CLAIMS

I claim:

1) A method of preparing non-volatile bituminous material for transport comprising:

   a) accessing non-volatile bituminous material;

   b) heating the non-volatile bituminous material until it is suitably viscous for casting;

   c) introducing the suitably viscous non-volatile bituminous material to a plurality of molds, wherein each mold defines a mold cavity configured to define a brick of irregular shape and to receive the suitably viscous non-volatile bituminous material;

   d) filling each mold cavity of the plurality of molds with the suitably viscous non-volatile bituminous material;

   e) solidifying the suitably viscous non-volatile bituminous material in the plurality of molds until a plurality of substantially solid bricks are formed, wherein each of the substantially solid bricks comprises a modified tetrahedron having an outer surface comprising four non-planar surfaces oriented relative to one another at acute angles; and

   f) removing the plurality of bricks from the plurality of molds.

2) The method of claim 1 wherein the outer surface of each of the substantially solid bricks comprises a non-planar top surface and three non-planar face surfaces, wherein each of the non-planar face surfaces connects to adjacent non-planar face surfaces at angles of less than ninety degrees and to the non-planar top surface at an angle of less than ninety degrees.

3) The method of claim 1 further comprising blending the suitably viscous non-volatile bituminous material with an asphalt binder before introducing it to the plurality of molds.

4) The method of claim 1 further comprising blending the suitably viscous non-volatile bituminous material with a buoyancy enhancer before introducing it to the plurality of molds.

5) The method of claim 1 further comprising applying a coating to each of the plurality of bricks after removing them from the plurality of molds.

6) The method of claim 1 further comprising preparing the plurality of molds before introducing the suitably viscous non-volatile bituminous material, wherein preparing the plurality of molds comprises accessing a plurality of buoyant skeletons and positioning one buoyant skeleton in the mold cavity defined by each of the molds, wherein each buoyant skeleton comprises polymer.

7) The method of claim 6 wherein each of the buoyant skeletons comprises a structure of polymer fibers arranged in a matrix and a plurality of buoyant features supported by the polymer fibers at regular intervals throughout the matrix.

8) The method of claim 6 wherein each buoyant skeleton further comprises a plurality of pockets of gas formed within the polymer.

9) The method of claim 7 wherein the plurality of buoyant features comprises a plurality of capsules containing gas.

10) The method of claim 1 further comprising preparing the plurality of molds before introducing the suitably viscous non-volatile bituminous material to the plurality of molds, wherein preparing the plurality of molds comprises:

a) obtaining a desired polymer specification from a customer;

b) accessing a plurality of buoyant skeletons, wherein each of the buoyant skeletons comprises a polymer grid configured to satisfy the desired polymer specification provided by the customer; and

c) and disposing one buoyant skeleton in the mold cavity defined by each of the molds.

11) The method of claim 1 further comprising:

a) using a plurality of molds wherein each of the molds defines a channel extending from an upper surface of the mold to the mold cavity;

b) collecting the suitably viscous non-volatile bituminous material in a vessel;

c) dispensing the suitably viscous non-volatile bituminous material from the vessel to the plurality of molds through a plurality of retractable conduits in fluid communication with the vessel, wherein each retractable conduit is configured to fit within the channels defined by each of the molds and thereby be in fluid communication with the mold cavities defined by each of the molds.

12) A method of preparing non-volatile bituminous material for transport comprising:

a) heating non-volatile bituminous material until it is suitably viscous for casting;

b) retaining the suitably viscous non-volatile bituminous material in a vessel at a filling station, wherein the filling station is positioned along a conveyor;

c) accessing a plurality of molds, wherein each mold defines a modified tetrahedron mold cavity when assembled and comprises:

i) a lower mold part; and

ii) an upper mold part removably attachable to the lower mold part, wherein each upper mold part defines a channel extending from an upper surface of

the mold to the mold cavity defined by the mold when the lower and upper mold parts are attached;

d) arranging the plurality of lower mold parts on the conveyor;

e) attaching the plurality of upper mold parts to the plurality of lower mold parts;

