Super Core™
Magnetic Property Curves
JNEX-CORE  JNHF-CORE

JFE Steel Corporation
JFE Steel's Super Core™

Magnetic property curves

Typical magnetic property curves for each grade of Super Core™ is shown on the pages listed in the tables below.

Grade Page
10JNEX900 4 5 6 7 8 9 10 11 12 13
10JNHF600 14 15 16 17 18 19 20 21 22 23
20JNHF1300 24 25 26 27 28 29 30 31 32 33

Super Core is a registered trademark or trademark of JFE Steel Corporation in the United States and other countries.
## Unit Conversion Factors

### Magnetizing Force

<table>
<thead>
<tr>
<th></th>
<th>Oersted</th>
<th>A/m</th>
<th>A/in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oersted</td>
<td>1</td>
<td>7.96×10</td>
<td>2.02</td>
</tr>
<tr>
<td>A/m</td>
<td>1.256×10²</td>
<td>1</td>
<td>2.54×10²</td>
</tr>
<tr>
<td>A/in</td>
<td>4.95×10¹</td>
<td>3.94×10</td>
<td>1</td>
</tr>
</tbody>
</table>

### Core Loss

<table>
<thead>
<tr>
<th></th>
<th>w/kg</th>
<th>w/lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>w/kg</td>
<td>1</td>
<td>4.54×10⁻¹</td>
</tr>
<tr>
<td>w/lb</td>
<td>2.204</td>
<td>1</td>
</tr>
</tbody>
</table>

### Magnetic Flux Density

<table>
<thead>
<tr>
<th></th>
<th>Gauss</th>
<th>Tesla</th>
<th>Line/in²</th>
<th>Wb/m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauss</td>
<td>1</td>
<td>10⁴</td>
<td>6.45</td>
<td>10⁴</td>
</tr>
<tr>
<td>Tesla</td>
<td>10⁴</td>
<td>1</td>
<td>6.45×10⁴</td>
<td>1</td>
</tr>
<tr>
<td>Line/in²</td>
<td>1.55×10⁻¹</td>
<td>1.55×10⁻⁵</td>
<td>1</td>
<td>1.55×10⁻⁵</td>
</tr>
<tr>
<td>Wb/m²</td>
<td>10⁴</td>
<td>1</td>
<td>6.45×10⁴</td>
<td>1</td>
</tr>
</tbody>
</table>

### Magnetic Permeability

<table>
<thead>
<tr>
<th></th>
<th>Gauss/Oe</th>
<th>H/m</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGS Electro-magnetic Unit</td>
<td>1</td>
<td>1.257×10⁶</td>
</tr>
<tr>
<td>Henry per Meter(H/m)</td>
<td>7.958×10⁶</td>
<td>1</td>
</tr>
</tbody>
</table>

### Conversion of Core Loss as per AISA

<table>
<thead>
<tr>
<th></th>
<th>W/kg 60Hz</th>
<th>W/kg 50Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>W/kg 60Hz</td>
<td>1</td>
<td>0.79</td>
</tr>
<tr>
<td>W/kg 50Hz</td>
<td>1.266</td>
<td>1</td>
</tr>
</tbody>
</table>
High-Frequency Core Loss Curves

**10JNEX900** 0.10mm

** Measured by**: 25cm Epstein tester
** Test Specimens**: Taken parallel to the rolling direction, used as-sheared
** Assumed density**: 7.49kg/dm$^3$
High-Frequency Magnetization Curves

**10JNEX900**  0.10mm

- Measured by: 25cm Epstein tester
- Test Specimens: Taken parallel to the rolling direction
- Assumed density: 7.49kg/dm³

![Graph showing magnetic flux density (B) vs. magnetizing force (H) for different frequencies (1 kHz, 5 kHz, 10 kHz, 20 kHz, 30 kHz, 400 Hz)]
High-Frequency Excitation Curves

10JNEX900 0.10mm

Measured by: 25cm Epstein tester
Test Specimens: Taken parallel to the rolling direction
Assumed density: 7.49kg/dm³
High-Frequency Exciting Power Curves

10JNEX900

- 0.10mm

Measured by: 25cm Epstein tester
Test Specimens: Taken parallel to the rolling direction
Assumed density: 7.49kg/dm³

Specific Exciting Power VA (VA/kg) vs. Magnetic Flux Density B (T)
Core Loss Curves

<table>
<thead>
<tr>
<th>Material</th>
<th>Thickness (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10JNEX900</td>
<td>0.10</td>
</tr>
</tbody>
</table>

Measured by: 25cm Epstein tester
Test Specimens: Taken parallel to the rolling direction
Assumed density: 7.49 kg/dm³

50Hz

60Hz

Magnetic Flux Density B (T)

Core Loss W (W/kg)
Magnetization Curve

JNEX900

0.10mm

Test Specimens: Taken parallel to the rolling direction

Assumed density: 7.49kg/dm³

Frequency: 50Hz

Measured by 25cm Epstein tester
Excitation Curve

<table>
<thead>
<tr>
<th>10JNEX900</th>
<th>0.10mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measured by</td>
<td>25cm Epstein tester</td>
</tr>
<tr>
<td>Test Specimens</td>
<td>Taken parallel to the rolling direction</td>
</tr>
<tr>
<td>Assumed density</td>
<td>7.49kg/dm³</td>
</tr>
<tr>
<td>Frequency</td>
<td>50Hz</td>
</tr>
</tbody>
</table>

Measured by 25cm Epstein tester, Test Specimens: Taken parallel to the rolling direction, used as-sheared, Assumed density 7.49kg/dm³, Frequency 50Hz.
Exciting Power Curves

