

Needs Identification: Needs, Objectives, Constraints

Separation Connector Improvement

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Client

Orbital Science Corporation

- Electronics Packaging and Actuations
Manager- Mrs. Mary Rogers

Needs Identification

- Be able to withstand military specification testing
- Device should separate with a reasonable amount of force
- Must mate and de-mate a minimum of 50 times without failure or damage

Problem Statement

- The goal of the project is to design an improved separation connector.
- Separation must be achieved under dynamic loads of less than 200 lbf or static loads of less than 30 lbf and must be tested at least 50 times with no signs of damage or failure.

Objectives

- Create a smaller, inexpensive, more reliable, separation connector that is easy to manufacture
- Retail cost must be \$400 or below
- Easy to manufacture

Constraints

- Lightweight design
- Low out-gas material
- Size must not be increased more than 25% of the current design
- Must not de-mate prematurely

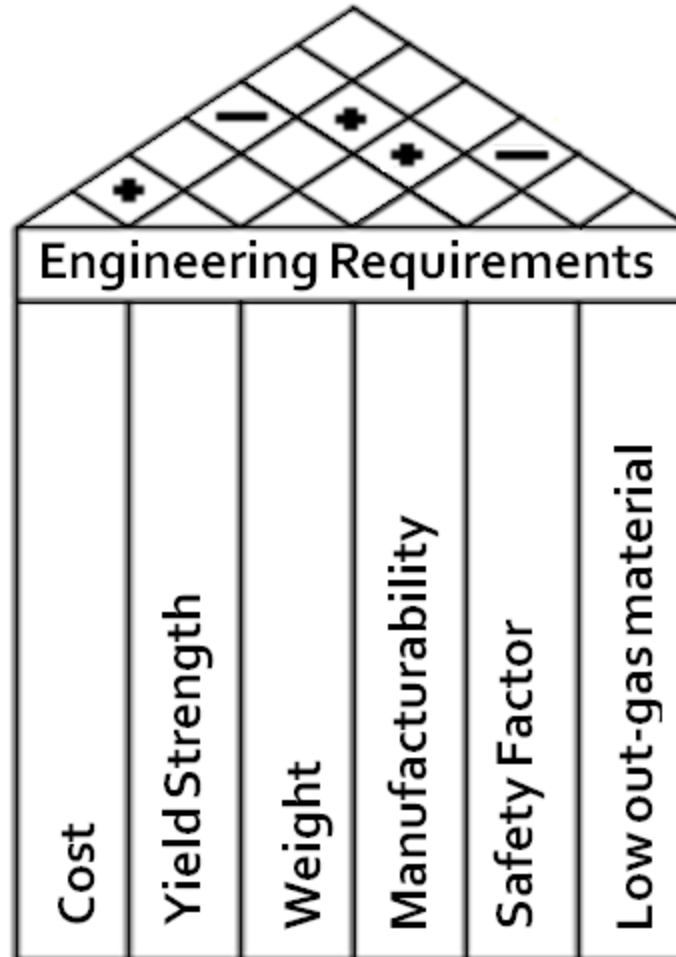
Table of Objectives

Objective	Criteria
Inexpensive	Cost
Ease of Manufacturing	Manufacturability
Reliability	Failure rate
Decrease in Size	Size

