

# Cast Products Chemical Composition

| Copper Alloy<br>UNS No. | Product Description   | Cu%                      | Pb%       | Sn%        | Zn%         | Fe%       | P%                | Ni%               | Al%       | Co% | Bi%                    | Mn%       | S%   | Sb%  | Si%   | Se%                    |
|-------------------------|-----------------------|--------------------------|-----------|------------|-------------|-----------|-------------------|-------------------|-----------|-----|------------------------|-----------|------|------|-------|------------------------|
| C83600                  | Leaded Red Brass      | 84.00-86.00 <sup>1</sup> | 4.00-6.00 | 4.00-6.00  | 4.00-6.00   | 0.30      | 0.05 <sup>2</sup> | 1.00 <sup>3</sup> | 0.005     |     |                        |           | 0.08 | 0.25 | 0.005 |                        |
| C83800                  | Leaded Red Brass      | 82.00-83.80 <sup>1</sup> | 5.00-7.00 | 3.30-4.20  | 5.00-8.00   | 0.30      | 0.03 <sup>2</sup> | 1.00 <sup>3</sup> | 0.005     |     |                        |           | 0.08 | 0.25 | 0.005 |                        |
| C84200                  | Leaded Semi-Red Brass | 78.00-82.00 <sup>1</sup> | 2.00-3.00 | 4.00-6.00  | 10.00-16.00 | 0.40      | 0.05 <sup>2</sup> | 0.80 <sup>3</sup> | 0.005     |     |                        |           | 0.08 | 0.25 | 0.005 |                        |
| C84400                  | Leaded Semi-Red Brass | 78.00-82.00 <sup>1</sup> | 6.00-8.00 | 2.30-3.50  | 7.00-10.00  | 0.40      | 0.02 <sup>2</sup> | 1.00 <sup>3</sup> | 0.005     |     |                        |           | 0.08 | 0.25 | 0.005 |                        |
| C84800                  | Leaded Semi-Red Brass | 75.00-77.00 <sup>1</sup> | 5.50-7.00 | 2.00-3.00  | 13.00-17.00 | 0.40      | 0.02 <sup>2</sup> | 1.00 <sup>3</sup> | 0.005     |     |                        |           | 0.08 | 0.25 | 0.005 |                        |
| C85700                  | Leaded Naval Brass    | 58.00-64.00 <sup>1</sup> | 0.80-1.50 | 0.50-1.50  | 32.00-40.00 | 0.70      |                   | 1.00 <sup>3</sup> | 0.80      |     |                        |           |      |      | 0.05  |                        |
| C86200                  | Manganese Bronze      | 60.00-66.00 <sup>1</sup> | 0.20      | 0.20       | 22.00-28.00 | 2.00-4.00 |                   | 1.00 <sup>3</sup> | 3.00-4.90 |     |                        | 2.50-5.00 |      |      |       |                        |
| C86300                  | Manganese Bronze      | 60.00-66.00 <sup>1</sup> | 0.20      | 0.20       | 22.00-28.00 | 2.00-4.00 |                   | 1.00 <sup>3</sup> | 5.00-7.50 |     |                        | 2.50-5.00 |      |      |       |                        |
| C86400                  | Manganese Bronze      | 56.00-62.00 <sup>1</sup> | 0.50-1.50 | 0.50-1.50  | 34.00-42.00 | 0.40-2.00 |                   | 1.00 <sup>3</sup> | 0.50-1.50 |     |                        | 0.10-1.50 |      |      |       |                        |
| C86500                  | Manganese Bronze      | 55.00-60.00 <sup>1</sup> | 0.40      | 1.00       | 36.00-42.00 | 0.40-2.00 |                   | 1.00 <sup>3</sup> | 0.50-1.50 |     |                        | 0.10-1.50 |      |      |       |                        |
| C86700                  | Manganese Bronze      | 55.00-60.00 <sup>1</sup> | 0.50-1.50 | 1.50       | 30.00-38.00 | 1.00-3.00 |                   | 1.00 <sup>3</sup> | 1.00-3.00 |     |                        | 0.10-3.50 |      |      |       |                        |
| C89320                  | Bismuth Tin Bronze    | 87.00-91.00              | 0.09      | 5.00-7.00  | 1.00        | 0.20      | 0.30              | 1.00 <sup>3</sup> | 0.005     |     | 4.00-6.00              |           | 0.08 | 0.35 | 0.005 |                        |
| C89325                  | Bismuth Tin Bronze    | 84.00-88.00              | 0.10      | 9.00-11.00 | 1.00        | 0.15      | 0.10              | 1.00 <sup>3</sup> | 0.005     |     | 2.70-3.70              |           | 0.08 | 0.50 | 0.005 |                        |
| C89520                  | Bismuth Tin Bronze    | 85.00-87.00              | 0.09      | 5.00-6.00  | 4.00-6.00   | 0.20      |                   | 1.00 <sup>3</sup> | 0.005     |     | 1.60-2.20 <sup>4</sup> |           | 0.08 | 0.25 |       | 0.80-1.10 <sup>4</sup> |
| C89831                  | Bismuth Tin Bronze    | 87.00-91.00              | 0.10      | 2.70-3.70  | 2.00-4.00   | 0.30      | 0.05              | 1.00 <sup>3</sup> | 0.005     |     | 2.70-3.70              |           | 0.08 | 0.25 | 0.005 |                        |
| C89833                  | Bismuth Tin Bronze    | 86.00-91.00              | 0.09      | 4.00-6.00  | 2.00-6.00   | 0.30      | 0.05              | 1.00 <sup>3</sup> | 0.005     |     | 1.70-2.70              |           | 0.08 | 0.25 | 0.005 |                        |

