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A Fundamental 3-Dimensional Design of Frosted Bottom Fluid Mug Using Catia V5 Computer Aided Software

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ABSTRACT. This paper reports the techniques of creating structural design of the Frosted Bottom Fluid Mug using CATIA V5 computer aided design software. The concept of selecting Frosted Bottom Design due to the advantages of the usage by the end-user in various ergonomic factors. Basically, the design is executed through various part modelling methods to ensure the output achieved as per desired.

KEYWORDS. Computer Aided Design; Isometric Drawing; Catia V5.

INTRODUCTION

Frosted mugs are aesthetically attractive. It can accommodate any space comfortably. It also adds the sense of warmth and style to any decor. This type of mugs is suitable for pleasant dine in environment in hotels and cuisines. Mostly, frosted mugs are preferred by food and beverage experts for their presentations is due to advantages such as easy cleaning, allocation of more sunlight, promotion of privacy, provision of sufficient energy, enhances security and improves the living space.



Figure 1.0: Sample Frosted Bottom Fluid Mug

METHODOLOGY

Step 1

Using CATIA V5 Drawing Software, Select YZ Plane. Initially, sketched a line. Followed by selection of 3-point Arc to create a frost structure curve. Once created, tangent all the intersecting lines to avoid any open contours. Created the sketch of the Frosted Bottom Mug as per below dimensions.

Length	100mm
Height	150 mm
Frost Bottom Curvature Radius	50mm

Table 1.0: Dimensions for sketch of the frosted bottom mug



Figure 1.1: Sketch outline of Frosted Bottom Mug

Upon creating the sketch of the Frosted Bottom Mug successfully, Convert the sketch to part design by Extrude Modelling method as per below dimension.

Table 1.1 : Dimensions for Extrude Modelling of Frosted Bottom M	lug
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Extrude Thickness	100mm



Figure 1.2: Extruded view of Frosted Bottom Mug

Once extruded the Frosted Bottom Mug successfully, Continue the sketch of Mug Holder with desired design. Tangent all the intersecting lines. Created the design by Extrude method and pocket the holder as per below dimensions.

Length 1	24.597mm
Length 2	29.937mm
Curvature Radius 1	7.071mm
Curvature Radius 2	6.427mm
Curvature Gap Radius	9.126mm

Table 1.2: Dimensions for Sketch Outline of Mug Holder



Figure 1.3: Sketch outline of Frosted Bottom Mug Holder

Once completed Step 3 successfully, Initiated the modelling process of Flat Edges to Filleted Edges according to dimensions below. Selected Variable Radius Fillet Modelling.

Table 1.3: Dimensions for Variable Fillet Modelling Radius of Mug Holder

Variable Fillet Radius 25 mm		
	Variable Fillet Radius	25 mm



Figure 1.4: Variable Radius Fillet Definition of Extruded Mug (Right)

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Figure 1.5: Variable Radius Fillet Definition of Extruded Mug (Left)

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Once completed Step 4 successfully, Initiated the Pocket Modelling process for Extruded Mug surface according to dimension below.

Table 1.4: Dimensions for Pocket Modelling process of Extruded Mug H	Holder
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Depth	60 mm



Figure 1.6: Pocket definition of Extruded Mug Surface

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Once completed Step 5 successfully, Initiated the modelling process of Flat Edges to Filleted Edges for Mug holder according to dimensions below. Selected Variable Radius Fillet method.

Table 1.5: Dimensions for modelling process of Flat Edges to Filleted Edges for Extruded

 Mug Holder

Depth	60 mm



Figure 1.7: Variable Radius Fillet Definition of Extruded Mug Holder

Once completed Step 6 successfully, Initiated the modelling process of Flat Edges to Chamfered Edges for Mug holder according to dimensions below.

 Table 1.6: Dimension for modelling process of Flat Edges to Chamfered Edges for Mug

 holder

1	Depth	60 mm
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Figure 8: Variable Radius Fillet Definition of Extruded Mug Holder

RESULT AND DISCUSSION

According to the result, the geometric design using Computer Aided Design techniques were successful. The entire steps in sketching and modelling process executed without any flaw.



Figure 1.9: 3-Dimensional View of Frosted Bottom Fluid Mug

CONCLUSION

As Frosted Design Structures provides many advantages in applications, its appreciable to consider the frosted bottom design for beverage container products. As a designer I found its convenient to create Frosted Bottom Design Structures using iconic design features in Catia V5 Drawing Software.