting the material, applying substances, etc. The different roughness of the paper is measured in grits and there are many different types of sandpaper, from very rough to very fine.
To choose sandpaper that best fits your project you should keep in mind the following characteristics:

1. the grit of the paper
2. the material/surface that you wish to sand
3. the smoothness that you hope to achieve with the final piece.

If you are trying to change a very rough surface to a very smooth one you might have to use different several different types of sandpaper with different grits.

Jeweller's mandrel:

these sticks come in different sizes and can be used to shape other pieces. A jeweller will probably need different types and sizes of mandrels for his work in order to make different things.
Mandrels are used in many different types of projects (such as: shaping rings and bracelets, etc.), therefore, there are as many types of mandrels as tasks to fulfil. However, they are not necessarily instruments which have been specifically created for this task, but can also be different objects that have the shape desired in the final product.

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