

Icon case report

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Abstract

This document is a report for our design and fabrication of a 3D-printed case for an icon.

Revision History

Revision	Date	Author(s)	Description
1.0	11SEP2026	TH	Creation

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Contents

1	Introduction	2
2	Design drivers	2
3	Design	5
3.1	Description	5
3.1.1	Icon	6
3.1.2	Overview	6
3.1.3	Bottom case	6
3.1.4	Top case	6
3.1.5	Plastic sheet	6
3.1.6	Bolts	6
3.2	Parts	7



4	Procurement and tools	9
4.1	Procurement	9
4.2	Tools	9
5	Fabrication	9
6	Assembly	9
7	Conclusion	10
8	Drawings	10

Acronyms

CAD Computer assisted design
PETG polyethylene terephthalate glycol

1 Introduction

We cover the Computer assisted design (CAD) and fabrication of a 3D-printed case for protecting and displaying an icon. The final, assembled, result can be seen on [Figs. 1](#) and [2](#).

2 Design drivers

We present the high-level specification which drives the design.

Display case The case is meant for displaying the icon at home. It shall allow a clear view of the art. It shall place the icon in the center.

Size The case shall take the minimal amount of space, while meeting the other requirements. It shall be compatible with 3D printer print volumes.

No play The assembled design shall not involve play between the parts, especially in the parts in the contact with the icon top face. The motivation is to avoid scratching and wear.

Disassembly The design shall allow full disassembly, in the event the case must be removed for replacement.

Sourcing The design shall minimize the components and manufacturing sourcing required.



Figure 1: Final assembled assembled case: top face.



Figure 2: Final assembled assembled case: bottom face.

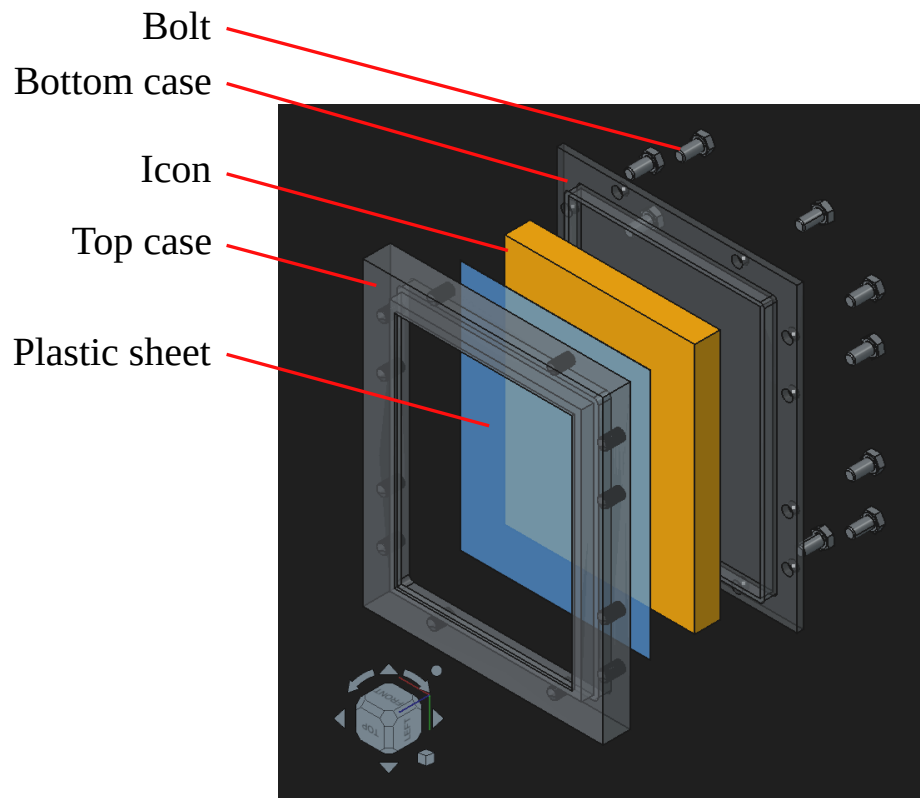


Figure 3: Assembly CAD: exploded view.

