



## Custom DuraTherm® Pattern Design Guidelines

07/28/2011

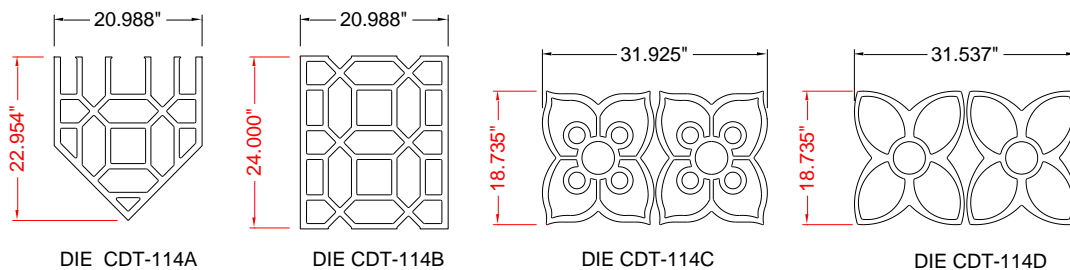
Custom DuraTherm® pattern production requires a minimum material purchase of 5,000 sq. ft.

### Definitions

1. DuraTherm® Thermoplastic Component(s) – The individual thermoplastic pieces used as ‘building blocks’ in various combinations to create the layout. The maximum size of each piece of thermoplastic is 2’ wide x 3’ long.
2. Stamping Template – The thick, patterned, plastic sheet used to create the impression in the pavement. Whenever possible, the stamping template size should be optimized to fit within the heating area of the SR-60 or SR-120 reciprocating infrared heaters (see page 3).
3. Layout – The final pattern resulting from the combination of one or more pieces of DuraTherm thermoplastic and stamping templates to create a large scale effect.

### DuraTherm® Thermoplastic Component Design Requirements

1. Material Yield – The maximum width of the thermoplastic sheet used in production is 2 ft. (.6m), and the maximum length is 3 ft (.91m). The shape of each component should be designed to maximize these dimensions, in order to create the best material yield and keep waste to a minimum.



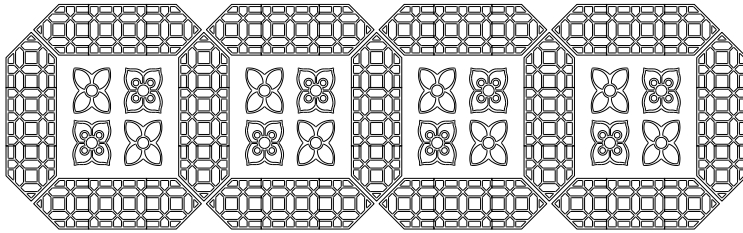
Above are examples of thermoplastic piece dimensions. Note the floral dies (C and D) are an example of poor material yield, as they do not maximize the material available from a 2’x3’ sheet.

2. Larger design elements can be broken up into smaller parts using multiple sheets of material. Again, the maximum individual component dimensions are 2’ x 3’ (.6m x .91m) which is ideal for handling, packaging and shipping.
3. DuraTherm material is one sided; meaning the material must be installed face up. Symmetrical shapes are best, because during the installation, the stamping templates need to be flipped after each print. By keeping the thermoplastic components symmetrical, the mirror image is the same. This eliminates the need for “lefts” and “rights” of one geometric shape, which will help keep the material and production costs lower with fewer thermoplastic piece designs and fewer stamping templates. This will also simplify the installation.

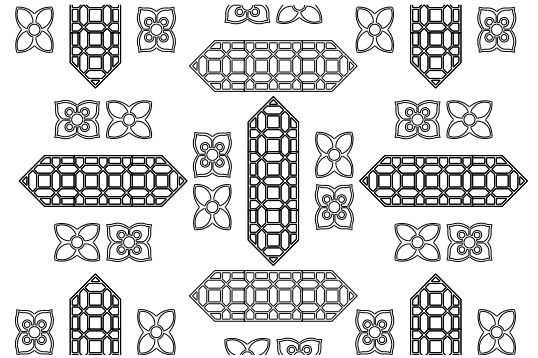
**Remember:** If there are many different elements in a design, the quantity and cost of thermoplastic pieces and stamping templates will be higher, and the finished DuraTherm job will be more complex and costly to install. It’s best to maximize the repeatability of the pattern and limit the number of components.

**DuraTherm® Stamping Template Designs**

1. Along with the thermoplastic components, the stamping template used for installation must also be designed. There are two approaches to the layout design:
  - a. Continuous: One or two template designs that are able to be flipped and rotated in various ways, which will work together with interlocking designs to create an overall continuous layout. This is ideal for lineal applications such as crosswalks and medians.
  - b. Floating: Random layouts of panels as far apart or as close together as you wish, without the need to be interlocked together. This allows more freedom with the pattern layout, but will complicate the installation. This may be more suited for pedestrian courtyard areas and parking lots.

