Easy Opening Package Design

SCV (Song&Choi Vic Company

Mr. song
Mr. Choi

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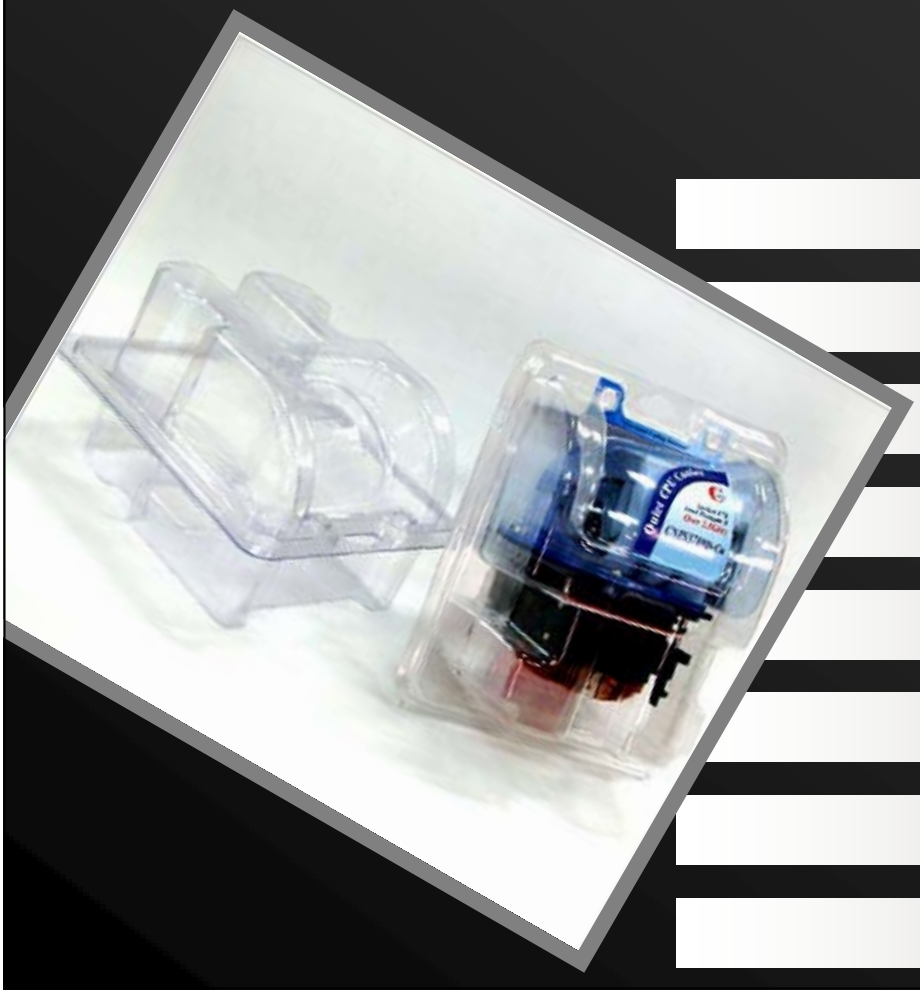
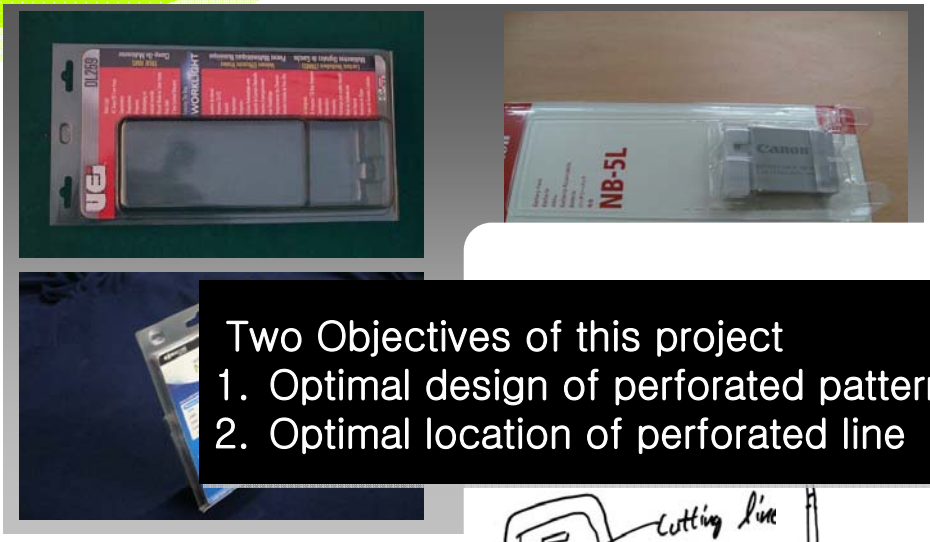
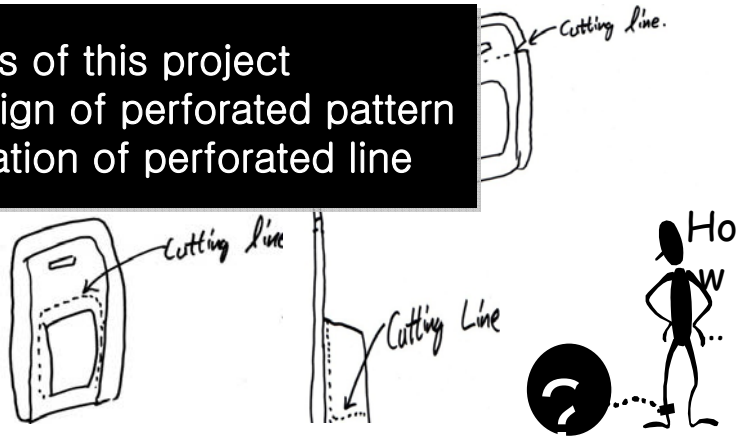