Protection level The design shall protect against hand manipulation, dust, liquid projections. The protection against water submersion, heat, shocks, is not taken into account.

3 Design

A description of the design solution is given, followed by the list of parts and fasteners.

3.1 Description

A detailed description of the design is given, with comments on each part. The CAD parts are shown on [Fig. 3](#). The top case and bottom case are shown transparent for the sake of readability.

3.1.1 Icon

The icon to protect is a rectangular block. Its dimensions dictate the dimensions of the case's parts. The design is made for the particular icon we had to protect. It can be generalized to any other piece of art with the same overall shape.

The icon face with the art is referred to as the *top face*. Note the icon has a small extrusion on its back, used for attaching to a nail on a wall. We chose not to remove it, but rather accommodate it in our design through a small notch on the bottom case.

3.1.2 Overview

The design consists in having a case split in two parts: a *top case*, and a *bottom case*. The icon rests in a pocket inside the case. A plastic sheet is inserted between the icon top face and the top case, and is pinched in place during assembly. The two parts of the case are held in place using threaded holes and bolts.

3.1.3 Bottom case

The bottom case is where the icon sits in assembly. The pocket holds the icon in place laterally, with a little lateral play. The walls of the pocket come up halfway to the thickness of the icon. There is a notch at the bottom of the pocket to accommodate the attachments on the bottom face of the icon. The bottom case has passthrough holes for the bolts.

3.1.4 Top case

The top case is assembled on top of the bottom case. It has a corresponding pocket. The icon is held on the top by a thin border. The outer part, outside of the pocket walls, is extruded towards the bottom case plane holding the bolt holes, with a slight tolerance around the pocket walls, to allow sliding assembly. There is an intentional gap between the top case and the bottom case in the depth direction, making sure the icon is being pinched after final assembly. The top case has threaded holes, with oversized tolerances for 3D printing.

3.1.5 Plastic sheet

We use a plastic sheet readily available anywhere. It is cut to the same size as the icon top face.

3.1.6 Bolts

We use 3D-printed bolts, with standard size, for closing the case. There is only one model of bolts in the whole design. We use a hex head since tooling for it is fairly common, and works well with plastic. Thumb screws were considered, but the head is generally too big.

Part name	Drawing reference	Quantity	Unit weight
Icon	PRJ3-DRW1	1	295 g
Plastic sheet	PRJ3-DRW2	1	Negligible
Bottom case	PRJ3-DRW3	1	146 g
Top case	PRJ3-DRW4	1	129 g

Table 1: Parts list.

3.2 Parts

[Tab. 1](#) lists the parts in the design, along with a reference to the corresponding drawing, quantity, and weight. The icon itself is included for reference. The weight is estimated through the 3D-printer Prusa slicer, with the settings used for fabrication. The total mass (with the icon and fasteners) is 592 g.

[Tab. 2](#) lists the fasteners, along with standard, dimensions, type, quantity and weight. The total mass of fasteners is 21.5 g.

Name	Standard	Material	Dimension	Type	Quantity	Unit weight
Bolt	DIN-933	PETG	M8x16	Hex head	12	1.79 g

Table 2: List of fasteners.

Part name	Print time
Bottom case	3h30m
Top case	3h47m
Bolt x12	1h12m

Table 3: Parts printing time.

4 Procurement and tools

We list the materials procured, as well as the tools needed for fabrication and assembly.

4.1 Procurement

I procured,

1. Plastic sheets in A4 format, 200 microns thick, from the supplier Albyco Nederland BV. The article code is `SBTR20A4100_ALB`.
2. A roll of 3D-printing polyethylene terephthalate glycol (PETG) filament from Creality. This is 1.75 mm filament. A single 1 kg roll is sufficient for this project.

4.2 Tools

The following tools are needed, either for fabrication or assembly.

