

Client Needs and Specifications

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October 9, 2013

Overview

- Client
- Needs and Goal
- Objectives
- Constraints
- Operating Environment
- Project Plan
- Conclusions

Client

- W.L. Gore
- International Company
- Medical, fabrics and other products
- Local office in Flagstaff, AZ
- Looking to prepare incoming engineers by sponsoring real-world application projects.

Needs and Goal

- A current portable sanitization device that will decrease the bioburden levels past a certain threshold.
- Develop a portable sanitization process that disinfects bioburden amounts past acceptable levels.

Objectives

- Sanitizes within regulation bioburden levels
- Chemical exposure and residue within regulated concentration
- Materials sanitized retain functionality
- Sanitization system characterizes portability
- Cost to produce is comparatively inexpensive
- Low sanitization cycle time

Objectives: Quantified List

Objective	Definitive Justification	Units of Measurement
Reducing bioburden levels	Common pathogens and bacterias eliminated	%*
Chemical exposure/residue	Concentration of substance in air space at 25°C and 1 atmosphere	mg/m ³ , ppm
Material functionality retention	Process temperature	°C
System portability	System dimensions and weight	cm, kg
Comparatively inexpensive	Cost compared to similar devices within budget	dollars
Low cycle time	Cycle duration allows for immediate use of sanitized materials	minutes

Constraints

- Ease of use
 - Complies with door size standards (limitation 3'X3'X6')
 - Acceptable cycle time (60 minutes)
 - Cycle ends automatically
- No Ethylene Oxide (EtO)
- Temperature less than 70°C

Operating Environment

- Medical industry setting
- Sterile hospital setting
- Cleanrooms setting

Quality Function Deployment

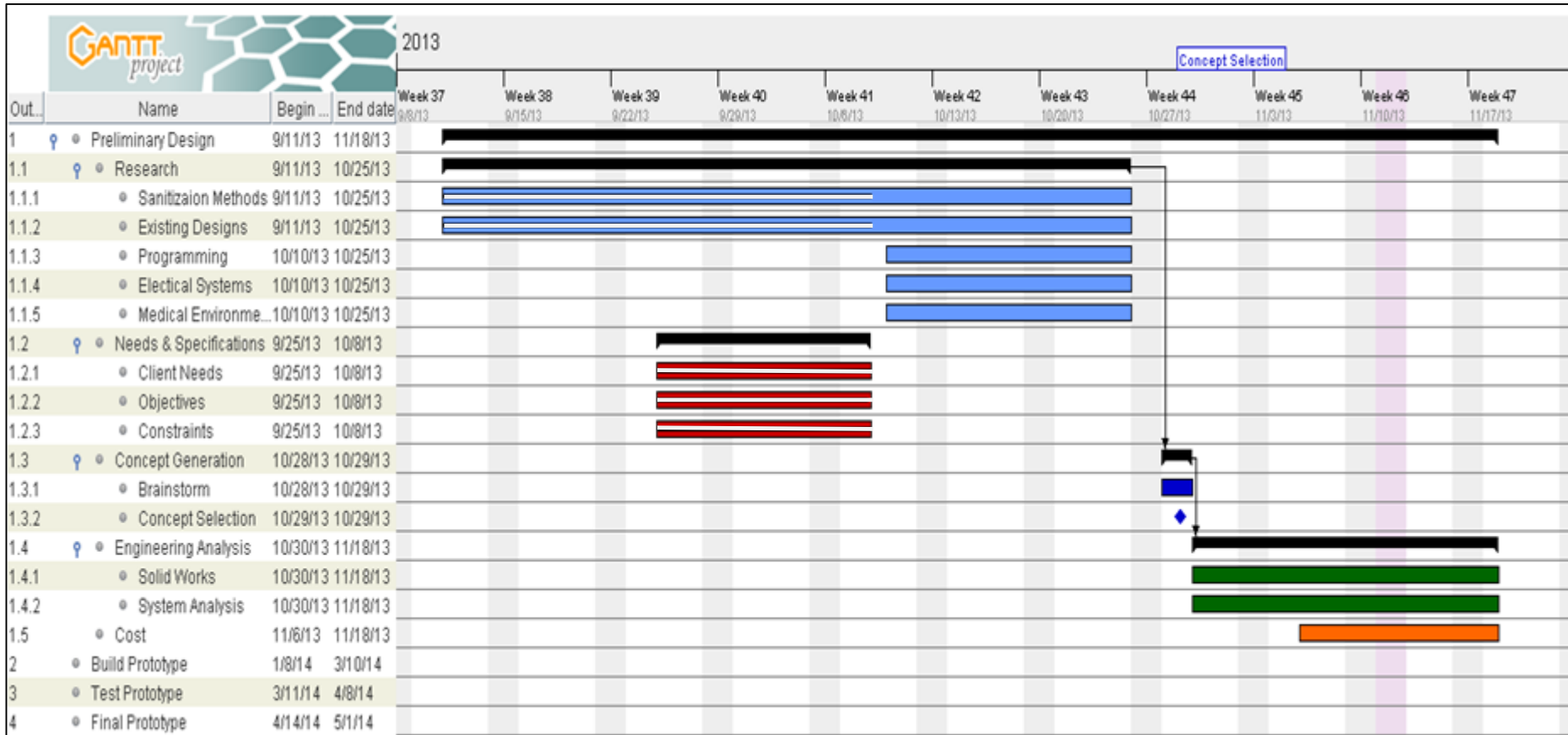
		Engineering Requirements									Benchmarks			
		Importance out of 5	% Importance	Size	Weight	Cost to produce	OSHA standards	Low operating temp.	Cycle time	Power source	Bioburden reduction	Autoclaves	Hydro peroxide vapor process	
Customer Requirements	Easily transported by one person	5	19%	9	3	1	1				3	x		
	Low cost	3	12%	1	1	9	3	3	3	1	3	x		
	Safe	5	19%	3	3	3	9			1	3	x		
	Sanitizes a variety materials	5	19%	3		3		9	1	1	9		x	
	Short cycle time	3	12%	3		1	1	1	9	3	3	x	x	
	Cycle ends automatically	5	19%			3	1		9	9		x	x	
		Importance		3.3	1.3	3.1	2.6	2.2	3.3	2.6	3.6			
		% Importance		15%	6%	14%	12%	10%	15%	12%	16%			
		units		cm ²	kg	\$	varies	°C	min	W	%			
				7225	<11.5	2500	Yes	<70	<60	<1000	>50			
				Engineering Targets										

