**What is claimed is:**

1. A thermoformable base film comprising:

a first layer comprising a high-density polyethylene and a nucleating agent,

a second layer comprising a high-density polyethylene, and

a third layer comprising a high-density polyethylene and a nucleating agent,

wherein the first layer and the third layer each form a surface of the thermoformable base film,

wherein the second layer is located between the first layer and the third layer, and wherein after thermoforming, the thermoformable base film maintains the shape taken during thermoforming.

2. The thermoformable base film according to claim 1, further comprising a fourth layer comprising a high-density polyethylene and an inorganic particle, wherein the inorganic particle is present in the fourth layer at a level of at least 10% by weight and wherein the fourth layer is between the first layer and the third layer.

3. The thermoformable base film according to claim 2, wherein the inorganic particle is calcium carbonate.

4. The thermoformable base film according to claim 1, wherein the first layer further comprises a metallocene linear low-density polyethylene.

~~5. The thermoformable base film according to claim 1, wherein the first layer and the third layer each form a surface of the thermoformable base film.~~

5~~6~~. The thermoformable base film according to claim 1, further comprising an oxygen barrier layer comprising an ethylene vinyl alcohol copolymer, wherein the oxygen barrier layer is located between the first layer and the third layer.

6~~7~~. The thermoformable base film according to claim 1, further comprising a center layer comprising an ethylene vinyl acetate copolymer and wherein the thermoformable base film is palindromic.

7~~8~~. The thermoformable base film according to claim 1, wherein the second layer further comprises a hydrocarbon resin.

8~~9~~. The thermoformable base film according to claim 1, wherein the second layer further comprises a nucleating agent.

9~~10~~. A thermoformable base film comprising:

a first layer comprising a high-density polyethylene and a nucleating agent,

a second layer comprising from 60% to 90%, by weight, of a high-density polyethylene and from 2.5 to 30%, by weight of a hydrocarbon resin, and

a third layer comprising a high-density polyethylene and a nucleating agent,

wherein the second layer is located between the first layer and the third layer, wherein the second layer has a thickness that is from 25% to 90% of the total thickness of the thermoformable base film, wherein the high-density polyethylene is present in the first layer at a level of at least 90% by weight relative to the first layer, and wherein the high-density polyethylene is present in the third layer at a level of at least 90% by weight relative to the third layer.

10~~11~~. The thermoformable base film according to claim ~~10~~9, wherein the thermoformable base film has a total composition suitable for recycling.

11~~12~~. The thermoformable base film according to claim ~~10~~9, wherein the thermoformable base film is essentially free from polyester, ethylene vinyl alcohol copolymer and polyamide.

12~~13~~. A thermoformed base comprising:

the thermoformable base film according to claim 1,

at least one cavity, and

a flange surrounding each of the cavities.

13~~14~~. The thermoformed base according to claim ~~13~~12, wherein the thermoformed base maintains the shape taken during thermoforming.

14~~15~~. A packaged product comprising:

the thermoformed base according to claim ~~13~~12,

a lid packaging component, and

a product,

wherein the lid packaging component is hermetically sealed to the flange of the thermoformed base and the product is enclosed in the at least one cavity of the thermoformed base.

15~~16~~. The packaged product according to claim ~~15~~14, wherein the lid packaging component comprises a heat-sealing layer and a layer comprising at least one of metal and paper.

16~~17~~. The packaged product according to claim ~~16~~15, wherein the lid packaging component is peelably sealed to the flange of the thermoformed base.

17~~18~~. The packaged product according to claim ~~15~~14, wherein the thermoformed base and the lid packaging component are recyclable in the same recycle process.

18~~19~~. The packaged product according to claim ~~15~~14, wherein the at least one cavity of the thermoformed base may be depressed manually, and the product may be pushed through the lid packaging component for product dispensing.

19~~20~~. The packaged product according to claim ~~15~~14, wherein the lid packaging component comprises:

a first exterior layer comprising a high-density polyethylene and an inorganic particle,

a first interior layer comprising a high-density polyethylene, a nucleating agent and optionally a hydrocarbon resin, and

a second exterior layer comprising a polyethylene-based material.