

Exploring Heesch's Classification of
Asymmetric, Isohedral Tiles Using
Tessellation Exploration!

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In my article, [Adapting Escher's Rules for "Regular Division of the Plane" to Create *TesselMania!*](#)[®], I mentioned that the German Mathematician, Heinrich Heesch, proved that there are 28 different types of asymmetric tiles that can cover the plane in an isohedral manner. As part of his proof he invented an elegant naming scheme that uniquely classifies each type of tile and also serves as an algorithm to construct the tile. The naming scheme was explained in my article.

Since the Escher Congress of 1998, I have written a new program, *Tessellation Exploration!* for creating Escher-like tessellations of the plane. For this CD-ROM I have put together a special version of the program that uses the slide show feature to illustrate the 28 Heesch types. To view these tiles click on the appropriate button below. You may get a message that a program is going to run; if so, click on the open button.

Once the program is running, click on the Continue button. Use the arrow buttons to move through the examples or click on the Run Slide show button. If you stop the slide show, you can click on the Tile Build button or on the Tessellate, Morph, or Shrink buttons. The Full Screen button will fill your screen with the tessellation. Click on the filled screen to return to the program. To exit the program and return to this page, use File Exit (or Quit).



Click to Launch
Macintosh Version



Click to Launch
Windows Version

Click on the picture below to view the tutorial movie to illustrate how the program *Tessellation Exploration!* works.

The example folder includes the following tiles and their associated Heesch type.

Triangular Based

H_01.tsl	CCC
H_02.tsl	GGC
H_03.tsl	CC ₄ C ₄
H_04.tsl	CC ₃ C ₃
H_05.tsl	CC ₆ C ₆

Quadrilateral Based

H_06.tsl	TTTT
H_07.tsl	CCCC
H_08.tsl	TCTC
H_09.tsl	TGTG
H_10.tsl	G ₁ G ₂ G ₁ G ₂
H_11.tsl	G ₁ G ₁ G ₂ G ₂
H_12.tsl	GGCC
H_13.tsl	GCGC
H_14.tsl	C ₄ C ₄ C ₄ C ₄
H_15.tsl	C ₃ C ₃ C ₃ C ₃
H_16.tsl	C ₃ C ₃ C ₆ C ₆

Pentagonal Based

H_17.tsl	TCTCC
H_18.tsl	CC ₄ C ₄ C ₄ C ₄
H_19.tsl	CC ₃ C ₃ C ₆ C ₆
H_20.tsl	CG ₁ G ₂ G ₁ G ₂
H_21.tsl	TCTGG

Hexagonal Based

H_22.tsl	TTTTTT
H_23.tsl	TCCTCC
H_24.tsl	C ₃ C ₃ C ₃ C ₃ C ₃ C ₃

H_25.tsl	TG₁G₂TG₂G₁
H_26.tsl	TG₁G₁TG₂G₂
H_27.tsl	CG₁CG₂G₁G₂
H_28.tsl	TCCTGG

Tessellation Exploration! is published by Tom Snyder productions, for more information please visit www.tomsnyder.com.