W. R. GRACE & CO.
RESEARCH DIVISION
Washington Research Center, Clarksville, Maryland 21029

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CONSOLIDATED MONTHLY SUMMARY

OCTOBER 1970

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W. R. GRACE & CO.

RESEARCH DIVISION

Washington Research Center, Clarksville, Maryland 21029

November 20, 1970

MONTHLY REPORT FOR OCTOBER 1970

CONSOLIDATED EDITION

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NOT TO GO OUTSIDE U.S.

This report contains information on the following activities at the Washington Research Center.

INORGANIC RESEARCH

I-1 ALFALOX CUTTING TOOLS
I-2 KEMALOX POWDERS
I-3 CERAMIC DEVELOPMENT EQUIPMENT FACILITY
I-4 AUTO EMISSIONS CATALYST
I-5 MONOLITHIC CATALYST SUPPORTS
I-6 NEW MOLECULAR SIEVE COMPOSITIONS
I-7 ZEOLITE STABILITY AND ACTIVITY
I-8 CLAY COMPOUNDS
I-9 LEAF BALL AUTOMATION
I-10 ADVANCED NAVAL FUELS
I-11 ADVANCED SPACE FUELS

ORGANIC RESEARCH

O-1 LOW COST CURABLE LIQUID POLYMERS
O-2 CAN COMPOUNDS - CAN END ADHESIVES
O-3 FIRE RETARDANT MATERIALS
O-4 ADHESION STUDIES - CRYOVAC COOPERATIVE STUDY
O-5 PACKAGING MATERIALS - NON-HALOGENATED BARRIER MATERIALS
O-6 CAN COMPOUNDS - OVERSTRIPE FOR CONOWELD SIDE SEAM
O-7 POLYMER FOAM STUDIES

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ORGANIC RESEARCH, Cont'd.

O-8 PHOTOCHEMISTRY STUDIES - PHOTOENHANCED ADHESION
O-9 EXPLORATORY - PHOTOCURING OF POLYBUTADIENE
O-10 EXPLORATORY - SOUND ABSORBING PRODUCTS
O-11 EXPLORATORY - ADDITIVES TO POLYOLEFINS
O-12 EXPLORATORY - PHOTOSENSITIVE LOGO FOR PACKAGING FILMS

CLP TASK FORCE RESEARCH

C-1 UV CURABLE INKS
C-2 LOW COST CLP SYSTEMS
C-3 ALTERNATIVE CURING AGENTS
C-4 PHOTORESISTS
C-5 LITHOGRAPHIC PRINTING PLATE
C-6 NEW APPLICATION FOR CLP MATERIALS
C-7 DARK STABILITY
C-8 CLP CASTS
C-9 LETTERFLEX SUPPORT
C-10 CLP MARKET DEVELOPMENT STUDIES
C-11 CLP RIGIDIZABLE STRUCTURES

AGRICULTURAL RESEARCH

A-1 HAMPSHIRE DIVISION EFFLUENT HANDLING
A-2 REFORMULATION AND EVALUATION OF MONO-KOTE
A-3 HERBICIDE COATED UREA

BIOCHEMICAL RESEARCH

B-1 ADAPTED RUMEN MICROBES (ARM)
B-2 "CHRON-X"
B-3 SALTS OF ISOBUTYRIC ACID AS POULTRY FEED ADDITIVES
B-4 SALTS OF ISOBUTYRIC ACID AS A MOLD INHIBITOR IN SILAGE
B-5 SCOURS PREVENTATIVES

GOVERNMENT CONTRACT OPERATIONS

G-1 PENDING PROPOSAL: OPTIMAL POLYESTER RESIN SYSTEMS FOR REINFORCED SURFACINGS (AIR FORCE)
G-2 PENDING PROPOSAL: FIRE RETARDANT PLASTICS (NAVY)
G-3 PENDING PROPOSAL: HAZARDOUS CHEMICALS
G-4 NEW PROPOSAL: REMOVAL OF TOXIC METALS FROM WASTE WATER (FWQA)

OTHER R&D

OT-1 GRACE SUGAR PROCESS

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These items are included in the various editions of the report as shown below:

ACG Edition	I-8; A-3; B-1,2,3,4,5; G-3
DAV Edition	I-1,2,3,4,5,6,7,8; O-3; G-3,4
HAMP Edition	O-3,11; A-1; G-3,4
COV Edition	I-9; O-4,5,7,8,11,12
HATCO Edition	O-3; B-3,4,5; G-1,2,3
European Edition	I-1,2,3,4,5,6,7,8; O-3,10; C-1,2,3,4,5,6,7,8, C-9,10; G-3,4
SPG Edition	G-3,4
PFD Edition	I-5; O-3,10; C-1,2,3,4,5,6,7,8,9,10,11
CPD Edition	I-8; O-3,7,10; A-2
P&CD Edition	O-3,5; C-1,2,3,4,5,6,7,8,9,10,11
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Consolidated Foreign Edition	I-1,2,3,4,5,6,7,8; O-2,3,4,5,6,7,8,10,11,12; C-1,2,3,4,5,6,7,8,9,10; G-4
Consolidated Edition	All Items

technique and the anticipated benefits outlined above appear to be realizable. The disposal of by-product gypsum and establishing a water-ammonia balance is required before a complete usable process can be assured. A meeting to review the project with Hampshire is scheduled for November 10.

A-2 REFORMULATION AND EVALUATION OF MONO KOTE (Project 2659)

The short range objective of the Mono-Kote program is to determine means for improving bond strength between Mono-Kote and galvanized steel, with and without asbestos fibers.

Currently, a study is underway using inorganic chemical additives with standard Mono-Kote (MK-3) to promote greater cohesive and adhesive bond strengths. This study, approximately three-fourths complete, is concerned with evaluation of 25-30 selected compounds which are added to Mono-Kote at 2% weight concentration; such selections representing a random sampling of the Periodic Table as well as known cementitious materials. The present Mono-Kote product develops bond strengths of 0.91 to 1.72 psi. Laboratory formulations incorporating various additives have been shown to develop bond strengths of from 4.2 to 6.0 psi depending on the specific additive. Bond failure in these formulations occurs primarily as cohesive ruptures. Upon completion of the laboratory research, an analysis of bond strength data should permit selection of the better compounds for high temperature tests.

A-3 HERBICIDE COATED UREA (Project 4834)

We have been advised by Amchem that the results with Uraben (urea coated with Amiben) as a rice herbicide were extremely promising in the second test at Santo Domingo. Another 100-200 pound test lot similar to the first prepared at WRC is required by Amchem for immediate use, with 10,000 pounds needed in February, 1971.

The laboratory method of "spraying and drying" used at WRC for making Uraben is not economically feasible for large scale production. Consideration is being given to the possibility of adapting an oil-prilling process developed by TVA for the production of the additional quantity of Uraben. Any further work on this project is contingent upon the extent of Amchem's financial participation.

BIOCHEMICAL RESEARCH

B-1 ADAPTED RUMEN MICROBES (ARM) (Project 4623)

The ARM program was reviewed in depth with ACG on October 22. It was the consensus of those present that additional tests in commercial feedlots would be needed to obtain proof of efficacy of