

Ch
reviewed
D. C. Avon
2/4/94

F-302

~~CONFIDENTIAL~~

10065-181

R

SECOND MODIFICATION TO PROJECT AGREEMENT NO. 4

729682

of

APPENDIX B TO SUBCONTRACT 212

between

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA

and

MONSANTO RESEARCH CORPORATION

BEST COPY AVAILABLE

INTRODUCTION

This Second Modification to Project Agreement No. 4 of Appendix B to Subcontract 212 is entered into by and between The Regents of the University of California, hereinafter called "University", and Monsanto Research Corporation, hereinafter called "Subcontractor".

PURPOSE

The purpose of this modification is to increase the level of effort to be performed under Project Agreement No. 4, to extend the term through February 14, 1966, and to increase the estimated cost and fixed fee.

CHANGE

Project Agreement No. 4 of Appendix B to Subcontract 212 is changed by mutual agreement of the parties as follows:

SECTION I - GENERAL SCOPE OF WORK is hereby changed to read:

"As approved and directed by the University's Technical Coordinator, Subcontractor shall devote approximately 10,000 man hours of technical effort on rigid low density foam. In this effort, Subcontractor shall develop and evaluate foam with high compression strengths and rigidity combined with minimum pore size and lightness. The ultimate objective of this effort is to develop foams with specific densities and optimum compressive strengths as well as other properties as specified by the University.

"Work under this Project Agreement is a continuation of work begun under Lawrence Radiation Laboratory Purchase Order 2803005."

CLASSIFICATION CANCELLED OR

CHANGED TO Unclassified

December 10, 1964

BY AUTH. TCG-WM-1 708.8*

BY TS/edw DATE 10-27-95

BY Juanita DATE 10/30/95

1257936

~~RESTRICTED DATA~~

This document contains restricted data defined in the Atomic Energy Act of 1954. Its transmittal or disclosure of its contents in any manner to an unauthorized person is prohibited.

~~CONFIDENTIAL~~

GROUP 1 - Excluded from automatic downgrading and declassification

~~CONFIDENTIAL~~

SECTION II - TECHNICAL SCOPE OF WORK is hereby changed to read:

Task A

"Subcontractor shall perform, on a best efforts basis, an investigation of various applications of polymer systems to develop a rigid foam of low density (0.5 pounds per cubic foot or lower) with the following characteristics:

1. Uniform small cell size (40 - 500 microns).
2. Foams having essentially all open cells.
3. Foams having essentially all closed cells.
4. Good dimensional stability under temperature range of -65°F to 165°F.
5. Machinability to fine tolerances.
6. Toughness (not friable).
7. Maximum compressive strength.
8. Castability (desirable, but not essential. Castability is almost a processing convenience since parts having most density requirements will require machining to remove the skin).
9. Chemically clean composition.

The density requirement of 0.5 pounds per cubic foot should be treated as a rough approximation; lower densities are actually desired. A material of a density range of two to three pounds is also required. This material must also meet the requirements of the one-half pound density material."

Task B

"Efforts to achieve a chemically clean composition in the finished foam shall include but not be limited to strict control of reagents by methods approved by the University Technical Coordinator.

"Foaming methods to be considered shall include:

1. 'Beating-in' of air or gas into a viscous medium followed by curing.
2. Vaporization of a low boiling component(s).
3. CO₂ evolution from chemical decomposition reactions.

December 10, 1964
2nd Mod. to PA 4
MRC - SC 212

- 2 -

1257937

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

4. N₂ evolution from chemical decomposition reactions.
5. Incorporation of hollow spheres in a binder.
6. Incorporation of a solid that can later be distilled, sublimed or washed out of the matrix.
7. Adding low density cells (microballoons, etc.) to a binder system.

"Subcontractor will use a foam making machine to refine formulations proven satisfactory in preliminary screenings. The University will furnish a foam making machine for this purpose."

Upon completion of work under Tasks A and B, or as directed by the University's Technical Coordinator, Subcontractor shall commence work under Task C as specified below:

Task C

1. Subcontractor will prepare chemically pure, small cell size, rigid polymethane foams having densities of 0.008, 0.020 and 0.051 grams/cc with uniform density. The permissible variation in density shall be no greater than $\pm 5\%$ of the nominal specified density.
2. Develop a machine process for making large size single pour castings for each specific density.
3. The optimization of formulations and machine running conditions for use on the American Latex Company Model L-50 Stafoamer and possibly the Mobay Chemical Company Model M Sprayer.
4. Foams developed under this contract shall meet the following requirements:
 - a. Good dimensional stability over the military temperature range of -65°F to 165°F.
 - b. Machinable to a fine tolerance.
 - c. Non-friable.
 - d. Highest compressive strengths while satisfying other requirements.
 - e. As high a thermal conductivity as possible.

December 10, 1964
2nd Mod. to PA 4
MRC - SC 212

- 3 -

~~CONFIDENTIAL~~

1257938

~~CONFIDENTIAL~~

- f. Open cell foams, if possible.
- g. Chemical purity requirements satisfied.

"5. To obtain above objectives Subcontractor shall, when possible, use commercially available materials which can be successfully used at other producing facilities."

SECTION V - SCHEDULE AND DELIVERY is hereby changed to read:

"Research and development work under this Agreement shall commence February 15, 1963 and shall continue for a period of approximately 36 months. All work shall be completed and all reports shall be submitted prior to February 14, 1966."

SECTION VI - TERM, ESTIMATES, FIXED FEE, COSTS AND EXPENSES is hereby changed to read:

"In accordance with ARTICLE II - TERM, ARTICLE III - ESTIMATES AND FIXED FEE, and APPENDIX A - COSTS AND EXPENSES OF SUBCONTRACT 212, the Subcontractor shall be reimbursed in an amount not to exceed ONE HUNDRED TWENTY FOUR THOUSAND THREE HUNDRED NINETY FOUR AND NO/100 DOLLARS (\$124,394.00) which shall include the Subcontractor's fixed fee of NINE THOUSAND TWO HUNDRED NINETY AND NO/100 DOLLARS (\$9,290.00) for services rendered by Subcontractor from February 15, 1963 through February 14, 1966."

ALL OTHER TERMS AND CONDITIONS of Project Agreement No. 4 of Appendix B to Subcontract 212 shall remain in full force and effect except as changed herein.

ACCEPTED

MONSANTO RESEARCH CORPORATION

By *E. J. Baumgart*
 Title Laboratory Director
 Date 29 December 1964

AUTHORIZED

UNIVERSITY OF CALIFORNIA
 LAWRENCE RADIATION LABORATORY

By *W. B. Reynolds*
 Title Business Manager
 Date JAN 7 - 1965
 Lawrence Radiation Laboratory

APPROVED

U. S. ATOMIC ENERGY COMMISSION

By *P. M. Goodbread*
 Title Manager for Administration
San Francisco Operations Office
 Date JAN 26 1965

1251939

December 10, 1964
 2nd Mod. to PA 4
 MRC - SC 212

~~CONFIDENTIAL~~

~~RESTRICTED DATA~~
 This document contains restricted data as defined in the Atomic Energy Act of 1954. Its transmittal or disclosure of its contents in any manner to an unauthorized person is prohibited.
 GROUP 1 - Excluded from automatic downgrading and declassification