CLAIMS

WHAT IS CLAIMED IS

1. A low-temperature stable lubricating composition exhibiting pumpability comprising:

a base oil of lubricating viscosity;

about 0.5 to about 1.0 weight percent of a polymeric additive including a blend of an esterified~~modified~~ styrene-maleic anhydride copolymer and a poly(meth)acrylate copolymer effective to maintain a pumpable fluid, wherein the polymeric additive includes about 40 weight percent to about 60 weight percent of the esterified styrene-maleic anhydride copolymer based on the total weight of the esterified styrene-maleic anhydride copolymer and the poly(meth)acrylate copolymer; and wherein the lubricating composition with the polymeric additive maintains a pumpable fluid at temperature down to -40 °C. as evidenced by passing MRV performance pursuant to ASTM D4684 with a viscosity less than 60,000 cP and a yield stress less than 35.

2. The low-temperature stable lubricating composition of claim 1, wherein the lubricating composition further includes one or more of a succinimide dispersant, a borated succinimide dispersant, an overbased calcium sulfonate, an overbased magnesium sulfonate, a zinc dialkyldithiophosphates, an alkylated diphenyl amine antioxidant, an antifoamant, or combinations thereof.

~~3. The low-temperature stable lubricating composition of claim 1, wherein the modified styrene-maleic anhydride copolymer is an esterified styrene-maleic anhydride copolymer.~~

3~~4~~. The low temperature stable lubricating composition of claim 1~~3~~, wherein the esterified styrene-maleic anhydride copolymer is esterified with a long chain alcohol having an alkyl chain length of 10 to 22 carbons.

4~~5~~. The low temperature stable lubricating composition of claim 3 ~~or 4~~, wherein the esterified styrene-maleic anhydride copolymer has a number average molecular weight of about 10,000 to about 100,000.

5~~6~~. The low-temperature stable lubricating composition of ~~any preceding~~ claim 1, wherein the poly(meth)acrylate copolymer includes reactants selected from C1 to C24 linear or branched alkyl (meth)acrylate reactants.

6~~7~~. The low-temperature stable lubricating composition of ~~any preceding~~ claim 5, wherein a number average molecular weight of the poly(meth)acrylate copolymer is about 20,000 or more.

~~8. The low-temperature stable lubricating composition of any preceding claim, wherein the lubricating composition includes about 1 weight percent or less of the polymeric additive, preferably about 0.5 to about 0.6 weight percent.~~

7~~9~~. The low-temperature stable lubricating composition of ~~any preceding~~ claim 1, wherein the ratio of the modified styrene-maleic anhydride copolymer to the poly(meth)acrylate copolymer is about 1:2 to about 1:0.7.

8~~10~~. The low~~-~~temperature stable lubricating composition of ~~any preceding~~ claim 1, wherein the ~~polymeric additive includes about 40 weight percent to about 60 weight percent of the modified~~esterified styrene-maleic anhydride copolymer is esterified with a long chain alcohol having an alkyl chain length of 10 to 22 carbons and has a number average molecular weight of about 10,000 to about 100,000; wherein ~~based on the total weight of the modified styrene-maleic anhydride copolymer and~~ the poly(meth)acrylate copolymer includes a blend of one or more of C1 to C4 (meth)acrylate monomer units, C12 to C16 (meth)acrylate monomer units, or C16 to C20 (meth)acrylate monomer units and has a number average molecular weight about 20,000 or more.

9~~11~~. A method for maintaining a pumpable viscosity of a lubricating composition, the method comprising adding to a lubricating composition about 0.5 to about 1 weight percent of a polymeric ~~an~~ additive ~~of claims 1-10~~ effective to maintain a pumpable fluid as evidenced by a passing MRV performance pursuant to ASTM D4684 at temperatures down to about -40 °C.; wherein the polymeric additive includes a blend of an esterified styrene-maleic anhydride copolymer and a poly(meth)acrylate copolymer, wherein the polymeric additive includes about 40 weight percent to about 60 weight percent of the esterified styrene-maleic anhydride copolymer based on the total weight of the esterified styrene-maleic anhydride copolymer and the poly(meth)acrylate copolymer.

~~12. Use of a polymer additive of claims 1-10 for achieving a passing MRV pumpability pursuant to ASTM D4684.~~

10. The method of claim 9, wherein the esterified styrene-maleic anhydride copolymer is esterified with a long chain alcohol having an alkyl chain length of 10 to 22 carbons.

11. The method of claim 10, wherein the esterified styrene-maleic anhydride copolymer has a number average molecular weight of about 10,000 to about 100,000.

12. The method of claim 9, wherein the poly(meth)acrylate copolymer includes reactants selected from C1 to C24 linear or branched alkyl (meth)acrylate reactants.

13. The method of claim 12, wherein a number average molecular weight of the poly(meth)acrylate copolymer is about 20,000 or more.

14. The method of claim 9, wherein the ratio of the modified styrene-maleic anhydride copolymer to the poly(meth)acrylate copolymer is about 1:2 to about 1:0.7.

15. The method of claim 9, wherein the esterified styrene-maleic anhydride copolymer is esterified with a long chain alcohol having an alkyl chain length of 10 to 22 carbons and has a number average molecular weight of about 10,000 to about 100,000; wherein the poly(meth)acrylate copolymer includes a blend of one or more of C1 to C4 (meth)acrylate monomer units, C12 to C16 (meth)acrylate monomer units, or C16 to C20 (meth)acrylate monomer units and has a number average molecular weight about 20,000 or more; and wherein the lubricating composition with the polymeric additive maintains a pumpable fluid at temperature down to about -40 °C. as evidenced by a passing MRV performance pursuant to ASTM D4684 with a viscosity less than 60,000 cP and a yield stress less than 35.