1. Market Description

This bicycle is to be designed for the mass consumer market. The expected sales volume is 100,000 per year. Affordability, excellent performance/cost ratio and light weight are most important to be successful in this market.

2. Requirements

Manufacturing Cost (C): $C \leq 6.7$ /part

Performance $(\delta_1, \delta_2, f_1)$:
- Displacement $\delta_1 \leq 0.057$ mm
- Displacement $\delta_2 \leq 0.009$ mm
- First natural frequency $f_1 \geq 320$ Hz

Mass (m): $m \leq 0.30$ lbs

Surface Quality (Q): $Q \geq 4$

Load Case (F):
- $F_1 = 50$ lbs / $F_2 = 100$ lbs / $F_3 = 50$ lbs

The part has to conform to the interface requirements and geometrical boundary conditions shown on page 2 of this document. This requirement cannot be waived.

3. Priorities

Structural performance is the first priority for this product. Next, the customer cares about light-weighting (low mass) and thirdly, manufacturing cost should be as low as possible. These priorities are shown in the Ishii-matrix below:

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Constrain</th>
<th>Optimize</th>
<th>Accept</th>
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</thead>
<tbody>
<tr>
<td>Cost</td>
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<tr>
<td>Performance</td>
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<tr>
<td>Mass</td>
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</tbody>
</table>

Modifications to these requirements have to be negotiated with Management.
No forbidden zone for your team

Dimensions

Design freedom: ± 0.800

Design freedom: ± 0.100

4 × φ0.406