The Story of a Reader Chair

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About the author

Michal Polák lives in the Czech Republic, in the town of Újezd u Brna, South Moravia. He graduated in 2001 from the advertising and graphics program of the College of Applied Arts and Graphics in Jihlava. In 2009, he completed a design program at the Academy of Arts, Architecture and Design in Prague. He now works at Francisdrake, his own graphics studio, with his colleague Zdenek Pudil. For many years, Michal has worked with CorelDRAW as a primary tool for creating all types of designs, including stationery, catalogs, logotypes, corporate identity materials, business cards, posters, Web designs, and technical drawings. The chair design featured in this article received an award at the Mobitex 2006 international trade fair. Visit Michal's Web site at **www.francis-drake.eu**.

The Story of a Reader Chair

A café is a place where you go for good coffee, chocolate, and desserts; a place where you meet friends, relax, and read books; a place where you spend your free time. Cafés are filled with readers of classic books and modern notebook users. What do people carry with them into the café? Jackets, scarves, hats, books, magazines, newspapers, and so on. The question is, where to put all these items? The tables in coffee shops are usually very small and often covered with advertising leaflets. There is place only for a cup of coffee or dessert, not for big books and magazines. The main idea for this project was to design an original chair for a café. The challenge was to create a chair that was comfortable, compact, and equipped with convenient and versatile storage space, which could be used for books, magazines, or coats. By creating a pocket on the backrest of the chair, I solved the problem (Figure 1).

Figure 1: Final design

Ideas and sketches

The shape of the pocket was inspired by the notion of an open book. The backrest was envisioned as a double-layer surface gradually splitting up into two separate planes and opening up a space for the placement of books or papers.

My initial sketches (Figure 2) depict the march of ideas when I brainstormed about the various ways to store newspapers, books, or magazines. Newspapers can be rolled up or stacked up flat, and books can be opened up or kept sealed in hard cover.

At first I wanted to create a closed pocket, but then I realized that it is much better to leave it open on the sides, so people can use it to store different kinds of reading materials regardless of their shape. Rolled-up newspapers, for example, can fit comfortably in the cylindrical bottom.

First, I put my idea on paper (Figure 3). Then I developed several sketches, from which I chose the final version. I scanned the sketch into the computer so I could use it as a starting point for the design.

Figure 2: Sketching out ideas

Figure 3: Initial sketch of the chair

Tracing the basic shape

After I scanned and imported the sketch into CorelDRAW, I used the **Bézier** tool to trace the basic shape of the chair as seen from the side (Figure 4).

Figure 4: Outlining the main shape

While drawing with the **Bézier** tool, I could switch to Quick Pan mode by holding down the middle mouse button and dragging. The pan mode for drawing tools allows smooth panning without having to scroll down the page or change tools. I created one continuous curve for the top part of the chair (Figure 5).

Figure 5: Outline of the top of the chair

For the back chair leg, I created a rectangle with the **Rectangle** tool (Figure 6) and then skewed the rectangle (Figure 7) by using the **Transformations** docker (**Window ▶ Dockers ▶ Transformations ▶ Skew**). Now the basic outline was complete.

Figure 6: Drawing a rectangle for the leg

Figure 7: Skewing the rectangle

Ergonomics

When designing furniture, I always use a digital human model to ensure that the final product follows basic ergonomic principles. I

use the same figure in different sizes, depending on the project. For example, projects such as designing car seats for children or chairs for people of different ages require human models of various sizes.

In this case, I used a ready-made human figure with a height of 175 cm set in a proper sitting position (Figure 8). The virtual model came from a 3D program, Rhinoceros 3D, which is easy to use with CorelDRAW.

Digital human models are an essential tool in industrial design. Designers should always use digital models to check the proportions of their products. If you design chairs, car seats, beds, bathtubs, cars, homes, and so on, you have to use human figures to guarantee compliance with safety and ergonomic standards. To make sure that the chair was ergonomic and comfortable for sitting, I had to use either a digital model, or a real human sitting on a prototype of the chair.

After importing the seated figure into CorelDRAW, I used the **Freehand** tool to create curves around it and outline the basic surfaces of a chair (Figure 9). Holding down **Shift** while drawing with the **Freehand** tool creates a straight line. For the backrest, I drew a curve along the back of the figure, and then scaled the curve to make it longer (Figure 10).

