

## Magnetic Characteristics

## SmCo<sub>5</sub>

| Material                 | Grade                 | Br      |           | Hcb       |         | Hcj     |           | (BH)max   |                   | Tc      | Density           | Tw  | α <sub>Br</sub> | α <sub>Hcj</sub> |        |
|--------------------------|-----------------------|---------|-----------|-----------|---------|---------|-----------|-----------|-------------------|---------|-------------------|-----|-----------------|------------------|--------|
|                          |                       | kGs     | T         | kOe       | kA/m    | kOe     | kA/m      | MGOe      | kJ/m <sup>3</sup> | °C      | g/cm <sup>3</sup> | °C  | %/°C            | %/°C             |        |
| SmCo <sub>5</sub>        | 16                    | 8.1-8.5 | 0.81-0.85 | 7.8-8.3   | 620-660 | 15-23   | 1194-1830 | 14-16     | 110-127           | 750     | 8.3               | 250 | -0.050          | -0.300           |        |
|                          | 18                    | 8.5-9.0 | 0.85-0.90 | 8.3-8.8   | 660-700 | 15-23   | 1194-1830 | 16-18     | 127-143           | 750     | 8.3               | 250 | -0.050          | -0.300           |        |
|                          | (SmPr)Co <sub>5</sub> | 20      | 9.0-9.4   | 0.90-0.94 | 8.5-9.1 | 680-725 | 15-23     | 1194-1830 | 19-21             | 150-167 | 750               | 8.3 | 250             | -0.050           | -0.300 |
|                          |                       | 22      | 9.2-9.6   | 0.92-0.96 | 8.9-9.4 | 710-750 | 15-23     | 1194-1830 | 20-22             | 160-175 | 750               | 8.3 | 250             | -0.050           | -0.300 |
|                          |                       | 24      | 9.6-10.0  | 0.96-1.00 | 9.2-9.7 | 730-770 | 15-23     | 1194-1830 | 22-24             | 175-190 | 750               | 8.3 | 250             | -0.050           | -0.300 |
| SmCo <sub>5</sub>        | 20S                   | 9.0-9.4 | 0.90-0.94 | 8.5-9.1   | 680-725 | 18-23   | 1433-1830 | 18-20     | 143-160           | 750     | 8.3               | 250 | -0.045          | -0.280           |        |
|                          | 22S                   | 9.2-9.6 | 0.92-0.96 | 8.9-9.4   | 710-750 | 18-23   | 1433-1830 | 20-22     | 160-175           | 750     | 8.3               | 250 | -0.045          | -0.280           |        |
| (SmGd)Co <sub>5</sub>    | LTC10                 | 5.9-6.3 | 0.59-0.63 | 5.8-6.2   | 460-493 | 18-23   | 1433-1830 | 8.5-10    | 68-80             | 700     | 8.3               | 250 | Temp Range      | α <sub>Br</sub>  |        |
| Low Temp.<br>Coefficient |                       |         |           |           |         |         |           |           |                   |         |                   |     | 20-100°C        | -0.004           |        |
|                          |                       |         |           |           |         |         |           |           |                   |         |                   |     | 100-200°C       | -0.021           |        |
|                          |                       |         |           |           |         |         |           |           |                   |         |                   |     | 200-300°C       | -0.042           |        |