<sup>1</sup>In determining Cu min., Cu may be calculated as Cu + Ni.    <sup>2</sup>For continuous castings, P shall be 1.5%, max.    <sup>3</sup>Ni value includes Co.    <sup>4</sup>Bi:Se >= 2:1  
 Note: Unless otherwise noted, single values represent maximums.

## Cast Products Chemical Composition (continued)

| Copper Alloy<br>UNS No. | Product Description    | Cu%                      | Pb%       | Sn%         | Zn%        | Fe%  | P%                     | Ni%                    | Al%   | Co% | Bi%       | Mn% | S%   | Sb%  | Si%   | Se% |
|-------------------------|------------------------|--------------------------|-----------|-------------|------------|------|------------------------|------------------------|-------|-----|-----------|-----|------|------|-------|-----|
| C89835                  | Bismuth Tin Bronze     | 85.00-89.00              | 0.09      | 6.00-7.50   | 2.00-4.00  | 0.20 | 0.10                   | 1.00 <sup>3</sup>      | 0.005 |     | 1.70-2.70 |     | 0.08 | 0.35 | 0.005 |     |
| C89844                  | Tin Bronze             | 83.00-86.00              | 0.20      | 3.00-5.00   | 7.00-10.00 | 0.30 | 0.05                   | 1.00 <sup>3</sup>      | 0.005 |     | 2.00-4.00 |     | 0.08 | 0.25 | 0.005 |     |
| C90300                  | Tin Bronze             | 86.00-89.00 <sup>1</sup> | 0.30      | 7.50-9.00   | 3.00-5.00  | 0.20 | 0.05 <sup>2</sup>      | 1.00 <sup>3</sup>      | 0.005 |     |           |     | 0.05 | 0.20 | 0.005 |     |
| C90500                  | Tin Bronze             | 86.00-89.00 <sup>1</sup> | 0.30      | 9.00-11.00  | 1.00-3.00  | 0.20 | 0.30 <sup>2</sup>      | 1.00 <sup>3</sup>      | 0.005 |     |           |     | 0.05 | 0.20 | 0.005 |     |
| C90700                  | Tin Bronze             | 88.00-90.00 <sup>1</sup> | 0.50      | 10.00-12.00 | 0.50       | 0.15 | 0.30 <sup>2</sup>      | 0.50 <sup>3</sup>      | 0.005 |     |           |     | 0.05 | 0.20 | 0.005 |     |
| C90800                  | Tin Bronze             | 85.00-89.00 <sup>1</sup> | 0.25      | 11.00-13.00 | 0.25       | 0.15 | 0.30 <sup>2</sup>      | 0.50 <sup>3</sup>      | 0.005 |     |           |     | 0.05 | 0.20 | 0.005 |     |
| C90810                  | High Tin Bronze        | Rem. <sup>1</sup>        | 0.25      | 11.00-13.00 | 0.30       | 0.15 | 0.15-0.80 <sup>2</sup> | 0.50 <sup>3</sup>      | 0.005 |     |           |     | 0.05 | 0.20 | 0.005 |     |