Then, I drew a horizontal line to mark the height of the backrest (Figure 11). I estimated that this height would be comfortable for a chair of this design, taking into account the figure's center of gravity.

Based on the digital model, I had found the right proportions for a chair that supports proper sitting posture.
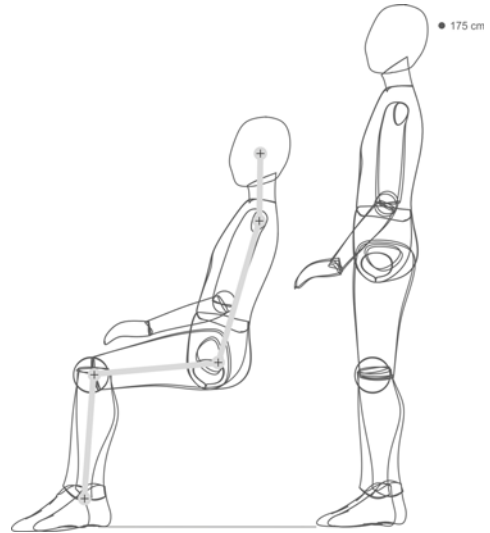

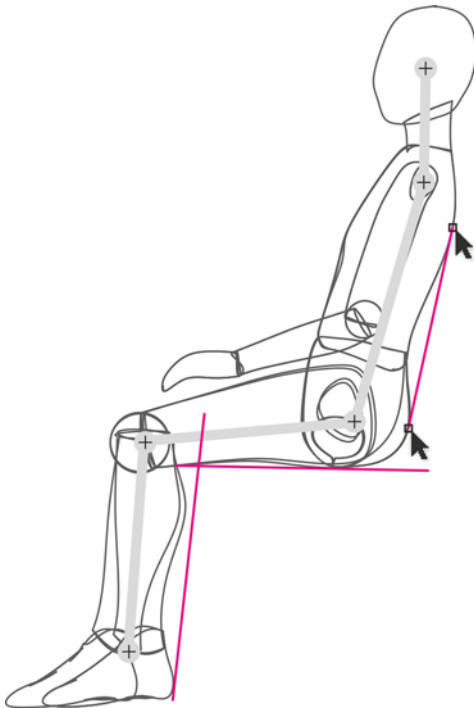*Figure 8: A human figure is imported into CorelDRAW.*

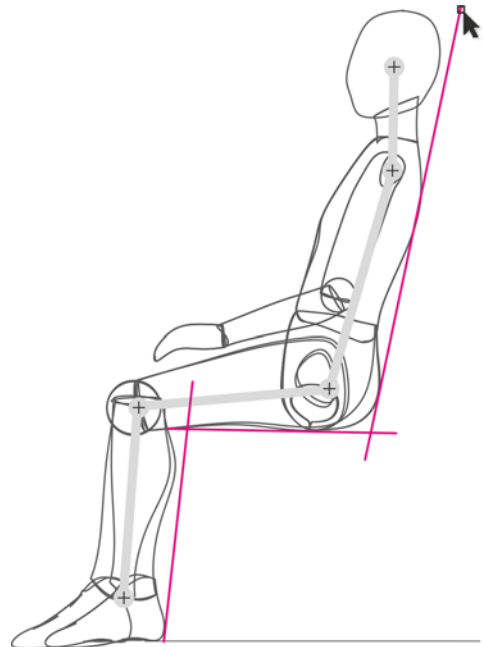*Figure 9: Drawing a chair outline around the figure*