1. A 3D printer. Mine is a Prusa Core One.
2. Hex head dowel key.

5 Fabrication

All the parts and fasteners are 3D-printed using the listed 3D printer and filament. The CAD files used are at the git tag `asm_0`. The slicer used is `PrusaSlicer 2.9.6`. For the parts, the setting is 0.20 mm SPEED, with *Generic PETG* and 15% infill. For the bolts, we used 100% infill, with rectilinear fill pattern. There are no points of attention for these prints, they are straightforward. The print times are listed in [Tab. 3](#).

The plastic sheet must be cut to size (scissors are fine).

6 Assembly

The assembly is simple,

1. Lay the bottom case on a flat surface, with the pocket upwards.

2. Place the icon inside the pocket, top face up and with the bottom attachment in the corresponding notch.
3. Place the plastic sheet on top of the icon, flush with its sides.
4. Slide the top case on top of the assembly.
5. Flip the assembly, holding it together.
6. Insert the bolts in the holds. Tighten *weakly* in sequence.

We used a 3D-printed mock icon in order to test the assembly procedure first, without damage risk to the actual icon. Note that, as usual, 3D-printed threads and bolts are delicate, do not use more than finger strength.

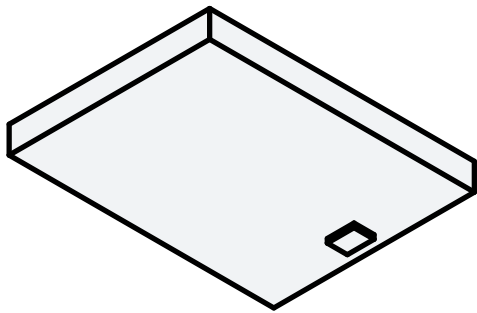
7 Conclusion

The final result meets the specification. There is absolutely no play in the assembly. The fabrication and assembly are simple, no major incidents were encountered.

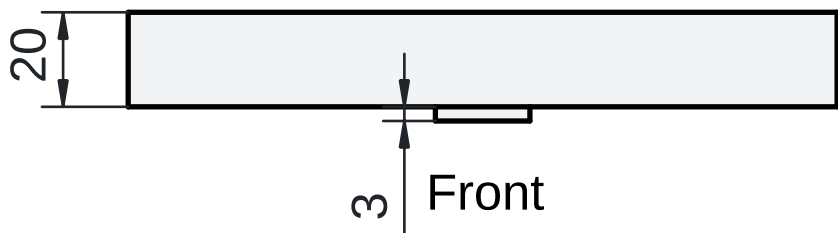
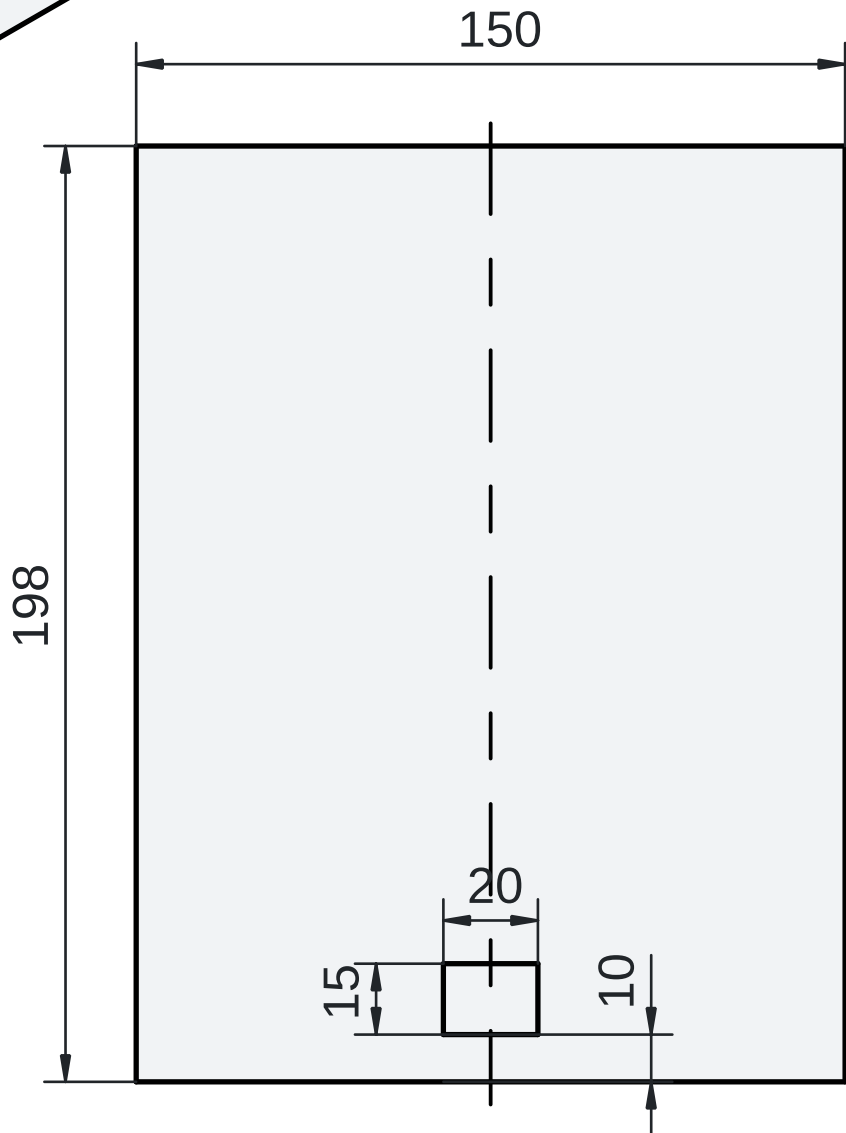
The 3D-printed bolts may be too delicate, and metallic threaded inserts could be considered as a replacement if numerous assembly/disassembly cycles are necessary.

