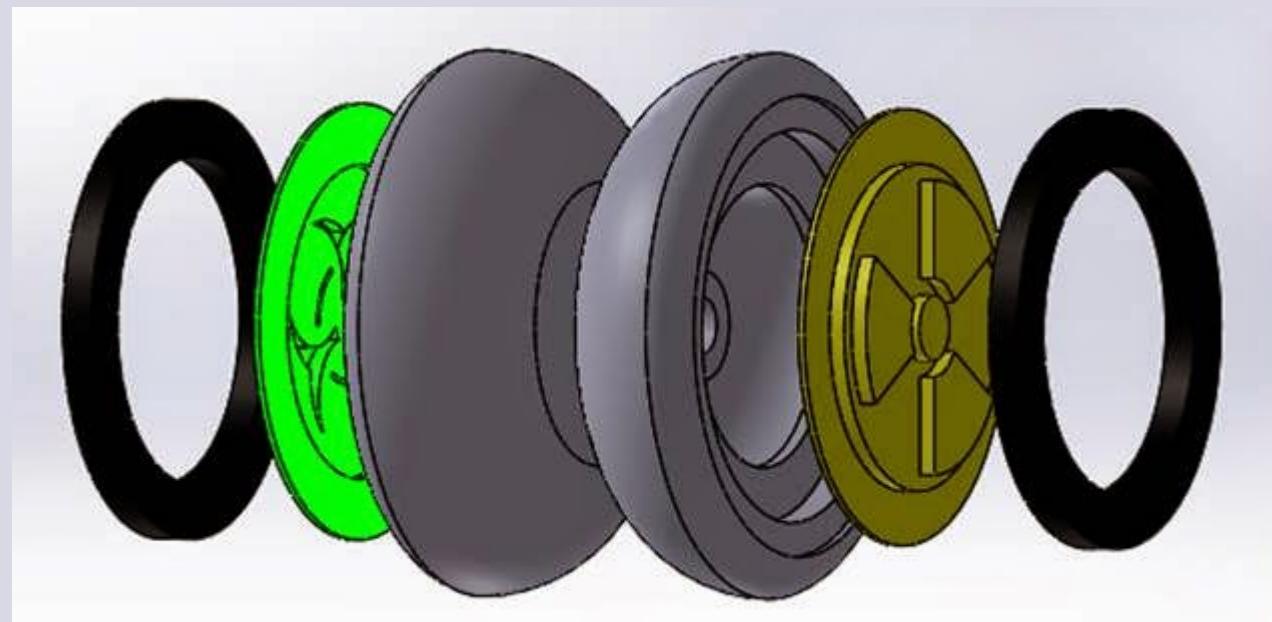


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ALEX SPRINGER | PETER GRAY RILEY | GRACE CONNORS | MAX MALINOWSKI | CAMI RAMIREZ-ARAU | CONNIE LIU

## CONCEPT

- dual themed
- glow-in-the-dark
- aesthetically flush exterior
- press fit



## SPECIFICATIONS

Part	Designed	Measured
Biohazard Thermoform	OD: $1.500 \pm 0.005"$	OD: $1.505 \pm 0.002"$
Radioactive Thermoform	Hole: $0.081 \pm 0.005"$	Hole: $0.081 \pm 0.002"$
Injection Mold Ring	OD: $2.078 \pm 0.005"$	OD: $2.073 \pm 0.002"$
Injection Mold Core	ID: $2.068 \pm 0.005"$	ID: $2.068 \pm 0.003"$

**Within Specs:** TF Radioactive, IM Core  
**Outside Specs:** TF Biohazard, IM Ring

## ASSEMBLY

SUCCESS!



