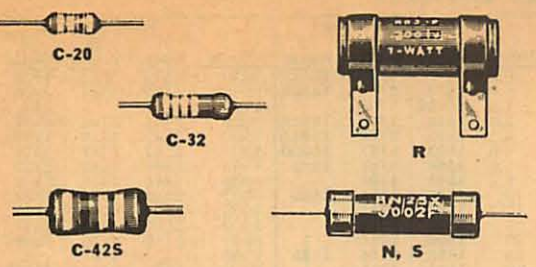
# CORNING Resistors




### TYPES H AND R POWER RESISTORS

Outstanding performance under shock and moisture. Tin oxide film fused to Corning glass core at red heat. Silver metallized termination bands at ends; special silicone base paint. TYPE H: High frequency, non-inductive type for use in dummy antennas, circuit loading, damping and terminating. Dissipation may be increased by 12% if mounted vertically; power ratings, up to 4 times by forced air cooling. TYPE R: Non-reactive high power type for computers, power supplies and other precision gear. Combine high moisture resistance with high overload capacity. Meet MIL-R-11804D specifications. **Voltage Coefficient:** 0.001% per volt, average. **Temperature Coefficient:** Less than ±500 ppm per ° C in −55° C to +235° C range. **Load Life:** 3% resistance change after 500 hours at max. dissipation, 40° C, Type H. Less than .5% after 1000 hours at rated dissipation, Type R. **Moisture Resistance:** Exceeds MIL-R-11804D. **Resistance Values:** Per MIL-R-11804D decade table only. **Standard Tolerance:** ±5%; write for prices on ±1%, 2% and 10%. **Size:** 1½" lg. x 19/32" dia. max., R31 and H31; 3" lg. x 19/32" dia. max., R33 and H33; 4" lg. x 29/32" dia. max., R35 and H35; 6" lg. x 1 5/16" dia. max., R37 and H37; 12" lg. x 1 5/16" dia. max., R39 and H39.

| Corning No. | Watts at 25°C | Resistance Range, Ohms | Volts | Net Each, Lots of 1-9 | 10-49 | 50-99 | 100-249 |
|---|---|---|---|---|---|---|---|
| H31 | 7* | 1001–70K | 525 | $ 5.08 | $ 4.35 | $ 3.63 | $2.47 |
| H33 | 15* | 1001–70K | 1380 | 5.43 | 4.65 | 3.88 | 2.64 |
| | | 71K–150K | | 5.60 | 4.80 | 4.00 | 2.72 |
| H35 | 30* | 1001–70K | 2275 | 6.37 | 5.46 | 4.55 | 3.09 |
| | | 71K–150K | | 6.55 | 5.61 | 4.68 | 3.18 |
| | | 151K–3 0K | | 6.76 | 5.79 | 4.83 | 3.28 |
| | | 301K–500K | | 7.00 | 6.00 | 5.00 | 3.40 |
| H37 | 70* | 1001–70K | 3675 | 8.40 | 7.20 | 6.00 | 4.08 |
| | | 71K–150K | | 9.07 | 7.77 | 6.48 | 4.40 |
| | | 151K–300K | | 9.24 | 7.92 | 6.60 | 4.49 |
| | | 301K–500K | | 9.45 | 8.10 | 6.75 | 4.59 |
| H39 | 140* | 71K–150K | 7875 | 14.46 | 12.39 | 10.33 | 7.02 |
| | | 151K–300K | | 14.07 | 12.06 | 10.05 | 6.83 |
| | | 301K–500K | | 13.86 | 11.88 | 9.90 | 6.73 |
| | | 501K–1 meg | | 16.17 | 13.86 | 11.55 | 7.85 |
| R31† | 7 | 10–100 | 525 | 5.78 | 4.95 | 4.13 | 2.81 |
| | | 101–1000 | | 4.90 | 4.20 | 3.50 | 2.38 |
| R33† | 13 | 30–100 | 1380 | 6.13 | 5.25 | 4.38 | 2.98 |
| | | 101–1000 | | 5.25 | 4.50 | 3.75 | 2.55 |
| R35† | 25 | 20–100 | 2275 | 7.14 | 6.12 | 5.10 | 3.47 |
| | | 101–1000 | | 5.92 | 5.07 | 4.23 | 2.87 |
| R37† | 55 | 20–100 | 3675 | 10.99 | 9.42 | 7.85 | 5.34 |
| | | 101–1000 | | 8.47 | 7.26 | 6.05 | 4.11 |
| R39† | 115 | 40–100 | 7875 | 19.08 | 16.35 | 13.63 | 9.27 |
| | | 101–1000 | | 14.25 | 12.21 | 10.18 | 6.92 |
| | | 1001–70K | | 14.46 | 12.39 | 10.33 | 7.02 |

