CLAIMS

1. A non-oriented silicon steel for a high-speed motor, comprising the following chemical components in mass percentage: 0-0.0020% of C, 0-0.0010% of S, 0-0.0030% of N, 3.0%-3.4% of Si, 0.80%-1.0% of Al, 0.2%-0.4% of Mn, 0-0.01% of P, 0-0.004% of (Sn+Sb), 0-0.005% of Nb, 0-0.005% of V, 0-0.005% of Ti, 0-0.005% of Mo, 0-0.05% of Cr, 0-0.05% of Ni, 0-0.05% of Cu, the balance of Fe and inevitable inclusions; wherein, $0<(C+S+N)\leq 0.0050\%$; the thickness of finished product is in a range from 0.20mm to 0.30mm, and the grain size of finished product is in a range from 80μm to 100μm.

2. The non-oriented silicon steel for a high-speed motor according to claim 1, wherein the non-oriented silicon steel for a high-speed motor has a yield strength greater than or equal to 550MPa, a magnetic induction B_{5000} greater than or equal to 1.65, a high-frequency iron loss at a thickness of 0.30mm $P_{1.0/1000}$ less than or equal to 45W/kg, a high-frequency iron loss at a thickness of 0.25mm $P_{1.0/1000}$ less than or equal to 40W/kg, and a high-frequency iron loss at a thickness of 0.20mm $P_{1.0/1000}$ less than or equal to 35W/kg.

3. The non-oriented silicon steel for a high-speed motor according to claim 1 or 2, wherein, the content of (Si+2Al) is greater than or equal to 4.8 wt% and less than or equal to 5.2 wt%.

4. A method for preparing the non-oriented silicon steel for a high-speed motor according to any one of claims 1 to 3, comprising performing smelting and casting into a continuous casting billet, performing cooling and heating on the continuous casting billet, hot rolling, normalizing to form recrystallized grains and obtain normalized steel plates, pickling to obtain pickled steel plates, cold rolling, annealing, and coating treatment.

5. The method for preparing the non-oriented silicon steel for a high-speed motor according to claim 4, wherein the normalizing is performed at a temperature ranging from 830°C to

870°C for a time period ranging from 3 min to 5 min; a reduction rate of the cold rolling is controlled to be in a range from 89% to 90%; and the annealing is performed at a temperature ranging from 880°C to 900°C for a time period ranging from 120s to 150s.

6. The method for preparing the non-oriented silicon steel for a high-speed motor according to claim 4 or 5, wherein a vacuum induction furnace is used for smelting, the content of (C+S+N) is controlled to be greater than 0 and less than or equal to 0.0050 wt%, and a continuous casting billet with a thickness of 200mm to 250mm is casted.

7. The method for preparing the non-oriented silicon steel for a high-speed motor according to claim 4 or 5, wherein the step of cooling and heating on the continuous casting billet comprises naturally cooling the continuous casting billet to a temperature ranging from 400°C to 500°C, then heating to a temperature ranging from 1,080°C to 1,100°C at a heating rate of no more than 10°C/min, and then keeping at this temperature for 0.5 h to 1.0 h.

8. The method for preparing the non-oriented silicon steel for a high-speed motor according to claim 4 or 5, wherein the hot rolling includes 6 passes of rough rolling and 7 passes of finish rolling processes; and/or,

an intermediate billet with a thickness of 30mm to 45mm is obtained through rough rolling, and a hot-rolled plate with a thickness of 2.0mm to 3.0mm is obtained through finish rolling; and/or,

a final rolling temperature of finishing rolling is in a range from 800℃ to 860℃, a cooling temperature of finishing rolling is in a range from 600℃ to 660℃, a variation range of the final rolling temperature of finishing rolling and the cooling temperature of finishing rolling is ±15℃, and the total reduction rate of finishing rolling is in a range from 92.5% to 93.5%.

9. The method for preparing the non-oriented silicon steel for a high-speed motor according to claim 4 or 5, wherein after normalizing, the normalized steel plates are cooled to a temperature ranging from 80°C to 150°C, and then shot blasting and pickling processes are performed.

10. The method for preparing the non-oriented silicon steel for a high-speed motor according to claim 4 or 5, wherein the pickled steel plates are preheated to a temperature ranging from 100°C to 200°C before cold rolling; and/or, a size of the recrystallized grains after normalizing is in a range from 60μm to 80μm, and a volume ratio of the recrystallized grains is 100%.

11. The non-oriented silicon steel for a high-speed motor according to claim 1, comprising the following chemical components in mass percentage: 3.1%-3.4% of Si, and 0.002%-0.004% of Nb.

12. The non-oriented silicon steel for a high-speed motor according to claim 1, wherein the non-oriented silicon steel for a high-speed motor has a yield strength greater than or equal to 569MPa.

13. The method for preparing the non-oriented silicon steel for a high-speed motor according to claim 4 or 5, wherein a size of the recrystallized grains after normalizing is in a range from 64μm to 76μm.