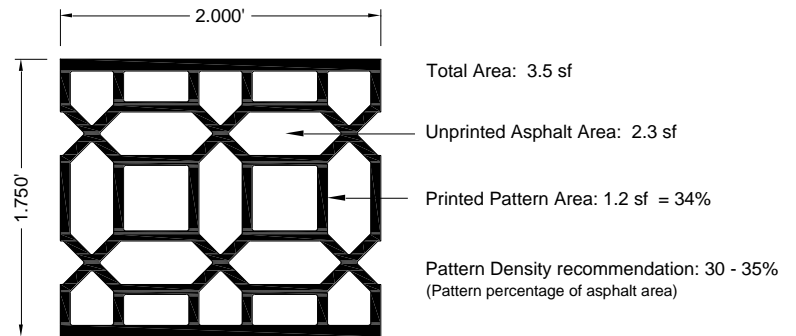


Example of Continuous

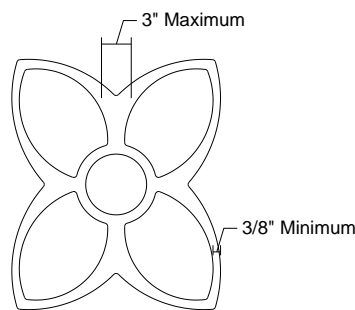


Example of Floating

2. Pattern Density – The stamping template makes an impression of the pattern into the asphalt. DuraTherm thermoplastic pieces are then laid and melted into these impressions. After extensive product testing, the best print density range on well compacted asphalt is around 30% - 35%. (This means you are displacing & covering 30% - 35% of the asphalt surface area with DuraTherm.)



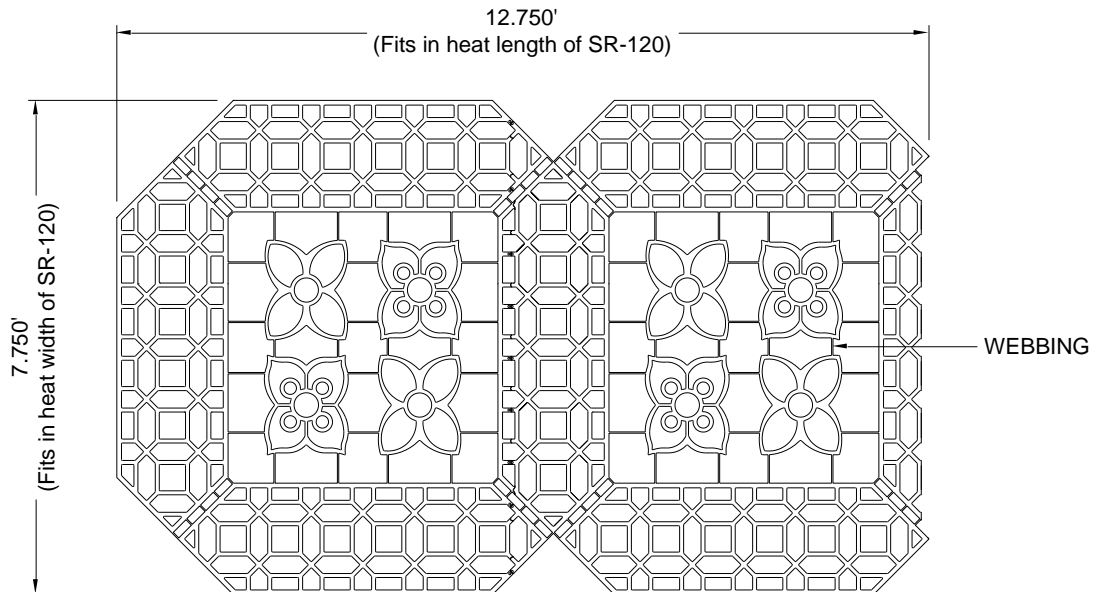
4. Line Width – This refers to the actual width of the DuraTherm thermoplastic component (such as a grout line or other design element) and is very important in design creation. The maximum line width is 1-1/4" (32 mm), though a wider line up to 3" is possible in small localized areas (see graphic below). The minimum width is 3/8" (9.525 mm). The preferred average is around 1".



Acceptable Variable Linewidths

### DuraTherm® Stamping Template Designs (continued)

5. Template Size – The stamping templates are light-weight and must be held in place firmly during imprinting to avoid shifting from side to side. Maximum template dimensions are 6' x 10' for the SR-60 and 8'8" x 13'4" for the SR-120. Narrow templates are printable but must be at least 3' long so they can be held in place while being imprinted.
6. Heating Area – The heating area of the reciprocating infrared heaters should be an important consideration in conceptual DuraTherm layouts. It is recommended to design templates that fit within the heating areas to increase productivity during installation. These areas are 5'-8" x 8'-8" for the SR-60 and 8'-6" X 12'-8" for the SR-120\*.  
(The graphic below is a template designed for the SR-120 heater.)



7. Template Webbing – Small, stand alone elements are not printable, unless they are “webbed” or connected to other parts in the design (as shown above). The result is narrow  $\frac{1}{4}$ ” connectors that will be imprinted lines, but are not filled with DuraTherm. The length of the connectors can range from 1” to 3”. This means you can have shapes of DuraTherm spaced 1” (25.4 mm) to 3” (76mm) apart. (The narrow  $\frac{1}{4}$ ” connectors cannot exceed 3” in length.)
8. Template Flipping – As the template is stamped, asphalt will build up on the underside of the template. This continues with each successive stamp. To avoid this, it is recommended that a symmetrical template be flipped over after each stamp, so the plate compactor can remove this build up while imprinting. Designers should keep this in mind, as this method allows for up to 10 prints on a single template. Template designs that are asymmetrical and unable to be flipped can only be stamped 4 or 5 times before being discarded, which can dramatically increase the template costs for a project. To avoid this, keep shapes symmetrical if at all possible.

**Please consult your local Flint Trading, Inc. Representative or Certified Applicator to advise which heater is available in your project area.**