# CLAIMS

1. High-Mn steel comprising:

a chemical composition containing, in mass%,

C: 0.288% or more and 0.700 % or less,

Si: 0.05 % or more and 1.00 % or less,

Mn: 20.0 % or more and 35.0 % or less,

P: 0.030 % or less,

S: 0.0070 % or less,

Al: 0.01 % or more and 0.07 % or less,

Cr: 0.5 % or more and 7.0 % or less,

N: 0.0050 % or more and 0.0500 % or less,

O: 0.0050 % or less,

Ti: 0.005 % or less, and

Nb: 0.005 % or less

with the balance being Fe and inevitable impurities; and

a microstructure having austenite as a matrix phase, wherein

the microstructure has a Mn segregation portion with a Mn concentration of 16 % or more and 38 % or less, and

the high-Mn steel has an average KAM (Kernel Average Misorientation) value of 0.3 or more, an absorbed energy in a Charpy impact test at -196 °C of 100 J or more, and a yield stress of 400 MPa or more.

2. The high-Mn steel according to claim 1, wherein the chemical composition further contains, in mass%, at least one selected from the group consisting of

Mo: 2.0 % or less,

V: 2.0 % or less,

W: 2.0 % or less,

Ca: 0.0005 % or more and 0.0050 % or less,

Mg: 0.0005 % or more and 0.0050 % or less, and

rare earth metal: 0.0010 % or more and 0.0200 % or less.

3. A method for producing high-Mn steel, comprising:

heating a steel material having the chemical composition according to claim 1 or 2 to a temperature range of 1100 °C or higher and 1300 °C or lower; and

hot rolling the steel material with a rolling finish temperature of 800 °C or higher and a total rolling reduction of 20 % or more.

4. The method for producing high-Mn steel according to claim 3, further comprising:

hot rolling the steel material with a rolling finish temperature of 700 °C or higher and lower than 950 °C; and

then subjecting the steel material to cooling treatment at an average cooling rate of 1.0 °C/s or more within a range of a temperature at or above (the rolling finish temperature - 100 °C) to a temperature ranging from 300 °C to 650 °C.