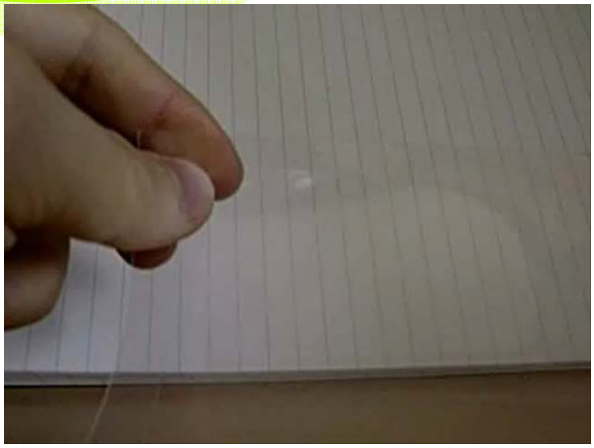
Previous work



Two Objectives of this project
1. Optimal design of perforated pattern
2. Optimal location of perforated line



Is it useful?



No pattern..

Square pattern..

Yes. It's useful!!

Material Selection

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	Weight	PP	PVC	PE
Manufacturability	1	4	3	4
Visibility	1	4	3	4
Cost	2	4	5	3
Environmental Impact	2	4	2	4
Total point		24	20	22

Good 5

Bad 1

PP is the best!

Working Plans

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Plan A

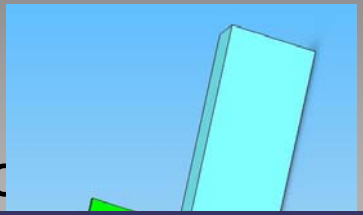
- Buying raw pp sheet
- Perforating using CNC machine
- Test and analysis
- Apply pattern and test

