Органайзер

1. Introduction

Project Description:

"This report aims to document the steps of designing and manufacturing a custom plastic box for storing drill bits using the **Rhinoceros** design software and 3D printing technology."

Project Importance:

- Improving the organization of tools and protecting them from damage.
- Demonstrating the efficiency of 3D printing in producing customized and practical products.

Objective:

To design a box that accommodates the different sizes and numbers of drill bits, providing:

- Ease of access and organization.
- Durability and lightweight construction.

2. Requirements

General Specifications:

- **Size:**120*20*80.
- **Features:** Lightweight, durable, vibration-resistant, and easy to open and close.

Tools and Software:

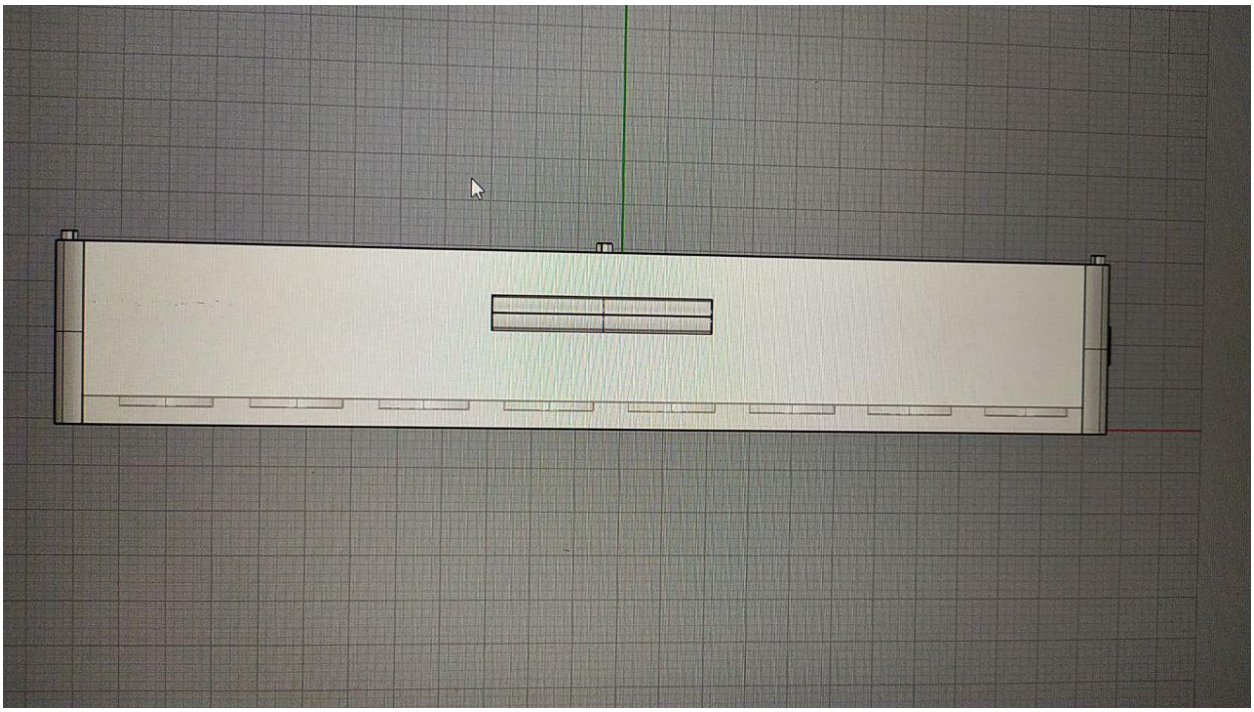
- **Design Software:** Rhinoceros.
- **3D Printer:** Creality.
- **Materials:** PLA.

