# Comparison of Solid Surface Manufacturing Process

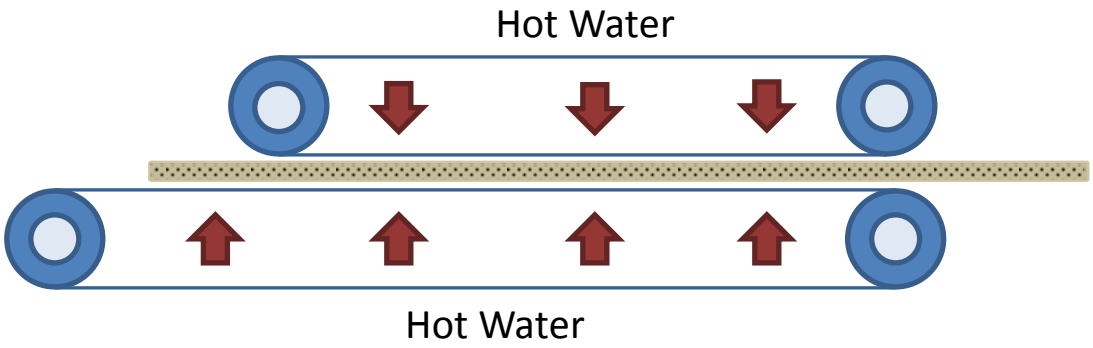
- Hanwha uses a Double Belt Casting Unit (DBCU) to manufacture Hanex brand Solid Surface.
- Other major manufacturers (LG, DuPont, Samsung, etc.) use a Single Belt Casting Unit (SBCU).

Hanwha L&C
Surfaces

# DBCU

Double Belt Casting Unit

Hanwha (Hanex) Manufacturing Process

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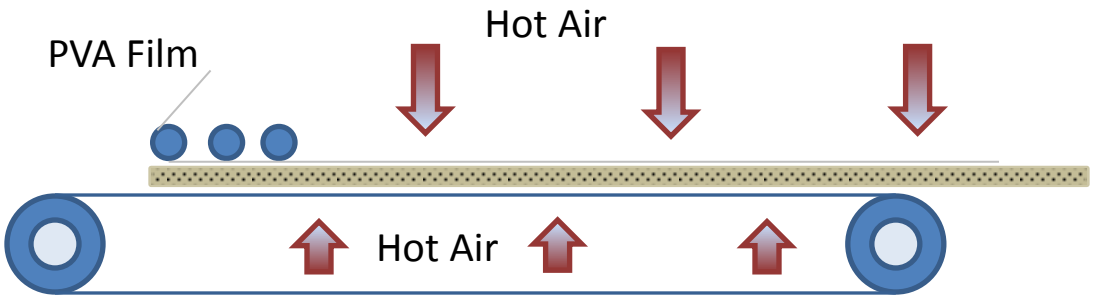
# SBCU

Single Belt Casting Unit

LG, Samsung, DuPont, Manufacturing Process



# Direct Comparison

**DBCU** Hanwha L&C | Surfaces

- Mixing of the materials uses the "ONE CAN" method; Every product and component of each batch is mixed together at once, therefore achieving uniformity of the material composition.
- Material variation is greatly minimized due to the highly uniform properties of the mix.
- Boiled water is supplied to the upper & lower belt to regulate curing. This provides excellent thermal control and maximizes the standardization of physical properties as the temperature at both the top and bottom of the sheet is controlled.
- Material properties as well as uniform composition is maximized by application of pressure to the sheet by the upper & lower casting belts.

**SBCU** (Others)

- Hardener is inserted just prior to casting. Since product hardening is initiated only after the hardener is added, the uniformity of the overall product is negatively impacted.
- Material variations in physical property ias a result of the imbalance in uniformity of the various components in the mix.
- Application of hot air through the lower belt to regulate curing results in inefficient thermal control. Since thermal energy is only applied by lower belt, and since the material hardens at high temperature, physical variations can result due to this ineffective thermal control.
- The single belt only functions as conveyor and top of the material is layered with a PVA (polyvinyl alcohol) film which does not apply any pressure to the product, making it coarse compared to DBCU.

# Direct Comparison

| **DBCU** Hanwha L&C \| Surfaces | **SBCU** (Others) |
| --- | --- |
| • Fabrication and workability of Hanex is superior since the physical property variation is minimized. Superior uniformity results in a high quality material that consistently out performs the competition. | • Product physical properties can vary and consistency is diminished compared to DBCU process. |

# Misc. Other Factors

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| • Pressure from the upper and lower belt helps to eliminate warping and reduce micro air bubbles in the material.<br>• Thickness control is more accurate.<br>• Process results in higher yields – waste is minimized. | • Higher incidence of warping and air pockets or bubbles in the sheets. This can translate to breakage and other problems during fabrication.<br>• Larger variations in thickness.<br>• Lower yields – higher waste factor. |