| C91000                  | Tin Bronze             | 84.00-86.00 <sup>1</sup> | 0.20      | 14.00-16.00 | 1.50       | 0.10 | 0.05 <sup>2</sup>      | 0.80 <sup>3</sup>      | 0.005 |     |           |     | 0.05 | 0.20 | 0.005 |     |
| C91100                  | High Tin Bronze        | 82.00-85.00 <sup>1</sup> | 0.25      | 15.00-17.00 | 0.25       | 0.25 | 1.00 <sup>2</sup>      | 0.50 <sup>3</sup>      | 0.005 |     |           |     | 0.05 | 0.20 | 0.005 |     |
| C91300                  | Tin Bronze             | 79.00-82.00 <sup>1</sup> | 0.25      | 18.00-20.00 | 0.25       | 0.25 | 1.00 <sup>2</sup>      | 0.50 <sup>3</sup>      | 0.005 |     |           |     | 0.05 | 0.20 | 0.005 |     |
| C91600                  | High Tin Bronze        | 86.00-89.00 <sup>1</sup> | 0.25      | 9.70-10.80  | 0.25       | 0.20 | 0.30 <sup>2</sup>      | 1.20-2.00 <sup>3</sup> | 0.005 |     |           |     | 0.05 | 0.20 | 0.005 |     |
| C91700                  | High Tin Bronze        | 84.00-87.00 <sup>1</sup> | 0.25      | 11.30-12.50 | 0.25       | 0.20 | 0.30 <sup>2</sup>      | 1.20-2.00 <sup>3</sup> | 0.005 |     |           |     | 0.05 | 0.20 | 0.005 |     |
| C92200                  | Leaded Tin Bronze      | 86.00-90.00 <sup>1</sup> | 1.00-2.00 | 5.50-6.50   | 3.00-5.00  | 0.25 | 0.05 <sup>2</sup>      | 1.00 <sup>3</sup>      | 0.005 |     |           |     | 0.05 | 0.25 | 0.005 |     |
| C92300                  | Leaded Tin Bronze      | 85.00-89.00 <sup>1</sup> | 0.30-1.00 | 7.50-9.00   | 2.50-5.00  | 0.25 | 0.05 <sup>2</sup>      | 1.00 <sup>3</sup>      | 0.005 |     |           |     | 0.05 | 0.25 | 0.005 |     |
| C92500                  | Nickel-Phosphor Bronze | 85.00-88.00 <sup>1</sup> | 1.00-1.50 | 10.00-12.00 | 0.50       | 0.30 | 0.30 <sup>2</sup>      | 0.80-1.50 <sup>3</sup> | 0.005 |     |           |     | 0.05 | 0.25 | 0.005 |     |
| C92700                  | Leaded Tin Bronze      | 86.00-89.00 <sup>1</sup> | 1.00-2.50 | 9.00-11.00  | 0.70       | 0.20 | 0.25 <sup>2</sup>      | 1.00 <sup>3</sup>      | 0.005 |     |           |     | 0.05 | 0.25 | 0.005 |     |
| C92800                  | Leaded Tin Bronze      | 78.00-82.00 <sup>1</sup> | 4.00-6.00 | 15.00-17.00 | 0.80       | 0.20 | 0.05 <sup>2</sup>      | 0.80 <sup>3</sup>      | 0.005 |     |           |     | 0.05 | 0.25 | 0.005 |     |

<sup>1</sup>In determining Cu min., Cu may be calculated as Cu + Ni.  
Note: Single values represent maximums.

