

## 1. Development Concept

6.5% Si steel is an excellent core material for high frequency applications because its resistivity is nearly 2 times higher than that of 3% Si steel and heat generation is small due to its small eddy current loss. On the other hand, 3% Si steel has the advantage of a higher saturation flux density in comparison with 6.5% Si steel due to its smaller content of Si, which is a nonmagnetic element.

With conventional technology, it was not possible to satisfy both high saturation flux density nearly equal to that of 3% Si steel and low iron loss at high frequency on the same level as 6.5% Si steel. Therefore, JFE Steel developed a new material, Gradient Si Super Core™ JNSF, which satisfies both high saturation flux density and low iron loss at high frequency<sup>1,2)</sup>.

(Thickness: 0.1 mm). Because 15JNSF950 has a low

## 2. Magnetic Properties of JNSF

**Figure 1** shows the direct current magnetization curves of the developed steel, 15JNSF950 (Thickness: 0.15 mm) and the 6.5% Si steel sheet 10JNEX900