*AC watts at 40° C. †MIL type RD31P, RD33P, RD35P, RD37P and RD39P respectively.

### TYPE N METAL-OXIDE FILM RESISTORS

#### NON-INSULATED TYPES

Small, economical units meet MIL-R-10509B, Characteristic X (non-insulated units). Made by bonding rugged metallic oxide film into the skin of Pyrex brand glass rod at red heat. Extremely stable; inherently impervious to moisture; unaffected by heat of solder, overloads or normal production handling. Moisture-resistant varnish baked on; withstands chlorinated hydrocarbon solvents used in cleaning flux from printed circuit boards. **Voltage Coefficient:** Less than 0.001% per volt. **Temperature Coefficient:** ±.025 % per °C, measured over temperature range of −55° C to +140° C is guaranteed. **Load Life:** Less than 0.35% resistance change after 1000 hours at rated wattage. Change guaranteed less than 1%. **Noise Level:** 0.1 μV per volt of applied signal. **Standard Tolerance:** ±1%; other tolerances available as noted. **Size:** .355" lg. x .131" dia., N12; .594" lg. x .172" dia., N20; .938" lg. x .297" dia., N25; 2.062" lg. x .297" dia., N30; Leads 1½" long.

| No. | MIL Type RN- | W | Resistance Range†, Ohms | V | Net Each, Lots of* 1-24 | 25-99 | 100-249 | 250-499 | 500-999 | 1000-4999 |
|---|---|---|---|---|---|---|---|---|---|---|
| N12 | ...... | ¼ | 100–133K | 250 | $0.72 | $0.38 | $0.31 | $0.23 | $0.18 | ...... |
| N20 | 20X | ½ | 10–49.9 | 350 | .72 | .38 | .31 | .23 | .18 | $0.16 |
| | | | 50–499 | | .60 | .32 | .24 | .15 | .13 | .11 |
| | | | 500–499K | | .60 | .32 | .24 | .15 | .12 | .085 |
| N25 | 25X | 1 | 10–99.9 | 500 | 1.05 | .53 | .41 | .28 | .24 | .22 |
| | | | 100–1.5 meg | | .90 | .48 | .35 | .22 | .19 | .16 |
| N30 | 30X | 2 | 30–199.9 | 750 | 1.35 | .72 | .54 | .35 | .32 | .29 |
| | | | 200–4.2 meg | | 1.08 | .57 | .43 | .29 | .27 | .20 |

*For ±0.5% tol., add 40% to above prices; for ±2% tol., discount 10% from above prices. Add 10% for non-standard values. †For resistance values, consult a MIL-BELL decade table.

### TYPE NA METAL-OXIDE FILM RESISTORS

Meets requirements of MIL-R-10509E, Characteristic D. Built-in reliability through continuous tin oxide fusing process and quality monitoring; unaffected by overloads and thermal shocking. **Frequency Characteristic:** Non-inductive. **Temperature Coefficient:** ±0.01%/° C, or 100 ppm over range of −55° C to +165° C on NA55, NA60 and NA65; ±0.02%/° C or 200 ppm on NA70. **Load Life:** Less than 0.5% in accordance with MIL-R-10509E. **Shelf Life:** One year shows Δ R of less than 0.1%. **Insulation Resistance:** 1 x $10^{10}$ megohms. **Standard Tolerance:** 1%. **Size:** NA55, 0.281" lg. x 0.090" dia.; NA60, 0.406" lg. x 0.145" dia.; NA65, 0.625" lg. x 0.215" dia.; NA70, 0.750" lg. x 0.287" dia.