<sup>2</sup>For continuous castings, P shall be 1.5%, max.

<sup>3</sup>Ni value includes Co.

## Cast Products Chemical Composition (continued)

| Copper Alloy UNS No. | Product Description      | Cu%                      | Pb%               | Sn%         | Zn%       | Fe%               | P%                | Ni%                    | Al%        | Co% | Bi% | Mn%  | S%                | Sb%  | Si%   | Se% |
|----------------------|--------------------------|--------------------------|-------------------|-------------|-----------|-------------------|-------------------|------------------------|------------|-----|-----|------|-------------------|------|-------|-----|
| C92900               | Leaded Nickel-Tin Bronze | 82.00-86.00 <sup>1</sup> | 2.00-3.20         | 9.00-11.00  | 0.25      | 0.20              | 0.50 <sup>4</sup> | 2.80-4.00 <sup>5</sup> | 0.005      |     |     |      | 0.05              | 0.25 | 0.005 |     |
| C93200               | Leaded Tin Bronze        | 81.00-85.00 <sup>1</sup> | 6.00-8.00         | 6.30-7.50   | 1.00-4.00 | 0.20              | 0.15 <sup>4</sup> | 1.00 <sup>5</sup>      | 0.005      |     |     |      | 0.08              | 0.35 | 0.005 |     |
| C93400               | High-Leaded Tin Bronze   | 82.00-85.00 <sup>1</sup> | 7.00-9.00         | 7.00-9.00   | 0.80      | 0.20              | 0.50 <sup>4</sup> | 1.00 <sup>5</sup>      | 0.005      |     |     |      | 0.08              | 0.50 | 0.005 |     |
| C93500               | High-Leaded Tin Bronze   | 83.00-86.00 <sup>1</sup> | 8.00-10.00        | 4.30-6.00   | 2.00      | 0.20              | 0.05 <sup>4</sup> | 1.00 <sup>5</sup>      | 0.005      |     |     |      | 0.08              | 0.30 | 0.005 |     |
| C93600               | High-Leaded Tin Bronze   | 79.00-83.00              | 11.00-13.00       | 6.00-8.00   | 1.00      | 0.20              | 0.15 <sup>4</sup> | 1.00 <sup>5</sup>      | 0.005      |     |     |      | 0.08              | 0.55 | 0.005 |     |
| C93700               | High-Leaded Tin Bronze   | 78.00-82.00              | 8.00-11.00        | 9.00-11.00  | 0.80      | 0.70 <sup>3</sup> | 0.10 <sup>4</sup> | 0.50 <sup>5</sup>      | 0.005      |     |     |      | 0.08              | 0.50 | 0.005 |     |
| C93800               | High-Leaded Tin Bronze   | 75.00-79.00              | 13.00-16.00       | 6.30-7.50   | 0.80      | 0.15              | 0.05 <sup>4</sup> | 1.00 <sup>5</sup>      | 0.005      |     |     |      | 0.08              | 0.80 | 0.005 |     |
| C93900               | High-Leaded Tin Bronze   | 76.50-79.50              | 14.00-18.00       | 5.00-7.00   | 1.50      | 0.40              | 1.50 <sup>4</sup> | 0.80 <sup>5</sup>      | 0.005      |     |     |      | 0.08              | 0.50 | 0.005 |     |
| C94000               | High-Leaded Tin Bronze   | 69.00-72.00              | 14.00-16.00       | 12.00-14.00 | 0.50      | 0.25              | 0.05 <sup>4</sup> | 0.50-1.00 <sup>5</sup> | 0.005      |     |     |      | 0.08 <sup>6</sup> | 0.50 | 0.005 |     |
| C94100               | High-Leaded Tin Bronze   | 72.00-79.00              | 18.00-22.00       | 4.50-6.50   | 1.00      | 0.25              | 0.50 <sup>4</sup> | 1.00 <sup>5</sup>      | 0.005      |     |     |      | 0.08 <sup>6</sup> | 0.80 | 0.005 |     |
| C94300               | High-Leaded Tin Bronze   | 67.00-72.00              | 23.00-27.00       | 4.50-6.00   | 0.80      | 0.15              | 0.08 <sup>4</sup> | 1.00 <sup>5</sup>      | 0.005      |     |     |      | 0.08              | 0.80 | 0.005 |     |
| C94700               | Nickel-Tin Bronze        | 85.00-90.00              | 0.09 <sup>2</sup> | 4.50-6.00   | 1.00-2.50 | 0.25              | 0.05              | 4.50-6.00 <sup>5</sup> | 0.005      |     |     | 0.20 | 0.05              | 0.15 | 0.005 |     |
| C94700HT             | Nickel-Tin Bronze        | 85.00-90.00              | 0.09 <sup>2</sup> | 4.50-6.00   | 1.00-2.50 | 0.25              | 0.05              | 4.50-6.00 <sup>5</sup> | 0.005      |     |     | 0.20 | 0.05              | 0.15 | 0.005 |     |
| C94800               | Leaded Nickel-Tin Bronze | 84.00-89.00              | 0.30-1.00         | 4.50-6.00   | 1.00-2.50 | 0.25              | 0.05              | 4.50-6.00 <sup>5</sup> | 0.005      |     |     | 0.20 | 0.05              | 0.15 | 0.005 |     |
| C95200               | Aluminum Bronze          | 86.00 min                |                   |             |           | 2.50-4.00         |                   |                        | 8.50-9.50  |     |     |      |                   |      |       |     |
| C95300               | Aluminum Bronze          | 86.00 min                |                   |             |           | 0.80-1.50         |                   |                        | 9.00-11.00 |     |     |      |                   |      |       |     |
| C95300HT             | Aluminum Bronze          | 86.00 min                |                   |             |           | 0.80-1.50         |                   |                        | 9.00-11.00 |     |     |      |                   |      |       |     |