## MANUFACTURING



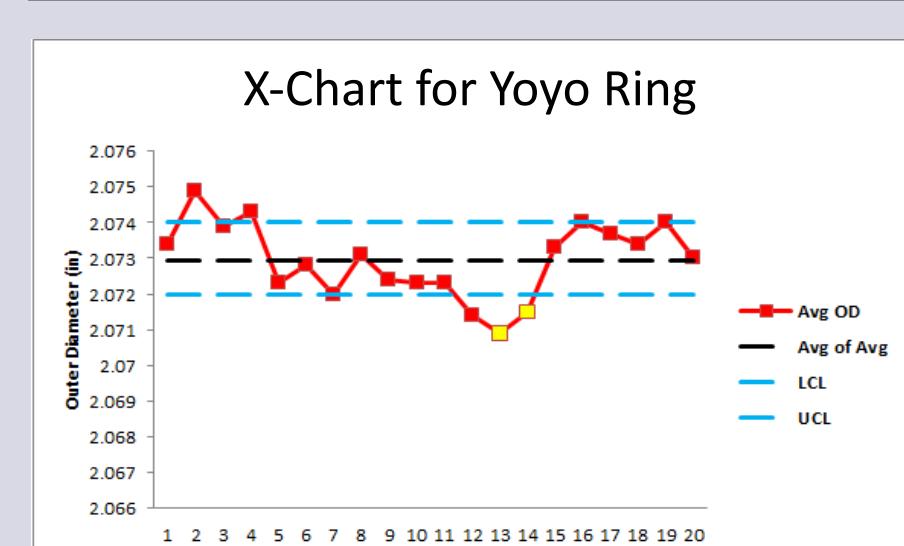
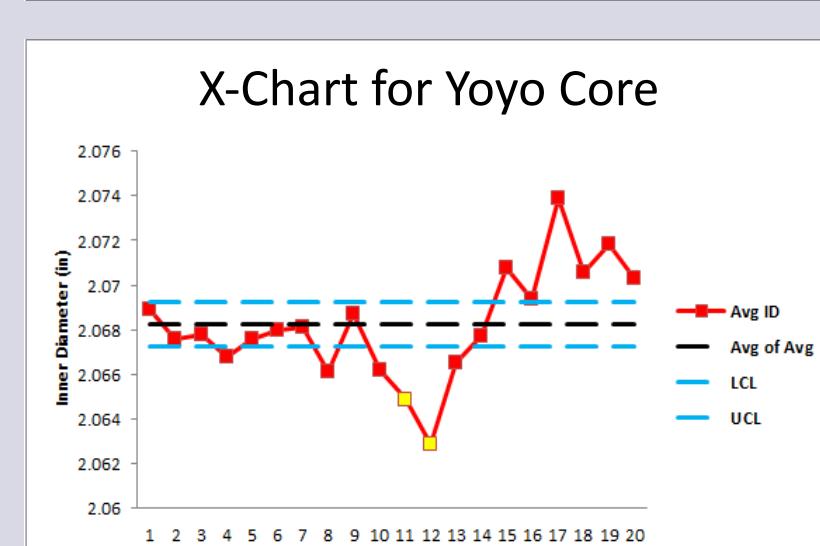
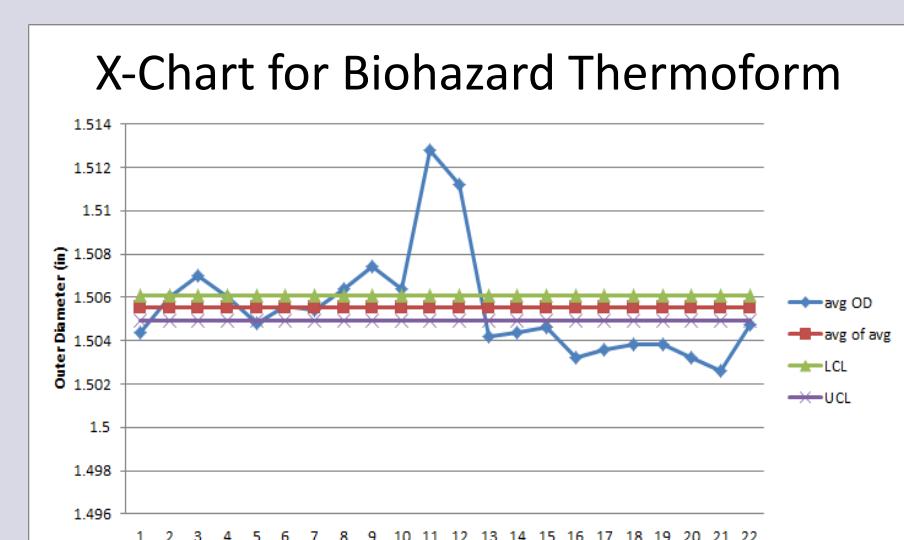
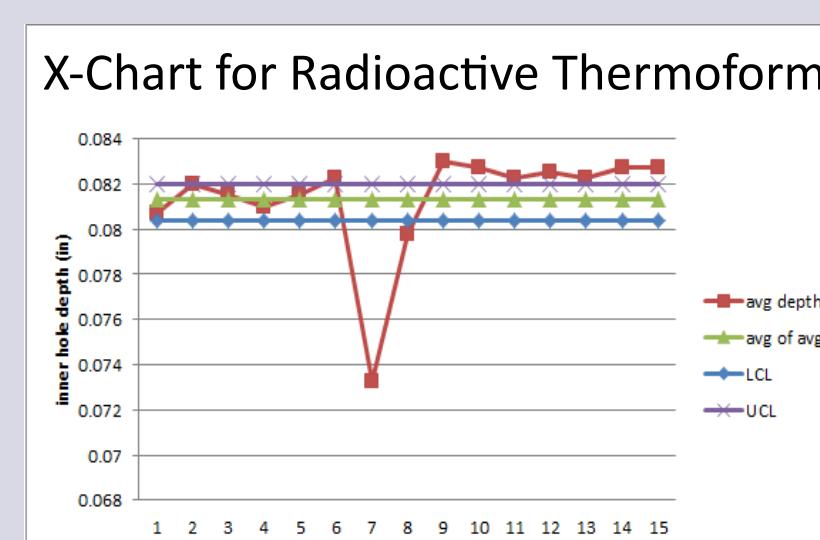
### PROCESS CAPABILITY

Biohazard Thermoform: 1.117

Radioactive Thermoform: 0.96

Injection Mold Ring: 0.417

Injection Mold Core: 0.25



### ERRORS

- inconsistency in color
- bubbles in vinyl stickers
- visible flash in some yoyo cores
- fit is loose on some parts

## SCALE UP

### 2.008 PROCESS

### MANUFACTURING 10000 YOYOS

**Material:**  $2*C_{IM} + C_{TF} + C_{nuts} + C_{axle} + C_{bolts} = \$1.47$

**Tooling:**  $(C_{tooling} * time)/n = \$1.25$

**Equipment:**  $C_{IM} + C_{TF} = \$1.36$   
 $1/Time * (C_{machine}/L^t)$

**Overhead:**  $C_{design} + C_{energy} + C_{labor} = \$67.60$

**\$71.68/yoyo**

**Material:**  $2*C_{IM} + C_{TF} + C_{nuts} + C_{axle} + C_{bolts} = \$1.12$

**Tooling:**  $custompart.net = \$0.77$

**Equipment:**  $C_{IM} + C_{TF} = \$0.05$

**Overhead:**  $C_{design} + C_{energy} + C_{labor} = \$3.52$

**\$5.46/yoyo**