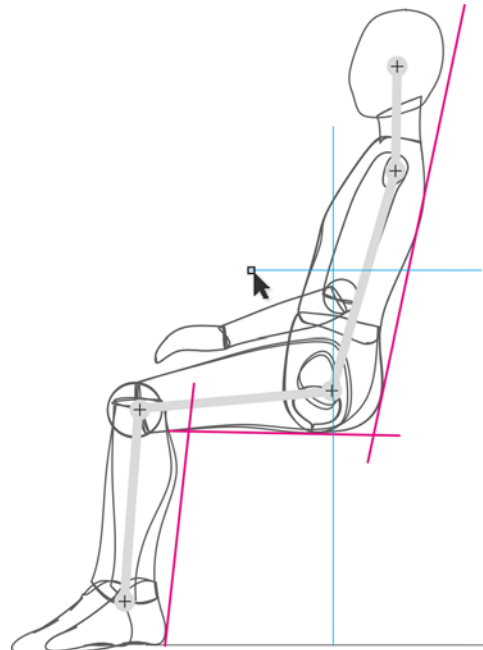

Figure 10: Extending the curve for the backrest

Figure 11: Drawing a horizontal line to mark the height of the backrest

When the outline was complete, I separated it from the human figure (Figure 12). I now had a basic outline representing a chair constructed according to ergonomic principles.
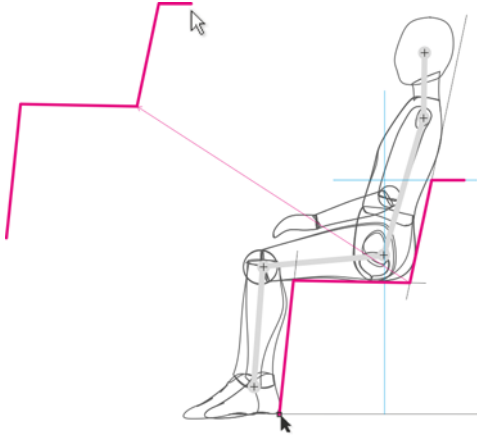

Figure 12: Separating the outline

I put the original traced shape on one layer, and then I placed the ergonomic outline on another layer on top of it (Figure 13).

Figure 13: The ergonomic outline is superimposed on top of the original traced shape.

I drew a new outline with the **Bézier** tool, using as guidelines the ergonomic outline and the original traced sketch. The resulting shape represented a chair outline adapted to ergonomic principles. Then I duplicated every line and placed the copy at a distance from the original to account for the thickness of the material (plywood). I measured the real thickness of the plywood and applied the same proportions in the drawing (Figure 14).
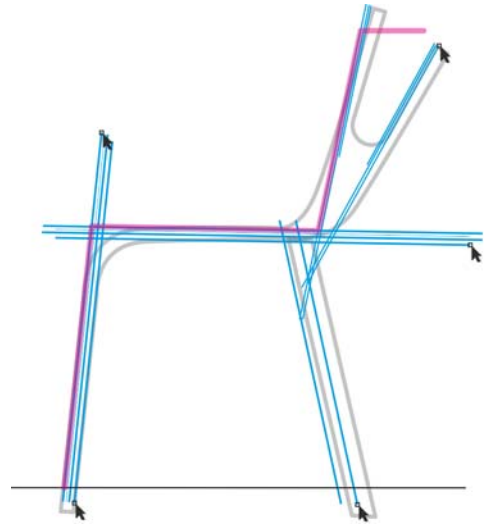

Figure 14: The blue lines are duplicated and spaced out according to the thickness of the material.

Next, I selected the **Ellipse** tool. I then created circles of different sizes and snapped them to the intersections where I wanted to create rounded corners (Figure 15). I shortened the straight lines to the points where they intersected with the circles (Figure 16).

To create rounded corners, I broke up the circles into arcs by clicking the **Arc** button on the property bar, and then I moved the end points of each arc so that the arc was 1/4 of the circle (Figure 17).

You can move the nodes of the arc manually with the **Shape** tool or type values in the **Starting and ending angles** boxes on the property bar for greater precision.
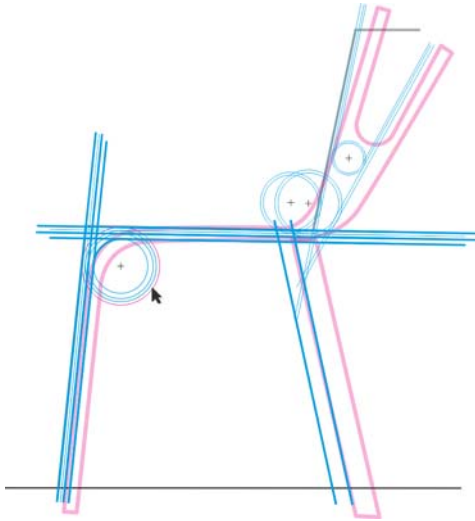

