---------INTERNAL DIST BUTION ONLY---------

F3C1

REQUESTER	BLDG. & R	DELIVER TO: BLDG., ROOM	N FY	EXTENSION	HOLD FOR
BATZEL	L-436	L.PECK L-421	L.PECK	7650	

APPROVED BY	ACCOUNT NO.	AMOUNT OF P.O		STAT CODE	REQ. NO
BATZEL	SEE BELOW	40622.00	00000	820321	5730-19

729639

QUESTIONS: PLEASE CONTACT BUYER

BUYER	CODE	ORDER NO.	SELLER CODE	DATE	
F.G.HERAS	562	4714103	00000	10/05/65	LH

FROM RECEIPT OF GOODS OR INVOICE WHICHEVER IS LATER.

1. ½%-10 DAYS 5. 2%-10 DAYS
2. 1%-10 DAYS 6. 2%-30 DAYS
3. 1%-30 DAYS 7. NET 30 DAYS
4. 2%-10TH PROX. 8. AS SHOWN

RATED ORDER	CERT. UNDER D.M.S. REG.
DO E2	1

THE ABOVE ORDER NO & SELLER CODE MUST BE ON EACH PACKAGE, SHIPPING RECEIPT AND INVOICE.

TERMS: (AS CODED) NOT APPLICABLE

TO

MONSANTO RESEARCH CORPORATION
1515 NICHOLAS ROAD
DAYTON 7, OHIO 45407
ATTENTION - T. L. GOSSAGE

SHIP TO

NOT APPLICABLE

UNIVERSITY OF CALIFORNIA

LAWRENCE RADIATION LABORATORY

PURCHASE ORDER

FOR CONTRACT NO. W-7405-ENG. 48
WITH THE ATOMIC ENERGY COMMISSION

R

FOR RESALE State Sales Tax should not be charged, as the University holds State Sales Tax Permit C 135323.

Mail Invoice In Duplicate to:
Lawrence Radiation Laboratory
University of California
Accounting Office. P.O. Box 528
Berkeley, California 94701

SHIP VIA (as coded)	TRANSPORTATION TERMS (as coded)	F. O. B. (as coded)
1. PICKUP 2. PARCEL POST 3. U P S 4. RAIL EXPRESS 5. MOTOR FREIGHT 6. RAIL FRT. FORWARDER 7. AIR PARCEL POST 8. AIR EXPRESS 9. AIR FRT. FORWARDER 0. SEE APPENDIX B	1. ACCOUNT OF UNIVERSITY-DO NOT INSURE 2. ACCOUNT OF SELLER-PREPAID 0 SHIPPING POINT NOT APPLICABLE	1. DESTINATION 2. SHIPPING POINT 3. SHIP. PT. FREIGHT ALLOWED 4. N/APPLICABLE

ITEM NO.	LRL CATALOG NO. IF APPLICABLE	DESCRIPTION	QUANTITY	UNIT PRICE	TOTAL PRICE	PROMISED DEL TO CARRIER
		STUDY CP INJECTION MOULDING				
		THIS COST PLUS FIXED FEE ORDER COVERS RESEARCH AND DEVELOPMENT EFFORT IN ACCORDANCE WITH THE TERMS AND CONDITIONS OF PURCHASE ORDER 4714103 AND APPENDICES A AND B THERETO.				
		AS PROVIDED IN ARTICLE II, THE EFFECTIVE TERM OF THIS ORDER SHALL COMMENCE UPON RECEIPT BY SUBCONTRACTOR OF A FULLY AUTHORIZED ORDER AND SHALL CONTINUE FOR A PERIOD OF TWELVE /12/ MONTHS.				
		THE PRESENTLY ESTIMATED COST PLUS FIXED FEE UNDER THIS ORDER IS --				
		ESTIMATED COST.....$37,440.00				
		FIXED FEE.....$3,182.00				
		COST PLUS FIXED FEE.....40622.00/11306/				
		THE TERMS AND CONDITIONS ON THE REVERSE SIDE OF THIS FORM RL 2354D ARE HEREBY DELETED.				
		ACCOUNT NUMBERS ARE TO BE CHARGED AS FOLLOWS -				
		5122-13 - $35,000.00				
		5104-13 - BALANCE OR $6000.00				

XXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXX

The Terms and Conditions On the Reverse Side Constitute A Part Of This Order

Authorized By

UNIVERSITY OF CALIFORNIA

9-15-48

RL-2354d (R PART)

COST AND PRICE ANALYSIS - RESEARCH AND DEVELOPMENT CONTRACTS

(This form is to be used in lieu of DD Form 633, as provided under ASPR 16-206. It will be executed and submitted with proposals in response to "Requests for Proposals," for the procurement of research and development services. If your cost accounting system does not permit analysis of costs as required, contact the purchasing office for further instructions.)

