PRODUCTION ENGINEER

PAGE NO. —

DATE 10-3-49

SUBJECT—

Production Equipment for Thermobestos Pipe Covering and Thermoflex Insulating Felts
Manville Appro. #931-E-212 - $56,344

PURPOSE

To present the necessary data and estimates to permit financial appraisal of the proposed production equipment expenditure for Thermobestos (Amosite) Pipe Covering and Thermoflex Insulating Blankets.

CONCLUSION

Recommendation for action is contingent upon the outcome of the financial appraisal.

SUMMARY

The Sales Department proposes to add Thermobestos Pipe Covering to the Insulations line to overcome our inability to compete with "Unibestos" and prevent further loss of sales contracts. The forecasted sales total 100,000 section, $422,000 list value and $325,000 net value.

It is proposed to revise the present Research pilot plant pipe covering machine for the manufacture of all size Thermobestos covering as well as Thermoflex Insulation blankets. In addition to the estimated $30,000 replacement value of useful Research facilities an additional equipment expenditure of $56,344 is required.

TIME TO COMPLETE

6 months after authorization is received.

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PREPARED BY R. W. Dobson REQUESTED BY A. Cromwell APPROVED W. L. VanDerbeek

SUBJECT—

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DISCUSSION

General

The Sales Department contends that because of our inability to furnish insulation comparable and competitive with the Union Asbestos, "Unibestos", J-M lost specific applied insulation contracts in 1948 in excess of $2,255,000 plus many other unlisted contracts, (Enclosure C).

On the basis of the 15% average gross profit for all applied contracts completed and billed in 1948, this represents a loss of potential gross profit of $338,000 on these specific contracts. In addition there is a loss of profit on the insulating material (Magnesia, Superex, and other insulations) with a sales value of $676,500 (material sales value on this type of contract approximates 30% of the contract price).

Johns-Manville has no insulation in the product line to compete with the single layer, tough, removable and replaceable qualities of Unibestos. In the Houston area, Magnolia Petroleum is the only oil company that does not specify Unibestos. Inasmuch as many contractors (Foster-Wheeler, Kellogg, Lummus and others) will not split up jobs, and many owners refuse to consider more than one insulating contractor on the job, Johns-Manville loses not only the amosite insulation sales but the Magnesia and Superex sales as well. In many instances we cannot even bid.

Thermobestos Pipe Covering

The need for an amosite pipe covering was apparent over ten years ago, and Research has had a product under active development (except for the periods of wartime interruption and amosite shortages) since that time. Installation of the original pilot plant equipment was completed in 1946. The sodium silicate bonded amosite-perlite covering (Thermobestos) that has been developed is now competitive in every respect with the "Unibestos" covering. An initial order of Thermobestos covering is now being made on the pilot plant equipment under Research supervision for use on the Carthage Hydrocol contract. With the exception of design and mechanical limitations of the pilot plant equipment, the initial production run is satisfactory.

Product and manufacturing equipment development has reached the point where Sales, Research, and Production agree that product commercialization is desirable and necessary.

Thermoflex Insulation Blankets

The Thermoflex Insulation Blankets now in the regular J-M product line are produced on Thermobestos pilot plant equipment. Inasmuch as these blankets can be formed on the pipe covering unit without loss of efficiency, Manville Appropriation 931-U-199 for $9,828 for the installation of a blanket machine to produce 30,000 felts per year has been held up at the Division level until the available capacity of the pipe covering production equipment could be determined. Financial analysis 8-5-49 of the Manville appropriation indicated that the expenditure of $9,828 would be recovered from earnings after income taxes within one month.

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Amosite Fibre Limitation - Pipe Covering

Agreement between Cape Asbestos and Union Asbestos & Rubber limits amosite fibre usage in pipe covering (not insulation blankets) to that amount required for amosite pipe covering sold on the basis of an accessory material. It is estimated that up to 500 tons per year of amosite fibre can be used for pipe covering without objection. This amount of fibre is available to J-M for use in pipe covering.

