



MATERIAL CERTIFICATION

Customer: Defense Logistics Agency
 Defense National Stockpile Center
 1745 Jefferson Davis Highway, Suite 100,
 Crystal Square 1, Arlington, VA 22202

Date: May 20, 1991
 S.O.#: EMG006
 P.O.#: DLA-300-90-C-0032
 Specification: P-100A, Rev. R1

Material Description:

Item 1 - Lot No. 4737 - One (1) Beryllium Billet, Grade A.
 Net Weight: 2871.0 lbs.
 Gross Weight: 3336.5 lbs. *K 168*

| CHEMICAL COMPOSITION: (WT. %) | | | | | MECHANICAL PROPERTIES | | | | | | | | | | | | | | |
|-------------------------------|----------|-----------|--------------|--------|---|-----------|-----------|---|----------|-------|--|------|------|-----|------|----|------|------|----|
| Element | Top 4737 | Bot. 4737 | Date of Test | Direct | Y.P. D48 | FTU (Ksi) | FTY (Ksi) | % EL | Yld./Ult | Temp. | | | | | | | | | |
| Be | 99.2 | 99.2 | | Top: | | | | | | | | | | | | | | | |
| BeO | .7 | .8 | 4/23/91 | Long. | 33.0 | 48.7 | 32.4 | 3.2 | .68 | Room | | | | | | | | | |
| Fe | .09 | .09 | " | Long. | 33.4 | 49.2 | 32.7 | 3.6 | .68 | " | | | | | | | | | |
| C | .07 | .07 | " | Trans. | 34.2 | 53.0 | 32.8 | 5.6 | .64 | " | | | | | | | | | |
| Al | .03 | .03 | " | Trans. | 35.6 | 54.0 | 34.2 | 6.5 | .66 | " | | | | | | | | | |
| Mg | .02 | .02 | " | Trans. | 12.3 | 16.2 | 11.8 | 21.0 | .76 | 1200° | | | | | | | | | |
| Si | .02 | .02 | | | | | | | | | | | | | | | | | |
| Mn | <.01 | <.01 | | Bot.: | | | | | | | | | | | | | | | |
| Cr | <.01 | <.01 | 4/23/91 | Long. | 33.0 | 49.1 | 32.7 | 3.1 | .67 | Room | | | | | | | | | |
| Ni | <.01 | <.01 | " | Long. | None | 49.7 | 32.6 | 3.4 | .66 | " | | | | | | | | | |
| Ti | .02 | .02 | " | Trans. | 33.5 | 53.9 | 32.5 | 7.1 | .62 | " | | | | | | | | | |
| Cu | <.01 | <.01 | " | Trans. | 36.5 | 55.3 | 34.9 | 7.5 | .66 | " | | | | | | | | | |
| S | <.01 | <.01 | " | Trans. | None | 17.1 | 12.1 | 23.0 | .71 | 1200° | | | | | | | | | |
| U | <.01 | <.01 | | | | | | | | | | | | | | | | | |
| | | | | | DENSITY gm/cc: | | | AVG GRAIN SIZE: (Microns) | | | | | | | | | | | |
| | | | | | 99.98 % Theoretical | | | <table border="1"> <tr> <td></td> <td>Avg.</td> <td>Max.</td> </tr> <tr> <td>Top</td> <td>11.6</td> <td>43</td> </tr> <tr> <td>Bot.</td> <td>11.4</td> <td>47</td> </tr> </table> | | | | Avg. | Max. | Top | 11.6 | 43 | Bot. | 11.4 | 47 |
| | Avg. | Max. | | | | | | | | | | | | | | | | | |
| Top | 11.6 | 43 | | | | | | | | | | | | | | | | | |
| Bot. | 11.4 | 47 | | | | | | | | | | | | | | | | | |
| | | | | | RADIOGRAPHIC INSP. PER | | | PENETRANT INSP. PER | | | | | | | | | | | |
| | | | | | P110A, R1 | | | P110A, R1 & MIL-STD-6866 | | | | | | | | | | | |
| | | | | | ADDITIONAL INFORMATION: | | | | | | | | | | | | | | |
| Batch No. | | | | | Ultrasonic inspection per P110A, R1. | | | | | | | | | | | | | | |
| (Metallic) Other Elem. ea. | | | | | X-ray No. H-4673 | | | | | | | | | | | | | | |
| Others Total | | | | | <i>DLA/DUS 2</i> <i>Wm J. Tiel, QAS</i> <i>22 MAY 91</i> | | | | | | | | | | | | | | |

This is to certify that the above material satisfies the requirements of Specification see above

Drawing _____ Purchase Order see above and was removed from Pressing No. 4737

K 168

R.P. Garner

BRUSHWELLMAN INC. R. P. Garner
QUALITY CONTROL