

What is claimed is:

1. A hot-dip Zn-Al alloy coated steel sheet characterized by comprising a hot-dip Zn-Al alloy coating layer containing 1.0 to 10 percent by mass of Al, 0.2 to 1.0 percent by mass of Mg, 0.005 to 0.1 percent by mass of Ni, and the balance being Zn and incidental impurities on at least one surface of a steel sheet.

2. The hot-dip Zn-Al alloy coated steel sheet according to Claim 1, characterized in that Ni is concentrated in an outermost surface layer portion of the hot-dip Zn-Al alloy coating layer.

3. The hot-dip Zn-Al alloy coated steel sheet according to Claim 1 or Claim 2, characterized in that the hot-dip Zn-Al alloy coating layer comprises binary eutectic of Zn-Al and ternary eutectic of Al-Zn-Mg intermetallic compound.

4. The hot-dip Zn-Al alloy coated steel sheet according to Claim 3, characterized in that the Mg intermetallic compound is $MgZn_2$.

5. The hot-dip Zn-Al alloy coated steel sheet according to Claim 3 or Claim 4, characterized in that the hot-dip Zn-

Al alloy coating layer includes 10 to 30 percent by area of ternary eutectic of Al-Zn-Mg intermetallic compound on a cross-section of the coating layer basis.

6. A method for manufacturing a hot-dip Zn-Al alloy coated steel sheet, comprising the steps of dipping a steel sheet into a hot-dip Zn-Al alloy coating bath and pulling up and cooling the steel sheet so as to form a hot-dip Zn-Al alloy coating layer on a steel sheet surface,

characterized in that

the steel sheet pulled up from the coating bath is cooled to 250°C at a cooling rate of 1°C to 15°C/sec, and

the hot-dip Zn-Al alloy coating layer contains 1.0 to 10 percent by mass of Al, 0.2 to 1.0 percent by mass of Mg, 0.005 to 0.1 percent by mass of Ni, and the balance being Zn and incidental impurities.

What is claimed is:

[Claim 1]

A hot-dip Zn-Al alloy coated steel sheet characterized by comprising a hot-dip Zn-Al alloy coating layer containing 1.0 to 10 % by mass of Al, 0.2 to 1.0 % by mass of Mg, 0.003 to 0.1 % by mass of Ni, and the balance consisting of Zn and inevitable impurities on at least one surface of the steel sheet.

[Claim 2]

The hot-dip Zn-Al alloy coated steel sheet according to claim 1, characterized in that Ni is concentrated in an outermost surface layer portion of the hot-dip Zn-Al alloy coating layer.

[Claim 3]

The hot-dip Zn-Al alloy coated steel sheet according to claim 1 or 2, characterized in that the hot-dip Zn-Al alloy coating layer contains binary eutectic of Zn-Al and ternary eutectic of Al-Zn-Mg intermetallic compound.

[Claim 4]

The hot-dip Zn-Al alloy coated steel sheet according to claim 3, characterized in that the Al-Zn-Mg intermetallic compound is $MgZn_{12}$.

[Claim 5]

The hot-dip Zn-Al alloy coated steel sheet according to claim 3, characterized in that the hot-dip Zn-Al alloy coating layer contains 10 to 30 % by area of ternary eutectic of Al-Zn-Mg intermetallic compound on a cross-section of the coating layer.

[Claim 6]

The hot-dip Zn-Al alloy coated steel sheet according to claim 3, characterized in that the average major diameter of the binary eutectic of Zn-Al is 10 μm or less.

[Claim 7]

A process for producing a hot-dip Zn-Al alloy coated steel sheet comprising: dipping a steel sheet into a hot-dip Zn-Al alloy coating bath, pulling up the steel sheet from the coating bath and cooling it down, and forming a hot-dip Zn-Al alloy coating layer on a surface of the steel sheet, characterized in that the cooling rate of the steel sheet pulled up from the coating bath down to a temperature of 250°C is 1 to 15°C/sec, and that the hot-dip Zn-Al alloy coating layer contains 1.0 to 10 % by mass of Al, 0.2 to 1.0 % by mass of Mg, 0.003 to 0.1 % by mass of Ni, and the balance consisting of Zn and inevitable impurities.