Sales Forecast

The Sales forecast indicates a requirement of 100,000 sections of Thermobestos Pipe Covering in all pipe sizes 1/2" through 30". Calculations based on the Sales forecast breakdown convert this to 1,240,000 board feet with a list value of $422,000. Sales value of this material, at the anticipated average discount of 23% off list (including crating and canvas jacketing) is $325,000 (Enclosure B). Amosite fibre required for this volume of sales is estimated at 900,000 pounds of Amosite (450 tons).

Equipment Requirements

Research Commercialization Project Proposals 433-CPP-1 (3-31-49) and 433-CPP-2 (8-26-49) recommended;

a. the installation of a second machine to manufacture insulating blankets and pipe covering in pipe sizes 14" and over,

b. design and mechanical changes to the existing pilot plant equipment to overcome present difficulties in producing pipe covering 12" and smaller.

The total required expenditure for the two forming units, including necessary dust collecting and fibre feed equipment would amount to $60,388 (Enclosure A).

Inasmuch as (a) sales forecasts will require only 2 shift operation of one machine, and (b) no operating efficiency will be lost by the move, the Production Department proposes to equip the revised pilot plant machine to produce all size pipe coverings as well as insulating blankets. This can be accomplished at a considerable reduction in expenditure over the Research proposal for 2 machines. The estimated expenditure for mechanical changes and additions to the pilot plant equipment to permit optimum operating efficiency totals $56,344 as follows:

Proposed - one Universal Pipe Covering & Blanket Machine			
a.	General Engineering Report #16 estimate	$17,792	
	Research recommended additions	2,200	
			$19,992
b.	Dust Control - forming		8,600
	Total cost of pipe machine for up to 12" pipe at a capacity equivalent to 350# of amosite per hour		$28,592

c. Added cost to increase small pipe production rate to an estimated maximum of 700#/hour amosite for 12" pipe

1.	new brammell fibre feed	$2,332	
2.	new fibre cross feed	935	
3.	attrition mill with independent drive	8,415	
4.	less item 1 #16 estimate amosite fibre feed	-1,540	
			$10,142
	Total cost of pipe forming machine, small pipe, at satisfactory production rate		$38,734

d. Added cost for large pipe covering 14" and over

1.	hydraulic forming yokes	$1,100	
2.	monorail	660	
3.	hoists (3)	1,100	
4.	mandrel removing device	1,100	
5.	mandrel coating device	1,100	
6.	reverse oven conveyor	550	
7.	replace 2 - 30" mandrels	1,000	
8.	rolling and spray unit	2,200	
9.	6 extra mandrels 22", 24", 26", 30", 36"	2,200	
			$11,010
	Total forming equipment		$49,744
e.	Added cost - finishing, dust control		6,600
	GRAND TOTAL		$56,344

Replacement Value - Pilot Plant Equipment

It is estimated that the replacement value of that portion of existing pilot plant equipment that will be included in the production set up is approximately $30,000.

Machine Hours Required

Machine hours required for the formation of the forecast volume and assortment of pipe covering are calculated as follows:

(a) The forecast 227,000 Bf in pipe sizes 1/2" through 3" in thicknesses through 2" require 162,000 lbs. of Amosite. Production hours at an average amosite usage rate of 350 lbs per hour total 465 hours

(b) The forecast 823,000 Bf in remaining pipe sizes through 12" in all thicknesses require 590,000 lbs of Amosite. Production hours at the estimated average amosite usage of 550 lbs per hour total 1500 hours

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(c) The forecast 194,000 LF in pipe sizes 14" and over require 139,000 lbs of Amosite. Production hours at the estimated average amosite usage of 500 lbs per hour total — 280 hours

(d) The forecast 30,000 insulation blankets at the average production rate of 11.2 per hour require — 2700 hours