10JNEX900 0.10mm

- Measured by: 25cm Epstein tester
- Test Specimens: Taken parallel to the rolling direction
- Assumed density: 7.49kg/dm³
D.C. Magnetization Curve
D.C. Permeability Curve

**Measurement Details**

- **Material:** 10JNEX900 0.10mm
- **Measurement Method:** 25cm Epstein tester
- **Test Specimens:** Taken parallel to the rolling direction, used as-sheared
- **Assumed Density:** 7.49 kg/dm³
**D.C. Hysteresis Loops**

**10JNEX900** 0.10mm

- **Measured by:** 25cm Epstein tester
- **Test Specimens:** Taken parallel to the rolling direction, used as-sheared
- **Assumed density:** 7.49kg/dm³
High-Frequency Core Loss Curves

10JNHF600  0.1mm

Measured by: 25cm Epstein tester
Test Specimens: Taken parallel to the rolling direction
Assumed density: 7.53g/cm³
High-Frequency Magnetization Curves

10JNHF600 0.1mm

Measured by: 25cm Epstein tester
Test Specimens: Taken parallel to the rolling direction: used as-sheared
Assumed density: 7.53g/cm³
High-Frequency Excitation Curves

**10JNHF600 0.1mm**

- Measured by: 25cm Epstein tester
- Test Specimens: Taken parallel to the rolling direction, used as sheared
- Assumed density: 7.53g/cm³
High-Frequency Exciting Power Curves

10JNHF600 0.1mm

Measured by: 25cm Epstein tester
Test Specimens: Taken parallel to the rolling direction; used as-sheared
Assumed density: 7.53g/cm³
Core Loss Curves

10JNHF600

0.1mm Tested by 25cm Epstein tester

Test Specimens: Taken parallel to the rolling direction

Assumed density: 7.53g/cm³

Magnetic Flux Density B (T) Core Loss W (W/kg)
Magnetization Curve

10JNHF-600

0.1mm

Measured by:
25cm Epstein tester

Test Specimens:
Taken parallel to the rolling direction

Assumed density:
7.53g/cm³

Magnetic Flux Density B (T)

Magnetizing Force H (A/m)
Excitation Curve

<table>
<thead>
<tr>
<th>10JNHF600</th>
<th>0.1mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measured by</td>
<td>25cm Epstein tester</td>
</tr>
<tr>
<td>Test Specimens</td>
<td>Taken parallel to the rolling direction</td>
</tr>
<tr>
<td>Assumed density</td>
<td>7.53g/cm³</td>
</tr>
</tbody>
</table>
Exciting Power Curves

**10JNHF600 0.1mm**

- Measured by: 25cm Epstein tester
- Test Specimens: Taken parallel to the rolling direction, used as-sheared
- Assumed density: 7.53g/cm³
D.C. Magnetization Curve
D.C. Permeability Curve

<table>
<thead>
<tr>
<th>B-H</th>
<th>H-B</th>
</tr>
</thead>
</table>

10JNHF600 0.1mm

Measured by: 25cm Epstein tester
Test Specimens: Taken parallel to the rolling direction
Assumed density: 7.53g/cm³

Magnetic Flux Density B (T)
Magnetizing Force H (A/m)
Permeability μ (emu)
D.C. Hysteresis Loops

10JNHF600 0.1mm

Measured by: 25cm Epstein tester
Test Specimens: Taken parallel to the rolling direction; used as-sheared
Assumed density: 7.53g/cm³
High-Frequency Core Loss Curves

20JNHF1300 0.2mm

Measured by: 25cm Epstein tester
Test Specimens: Taken parallel to the rolling direction
Assumed density: 7.57g/cm³
High-Frequency Magnetization Curves

20JNHF1300 0.2mm

Measured by : 25cm Epstein tester
Test Specimens : Taken parallel to the rolling direction
Assumed density : 7.57g/cm³
High-Frequency Excitation Curves

20JNHF1300 0.2mm

Measured by: 25cm Epstein tester
Test Specimens: Taken parallel to the rolling direction
Assumed density: 7.57g/cm³
High-Frequency Exciting Power Curves

20JNHF1300 0.2mm

Measured by: 25cm Epstein tester
Test Specimens: Taken parallel to the rolling direction
Assumed density: 7.57g/cm³
Core Loss Curves

20JNHF1300 0.2mm

Measured by: 25cm Epstein tester
Test Specimens: Taken parallel to the rolling direction
Assumed density: 7.57g/cm³
Excitation Curve

20JNHF1300 0.2mm

Measured by: 25cm Epstein tester
Test Specimens: Taken parallel to the rolling direction
Assumed density: 7.57g/cm³
Exciting Power Curves

20JNHF1300 0.2mm

Measured by: 25cm Epstein tester
Test Specimens: Taken parallel to the rolling direction
Assumed density: 7.57g/cm³
D.C. Magnetization Curve
D.C. Permeability Curve

20JNHF1300 0.2mm

Measured by: 25cm Epstein tester
Test Specimens: Taken parallel to the rolling direction
Assumed density: 7.57g/cm³

Magnetic Flux Density B (T) vs. Magnetizing Force H (A/m)
Permeability μ (emu) vs. Magnetizing Force H (A/m)
D.C. Hysteresis Loops

Test Specimens: Taken parallel to the rolling direction: used as-sheared
Assumed density: 7.57 g/cm³

Measured by: 25 cm Epstein tester

Magnetic Flux Density B (T)

Magnetizing Force H (A/m)
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