8 Drawings

All the design drawings are attached at the end of this report.



Overview

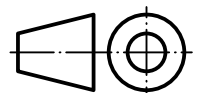


Front

Part Material:
Wood

General tolerances:
ISO 2768-m

Scale:
5 : 8



Title: Icon	Created by: Thomas HOULLIER		Owner: CC-BY 4.0 license	
Document type: Part drawing	Approved by: None			
Drawing number: PRJ3-DRW1	Language: EN	Issue date: 11 Sep 2026	Revision: v1.0	Sheet: 1 / 1

1

2

3

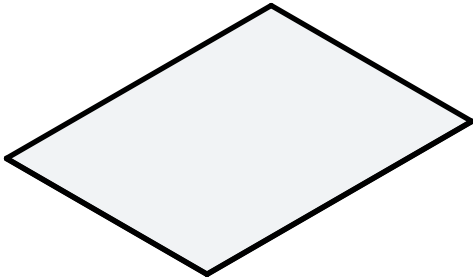
4

150

198

0.2

Front

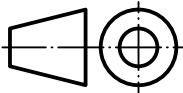


Overview

Part Material:
Transparent plastic

General tolerances:
ISO 2768-m

Scale:
5 : 8



Title: Plastic sheet	Created by: Thomas HOULLIER		Owner: CC-BY 4.0 license	
Document type: Part drawing	Approved by: None			
Drawing number: PRJ3-DRW2	Language: EN	Issue date: 11 Sep 2026	Revision: v1.0	Sheet: 1 / 1