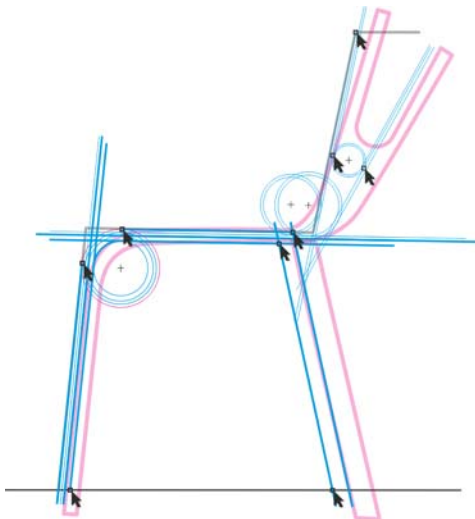Figure 15: Circles are added at intersections of straight lines.

Figure 16: The straight lines are shortened so that they end at the intersections with the circles.
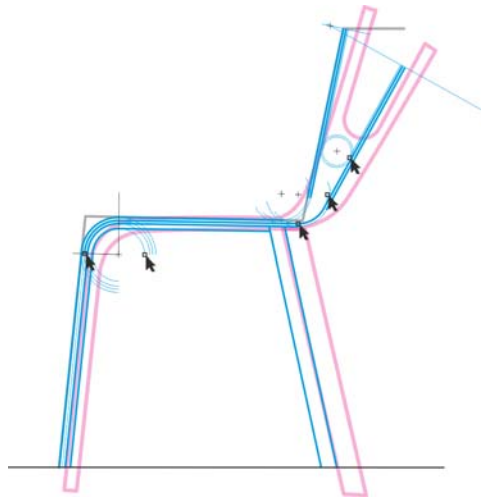

Figure 17: Turning the circles into arcs to create rounded corners

The outline was now complete. The design captured the original idea from the traced sketch, while also incorporating basic ergonomic principles (Figure 18).
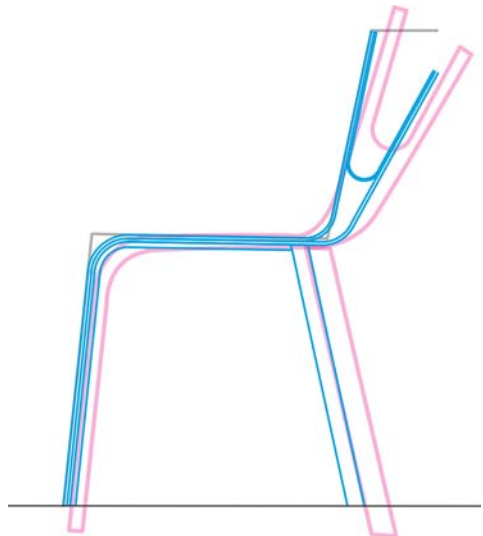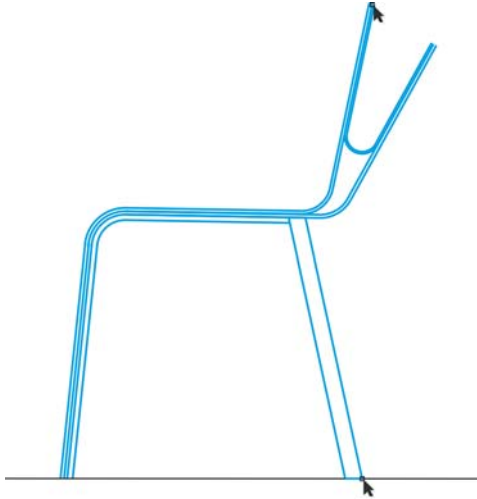

