Y-12

OAK RIDGE Y-12 PLANT

MARTIN MARIETTA

Y-12 DEVELOPMENT ORGANIZATION TECHNICAL PROGRESS REPORT

Part 9 - Summaries (U)

Period Ending May 1, 1995

RECEIVED
DEC 19 1995
OSTI

MANAGED BY
MARTIN MARIETTA ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED *JK*

MASTER

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

**Y-12 DEVELOPMENT ORGANIZATION
TECHNICAL PROGRESS REPORT**

Part 9 - Summaries (U)

Compiled by
W. D. Babb

Period Ending May 1, 1995

Prepared by the
Oak Ridge Y-12 Plant
P.O. Box 2009, Oak Ridge, Tennessee 37831-8169
managed by
LOCKHEED MARTIN ENERGY SYSTEMS, INC.
for the
U.S. DEPARTMENT OF ENERGY
under contract DE-AC05-84OR21400

Organization Chart

JUNE 1995

- AA AFFIRMATIVE ACTION
¹ PART-TIME
² DUAL CAPACITY
³ LOAN TO ANOTHER DIVISION
⁴ ACTING
⁵ LOAN FROM ANOTHER DIVISION
⁶ COORDINATOR
⁷ AUTHORIZED DERIVATIVE CLASSIFIER (ADC)

CONTENTS

MATERIALS ENGINEERING - PART 3	5
NICKEL-ALUMINUM-BRONZE CASTING FEASIBILITY STUDY	5
CERAMIC/PLASTICS/CARBON MATERIALS DEVELOPMENT - PART 5	5
NONGRAPHITE	5
MICROWAVE HEATING OF MATERIALS	5

.

2

-

.

5

MATERIALS ENGINEERING - PART 3

NICKEL-ALUMINUM-BRONZE CASTING FEASIBILITY STUDY

A. L. DeMint and A. W. Maxey

In an effort to integrate vertically the manufacturing processes at the Oak Ridge Centers for Manufacturing Technology and at the same time obtain higher-quality nickel-aluminum-bronze castings more quickly than outside sources were providing, a development program was started, addressing the problems of casting these types of components. Several small demonstration castings were made under vacuum and in graphite to assess the quality achievable by using this system. Results were promising enough that the system will be scaled up to produce larger castings in the near future.

CERAMIC/PLASTICS/CARBON MATERIALS DEVELOPMENT - PART 5

NONGRAPHITE

C. E. Holcombe, Jr., and M. S. Morrow

A special lifting fixture for the one-piece TRIBOCOR crucible (to be evaluated for intermediate-scale-Production runs) is now being made. The two-piece TRIBOCOR crucible of the same size was re-examined and considered to be usable if a new bottom section can be made.

The preparation of small-scale-Production crucibles by plasma spraying of TRIBOCOR onto niobium is continuing. Microwave heat treatment of this size crucible has been demonstrated successfully. Conventional plasma-spray coating appears to offer advantages over "vacuum" plasma spraying for preparing the coatings.

MICROWAVE HEATING OF MATERIALS

C. E. Holcombe, Jr., and M. S. Morrow

Encapsulant/stucco "shells" for "casketing" boron carbide (B_4C) or silicon carbide (SiC) results in consistent attainment of the necessary $\geq 2100^\circ C$ processing temperatures for these nonoxide materials. Gelcasting is an excellent technique for making shapes with both B_4C and SiC . Tiles of B_4C were prepared and will be microwave sintered soon.

Microwave heat treatment/nitridation of plasma-sprayed TRIBOCOR layers onto niobium and stainless steel coupons continues to look very promising for producing high-density, titanium nitride surface layers.

METRIC CONVERSIONS

Distribution**Allied Signal - Kansas City Division**

Hofmann, J. W.

Stoltz, D. L.

Department of Energy - Albuquerque

Nonnuclear Technology Branch, WQD

Nuclear Technology Branch, WQD

Department of Energy - Oak Ridge

Carpenter, P. A.

Edlund, R. A.

Spence, R. J.

EG&G - Mound Applied Technologies

Records Management

EG&G - Rocky Flats Plant

Manager, Document Control-CCDM

Lawrence Livermore National Laboratory

Clough, R. E.

Copeland, A. B.

Hanafee, J. E.

Technical Information Division

Vandrisevits, R. A.

Los Alamos National Laboratory

Casey, H.

Gunderson, T. C.

Hanson, E. M.

Hecker, S. S.

Larson, T. E.

Miller, D. G.

Report Library

Shafer, B. P.

Stretz, L. A.

Witt, L. E.

Martin Marietta Specialties Components, Inc.

Taylor, S. L. (Document Control)

Mason & Hanger, Silas-Mason, Pantex

Franklin, K.

Oak Ridge Y-12 Plant

Bowers, G. L.

Gordon, V. E.

Lee, A. K./DOE-OSTI (2)

Northcutt, W. G., Jr.

Post, D. W.

Stout, J. D.

Y-12 Central Files (Y-12RC)

Zava, A. K.

9202 File Point

Sandia National Laboratories - California

Cull, E. T.

Hiles, L. A.

Lindner, D. L.

Technical Library

Sandia National Laboratories - New Mexico

Berardino, A. C.

Hines, W. C.

Lane, T. B.

Edrington, T. S.

Westinghouse - Savannah River Plant

Knight, J. R.