

ME349 Engineering Design Projects

Product Design Specification

The product design specification is a listing of the critical parameters, specifications and requirements for the product you are designing. It is a statement of what the product should be and should do. This is a constantly evolving document. It is subject to change as the project progresses and as more information is learned. Detail is added as the design grows.

The product design specification is driven by customer needs. It is intended to show what you are trying to achieve, NOT what you will end up with.

The following is a list of elements that might appear in a product design specification. It is not intended to be all inclusive.

Intended market

Product cost(s)

Operating environment (temp, pressure, humidity, dust, dirt, vibration, contamination, corrosion, etc.)

Engineering performance (e.g. force, speed, power, torque)

Product operators / users

Ergonomics

User interface

Dimensions

Weight

Materials

Product life

Service life

Storage shelf life

Reliability

Mean time to failure

Disposal / Reuse

Assembly

Installation

Regulatory environment (federal, state, local)

Patent infringement

Safety

Test protocol

Product liability

Intended market

Packaging

Shipping and storage

Overall "look" (buyer perception)

When writing your product design specification, formulate a table of columns. List the requirements, define a metric (units) if at all possible, define a target value or at least a range. Finally, try to include a comment on where the specification came from (customer needs, governmental regulation, competition, etc.)

Try to be comprehensive, even if you may have to ignore the requirement later due to time constraints.

Remember that specifications will overlap and conflict (e.g. high strength vs. low weight). Don't worry at this stage, they will sort themselves out as compromises are made.

To define specifications, look to:

Customers (first and foremost)

Competing products (use reverse engineering)

Analogous products

Patents

Trade magazines (identify the driving technology of the product...power/weight, materials, user interface)

Published standards (ASME, Mil-Spec, ASTM...)

Engineering handbook and textbooks

Experience

Experts