



## *Morning Glory*

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The design challenge for this three dimensional art wear, *Morning Glory* is to create a transformative garment inspired by biomimicry. Biomimicry is design innovation inspired by nature (Benyus, 2002). Robot engineers of today are looking into the movements of insects and animals for improvement in mechanical movements. However, unlike forms in nature, these metal mechanisms require nuts and bolts for assembly.

*Morning Glory* is applying two levels of biomimicry through textile innovation: it not only mimics form and shape, but also imitates movement- bloom and wilt. Morning glory's most common colors are blue and purple, while some have white or mix of above colors (Lewis, 2008).

Colors and shapes of Morning glory are translated into textiles. Translucent sky blue and purple polyesters are pleated and sewn with clear monofilament (fishing wire), cooper wire, and Nitinol wire. To achieve light-weight, fluid transformative movements through textiles, vast amount of exploration on fabrics, pleats, wires, and construction methods are examined.

For Autumn/Winter collection in 2007, Hussein Chalayan introduces self-moving black hood operated by complicated electric wire placement on the back (Loschek, 2009). Victor & Rolf's extensive tulle dress collection for Spring/Summer 2010 have a great volume and weight. *Morning Glory* is a light-weight transformative art wear, which moves and creates volume in itself according to the temperature change.

### **Hand-pleats**

Various directions (including bias) of silks, polyesters, as well as pleat sizes are examined in order to find a suitable material condition for *Morning Glory* construction. Among all, 2cm (Approx. 0.7 inches) 100% polyester pleats maintained the most desirable flowing motion. Polyesters are folded, steamed and heated with a cardboard frame to give maximum elasticity, and right rigidity for sewing. As Polyesters are thermoplastic fiber which reacts to heat, pleats remain in its shape as formed in boiling temperature.

### **Wire Insertion**

Woven cooper wires are inserted as a back bone, and Nitinol wires for the parts to control movement of the garment. Insertion of Nitinol wire, also known as 'shape memory alloy', allows a gradual transformation according to the temperature change that is programmed to the wire. Activating temperature is from 30°C (86°F) to 50°C (122°F) (Education Innovation, 2015).

### **Silhouettes**

This piece is a contemporary take on traditional Korean costume, Hanbok. Inspired by form of Hanbok, which is usually made of silk, it is replaced by polyester to achieve similar translucency. Hanbok consists of two parts:

white inner dress and colorful outer dress with a short cropped jacket and a voluminous long dress. Both parts remain flat, yet create volume only when worn. Inner long dress is made of white 100% polyester, weight of 400g (13 oz.). The dress is 30 inches long. Maximum bloom width is 35 inches.

**Construction: Sewing of Pleats (Outer Dress) and Inner Dress**

Translucent polyesters are layered in numerous ways to create gradual gradation. Each piece is sewn with clear monofilament (fishing wire) to increase translucency. In order for pleats to stand up vertically, some parts of pleats are manually stitched onto the inner dress by hand.

**References**

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*Figure 1. Front View, Figure 2. Back View*



*Figure 3. Side View, Figure 4. Detail: Gradation, Expanded (Bloom) View*