3. Design Steps Using Rhinoceros

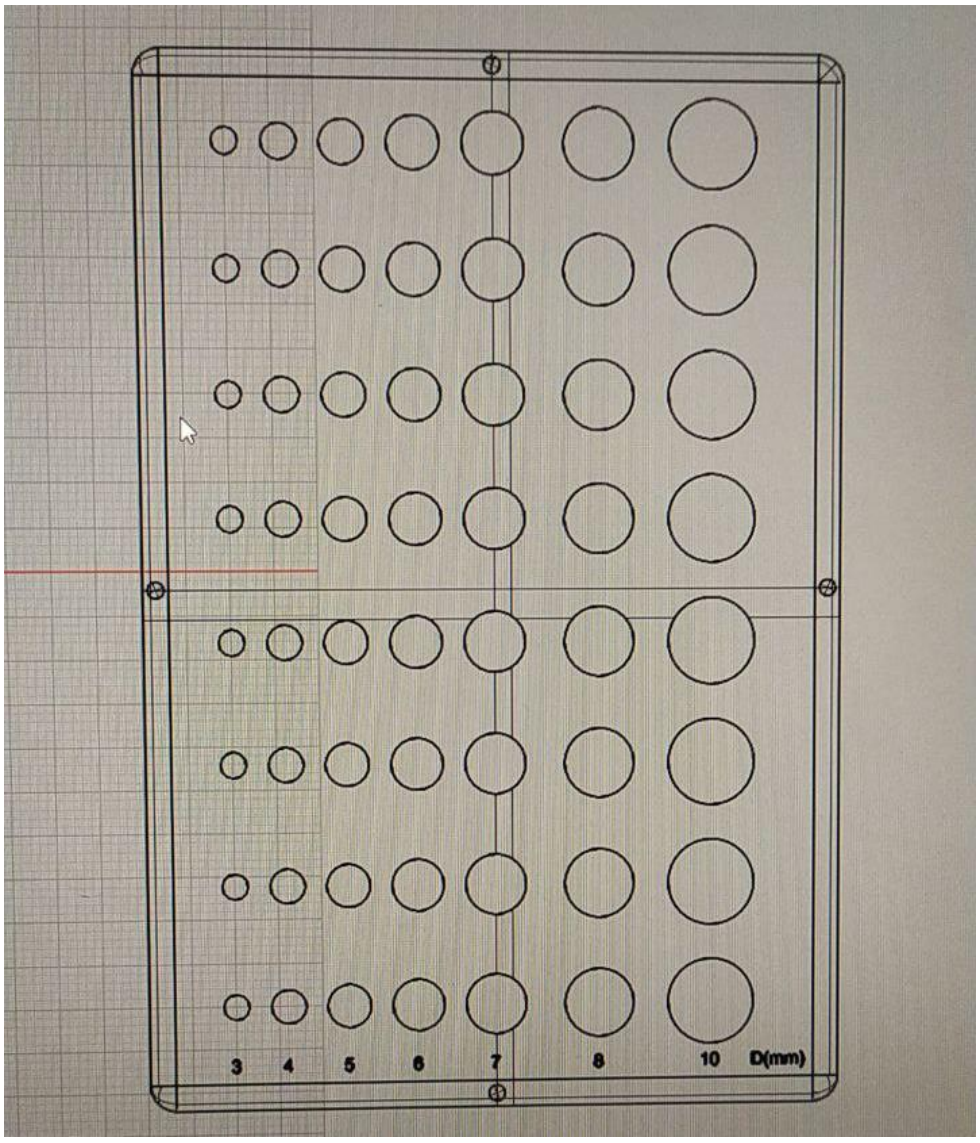
3.1. Conceptualizing the Idea

3.2. Creating the 3D Model

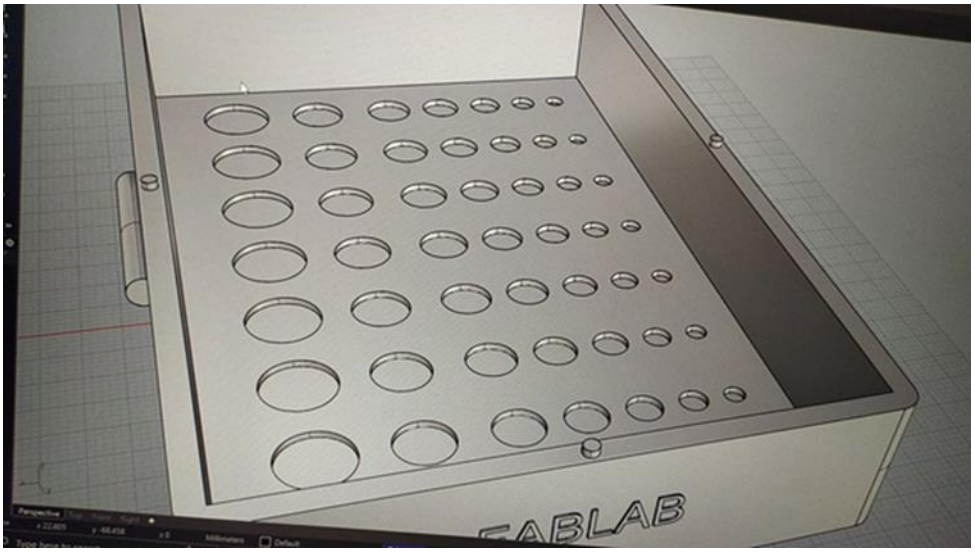
1. **Base Design:**
    - Use the *Rectangle* tool to draw the base of the box with dimensions appropriate for the drill bits.
    - Use *Extrude Curve* to raise the base to a suitable height, forming the box's bottom section.
2. **Adding Internal Dividers:**
    - Design internal dividers using tools like *Line* and *Offset* to define compartments for each drill bit.
    - Raise the dividers using *Extrude*, maintaining the same wall thickness as the box.



