Claims

What is claimed is:

1. A drag reducing agent (10, 20, 30) characterized by:

a core (12, 22, 32) comprising a polyolefin and a deactivated polymerization catalyst; and

a temporary container (11, 21, 31) encapsulating the core, the temporary container comprising a container material, which includes an ethylene vinyl acetate copolymer, an ethylene vinyl alcohol copolymer, a polyvinylpyrrolidone, an ethylene vinylpyrrolidone copolymer, a vinylpyrrolidone vinyl acetate copolymer, ~~a polyvinyl acetate, polyvinyl alcohol, a polyethylene oxide, a polyethylene glycol, polyvinylidene chloride,~~ a polysaccharide or its derivative, or a combination comprising at least one of the foregoing;

wherein a largest dimension of the drag reducing agent is greater than ~~about~~ 1,000 microns.

~~2. The drag reducing agent of claim 1, wherein the core further comprises a deactivated polymerization catalyst.~~

~~3~~2. The drag reducing agent of claim 1, wherein the largest dimension of the drag reducing agent is greater than ~~about~~ 0.5 centimeters and up to ~~about~~ 30 centimeters.

~~4~~3. The drag reducing agent of claim 1, wherein the temporary container has two or more layers, and at least one layer comprises the container material.

~~4~~5. The drag reducing agent of claim ~~4~~3, wherein each of the two or more layers independently comprises the container material.

~~6~~5. The drag reducing agent of claim 1, wherein the temporary container has an inner surface and an opposing outer surface (31E), and a coating (31F) is disposed on at least one of the inner and outer surfaces of the temporary container, the coating comprising a wax, a silicone, or a combination comprising at least one of the foregoing.

~~7~~6. The drag reducing agent of claim 1, wherein the temporary container has a thickness of ~~about~~ 1 to ~~about~~ 1,000 microns.

~~8~~7. The drag reducing agent of claim 1, wherein the temporary container fully encapsulate the core.

~~9~~8. The drag reducing agent of claim 1, wherein polyolefin is polymerized within the temporary container from a drag reducing agent forming component comprising (i) at least one olefin monomer, or (ii) at least one olefin oligomer, or a combination of (i) and (ii).

~~10~~9. The drag reducing agent of claim ~~9~~8, wherein the drag reducing agent forming

component further comprises at least one styrene, a vinyl acetate, a vinylalkylene carboxylic ester, an oligomer of the vinylalkylene carboxylic ester, or a combination thereof.

~~11~~10. The drag reducing agent of claim 1, wherein the polyolefin is present in an amount of ~~about~~ 80 wt% to ~~about~~ 99.99 wt%, based on the total weight of the drag reducing agent.

~~12~~11. A composition comprising the drag reducing agent of any one of claims 1 to ~~11~~10.

~~13~~12. A process of manufacturing a drag reducing agent (10, 20, 30), the process characterized by:

injecting a catalyst and a drag reducing agent forming component comprising (i) at least one olefin monomer, or (ii) at least one olefin oligomer, or a combination of (i) and (ii) into a temporary container comprising a container material, which includes an ethylene vinyl acetate copolymer, an ethylene vinyl alcohol copolymer, a polyvinylpyrrolidone, an ethylene vinylpyrrolidone copolymer, a vinylpyrrolidone vinyl acetate copolymer, ~~a polyvinyl acetate, a polyvinyl alcohol, a polyethylene oxide, a polyethylene glycol, polyvinylidene chloride,~~ a polysaccharide or its derivative, or a combination comprising at least one of the foregoing;

sealing the temporary container (11, 21, 31);

allowing the drag reducing ~~additive~~ agent forming component to polymerize in the sealed temporary container to form a core (12, 22, 32) comprising a polyolefin; and

deactivating the catalyst in the temporary container while the temporary container is sealed,

wherein a largest dimension of the drag reducing agent is greater than ~~about~~ 1,000 microns.

~~14~~13. The method of claim ~~13~~12, wherein deactivating the catalyst comprises allowing a deactivating agent to diffuse into the temporary container to deactivate the catalyst, the deactivating agent comprising water, an alcohol, hydrogen sulfide, oxygen, or a combination comprising at least one of the foregoing.

~~15~~14. The method of claim ~~13~~12, further comprising making an aperture on the temporary container to allow water or oxygen to diffuse into the temporary container.