Figure 18: The final outline (blue) is based on the original traced sketch (purple) and the ergonomic outline (black).
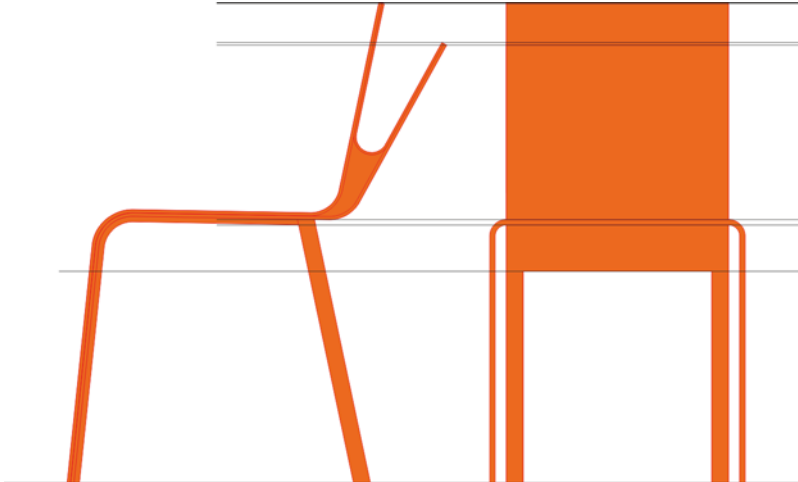
Finally, I closed all open lines of the object (Figure 19). I used the **Shape** tool to select each two end nodes that I wanted to join, and then clicked the **Join two nodes** button on the property bar.

When the side view of the chair was ready, I created the back view based on it (Figure 20).

Finally, I verified the design by adding the seated human figure to the chair (Figure 21).

Figure 19: All open curves are closed.

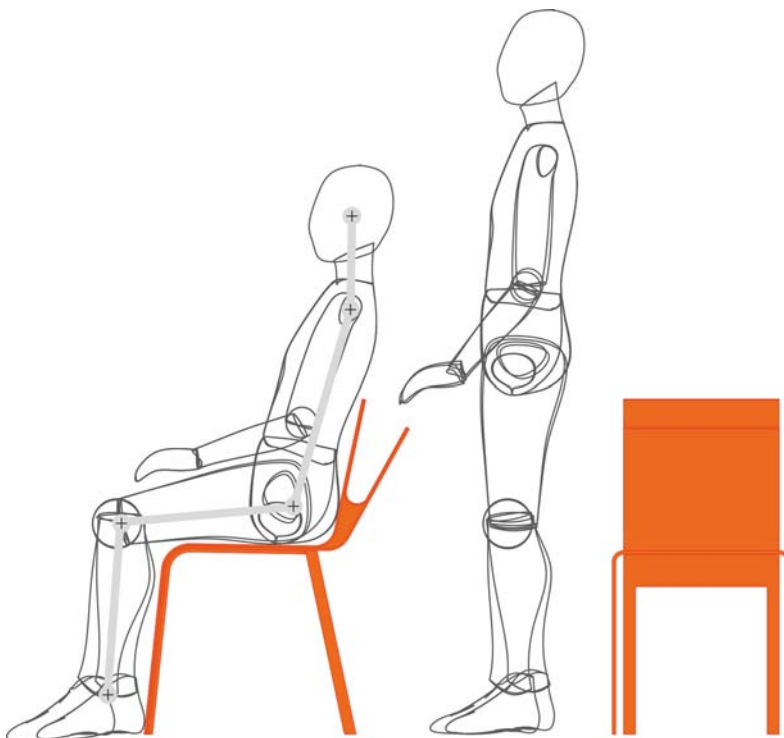*Figure 20: Side and back view of the chair*

Figure 21: Verifying the final design

Adding colors

With the rich color-mixing capabilities of CorelDRAW, I could fine-tune the color of the chair as needed.

CorelDRAW provides a fast and easy way to mix colors. First, I chose a color swatch from my printed RAL color chart, and then I recreated the color in CorelDRAW on my calibrated Eizo monitor. I usually use the CMYK and PANTONE color palettes.

When my color palette was ready, I simply dragged a color swatch to the object to apply the color (Figure 22). I used the **Interactive fill** tool to create transition effects from darker to lighter shades of the same color.

