



# HVAC-R and CO<sub>2</sub> Refrigeration Fittings

What's the difference?

## Materials

While refrigeration copper fittings typically are made of C12200 copper, CO<sub>2</sub> refrigeration copper fittings are made out of C19400 alloy, which offers superior properties when high pressure systems are considered.

### C1220 Copper

| %       | ELEMENTS |        |
|---------|----------|--------|
|         | Cu       | P      |
| Minimum | 99.9%    | 0.015% |
| Maximum | -        | 0.040% |

### C19400 Copper

| %       | ELEMENTS |       |       |      |        |
|---------|----------|-------|-------|------|--------|
|         | Cu       | Pb    | Zn    | Fe   | P      |
| Minimum | 97.0%    | -     | 0.05% | 2.1% | 0.015% |
| Maximum | -        | 0.03% | 0.20% | 2.6% | 0.15%  |

## Pressure Ratings

Refrigeration copper fittings have varying pressure limits contingent on size, whereas CO<sub>2</sub> fittings consistently withstand pressures up to 130 BAR, reflecting the heightened demands of CO<sub>2</sub> Refrigeration systems.

| SIZE (IN) | NDL PAC COPPER FITTINGS               |      | NDL ACR COPPER FITTINGS |      | NDL CO <sub>2</sub> COPPER FITTINGS |     |
|-----------|---------------------------------------|------|-------------------------|------|-------------------------------------|-----|
|           | PSI                                   | BAR  | PSI                     | BAR  | PSI                                 | BAR |
| 1/4"      | 725                                   | 50.2 | 1000                    | 68.9 | 1885                                | 130 |
| 3/8"      | 725                                   | 50.2 | 1000                    | 68.9 | 1885                                | 130 |
| 1/2"      | 620                                   | 42.9 | 1000                    | 68.9 | 1885                                | 130 |
| 5/8"      | 575                                   | 39.8 | 1000                    | 68.9 | 1885                                | 130 |
| 3/4"      | 505                                   | 34.8 | 1000                    | 68.9 | 1885                                | 130 |
| 7/8"      | 465                                   | 32.1 | 900                     | 62   | 1885                                | 130 |
| 1-1/8"    | 395                                   | 27.2 | 700                     | 48.2 | 1885                                | 130 |
| 1-3/8"    | 350                                   | 24.2 | 700                     | 48.2 | 1885                                | 130 |
| 1-5/8"    | 325                                   | 22.5 | 700                     | 48.2 | 1885                                | 130 |
| 2-1/8"    | 290                                   | 20   | 700                     | 48.2 | 1885                                | 130 |
| 2-5/8"    | 265                                   | 18.5 | 700                     | 48.2 | -                                   | -   |
| 2-5/8"+   | Above 2-5/8" according to ASME B16.22 |      |                         |      | -                                   | -   |

## Size Range

Refrigeration copper fittings are available in larger diameters, catering to applications exceeding 4 inches, whereas CO<sub>2</sub> copper fittings are typically limited to sizes up to 2-1/8 inches, aligning with the CO<sub>2</sub> refrigeration tubes.

## Brazing Process

The brazing process for both ACR copper fittings and CO<sub>2</sub> refrigeration copper fittings is the same. It is recommended for the brazing alloy to contain at least 2% silver. When brazing either of the copper alloys to brass, a silver content above 44% is recommended.