FORM APPROVED
BUDGET BUREAU NO. 22-R208

PURCHASE REQUEST NUMBER
IFP 4714103

NAME AND ADDRESS OF OFFEROR
Monsanto Research Corporation
PO Box 8, Sta. B, Dayton, Ohio

TITLE OF PROJECT
Injection Molding Research and Development

DETAIL DESCRIPTION

1. DIRECT LABOR (Specify)	Mo. Salary Range Min.-Max.	ESTIMATED HOURS	RATE /HOUR	TOTAL ESTIMATED COST (Dollars)
Res. Mgr.-Project Ldr.	$ 1260-1970	100	$9.21	$ 921
Research Specialist	875-1370	200	5.05	1,010
Sr. Res. Chemical Engr.	785-1225	1,800	5.79	10,422
Research Technician	505- 710	200	3.95	790
		2,300		13,143
Salary Related Cost @ 19%				2,497
TOTAL DIRECT LABOR				15,640

2. BURDEN (Overhead - specify) DEPARTMENT OR COST CENTER	BURDEN RATE	X BASE =	BURDEN ($)	
Proposed Overhead Ceiling	103%	15,640	16,109	
TOTAL BURDEN				16,109

3. DIRECT MATERIAL	EST COST ($)	
TOTAL MATERIAL		2,000
4. SPECIAL TESTING (Including field work at Government installations)		
TOTAL SPECIAL TESTING		
5. SPECIAL EQUIPMENT (If direct charge - specify in Exhibit B, reverse)		
6. TRAVEL (If direct charge)		
a. TRANSPORTATION	500	
b. PER DIEM OR SUBSISTENCE	100	
TOTAL TRAVEL		600
7. CONSULTANTS (Identity - purpose - rate)		
TOTAL CONSULTANTS		---
8. SUBCONTRACTS (Specify in Exhibit A on reverse)		---
9. OTHER DIRECT COSTS (Specify in Exhibit B on reverse - explain royalty costs, if any)		---
10. TOTAL DIRECT COST AND BURDEN		34,349
11. GENERAL AND ADMINISTRATIVE EXPENSE (Rate 10 % of item nos. 10)		3,435
12. TOTAL ESTIMATED COST		37,784
13. FIXED FEE OR PROFIT (State basis for amount in proposal) 8.5% of Item 12		3,211
14. TOTAL ESTIMATED COST AND FIXED FEE OR PROFIT		$ 40,995

DD FORM 1 SEP 60 633-4

125101

15. OVERHEAD RATE AND GENERAL AND ADMINISTRATIVE RATE INFORMATION

A. GOVERNMENT AUDIT PERFORMED	DATE OF AUDIT	ACCOUNTING PERIOD COVERED
[X] YES [ ] NO [ ] PENDING	Feb. 1965	CY 1964

B. NAME AND ADDRESS OF GOVERNMENT AGENCY MAKING AUDIT	C. DO YOUR CONTRACTS PROVIDE NEGOTIATED OVERHEAD RATES (ASPR 3-704)? (If yes, name Agency negotiating rates)
Defense Contract Audit Agency Air Force Branch, Bldg. 70, Area "C" Wright-Patterson AF Base, Ohio	NO

D. *(If no Government rates have been established furnish the following information)*

DEPARTMENT OR COST CENTER	RATE	BASE	TOTAL INDIRECT EXPENSE POOL	BASE FOR TOTAL

16. EXHIBIT A - SUBCONTRACT INFORMATION *(If more space needed, use blank sheets, identifying item number)*

NAME AND ADDRESS OF SUBCONTRACTOR(S)	SUBCONTRACTED WORK	SUBCONTRACT	
		TYPE	AMOUNT

17. EXHIBIT B - OTHER DIRECT COSTS *(Specify. If more space needed, use blank sheets, identifying item number)*

CERTIFICATE

The labor rates and overhead costs are current and other estimated costs have been determined by generally accepted accounting principles. Bidder represents: (a) that he [ ] has, [X] has not, employed or retained any company or person (other than a full-time bona fide employee working solely for the bidder) to solicit or secure his contract, and (b) that he [ ] has, [X] has not, paid or agreed to pay to any company or person (other than a full-time bona fide employee working solely for the bidder) any fee, commission, percentage or brokerage fee, contingent upon or resulting from the award of this contract, and agrees to furnish information relating to (a) and (b) above, as requested by Contracting Officer. *(For interpretation of the representation, including the term "bona fide employee," see Code of Federal Regulations, Title 44, Part 150.)*