House of Quality

A House of Quality matrix with 9 customer requirements on the vertical axis and 9 technical specifications on the horizontal axis. The matrix is a lower triangular grid. The relationships are indicated by symbols: ++ (strong positive), + (positive), - (negative), and blank (no relationship).

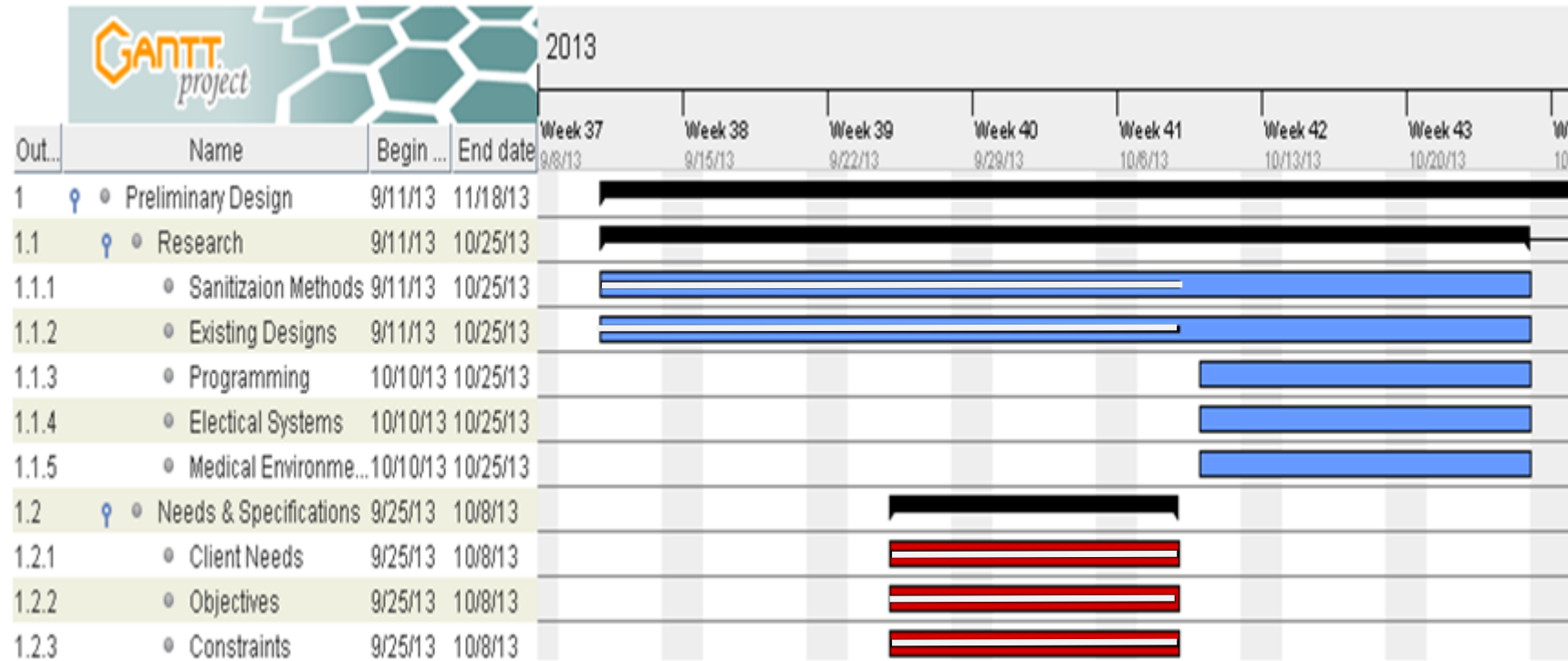
Customer Requirement	Technical Spec 1	Technical Spec 2	Technical Spec 3	Technical Spec 4	Technical Spec 5	Technical Spec 6	Technical Spec 7	Technical Spec 8	Technical Spec 9
Size									
Weight	++								
Cost to Produce	+								
OSHA standards	+	-					-		
Low operateing temp		+							+
Cycle time			-						
Power source			+					+	
Bioburden reduction				-					
					++				
						+			

Project Plan



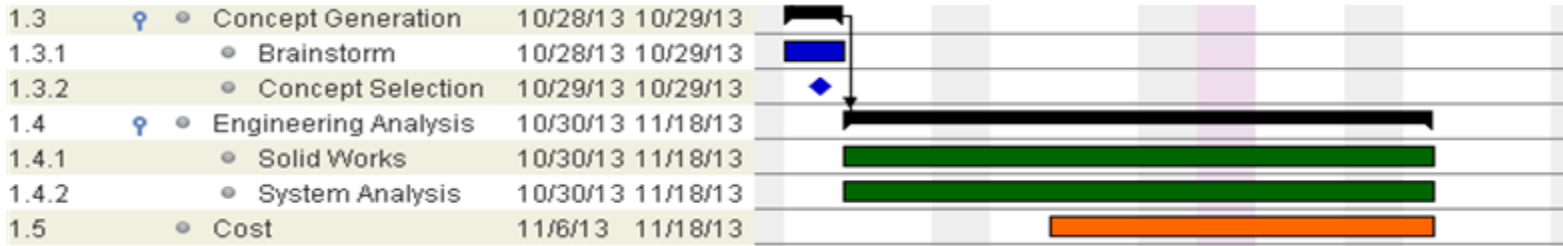
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Project Plan



Generated by Gantt Project

Project Plan



Generated by Gantt Project

Conclusion

- Project: Portable Sanitation Chamber
- Client: W.L. Gore
- Constraints: portable, safe and reduce bioburdens
- Cost: Under \$3,000
- Preliminary Design: research, specifications and designs
- Design Completion date: December 4, 2013

References

- [1] Occupational Safety and Health Administration, General Industry 29 CFR 1910: Hazardous and Toxic Substances, U. S. Department of Labor
- [2] W.L. Gore, *Portable Sanitization Chamber for Medical Manufacturing Use*, 2013.

Questions?