



## Customer Needs

### 1.2 Customer Needs

The customer needs are interpreted answers given by the sponsor and advisor that show the customers wants from the project. The objective of this project is to create new shoulder pads for football players. This project brief gives engineers the basic need of the project, but more detailed information needs to be identified. The first step in identifying the customer's needs is speaking with the sponsor and advisor through a zoom meeting on 9/17/2020 at 7pm Eastern time. Table 1 below shows the questions the team had asked our sponsor, and with the customers statements the interpreted need was determined.

Table 1. Interpreted Customer Needs from Sponsor and Advisor

Questions	Customer Statements	Interpreted Need
What is your motivation?	The experience from playing football drew him to conceptualizing the idea for shoulder pads.	The product provides better protection than existing shoulder pads.
What is your target audience?	The ideal starting market are parents of athletic children and athletic adults.	The target markets are sports equipment companies and sports organizations ranging from youth to professional.
Do you have any personal ideas?	A type of fabric with air pockets that can easily distribute an outside force is the personal idea.	A constructed fabric or padding of some kind that is very efficient in distributing energy from an outside force.



What is the intended application?	Fabric incorporated into football shoulder pads for better protection on the human body.	The product provides increased force distribution compared to existing products. The product is compatible with existing shoulder pad models
Do you have any alternative application?	Motorcyclists, other sportswear and sports gear, construction gear, etc.	Application of this product is ideally versatile towards any protective need.
What is your final goal?	A full-blown prototype is not expected. I understand that this is theoretical. I want to know how plausible this product could be.	Getting farther in research and calculations with making this fabric incorporation more likely. A prototype is not expected.
Do you have any expectations?	A fabric that can greatly spread out the force of a blow and can be easily incorporated into other available protective gear.	A lightweight, non-bulky, well-made product that can lessen the dangers of point of contact injuries.
What is your ideal project timeline?	A theoretical construction or accessible material is best identified to fit this air pocket fabric.	Create own timeline but stay connected.
Which injuries are of main concern?	Rib fractures and collarbone fractures are of main concern.	This product protects players or people from these injuries better than current options.
Is this product meant to last for a long period of time, or is it only useful once?	That is up to the plausibility of the research. Flexibility within this project is encouraged.	Ideally, this product is able to have multiple uses and resist mid power impacts lasting the span of a few years for sports gear and sportswear. If the research reveals that it is only viable for one-time use, the product infusion will adjust towards high impact protective gear such as helmets instead.



Multiple interpreted needs overlap which helps the team to narrow them down into fundamental needs. These needs are:

1. The product provides protection against impact through efficient energy distribution.
2. Product is lightweight and flexible.
3. Easily incorporated into already existing products.

### **1.3 Functional Decomposition**

### **1.4 Target Summary**

### **1.5 Concept Generation**

**Concept 1.**

**Concept 2.**

**Concept 3.**

**Concept 4.**