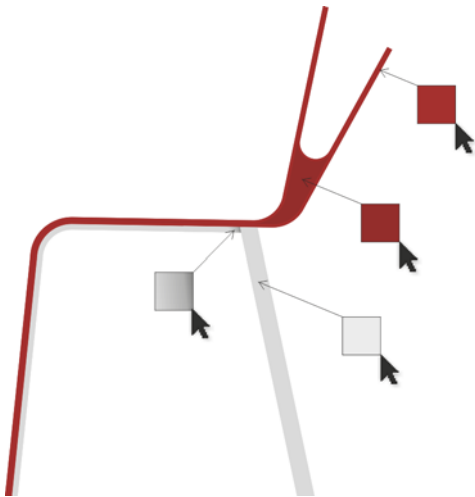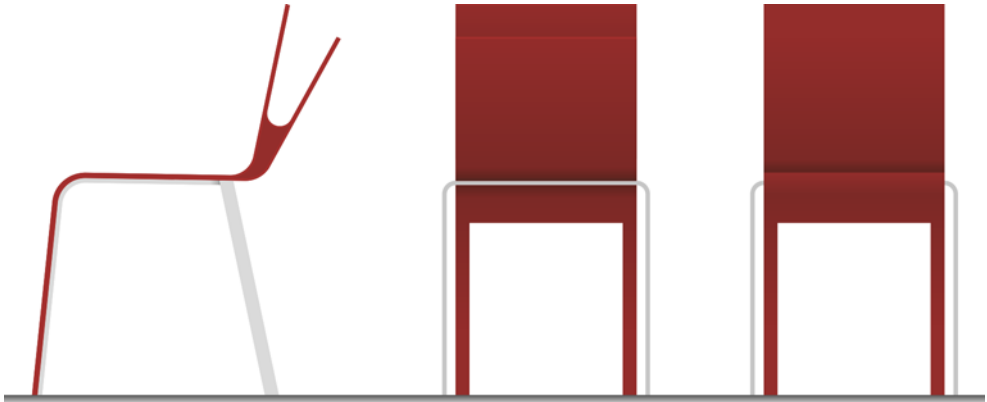I chose different colors that would make the chair look good (Figure 23).

Figure 22: Applying color to the chair

Figure 23: The chair in different colors

Figure 24: Side, back, and front view of the chair

Creating a 3D visualization

The chair was done in 2D views (Figure 24). Now was the time to convert it to 3D. I exported the basic outline of the chair as a DWG file, which I opened in the Autodesk® 3ds Max® Design software. The resulting visualization showed what the chair would look like in real space (Figure 25).

Figure 25: 3D view of the chair

Figure 26: Mirroring the rectangle and importing the chair

Creating a presentation booklet

When the 3D visualization was done, I opened CorelDRAW again to create a presentation booklet for the chair.

I wanted to create a single-fold 4-page brochure. First, I created the inside pages. I drew a rectangle and mirrored it to create a two-page spread (Figure 26). Then I imported the image of the chair and placed it in the middle of the two pages by snapping the center of the chair to the center of the page spread. The ability to snap objects to other objects, edges, or the center of the page is one of the great advantages of CorelDRAW. Thanks to this feature, I save a lot of time and I am 100% sure that the result will be accurate.

Next, I added text by using the **Text** tool and aligned it on the page by using alignment guides (Figure 27). The two inside pages of the booklet were done.

Figure 27: Adding text

On the back cover of the booklet, I wanted to create a visual presentation of the available colors for the chair. For each color, I created a small circle with a uniform fill, duplicated the circle (with the duplicate right on top of the

original), and then created a larger circle overlapping half of the duplicate circle (Figure 28). Then I selected the duplicate circle and the large circle, and clicked the **Intersect** button on the property bar to create an object from the intersection of the two objects. I discarded the two objects, leaving only the object created from their intersection. Then I filled this object with white and applied transparency to it, so that the underlying original small circle was partially visible. The transparency created a smooth transition between the light and dark shades of the color, producing a glow effect.

When I was done with the first circle, I dragged it to the right and pressed the right mouse button to duplicate it. I created multiple copies in different colors and spaced them evenly on the page, so that the distance between the circles was equal to their radius.
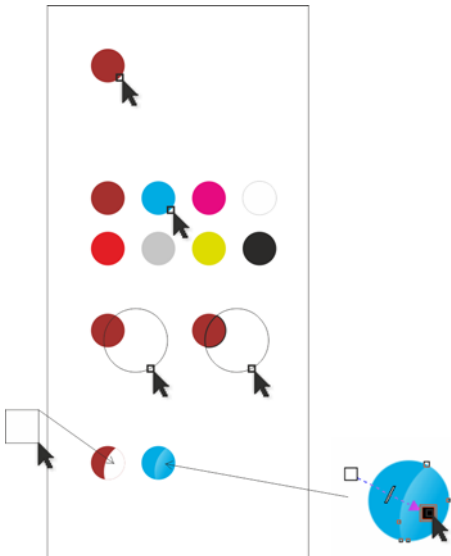

Figure 28: Creating color circles

On the back cover of the booklet, I placed the color samples and added text, and on the front cover I placed the image of the chair, which I cut and aligned with the page (Figure 29).