Total — 4945 hours

Estimated Out-of-Pocket Production Costs on Proposed Equipment

The estimated annual out-of-pocket cost to produce the forecast sales of 100,000 sections with a net sales value of $325,000 is developed as follows:

a. Material

Amosite fibre	
900,000 lbs. @ $.07045	$63,500
Sodium Silicate 27° Boume	
1,600,000 lbs @ $.008	12,800
Perlite	
385,000 lbs @ $.075	29,000
Mandrel coating	
Water - 20 gallons/hr - 2245 hrs	—
Sand - 30 lbs/hr @ $.00413 for 2245 hrs	280
CMC - .15 lbs/hr @ $.750 for 2245 hrs	250
#30 motor oil - .6 lbs/hr @ $.082 for 2245 hrs	110
Cartons	
Estimated 25,000 cartons @ $.80 each	20,000
Canvas	
Estimated 100,000 yards @ $.125 per yd.	12,500
Fuel Oil - drying	
20 gals/hr x 2245 hrs @ $.099 per gal.	4,450

b. Labor

Forming	
Pipe covering to 14" pipe size 1965 hours @ $6.52 per hour (5 man crew)	12,800
Pipe covering 14" pipe size and over 280 hrs @ $5.22 per hour (4 man crew)	1,500
Truck to saw room	
1150 man hours @ $1.31	1,500
Butt to 36"	
3500 man hours @ $1.31 (30 pcs/hr overall est.)	4,500

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b. Labor (Cont'd)

Slit 3500 man hours @ $1.31 (30 pcs/hr est.)	$ 4,500
Canvas 1000 man hours @ $1.20 (100 pcs/man hr)	1,200
Pack 3500 man hours @ $1.31 (30 pcs/hr est.)	4,500
Machine change 2245 hours @ 4 min./operating hour @ $6.52/hour	1,000

c. Variable Overhead - Added

Repair lubrication and Maintenance labor Estimate 400 hours @ $1.50	600
Repair and Maintenance materials - Estimate	400
Power 2245 hours @ $.40 per hour	900
Handling and Receiving 12 months @ $125/month	1,500

Benefits Attributable to Elements of Proposed Expenditure

Pipe Covering is now being produced for sale on the Research pilot plant equipment now installed in "C" Building at Manville. Although the pilot plant equipment makes a product of acceptable quality, design and mechanical weaknesses prevent continuous production operation without excessive rejects, excessive labor, and excessive maintenance. The rate of production is limited by the low capacities of the pilot plant attrition mill and certain other equipment.

The benefits attributable to the elements of the proposed expenditure of $56,344 are as follows:

a. Revisions to the existing pilot plant equipment for pipe covering through 12" pipe size, as recommended by Research 433-CPP-2 and General Engineering Report #16 and subsequent Research additions - $19,992.

Expenditure of this sum is necessary to:

1. Reduce the forming machine crew from 7 to 5 men.
2. Reduce rejects and lost production by 15% of total production.
3. Reduce small pipe covering set-up and machine adjustment downtime by an estimated 150 hours per year (at $6.52 per hr.)
4. Improve the quality of the pipe covering by insuring a more uniform density.
5. Reduce the cost of machine repairs by an estimated $2,000 per year.

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b. The expenditure of $5,600 for forming machine dust control equipment is necessary to protect the safety and health of employees.

c. The expenditure of the additional $10,142 for an attrition mill and fibre feed is necessary to:

1. Replace the worn out pilot plant attrition mill with one of larger capacity, (strict replacement cost $4500)
2. Increase the amosite production rate on all pipe covering over 3" x 2" and less than 14" (823,000 Ft) from 350 lbs per hour to an average of 550 lbs per hour, (3" IPS - 350 lbs/hr, 12" IPS - 700 lbs/hr).
3. Increase the amosite production rate for all pipe covering 14" and over from 350 lbs per hour to 500 lbs per hour.

d. The expenditure of an additional $11,010 is required to permit the efficient manufacture of pipe covering 14" and over as well as insulation blankets, on the revised pilot plant equipment.