Number of contractor employees [X] Over 500 [ ] Under 500

State incorporated in Delaware

DATE	SIGNATURE AND TITLE OF AUTHORIZED REPRESENTATIVE OF CONTRACTOR
31 Aug. 1965	T. L. Gossage, Asst. Dir. Gov't. Rel.

125 15 D 2

F 331

MONSANTO RESEARCH CORPORATION

DAYTON LABORATORY · DAYTON, OHIO 45407

AREA CODE 513 · PHONE 268-8441

14 September 1965

Mr. George Brim
Lawrence Radiation Laboratory
University of California
P.O. Box 808
Livermore, California

Subject: Monsanto Research Corporation Overhead Rate

Dear Mr. Brim:

As you know, there are several contracts between LRL and MRC which are being held up because of a disagreement on the Dayton Laboratory proposed overhead rate. These contracts include Castable Explosives, Polyurethane Foams, Injection Molding, and Personal Services. Mr. D. G. Comerford, MRC's Controller, has been in frequent communication with the San Francisco AEC Office. Likewise, I have discussed the situation with our cognizant Air Force Audit Office. It is my understanding that a letter has been sent from the Dayton Audit Office to the San Francisco AEC Office. This letter contains all of the information necessary for the AEC to make a determination on the Dayton Laboratory overhead rate.

Rather than delay these important programs any longer, I suggest for your consideration, that they now be executed with an overhead ceiling of 103%. If, after the San Francisco office completes their study of the FY-64 audit, it is determined that in accord with the AEC cost principles, the Dayton Laboratory overhead rate is less than 103%, say 92-95%, we will accept a modification to the contracts reflecting this lower rate.

I do believe that these programs should not be further delayed. The solution which I propose, I hope is acceptable both to LRL and the AEC Office.

Very truly yours,

T. L. Gossage
Assistant Director
Government Relations

TLG/mfc

1257503

3-1-17

In Reply to
Invitation for Proposal
IFP-4714103

reviewer:
D. L. Aron
2/4/94

UNCLASSIFIED

Technical
Proposal

F301

INJECTION MOLDING RESEARCH AND DEVELOPMENT

MONSANTO RESEARCH CORPORATION

A SUBSIDIARY OF MONSANTO COMPANY

DAYTON
LABORATORY

DAYTON, OHIO 45407

1257564

In Reply to
Invitation for Proposal
IFP-4714103

Technical
Proposal

INJECTION MOLDING
RESEARCH AND DEVELOPMENT

Submitted

to

University of California
Lawrence Radiation Laboratory
Livermore, California

E. E. Hardy, Laboratory Director

Ival O. Salyer, Project Leader

MONSANTO RESEARCH CORPORATION
Dayton Laboratory
Dayton, Ohio 45407

31 August 1965

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I. INTRODUCTION AND SUMMARY

Monsanto Research Corporation is pleased to reply to Lawrence Radiation Laboratory's Invitation for Proposal No. 4714103, to provide about 1-1/4 man years of effort directed toward evaluation of materials for AEC injection molding applications.

For the proposed work we can offer:

- An experienced, diversified research team of demonstrated capability in polymer characterization and injection molding research, with the combination of theoretical knowledge and practical know-how that success in such a program requires;
- An established, well-equipped research facility where similar work has been carried out for more than twenty years;
- Directly related research performed within Monsanto Research Corporation, both on Government contract, and as part of our own exploratory effort;
- Access to technical resources of our parent company, Monsanto Company, a diversified manufacturer of organic chemicals and polymeric materials.

During the past three years, Monsanto Research Corporation has been performing research and doing development on injection molding materials and processing, die design, and pilot production of parts in support of classified AEC programs. The currently proposed continuation of this program could get underway immediately without any delays for setting up the facility, personnel procurement and orientation, etc.