To crop the image of the chair to the page, I used a long and narrow rectangle. I selected both objects and clicked **Arrange ▶ Shaping ▶ Back minus front** (the chair being the back object and the rectangle the front).
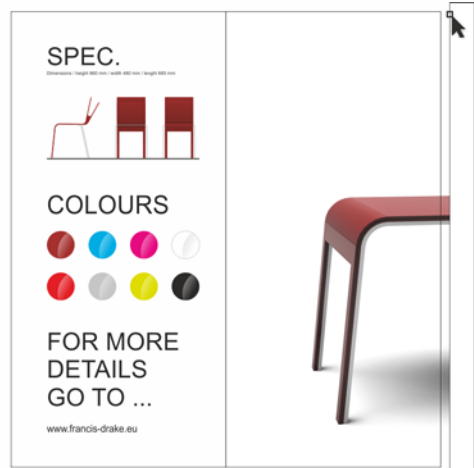

Figure 29: Trimming the end of the chair with a rectangle

All the objects were now aligned on the page in a harmonious and visually pleasing composition.

Next, I cut the image to the size needed for printing. Offset printers require adding a margin (also known as bleed) to allow for trimming the paper after printing. The final trim size of the brochure was 210 x 198 mm, so I added a 3.175 mm bleed on each side. This is a standard bleed size for offset printers. Finally, I exported the booklet to the PDF format with printer's marks, which CorelDRAW added automatically.

After that, the booklet was done and ready for print and production (Figure 30 and Figure 31).
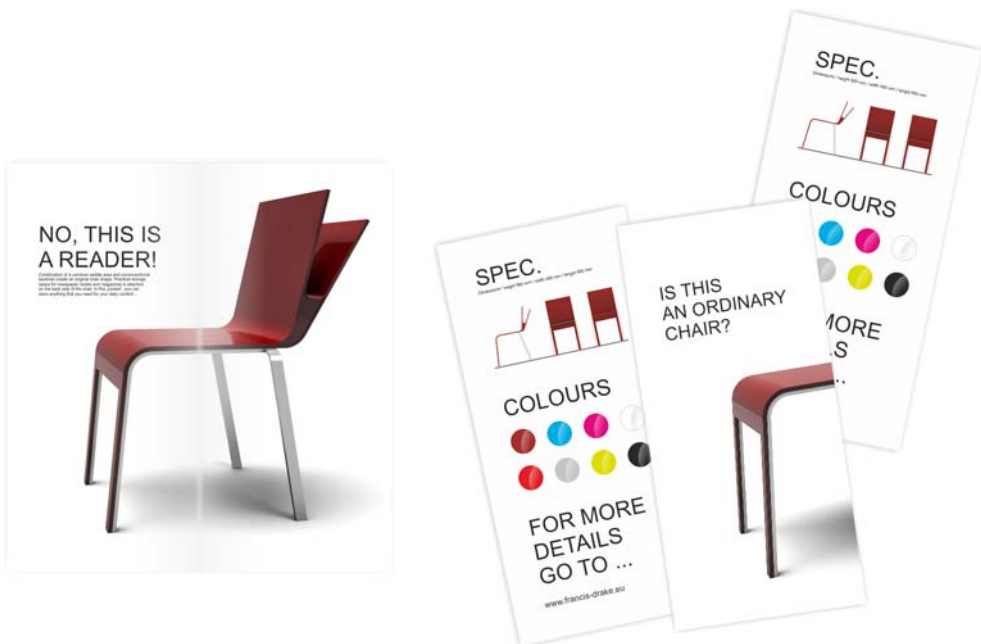
Figure 30: The finished booklet design