| Corning No. | MIL Type | Resis. Range, Ohms | V | Net Each, Lots of 1-24 | 25-99 | 100-199 | 200-999 | 1000-9999 |
|---|---|---|---|---|---|---|---|---|
| NA55 | RN55D | 51–150K | 250 | $0.95 | $0.41 | $0.19 | $0.17 | $0.12 |
| NA60 | RN60D | 10–49.9 | 300 | .99 | .46 | .32 | .24 | .19 |
| | | 50–249K | | .73 | .27 | .13 | .10 | .08 |
| NA65 | RN65D | 10–49.9 | 350 | .99 | .46 | .32 | .24 | .19 |
| | | 50–499K | | .73 | .27 | .13 | .10 | .08 |
| NA70 | RN70D | 51–1 meg | 500 | .75 | .30 | .16 | .12 | .10 |

### TYPE C METAL-OXIDE FILM RESISTORS

Long life operation; low temp. coefficient and noise level. Solvent-resistant insulating coating meets MIL-R-22684A (Navy) requirements. **Voltage Coefficient:** 0.001% per volt. **Temperature Coefficient:** ±200 ppm guaranteed, −55° C to +150° C. **Load Life:** Typical change, less than 1% after 1000 hours; C20 and C32 guaranteed less than 2%; C42 less than 3%. **Noise Level:** 0.1 μV per volt applied signal. **Insulation Dielectric:** Withstands a "V" block test at 1000 V rms for C-42 and C-32 and 700 V for C-20. **Moisture Resistance:** Typical resistance change after 240 hours in accordance with MIL-R-22684A and MIL-STD-202, Method 106, 0.3%. Guaranteed less than 1.5% for C-20 and C-32, 2% for C-42. **Resistance Values:** MIL-R-22684A and EIA STD GEN 102 values only. **Standard Tolerance:** ±2% and ±5%. **Size:** C-07, .250" lg. x .090" dia.; C20, .375" lg. x .138" dia.; C32, .562" lg. x .190" dia.; C42, .688" lg. x .318" dia. Leads, 1½" long; copper leads are standard on all C styles.

| Corning No. | MIL Type | W | Resis. Range, Ohms | Tol. | Net Each, Lots of 1-24 | 25-99 | 100-199 | 200-999 | 1000-9999 |
|---|---|---|---|---|---|---|---|---|---|
| C-07 | RL07 | ¼ | 51–150K | 2% | $0.352 | $0.269 | $0.214 | $0.135 | $0.112 |
| | | | | 5% | .305 | .233 | .185 | .117 | .097 |
| | | | | | 1-99 | 100-249 | 250-499 | 500-999 | 1000-4999 |
| C-20 | RL20 | ½ | 10–51 | 2% | $0.329 | $0.259 | $0.201 | $0.169 | $0.119 |
| | | | | 5% | .320 | .250 | .195 | .120 | .108 |
| | | | 52–150K | 2% | .300 | .240 | .180 | .150 | .090 |
| | | | | 5% | .250 | .200 | .150 | .090 | .065 |
| | | | 151K–470K | 2% | .340 | .260 | .210 | .170 | .099 |
| | | | | 5% | .280 | .220 | .170 | .120 | .095 |
| C-32 | RL32 | 1 | 10–51 | 2% | .329 | .259 | .201 | .169 | .119 |
| | | | | 5% | .320 | .250 | .195 | .120 | .108 |
| | | | 52–470K | 2% | .300 | .240 | .180 | .120 | .090 |
| | | | | 5% | .250 | .200 | .150 | .100 | .065 |
| | | | 471K–1meg | 2% | .340 | .260 | .210 | .170 | .099 |
| | | | | 5% | .280 | .220 | .170 | .120 | .095 |
| | | | | | 5-99 | 100-249 | 250-499 | 500-999 | 1000-4999 |
| C-42S | RL42 | 2 | 10–1.5 meg | 2% | $0.399 | $0.366 | $0.299 | $0.220 | $0.157 |
| | | | | 5% | .300 | .275 | .225 | .160 | .118 |
| C-42 | ..... | 2 | 10–1.5 meg | 10% | .200 | .142 | .120 | .090 | .057 |

