Theoretical Calculation
&
Pressure Test

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1. Theoretical Calculation

	Thickness (mm)	CTE(m/℃)	Temperature variation(℃)	Length Variation(mm)
Lead	97	$29.3*10^{-6}$	50(25 ~ -25)	L_1 =0.14mm
Polystyrene (scintillator)	291	$80*10^{-6}$	50(25 ~ -25)	L_2 =1.16mm
Al	20	$23.2*10^{-6}$	50(25 ~ -25)	L_3 =0.0232mm
Steel rod	462.5	$17.3*10^{-6}$	50(25 ~ -25)	L_4 =0.4mm
$L_1 + L_2 + L_3 - L_4$ =0.9232mm				

The length variation of shower with temperature

CTE ：coefficient of thermal expansion

According to calculation, the maximum stoke of spring must be longer than 0.9232mm.

Next step, we will test the pressure variation of shower with thickness, because we need to know how much pressure need to be compensated by spring after changing 1mm.

2. Pressure Test

Increase the pressure to 500kg

Tighten the 12 nuts (stop : number begin to change)

Reduce the number of pressure sensor right to 10kg

Unscrew the 12 nuts

The number of pressure sensor increase to 123kg

Even though we don't know how much pressure the 6 rods bear, we have got one data that pressure the 6 rods bear is bigger than 113kg(123-10) by this test.

Thank You ! ! !