Figure 31: Final printed booklet

Production drawings

The final task was to create production drawings for the chair manufacturer (Figure 32 and Figure 33). Using the **Dimension** tools in CorelDRAW, I simply dimensioned all chair parts. When the production drawings were complete, I printed them and handed them over to the manufacturer, who made the chair (Figure 34).
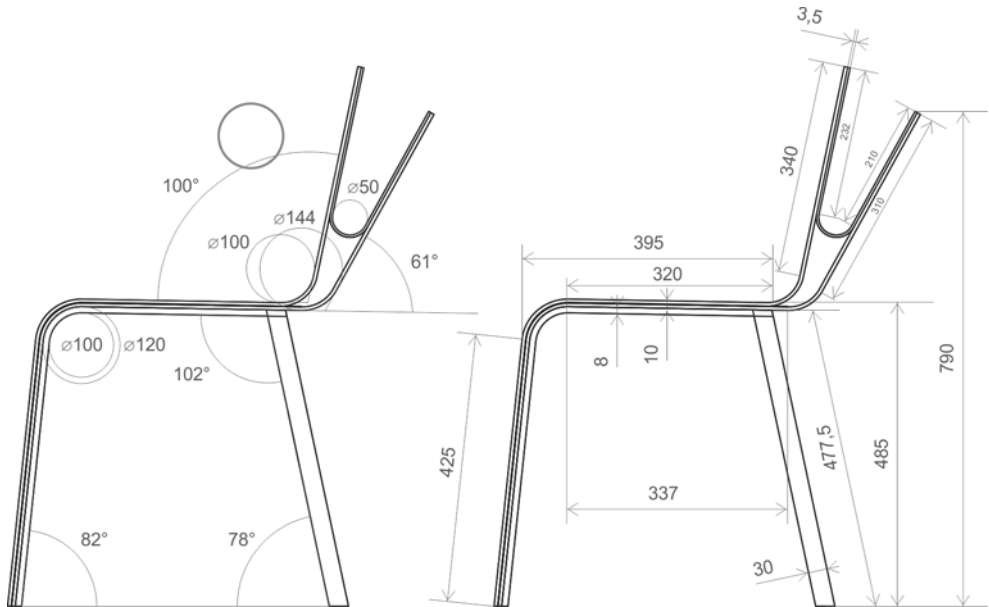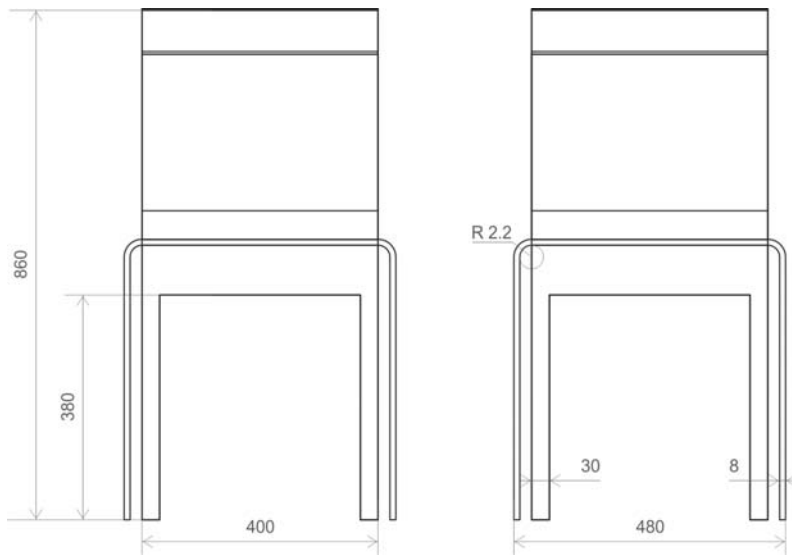

Figure 32: Production drawings (side view)

Figure 33: Production drawings (rear view)

Figure 34: Manufactured product

I use CorelDRAW as the main application for creating graphic materials. It's the perfect tool for developing the concept and basic shapes of the product design, which I subsequently export as curves to a 3D software to render photorealistic visualizations of the product. CorelDRAW also provides an easy way to make production drawings, which I send directly to the manufacturer.

CorelDRAW is a unique software that allows me to transfer my ideas from paper to reality. I use this tool for all my projects, including the creation of visual identities, Web sites, logos, catalogs, and product designs.