f) moving the plurality of molds with the conveyor to the filling station and dispensing the non-volatile bituminous material from the vessel to mold cavities defined by the plurality of molds through the mold channels defined by the upper mold parts of the plurality of molds;

g) moving the plurality of molds with the conveyor to a solidifying station and solidifying the non-volatile bituminous material in the molds until a plurality of substantially solid bricks are formed, wherein each substantially solid brick comprises a modified tetrahedron with four non-planar outer surfaces oriented relative to one another at acute angles;

h) moving the plurality of molds with the conveyor to a mold-disassembling station and removing the upper mold parts from the plurality of molds; and

i) removing the bricks from the plurality of molds.

13) The method of claim 12 wherein the modified tetrahedron mold cavity defined by each of the molds is configured to mold a substantially solid brick defined by an irregular outer surface, the outer surface comprising:

a) three non-planar face surfaces, wherein each non-planar face surface connects to the other non-planar face surfaces at angles of less than ninety degrees; and

b) a non-planar top surface integrally connected to each of the non-planar face surfaces at angles of less than ninety degrees.

14) The method of claim 12 wherein the non-volatile bituminous material is dispensed from the vessel with a plurality of retractable conduits in fluid communication with the vessel, wherein each of the retractable conduits is configured to fit within the channels defined by the upper mold parts of the plurality of molds.

15) The method of claim 12 further comprising moving the plurality of bricks to a coating station and applying a coating to the plurality of bricks after removing the bricks from the plurality of molds.

16) The method of claim 12 further comprising accessing a plurality of buoyant skeletons and placing a buoyant skeleton in each of the lower mold parts before attaching the upper mold parts, wherein each buoyant skeleton comprises a polymer matrix.

17) The method of claim 16 wherein each buoyant skeleton further comprises a plurality of buoyant features position at regular intervals throughout the polymer matrix.

18) The method of claim 17 further comprising:

a) obtaining a desired polymer specification from a customer before assembling the plurality of molds; and

b) when accessing a plurality of buoyant skeletons, selecting a plurality of buoyant skeletons configured to satisfy the desired polymer specification provided by the customer.

19) A method of preparing non-volatile bituminous material for transport comprising:

a) accessing non-volatile bituminous material;

b) heating the non-volatile bituminous material until it is suitably viscous for casting;

c) accessing a plurality of molds, wherein each mold defines a mold cavity configured to receive the suitably viscous non-volatile bituminous material and to mold a brick of irregular shape;

d) accessing a plurality of buoyant skeletons, wherein each buoyant skeleton comprises a polymer;

e) positioning a buoyant skeleton in the mold cavity defined by each of the molds,

f) filling the mold cavities defined by the molds with the suitably viscous non-volatile bituminous material;

g) solidifying the suitably viscous non-volatile bituminous material until a plurality of substantially solid bricks of irregular shape are formed; and

h) removing the plurality of substantially solid bricks of irregular shape from the plurality of molds.

20) The method of claim 19 wherein each buoyant skeleton further comprises a plurality of buoyant features supported by the polymer at regular intervals.

21) The method of claim 20 wherein the plurality of buoyant features comprises a plurality of pockets of gas formed within the polymer.

22) The method of claim 20 wherein each buoyant skeleton comprises a structure of polymer fibers.

23) The method of claim 22 wherein the plurality of buoyant features comprises a plurality of capsules containing gas.

24) The method of claim 20 further comprising:

a) before positioning a buoyant skeleton in a mold cavity of each of the plurality of molds, obtaining a desired polymer specification from a customer; and

b) customizing each of the plurality of buoyant skeletons to satisfy the desired polymer specification provided by the customer.

25) The method of claim 24 wherein customizing each of the plurality of buoyant skeletons comprises selecting the polymer according to the desired polymer specification provided by the customer.

26) The method of claim 25 wherein customizing each of the plurality of buoyant skeletons further comprises adjusting the size, quantity, or position of the plurality of buoyant features supported by the polymer.

27) The method of claim 19 wherein each substantially solid brick of irregular shape comprises a modified tetrahedron with four non-planar outer surfaced oriented relative to one another at acute angles.