Performance under this contract requires the application of a broad spectrum of disciplines and talents not readily found in most laboratories or commercial shops. First and foremost is required a thorough grounding in and an intimate knowledge of the physical and chemical characteristics of polymeric materials. This materials groundwork is traditional at Monsanto Research Corporation, and is derived not only from our own advanced contract research and development, but also from the long years

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of experience of the parent company -- an acknowledged leader in the polymer field.

Secondly, processing skill and understanding of the basic engineering response of these materials in different applications - including the AEC's classified applications - are required. The personnel who will be assigned to this project include men who are not only capable of contributing to the theoretical aspects of their profession, but who are also leaders in the science of materials and process development -- men whose ingenuity is rooted in sound experience; whose patents, publications, and professional stature attest to their ability.

Thirdly, there is required a broad array of processing and physical testing equipment. Analytical instruments are also needed for establishing the correlations between basic polymer material parameters and the engineering and performance properties which are of interest to the AEC. Almost all of the necessary equipment and instruments are on hand at MRC's Dayton Laboratory. A small 1-ounce injection molding machine for preliminary material tests is available. A larger 3 to 6 ounce Ankerwerke injection molding machine is being furnished by Lawrence Radiation Laboratory. An air conditioned building, equipped with all the necessary services, is already available for the continuing work. The physical testing and analytical facilities are also on-site.

We anticipate no subcontracting of any part of the proposed program.

The program in its entirety would be performed at the Dayton Laboratory of Monsanto Research Corporation, a wholly owned subsidiary of Monsanto Company. The subsidiary was established to conduct research, development, and special manufacturing activities in areas of interest to Government agencies, and attests to the company's interest in supporting and advancing Government programs.

Although the proposed program is not classified, the areas in which the work would be performed are currently being used for LRL's SRD classified research on injection molding. Thus, if the nature of the current program should become classified, this change could be readily accommodated in the proposed location of the work.

The requirements of the proposed program are discussed in the following sections, in accordance with LRL's Invitation for

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Proposal No. 4714103. Although we would plan to follow the program as outlined, at the direction of the Contract Monitor we will make any changes in emphasis which might be required for efficient accomplishment of the project goals.

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II. TECHNICAL APPROACH

A. THEORETICAL BACKGROUND

The measurements or parameters required to characterize new polymeric materials can, with some degree of simplification and approximation, be divided into three distinct groups.

The basic molecular parameters are those characteristics which can be measured independently of each other, and which describe the elemental composition, chemical structure, degree of polymerization, and molecular weight and distribution of the polymer.

The derived parameters define the basic interactions of the polymer system with external forces and materials. Such basic interactions result in characteristic solubilities, solution and melt viscosities, crystalline melting points, etc. The derived parameters are also useful, indirect means for determining the basic molecular parameters.

The engineering parameters are the experimentally determined properties that are important in the end-use applications of the material. Engineering parameters depend not only upon the basic and derived parameters, but are also controlled by such variables as mechanical and thermal history, orientation and annealing, phase relationships, plasticizing and polyblending, filler content, and sample geometry. Tests to establish the numerical value of the engineering parameters are highly empirical, and may be poorly reproducible unless done under the most carefully controlled conditions. Additionally, their relationship to basic and derived properties is in most cases complex. The methods used for determining the basic, derived, and engineering parameters must be adapted or modified to conform to the type of polymer under test. Thus, depending upon the polymer, several different types of tests may be used to determine the same or a closely related property. These tests are of either the precision scientific type, for basic and derived parameters, or of the standard test type, for engineering parameters. For all tests, accuracy is only as good as the equipment used and the skill with which it is operated.

In this program, engineering properties are desired which represent the functionality of a material under actual end-use conditions.

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Those of specific interest will be discussed in later sections. However, it should be noted that in selecting materials of interest, the basic molecular parameters and derived parameters will be most useful, especially where the direct determination of engineering parameters is impracticable. For example, long-term creep - let us say for a period of five years - would take five years to determine. However, knowledge of the glass transition temperature, as compared to temperatures which the material might be expected to encounter, would strongly indicate resistance to creep. The basic properties of the glass transition and the degree of crosslinking give a direct indication of creep resistance, as well as resistance to swelling by solvents.

In essence, while engineering properties are being determined, the more basic parameters will also prove most useful in determining the validity of the engineering measurements and extrapolating these measurements beyond possible test conditions.