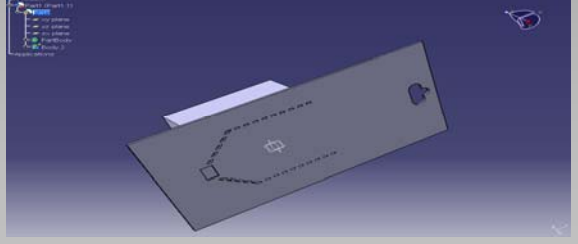
Plan B

- Making perforating tool by ourselves
- Test and analysis
- Apply pattern and test

Plan C

- Buying manufactured clamshell packages
- Making perforating tool by vacuum forming machine
- Test and analysis for pattern
- Test and analysis
- Apply pattern and test





Type of pattern

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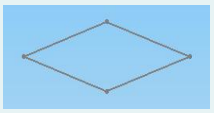
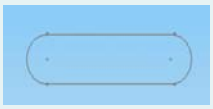
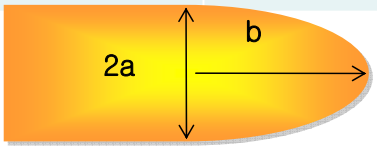
Type	Triangle	Circle	Rectangle
Shape			
Making Difficulty	Very Hard	Normal	Easy
Expected Efficiency	Min 10 times More efficiency than circle	$\frac{(a+b)^2}{ab}\times 100\%$	Min 10 times Less efficiency than circle



Experiment Plan

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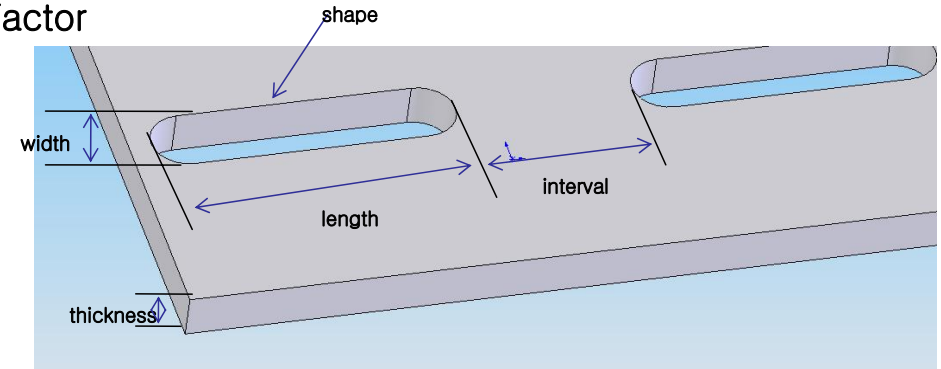
1. Method : Use Taguchi method

2. Target Force: 5kg for opening package.
   - From Korea institute of sport science grip force can be below 15.6kg for old women.
   - From market research there is no product which is over 2kg for clamshell package

3. Factor



4. Restricted Condition
   - Material : PP (Area 150mm * 150mm)
   - Patterns are started at its half shape.
   - Pattern line is located at sheet's center line.

Experiment Plan

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Control factor of pattern line

Factor	Quantity		
	1	2	3
Length	1mm	3mm	5mm
Shape	Triangle	Circle	Rectangle
Width	1mm	2mm	3mm
Interval	50%	100%	150%

Noise factor of pattern line

Factor	Quantity	
	1	2
Thickness	0.5mm	0.8mm

We assume there is no interaction in control factor.

Experiment Plan

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Orthogonal Array

Factor	A	B	C	D	Noise Factor		SN
Name	Length	Shape	Width	Interval	Thickness		
Test No. \ Row No.	1	2	3	4	1	2	
1	0	0	0	0			
2	0	1	1	1			
3	0	2	2	2			
4	1	0	1	2			
5	1	1	2	0			
6	1	2	0	1			
7	2	0	2	1			
8	2	1	0	2			
9	2	2	1	0			

Next Working Schedule

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	May 1st Week	May 2nd Week	May 3rd Week	May 4th Week
Buying PP sheet & manufactured PP clamshell				
Coding for CNC				
Experiment for find optimal perforation pattern				
Prototyping				
Analysis of prototype