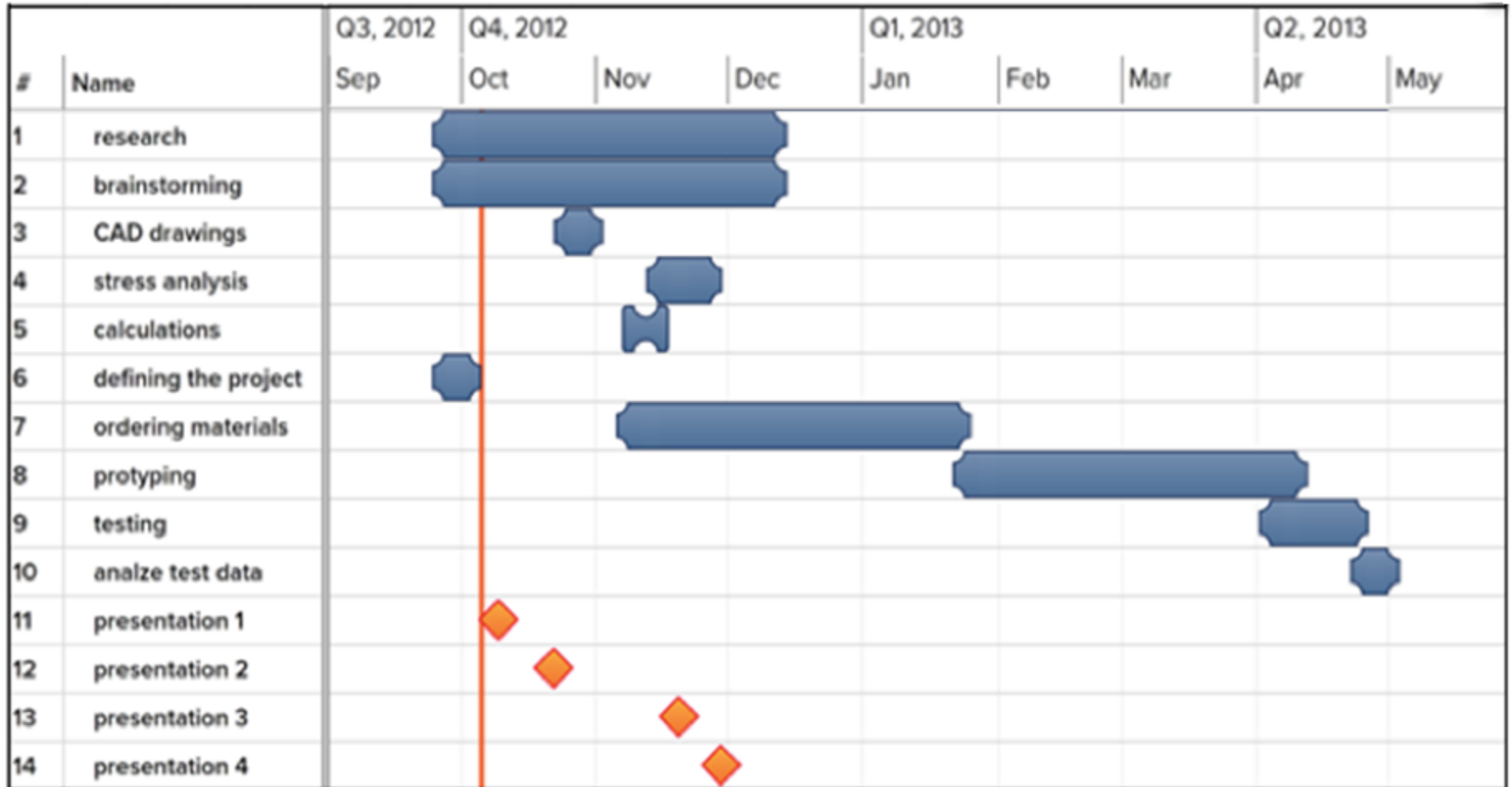
Functional Diagram

		Engineering Requirements					
		Yield Strength	Manufacturability	Safety Factor	Weight	Cost	Low out-gas in vacuum
Customer Requirements	Materials	x	x		x	x	x
	Contact Size				x	x	
	Resist Damaging	x		x			
	Inexpensive					x	
	Reliability	x		x			
	Easy to manufacture		x				
	Robust design				x		x
	Units	psi	\$/hr		lb	\$	
				1.5			
Engineering Targets							

House of Quality



Gantt Chart



Conclusion

- Customer needs a separation connector that is perfectly reliable and can dynamically demate under smaller loads than currently available
- Purpose of this project is to come up with an improved separation connector based on previous and current designs.

References

- "Amphenol Tri-Start Subminiature Cylindrical Connectors." *Powell Electronics*. Powell Electronics, n.d. Web. 4 Oct 2012. <<http://www.powell.com/Amphenol/D38999/D38999catalog.pdf>>.
- "A World of Interconnect Solutions." *Glenair*. Glenair, 2012. Web. 4 Oct 2012. <<http://www.glenair.com/interconnects/mildtl38999/>>.

Questions?