B. SPECIFIC OBJECTIVES

The specific objectives of this program are to compile information on new or undefined materials and, based on this information, obtain and evaluate the materials for injection molding of dimensionally stable parts. The molded material should have, as a minimum, the following combination of characteristics:

1. A high heat-distortion temperature,
2. Good optical clarity,
3. Low density,
4. Minimal creep,
5. Good chemical stability,
6. Linear and low coefficient of thermal expansion, and
7. Reasonable availability.

It is expected that other physical and chemical properties will be of significance, depending on the particular AEC application.

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These will be defined as needed. The primary objective will be to obtain a stable injection molded part having the characteristics listed above. The present state of the art is defined by commercial polycarbonates which exhibit a relatively good combination and value of the above characteristics.

C. EXPERIMENTAL APPROACH

The experimental program will consist of the following:

Survey of Commercial Literature - The latest product information on new or previously undefined thermoplastics of possible use in injection molding will be obtained. These data will be augmented by direct contact with polymer manufacturing concerns. Dealing directly with the manufacturer would most readily translate recent advances in materials to this program as well as establish reasonable availability at an early date. The formal journal literature and government reports will also be surveyed continuously throughout the program.

Analysis of Literature Properties - The available product data will be compiled and the characteristics of interest, as spelled out in Specific Objectives, will be compared to the state of the art materials. The commercial data will be weighted, as representing maximum values for commercial advertising. The properties of commercial polycarbonates and projected AEC needs will be used as a basis for comparison.

Requisition of Samples and Determination of the Necessary Undefined Properties - Polymer samples will be obtained, and, unless previously well-defined from the literature, will be examined for heat-distortion temperature, optical clarity, density, creep resistance, chemical stability, and coefficient of thermal expansion. Availability will be determined from the manufacturer.

The heat-distortion temperature will be determined by means of the stiffness torsion test (Clash-Berg), beam deflection test, and point indentation (Vicat) test. When an adequate specimen can be made, the torsional stiffness test will be utilized since a modulus below the glass transition, as well as through the transition, can be determined, thus giving an indication of both the heat-distortion temperature and the rate of approach to this temperature. The beam deflection test will be used for correlation

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to literature values since it has been used relatively more as a standard test. The point indentation test will be used where a shaped specimen cannot be readily obtained. This is a most convenient test which can provide usable distortion temperatures on oddly shaped specimens. A non-solvent heat transfer medium will be utilized in all three of these tests.

Optical clarity will be determined by visual observation of a typewritten page through a 1/8-inch to 1/4-inch molded flat section of the material. Observations will be made with the page against the surface and at various intervals to determine distortional effects. Reduction in transmitted intensity (see-thru clarity) will be compared to the present polycarbonates, rating them as minimal. It is expected that such subjective ratings will be adequate for preliminary screening purposes.

More quantitative measurements of optical transmittance can be obtained with the IDL Color-Eye. The Color-Eye will provide percent transmittance as a function of wavelength in the optical region, thus quantitatively describing the color. The color can then be described numerically in terms of hue, purity and brightness. By comparing transmittance values of light reflected (through a speciment) from a white and black surface, the haze of the material may be determined. Using a commercial polycarbonate as a reference standard, a specimen may readily be rated against the state of the art optical properties in both color and clarity.

Density will be measured by the volume displacement technique on pelleted or molded specimens.

Although time would not permit actual creep measurements of the required duration (7 years), constant stress tests on tensile or other preferred specimens will be conducted at elevated temperatures with relatively high loads. Normal extrapolation procedures will be applied to this creep data to provide some indication of long time creep resistance. Promising materials from these tests will then be loaded to 100 psi for longer term tests of actual performance.

Although not spelled out in the request, tensile modulus and strength from -65°F up to +165°F will be determined as an aid in predicting dimensional stability and the allowable temperature range of use. This will be conducted in standard constant strain rate apparatus and environmental chambers. When needed, dynamic tests, such as the torsion pendulum, will be utilized to provide

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glass transition temperatures as well as shear moduli from -75 up to 500°F.

Impact tests on a pendulum type apparatus will also be determined, especially when there is doubt that the impact resistance is adequate.

Chemical resistance will be determined by immersion in acids, bases, water and organic solvents. Where definite solubility is not evident, changes in mechanical properties can readily be determined by nondestructive dynamic tests after various aging times. The torsion pendulum and ball rebound tests will be most useful for such nondestructive dynamic determinations. Repetitive constant strain rate tests on tensile, flexural, and compressive specimens (to loads below the yield point), will also be used when applicable.