3. **Lid Design:**
    - Create a separate lid using the same dimensions as the base, adding edges for secure fitting.
    - Enhance the design by including slots or handles to facilitate opening and closing.



4. **Additional Features:**
    - Add holes or ridges to help grip and hold the drill bits.
    - Use *Boolean Operations* to add or remove details, such as openings or recesses.



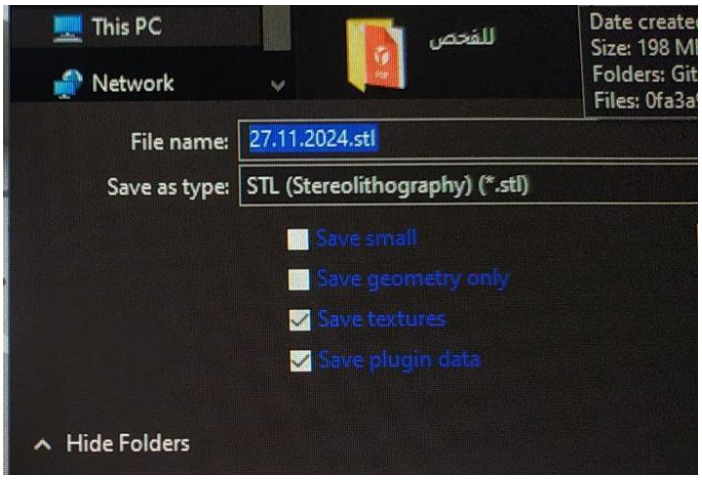
3.3. Verifying the Design

- **Dimensions Check:** Use the *Distance* tool in Rhinoceros to verify that all dimensions match the intended measurements.
- **Wall Thickness:** Ensure that the walls are strong enough for printing, with a recommended minimum thickness of 2 mm.

4. Preparing the Model for Printing

Exporting the File:

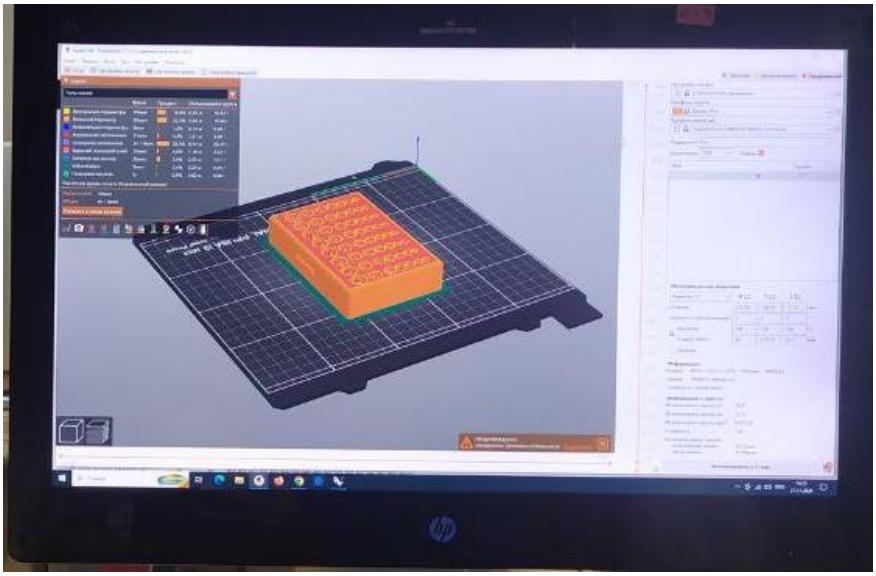
- Save the final design in STL format using the *Export Selected* option.



- Use *Mesh Analysis* tools to ensure the model is free of errors.

Slicing Settings:

- Load the STL file into the slicing software.