<sup>1</sup>In determining Cu min., Cu may be calculated as Cu + Ni. <sup>2</sup>The mechanical properties of C94700 (heat treated) may not be attainable if the Pb content exceeds 0.01%. <sup>3</sup>Fe shall be 0.35% max., when used for steel-backed bearings.

<sup>4</sup>For continuous castings, P shall be 1.5%, max. <sup>5</sup>Ni value includes Co. <sup>6</sup>For continuous castings S shall be 0.25% max.

Note: Unless otherwise noted, single values represent maximums.

## Cast Products Chemical Composition (continued)

| Copper Alloy UNS No.  | Product Description    | Cu%         | Pb%        | Sn%       | Zn%         | Fe%                    | P%   | Ni%                      | Al%         | Co%  | Bi% | Mn%       | S%   | Sb%  | Si%       | Se% |
|-----------------------|------------------------|-------------|------------|-----------|-------------|------------------------|------|--------------------------|-------------|------|-----|-----------|------|------|-----------|-----|
| C95400                | Aluminum Bronze        | 83.00 min   |            |           |             | 3.00-5.00              |      | 1.50 <sup>3</sup>        | 10.00-11.50 |      |     | 0.50      |      |      |           |     |
| C95400HT              | Aluminum Bronze        | 83.00 min   |            |           |             | 3.00-5.00              |      | 1.50 <sup>3</sup>        | 10.00-11.50 |      |     | 0.50      |      |      |           |     |
| C95410                | Aluminum Bronze        | 83.00 min   |            |           |             | 3.00-5.00              |      | 1.50-2.50 <sup>3</sup>   | 10.00-11.50 |      |     | 0.50      |      |      |           |     |
| C95410HT              | Aluminum Bronze        | 83.00 min   |            |           |             | 3.00-5.00              |      | 1.50-2.50 <sup>3</sup>   | 10.00-11.50 |      |     | 0.50      |      |      |           |     |
| C95500                | Nickel Aluminum Bronze | 78.00 min   |            |           |             | 3.00-5.00              |      | 3.00-5.50 <sup>3</sup>   | 10.00-11.50 |      |     | 3.50      |      |      |           |     |
| C95500HT              | Nickel Aluminum Bronze | 78.00 min   |            |           |             | 3.00-5.00              |      | 3.00-5.50 <sup>3</sup>   | 10.00-11.50 |      |     | 3.50      |      |      |           |     |
| AMS 4880-C95510       | Nickel Aluminum Bronze | 78.00 min   |            | 0.20      | 0.30        | 2.00-3.50              |      | 4.50-5.50 <sup>3</sup>   | 9.70-10.90  |      |     | 1.50      |      |      |           |     |
| C95520HT <sup>a</sup> | Nickel Aluminum Bronze | 74.50 min   | 0.03       | 0.25      | 0.30        | 4.00-5.50              |      | 4.20-6.00 <sup>3</sup>   | 10.50-11.50 | 0.20 |     | 1.50      |      |      | 0.15      |     |
