

## Deliverable C

### Introduction

Our main objective is to create a durable, reusable, and economical jig that is user-friendly, accurate, and effective. To achieve this, this document translates the requirements of the client into design criteria, specifying the functional requirements, nonfunctional requirements, and constraints necessary for this design. Additionally, a benchmarking analysis is conducted to evaluate the cost, weight, fastening system, and other aspects in comparison to comparable products available in the market. Additionally, the target specifications are listed to guide the design process.

### Design Criteria:

Need	Design Criteria
The jig is durable and reusable	Material
The jig is intuitive and easy to use/learn	Simple design
The jig is accurate and precise	Measurement indicators
The jig is consistent and efficient	Set-up time (min)
The jig can stay on the door	Fastening system
The jig is low cost	Cost (\$)

### Functional requirements:

- Fastening system
- Fit different door thicknesses (in)
- Measurement indicators
- Quick set-up time (min)

### Non-functional requirements:

- Aesthetics
- Simplicity
- Product life (# uses)
- Reliability

### Constraints:

- Cost (\$)
- Cutout dimensions (LxW in)
- Door thickness range (in)
- operating conditions: use of power tools
- operating conditions: dust

## Benchmarking

Specification	Cabinet Hinge Jig	Door Hinge Router Template Door Hinge	Vevor Door Hinge Jig
Company	TIMBUTUS	SEBUPAR	VEVOR
Cost	\$40.99	\$51.84	\$69.99
Weight	680 g	349 g	1650 g
Fastening System	Clamp	Screw	Screw
Measurement Indicator	none	Fixed measurement	Metric Ruler Guideline
Door thickness compatibility	no	Adjustable to 5 size configurations	Adjustable
Set up time	4 mins	5 mins	5 mins
Material	Rubber, High Quality Aluminum Alloy	Plastic material and silicone	Aluminum Alloy and Steel
Product Model			

## Target Specifications:

	Design Specifications	Relation	Value	Units	Verification Method
	<b>Functional Requirements</b>				
1	Allow for faster routing of flush bolts	=	Yes	N/A	test
2	Lightweight	<	5	lbs	Analysis, prototype
3	Durable	=	Yes	N/A	Test
4	Low Clamping Force	=	No	N/A	Test
5	Adjustable sizing	=	Yes	N/A	Prototype, test
6	Quick setup/removal time	<	3	min	Test

## Conclusion

In summary, this document translates the client's needs into design criteria, outlining the necessary requirements and constraints for the jig. These design criteria are essential to ensure that the resulting product meets the client's expectations for durability, reusability, precision, and other critical factors. Additionally, benchmarking was conducted, comparing our design specifications with products from companies such as Timbutus, Sebumar, and Vevor to gain insights and enhance the overall design. Through the assessment of the requirements outlined by the client and an evaluation of the benefits and weaknesses observed in benchmarked designs, target specifications were listed, highlighting the key criteria for the intended jig design. The design criteria and specifications were significantly influenced by the client meeting. Accuracy, consistency, and routing efficiency became top priorities. During the meeting, specific dimensions for the jig were established. These include a 1-inch width for routing and a 6  $\frac{3}{4}$ -inch inside length for routing. Additionally, we have recognized the importance of adaptability to accommodate various door thicknesses. As a result, we have determined that the jig should be able to support a minimum door thickness of 1  $\frac{3}{4}$  inches and a maximum of 2  $\frac{3}{4}$  inches. By utilizing the dimensions given by the client, it becomes possible to integrate adjustability into the design of the jig, improving the effectiveness of the final product. It is worth noting that the client highlighted the significance of cost in jig production. They have set a maximum budget of \$100 for the final design.