A4

1

2

3

4

A

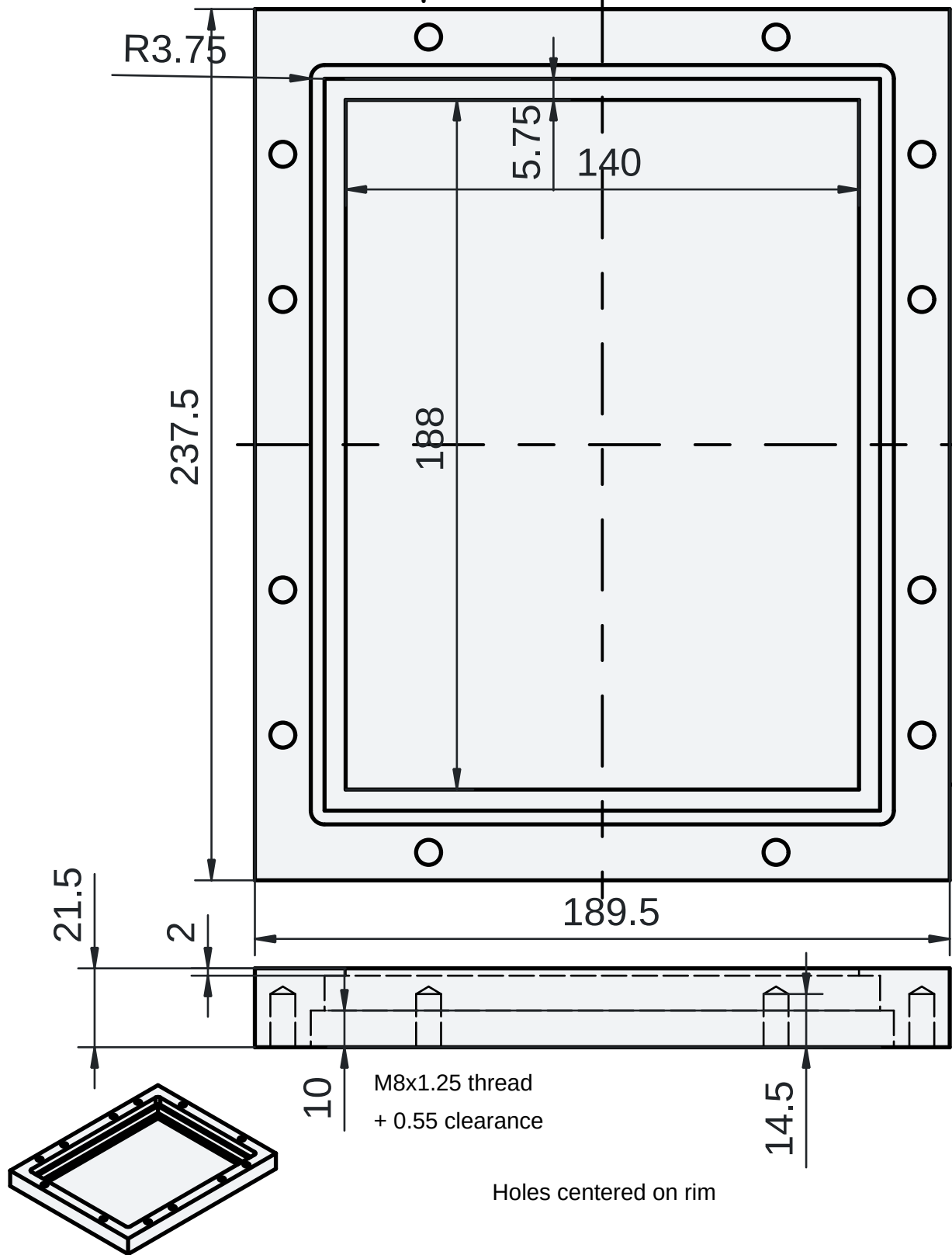
B

C

D

E

F

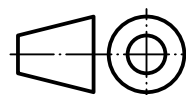


Part Material:
PETG

Overview

General tolerances:
ISO 2768-m

Scale:
5 : 8



Title: Top case	Created by: Thomas HOULLIER		Owner: CC-BY 4.0 license	
Document type: Part drawing	Approved by: None			
Drawing number: PRJ3-DRW4	Language: EN	Issue date: 11 Sep 2026	Revision: v1.0	Sheet: 1 / 1

A4