## Magnetic Characteristics

## Sm<sub>2</sub>Co<sub>17</sub>

| Material                         | Grade                | Br        |           | Hcb       |         | Hcj     |           | (BH)max |                   | Tc      | Density           | Max. Tw | α <sub>Br</sub> | α <sub>Hcj</sub> |
|----------------------------------|----------------------|-----------|-----------|-----------|---------|---------|-----------|---------|-------------------|---------|-------------------|---------|-----------------|------------------|
|                                  |                      | kGs       | T         | kOe       | kA/m    | kOe     | kA/m      | MGOe    | kJ/m <sup>3</sup> | °C      | g/cm <sup>3</sup> | °C      | %/°C            | %/°C             |
| Sm <sub>2</sub> Co <sub>17</sub> | 24H                  | 9.5-10.2  | 0.95-1.02 | 8.7-9.4   | 700-750 | ≥25     | ≥1990     | 22-24   | 175-191           | 800     | 8.4               | 350     | -0.030          | -0.200           |
|                                  | 26H                  | 10.2-10.5 | 1.02-1.05 | 9.4-9.8   | 750-780 | ≥25     | ≥1990     | 24-26   | 191-207           | 800     | 8.4               | 350     | -0.030          | -0.200           |
|                                  | 28H                  | 10.3-10.8 | 1.03-1.08 | 9.5-10.0  | 756-796 | ≥25     | ≥1990     | 26-28   | 207-220           | 800     | 8.4               | 350     | -0.030          | -0.200           |
|                                  | 30H                  | 10.8-11.0 | 1.08-1.10 | 9.9-10.5  | 788-835 | ≥25     | ≥1990     | 28-30   | 220-240           | 800     | 8.4               | 350     | -0.030          | -0.200           |
|                                  | Sm <sub>2</sub>      | 24        | 9.5-10.2  | 0.95-1.02 | 8.7-9.4 | 700-750 | ≥18       | ≥1433   | 22-24             | 175-191 | 800               | 8.4     | 300             | -0.030           |
| (CoFeCuZr) <sub>17</sub>         | 26                   | 10.2-10.5 | 1.02-1.05 | 9.4-9.8   | 750-780 | ≥18     | ≥1433     | 24-26   | 191-207           | 800     | 8.4               | 300     | -0.030          | -0.200           |
|                                  | 28                   | 10.3-10.8 | 1.03-1.08 | 9.5-10.0  | 756-796 | ≥18     | ≥1433     | 26-28   | 207-220           | 800     | 8.4               | 300     | -0.030          | -0.200           |
|                                  | 30                   | 10.8-11.0 | 1.08-1.10 | 9.9-10.5  | 788-835 | ≥18     | ≥1433     | 28-30   | 220-240           | 800     | 8.4               | 300     | -0.030          | -0.200           |
|                                  | 26M                  | 10.2-10.5 | 1.02-1.05 | 9.4-9.8   | 750-780 | 12-16   | 955-1273  | 24-26   | 191-207           | 800     | 8.4               | 300     | -0.030          | -0.200           |
|                                  | 28M                  | 10.3-10.8 | 1.03-1.08 | 9.5-10.0  | 756-796 | 12-16   | 955-1273  | 26-28   | 207-220           | 800     | 8.4               | 300     | -0.030          | -0.200           |
|                                  | 30M                  | 10.8-11.0 | 1.08-1.10 | 9.9-10.5  | 788-835 | 12-16   | 966-1273  | 28-30   | 220-240           | 800     | 8.4               | 300     | -0.030          | -0.200           |
|                                  | 28L                  | 10.2-10.8 | 1.02-1.08 | 5.2-9.0   | 413-716 | 5.5-10  | 438-796   | 26-28   | 207-220           | 800     | 8.4               | 250     | -0.030          | -0.200           |
|                                  | 30L                  | 10.8-11.5 | 1.08-1.15 | 5.2-9.0   | 413-716 | 5.5-10  | 438-796   | 28-30   | 220-240           | 800     | 8.4               | 250     | -0.030          | -0.200           |
| (SmEr)Co <sub>2</sub>            | LTC-22               | 9.4-9.8   | 0.94-0.98 | 8.4-9.0   | 668-715 | 15-20   | 1194-1591 | 21-23   | 167-183           | 840     | 8.4               | 300     | Temp Range      | α <sub>Br</sub>  |
| Low Temp.<br>Coefficient         | (CoTm) <sub>17</sub> |           |           |           |         |         |           |         |                   |         |                   |         | -50-25°C        | +0.005           |
|                                  |                      |           |           |           |         |         |           |         |                   |         |                   |         | 20-100°C        | +0.012           |
|                                  |                      |           |           |           |         |         |           |         |                   |         |                   |         | 100-200°C       | +0.006           |
|                                  |                      |           |           |           |         |         |           |         |                   |         |                   |         | 200-300°C       | -0.025           |

## Physical & Mechanical Properties

## SmCo

| Material | Grade   | Density           | Curie Temperature | Vickers Hardness | Compressing Strength | Electronic Resistivity | Bending Strength | Stretching Strength | Hot coefficient of Expansion |
|----------|---------|-------------------|-------------------|------------------|----------------------|------------------------|------------------|---------------------|------------------------------|
|          |         | g/cm <sup>3</sup> | °K                | MPa              | MPa                  | Ω·m                    | MPa              | MPa                 | 10 <sup>-6</sup> /°C         |
|          | SmCo5   | 8.30              | 1000              | 450-500          | 1000                 | 5~6x10 <sup>-5</sup>   | 150-180          | 400                 | //6 ⊥12                      |
|          | Sm2Co17 | 8.40              | 1100              | 550-600          | 800                  | 8~9x10 <sup>-5</sup>   | 130-150          | 350                 | //8 ⊥11                      |