| C95600                | Nickel Aluminum Bronze | 88.00 min   |            |           |             |                        |      | 0.25 <sup>3</sup>        | 6.00-8.00   |      |     |           |      |      | 1.80-3.20 |     |
| C95800                | Nickel Aluminum Bronze | 79.00 min   | 0.03       |           |             | 3.50-4.50 <sup>2</sup> |      | 4.00-5.00 <sup>2</sup>   | 8.50-9.50   |      |     | 0.80-1.50 |      |      | 0.10      |     |
| C95900                | Aluminum Bronze        | Rem.        |            |           |             | 3.00-5.00              |      | 0.50 <sup>3</sup>        | 12.00-13.50 |      |     | 1.50      |      |      |           |     |
| CONCAST380            | Aluminum Bronze        | Rem.        |            |           |             | 4.50-6.50              |      |                          | 14.00-16.00 | 2.50 |     | 3.25      |      |      |           |     |
| C96400 <sup>b</sup>   | Copper-Nickel          | Rem.        | 0.01       |           |             | 0.25-1.50              | 0.02 | 28.00-32.00 <sup>3</sup> |             |      |     | 1.50      | 0.02 |      | 0.50      |     |
| C96900HT <sup>c</sup> | Nickel Tin Bronze      | Rem.        | 0.02       | 7.50-8.50 | 0.50        | 0.50                   |      | 14.50-15.50 <sup>3</sup> |             |      |     | 0.05-0.30 |      |      |           |     |
| C97300                | Nickel Silver Bronze   | 53.00-58.00 | 8.00-11.00 | 1.50-3.00 | 17.00-25.00 | 1.50                   | 0.05 | 11.00-14.00 <sup>3</sup> | 0.005       |      |     | 0.50      | 0.08 | 0.35 | 0.15      |     |
| C97600                | Nickel Silver Bronze   | 63.00-67.00 | 3.00-5.00  | 3.50-4.50 | 3.00-9.00   | 1.50                   | 0.05 | 19.00-21.50 <sup>3</sup> | 0.005       |      |     | 1.00      | 0.08 | 0.25 | 0.15      |     |
| C97800                | Nickel Silver Bronze   | 64.00-67.00 | 1.00-2.50  | 4.00-5.50 | 1.00-4.00   | 1.50                   | 0.05 | 24.00-27.00 <sup>3</sup> | 0.005       |      |     | 1.00      | 0.08 | 0.20 | 0.15      |     |
| C99500                | Special Alloy          | Rem.        | 0.09       |           | 0.50-2.00   | 3.00-5.00              |      | 3.50-5.50                | 0.50-2.00   |      |     | 0.50      |      |      | 0.50-2.00 |     |

<sup>1</sup>In determining Cu min., Cu may be calculated as Cu + Ni.    <sup>2</sup>Fe content shall not exceed Ni content.    <sup>3</sup>Ni value includes Co.

<sup>a</sup>Chemical requirements for other elements: Cr 0.05%, max.

<sup>b</sup>Chemical requirements for other elements: C 0.15%, max and Nb 0.50-1.5%.

<sup>c</sup>Chemical requirements for other elements: Mg 0.15%, max and Nb 0.10%, max.

Note: Unless otherwise noted, single values represent maximums.