- Adjust print settings, such as:
  - **Layer Height:** 0.2 mm.
  - **Infill:** 20-30%.
  - **Extruder and Bed Temperature:** 85°C.
- Review the expected print time and material requirements: **2h 11min**.

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5. Printing Process

5.1. Initial Setup:

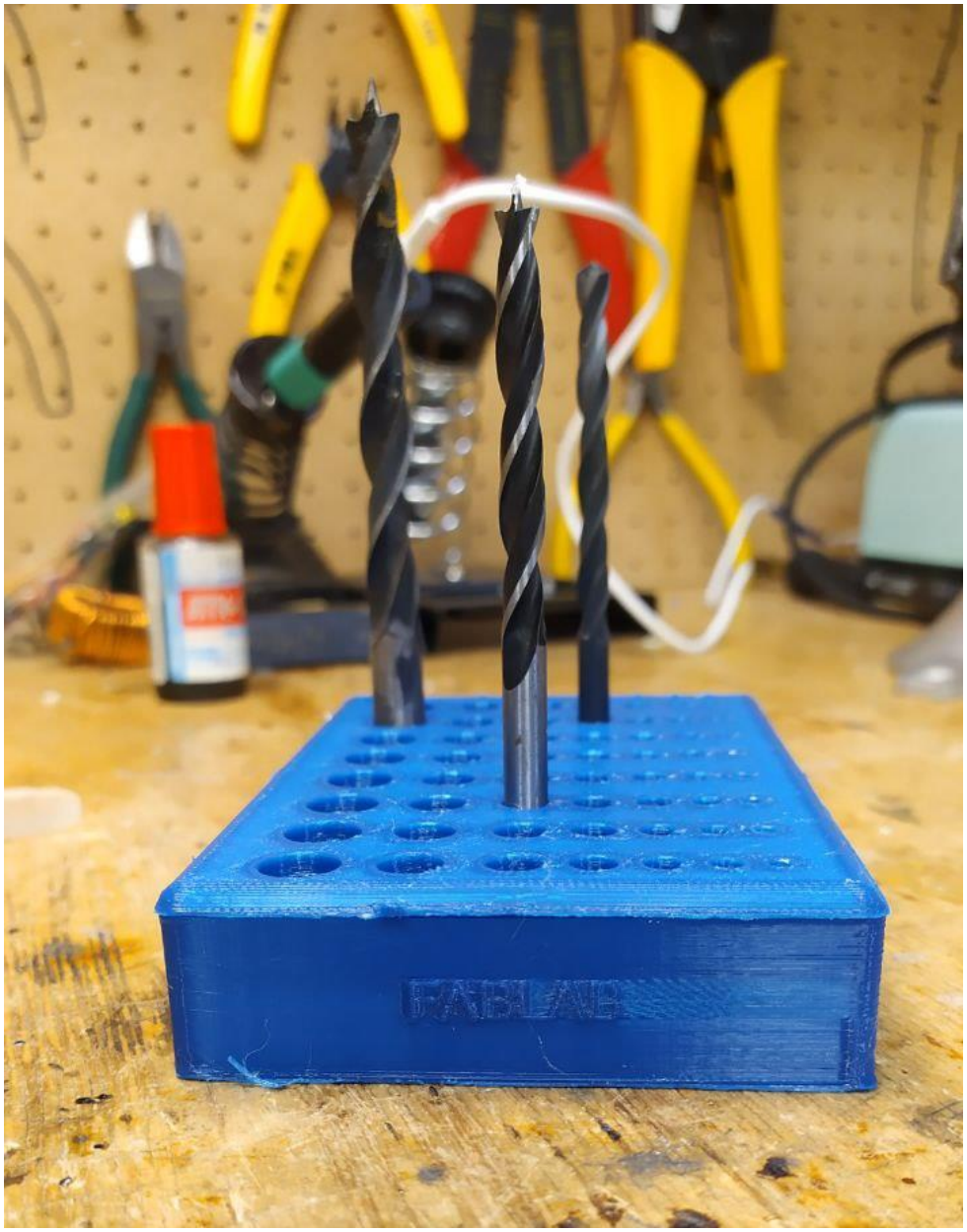
- Clean the print bed to ensure good adhesion of the first layer.
- Level the printer bed if necessary.

5.2. Printing:

- Start the printing process and monitor the first few layers to ensure proper adhesion and print quality.

5.3. Completing the Print:

- Carefully remove the printed box from the printer.
- Clean the edges and remove any excess parts.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