Hex-Pave

by Carl Hoff (carl.n.hoff@gmail.com)

There are 15 integer sided equiangular convex hexagons with edge lengths of 1, 2, and 3 units (seen to the left). The main objective is to pack all 15 pieces into a size 8 regular hexagon (the black boarder shown below). This puzzle has 19 solutions.

Some auxiliary objectives can also be considered:

(1) Pack the 14 pieces left after the smallest piece is removed.
   (3051 solutions)
   (a) and leave only 10 voids, the minimum possible, within the frame.
      (1 solution)
   (b) and leave 21 voids, the maximum possible, within the frame.
      (12 solutions if voids can touch at a corner, 3 solutions otherwise)
   (c) with no like colors sharing an edge.
      (75 solutions)
   (d) with no like colors touching, not even at a corner.
      (43 solutions)
   (e) with the 6 colors each in their own edge connected region.
      (1 solution)

(2) Pack the 14 pieces left after the second smallest piece is removed.
   (76378 solutions)