CLAIMS

I/We claim:

1. A cylinder lubricating oil composition for a crosshead diesel engine, the composition having:

a sulfated ash content of 2.0 to 5.5 mass%;

a base number of 15 to 45 mgKOH/g; ~~and~~

a kinematic viscosity at 100°C of 12.5 mm^2/s or more; and

an autoignition temperature of no less than 262°C, wherein the autoignition temperature is determined by means of pressurized differential scanning calorimetry as a temperature at which the composition begins to generate heat when 3 mg of the composition is heated in an oxygen atmosphere at a pressure of 1.0 MPa from 25°C to 500°C at a heating rate of 10°C/min,

the composition comprising:

a lubricant base oil;

(A) at least one of

a Ca salicylate detergent having a metal ratio of no more than 7 or

a Ca phenate detergent having a metal ratio of no more than 7;

(B) a Ca sulfonate detergent having a base number of no less than 10 mgKOH/g and less than 60 mgKOH/g;

(C) a Ca phenate detergent having a base number of 55 to 200 mgKOH/g;

(D) at least one of

an amine antioxidant or

a sulfur-containing compound; and

(E) a zinc dithiophosphate or a zinc dithiocarbamate,

wherein the sulfur-containing compound is a compound other than a

metallic detergent, a zinc dithiophosphate, a zinc dithiocarbamate, an oil-soluble organic molybdenum compound, and an ashless detergent; and

the lubricant base oil consists of one or more selected from the group consisting of Group I base oil of API base stock categories and Group II base oil of API base stock categories.

2. The cylinder lubricating oil composition according to claim 1,

the composition being used for lubrication of a crosshead diesel engine, the crosshead diesel engine using a fuel, the fuel having a flash point of no more than 15°C.

3. The cylinder lubricating oil composition according to claim 1 or 2,

the composition being used for lubrication of a crosshead diesel engine, the crosshead diesel engine using a fuel, the fuel comprising a hydrocarbon having 1 to 4 carbons.

4. The cylinder lubricating oil composition according to any one of claims 1 to 3,

the composition being used for lubrication of a crosshead diesel engine, the crosshead diesel engine using a fuel, the fuel comprising methane, ethane, ethylene, propane, butane, methanol, ethanol, dimethyl ether, or combination thereof.

~~**5.** The cylinder lubricating oil composition according to any one of claims 1 to 4, the composition comprising:~~

~~a lubricant base oil;~~

~~(A) a Ca salicylate detergent having a metal ratio of no more than 7, and/or a Ca phenate detergent having a metal ratio of no more than 7;~~

~~(B) a Ca sulfonate detergent having a base number of no less than 10 mgKOH/g and less than 60 mgKOH/g;~~

~~(C) a Ca phenate detergent having a base number of 55 to 200 mgKOH/g;~~

~~(D) an amine antioxidant and/or a sulfur-containing compound; and~~

~~(E) a zinc dithiophosphate or a zinc dithiocarbamate,~~

~~wherein the sulfur-containing compound is a compound other than a metallic detergent, a zinc dithiophosphate, a zinc dithiocarbamate, an oil-soluble organic molybdenum compound, and an ashless detergent.~~

~~6~~5. The cylinder lubricating oil composition according to any one of claims ~~5~~1 to 4, the composition comprising:

the component (B) in an amount of 100 to 1000 mass ppm in terms of Ca on the basis of the total mass of the composition;

the component (C) in an amount of 200 to 2000 mass ppm in terms of Ca on the basis of the total mass of the composition;

the component (D) in an amount of 0.10 to 5.0 mass% on the basis of the total mass of the composition; and

the component (E) in an amount of 100 to 700 mass ppm in terms of Zn on the basis of the total mass of the composition.

~~7~~6. The cylinder lubricating oil composition according to any one of claims 1 to 5 ~~or 6~~,

the component (D) comprising one or more selected from the group

consisting of: alkylated diphenylamine, alkylated phenyl-α-naphthylamine, phenyl-α-naphthylamine, phenyl-β-naphthylamine, thiadiazole, disulfides, sulfurized fats, polysulfides, and sulfurized olefins.

~~8~~7. The cylinder lubricating oil composition according to any one of claims ~~5~~1 to ~~7~~6, further comprising:

(F) an oil-soluble organic molybdenum compound.

~~9~~8. The cylinder lubricating oil composition according to claim ~~8~~7,

the component (F) comprising one or more selected from the group consisting of: molybdenum dithiocarbamate, molybdenum dithiophosphate, molybdenum-polyisobutenylsuccinimide complex, and dialkylamine salt of molybdic acids; and

the composition comprising the component (F) in an amount of no less than 100 mass ppm in terms of Mo on the basis of the total mass of the composition.

~~10~~9. The cylinder lubricating oil composition according to any one of claims ~~5~~1 to ~~9~~8, further comprising:

(G) an ashless dispersant having a number average molecular weight of no less than 2500,

wherein a product of the number average molecular weight of the component (G) and a concentration (unit: mass%) of the component (G) in the composition is no less than 9000.

~~11~~10. A method for lubricating a cylinder of a crosshead diesel engine, the

method comprising:

(a) operating a crosshead diesel engine using a fuel, the fuel having a flash point of no more than 15°C; and

(b) supplying the cylinder lubricating oil composition as in any one of claims 1 to ~~10~~9 to a cylinder of the crosshead diesel engine.

~~12~~**11.** The method for lubricating the cylinder of the crosshead diesel engine according to claim ~~11~~10,

wherein the fuel comprises a hydrocarbon having 1 to 4 carbons.

~~13~~**12.** The method for lubricating the cylinder of the crosshead diesel engine according to claim 10 or 11~~ or 12~~,

wherein the fuel comprises methane, ethane, ethylene, propane, butane, methanol, ethanol, dimethyl ether, or combination thereof.