### TYPE S HIGH TEMPERATURE RESISTORS

Meets rigid requirements of MIL-R-11804D, Characteristic P. May be used at full rating at 130° C ambient; at double rating at 25° C ambient. Made by bonding a rugged metallic oxide film into the skin of Corning glass rod at red heat. Extremely stable, impervious to moisture, and unaffected by solder heat or repeated overloads. High temperature-fungus-resistant silicone coating overall. Teflon® stand-off insulating sleeves available. **Voltage Coefficient:** Less than 0.001% per volt. **Temperature Coefficient:** Less than ±0.03% per ° C in −55° C to +235° C range, referred to 25° C. **Load Life:** Less than 0.35% resistance change after 1000 hours operation at rated dissipation. **Noise Level:** 0.1 μV per volt. **Resistance Values:** Standard values per MIL-R-11804-D only. **Standard Tolerance:** ±1% and ±5%. **Size:** .594" lg. x .172" dia., S20; .938" lg. x .297" dia., S25; 2.062" lg. x .297" dia., S30.

**KEL-F® Endcaps for S20 Types**—Net Each ................ **5c**
**KEL-F Endcaps for S25 or S30 Types**—Net Each ........... **10c**

| Corning No. | MIL Type | W | Resistance Range, Ohms | V | Net Each, Lots of 1-49 | 50-99 | 100-249 | 250-499 | 500-999 |
|---|---|---|---|---|---|---|---|---|---|
| S-20 | RD60P | 1 | 10–49 | 350 | $1.02 | $0.93 | $0.72 | $0.68 | $0.51 |
| S-20 | RD60P | 1 | 10–49* | 350 | .96 | .88 | .68 | .64 | .48 |
| S-20 | RD60P | 1 | 50–500K | 350 | .72 | .66 | .51 | .48 | .36 |
| S-20 | RD60P | 1 | 50–500K* | 350 | .69 | .63 | .49 | .46 | .34 |
| S-25 | RD65P | 2 | 10–99.9 | 500 | 1.05 | .96 | .74 | .70 | .52 |
| S-25 | RD65P | 2 | 10–99.9* | 500 | 1.02 | .93 | .72 | .68 | .51 |
| S-25 | RD65P | 2 | 100–40K | 500 | .75 | .69 | .53 | .50 | .37 |
| S-25 | RD65P | 2 | 100–40K* | 500 | .72 | .66 | .51 | .48 | .36 |
| S-25 | RD65P | 2 | 40K–1.5 meg | 500 | .87 | .80 | .62 | .58 | .43 |
| S-25 | RD65P | 2 | 40K–1.5 meg* | 500 | .84 | .77 | .59 | .56 | .42 |
| S-30 | RD70P | 4 | 30–199.9 | 750 | 1.23 | 1.12 | .87 | .82 | .61 |
| S-30 | RD70P | 4 | 30–199.9* | 750 | 1.14 | 1.04 | .80 | .76 | .57 |
| S-30 | RD70P | 4 | 200–100K | 750 | .87 | .80 | .62 | .58 | .43 |
| S-30 | RD70P | 4 | 200–100K* | 750 | .81 | .74 | .57 | .54 | .40 |
| S-30 | RD70P | 4 | 100K–4.2 meg | 750 | 1.05 | .96 | .74 | .70 | .52 |
| S-30 | RD70P | 4 | 100K–4.2 meg* | 750 | .99 | .91 | .70 | .66 | .49 |

*Tolerance ±5%; others ±1%; ±2% prices upon request.
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