It is expected that certain specific solvents will cause crazing of any particular thermoplastic. Therefore, those solvents which cause crazing will be determined. A critical examination of specimens in contact with expected environmental stress cracking solvents will be performed. Effect of this crazing on mechanical and optical properties will then be determined.

Linear coefficient of thermal expansion and, when necessary, volumetric coefficient of thermal expansion will be determined from -70 up to 170°F. The linear coefficient will be determined in a quartz tube dilatometer, and the volumetric expansion in a mercury displacement Pyrex bulb (from -30 to +170°F). Any non-linearity will especially be noted.

It is expected that certain of the above properties will be limiting as far as AEC interest is concerned so that a complete characterization will terminate with any single failure as indicated by the Project Monitor.

Determination of the Flow and Melt Characteristics for Moldability - The melt-flow characteristics and the range of useful processing temperatures and pressures will be determined in order to aid in predicting forming conditions. These will be determined on the Monsanto Capillary Extrusion Rheometer operated at constant strain rates. Data from this test will include the load necessary to extrude at a given rate and temperature, through an orifice of known size. Visual observation of the extrudate's character, waviness, etc. will also be made. Temperatures and rates at which thermal degradation occurs will also be noted.

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Determination of the Injection Molding Characteristics in Pilot or Small-Scale Injection Molding Equipment - Based on the conditions determined by the extrusion rheometer, the material will be injection molded in the MRC 1-ounce Watson Stillman and/or the AEC-supplied 3 to 6-ounce Ankerwerke machines. Physical test specimens will be molded and evaluated. These data will be compared to those obtained previously on compression molded specimens--in order to determine orientation effects. Machine settings and mold temperature, pressure, and time cycle will be varied to observe their effect on the molded product. Parts other than physical test specimens will also be molded at the direction of the Project Monitor.

Candidate Thermoplastic Materials

As stated previously, the commercial polycarbonate represents the state of the art of a single material having the desired properties. In addition to those materials which may be found through the survey, we would propose to examine in detail a known new polycarbonate of Eastman Plastics reported to have a higher heat-distortion temperature than present commercial polycarbonates. Polyphenylene oxide of General Electric, and Union Carbide's Polysulfone are also reported to have properties of interest, especially high heat-distortion. These materials have received an initial characterization, in prior MRC injection molding projects with the AEC, which indicates their possible utility.

Examination of Thermoset Materials

An area that will also be considered is that of thermoset materials which can be formed by transfer molding or other techniques. The thermoset materials inherently exhibit higher creep resistance and dimensional stability. Because of their crosslinked structure, thermoset materials are relatively unaffected at temperatures below the degradation point. Unfortunately, this thermoset structure normally results in a glassy, brittle material. However, the high degree of tailorability of the thermosets provides a readily available means of improving material toughness. For example, a range of properties from brittle to rubbery have been demonstrated by a number of epoxy and urethane systems.

Summation of the Total Characteristics Toward Specific AEC Problems

Where an improvement in total characteristics is indicated, the significant properties will be compared to those of present commercial polycarbonates and specific AEC requirements. The properties will be classified in importance, according to the particular

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application. For example, an increased heat-distortion temperature and improved optical clarity, in combination with other equivalent state of the art properties, will receive a high weight factor. An increased heat-distortion temperature would definitely move the range of use temperatures into a glassier region of the polymer, indicating improved creep resistance and dimensional stability of a molded specimen.

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III. EQUIPMENT

It is understood that the University will furnish and install, at the MRC laboratories in Dayton, for use under this contract, the following item of new major equipment.

1 each Injection Molding Machine, New Britton-Ankerwerke
Model 75
3-6 ounce capacity

NOTICE

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IV. PROGRAM SCHEDULE

Personnel	Job Description	Hours
I. O. Salyer	Manager, Polymer Research	100
W. E. Welch	Senior Research Engineer	1800
G. L. Ball III	Research Polymer Physicist	200
T. J. Bucher	Research Technician	200
	Total	2300

The rate of effort is to be 1-1/4 man years for a period of 1 year. No subcontracting is anticipated.

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V. REPORTS

Monthly Progress Reports will be issued by the 15th of each calendar month, covering the work completed during the preceding month. A final report will be prepared and issued upon completion of the program.

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