ENCLOSURE A

Thermobestos Pipe Covering
Thermoflex Blankets

Research Proposals

1. 433-CPP-1 - Thermobestos Pipe Covering

Proposed to build a new machine to produce Thermoflex blankets and pipe covering 14" and over

a. Gen. Engr. Report #14 estimate	$24,354	
Additional for dust control	8,600	
Replace 2 - 30" mandrels	1,000	
Additional for independent attrition mill drive	1,100	
TOTAL		$35,054

2. 433-CPP-2 - Thermobestos Pipe Covering

Proposed to modify the present unit to produce Pipe Covering in sizes up to and including 12"

a. Gen. Engr. Report #16 estimate	$17,792	
b. Research recommended additions		
1. new conveyor spray head $1,650		
2. change pre-set oven speed 550	2,200	
c. Additional for dust control	8,600	
Total to permit production equivalent to 350# Amosite per hour		28,592
		$63,646
d. Additional to increase production rate all sizes 15 BM and over from 350 BM/hour to 700 BM/hour (12" I.P.S.)		
1. New Bramwell feed	2,332	
2. Fiber feeder and piping	935	
3. Attrition mill, independent drive	8,415	
	11,682	
4. Less item H Report #16 - Raw Amosite Feed	- 1,540	10,142
Total - Forming Units		$73,788
3. Finishing End Dust Control		6,600
GRAND TOTAL		$80,388

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ENCLOSURE B

Division Headquarters
September 15, 1949

R. W. Dobson

Thermobestos Selling Prices
(Your letter September 13)

We expect to sell Thermobestos at prices which will net the company 23% discount f.o.b. factory for pipe covering and blocks. This is an average price for all classes of trade. It includes crating. The pipe covering should include a canvas jacket.

Incidentally, my forecast for Thermobestos is dated July 9, 1945, and calls for approximately $350,000 list value the first year.

H. N. DOSCHER

cc:
H. A. Kieselbach
A. Cromwell
W. L. VanDerbeek

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ENCLOSURE 6

Division Headquarters
May 18, 1949

H. A. Kieselbach

Effect of Thermobestos on Contract Securements - 1948

You are fully familiar with the fact that our Contract Units are placed at a considerable disadvantage when competing with Unibestos because:

(1) Where operating temperatures exceed 600°F, we must use two-layer construction, except in the narrow range from 600°F to 700°F where Spongefelt might be used.

(2) Where pipe sizes are 12" and over, we must use segmental pipe covering at all operating temperatures except temperatures below 700°F where Spongefelt might be used.

(3) In cases (1) and (2), the price of Spongefelt is prohibitive when we are competing with Unibestos and it is generally impractical to have so many different types of material on a contract.

(4) In some cases Thermobestos type of pipe covering was specified outright by the design engineers.

I have discussed with Mr. L. A. Baldwin the estimate of insulation contracts lost during 1948 due to Thermobestos not being available, and list the following:

Citcon	1,000,000	Lake Charles, La.
Std. Oil of Ohio	200,000	Lima, Ohio
Contenental Oil	250,000	Denver, Colorado
Crown Pet. Company	80,000	Houston, Texas
Lion Oil Company	250,000	El Dorado
Humble Oil Company	250,000	Baytown, Texas
Shell Oil Co. (3 jobs)	225,000	Houston, Texas
TOTAL CONTRACT VALUE	2,255,000	

All of the jobs were "Unit Price" contracts, and it is impossible to secure an accurate value, but we believe the total is conservative.

The average gross profit for all contracts completed and billed during 1948 was 15%

Applying this 15% of gross profit to the $2,255,000, we have an estimated $338,000 of gross profit lost on these contracts.

Since on this type of contract the average value of all Johns-Manville material is approximately 30% of the selling price, we lost the profit on material sales of approximately $676,500 which would have been used on these contracts.

D. D. CREWS

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Enclosure D

ENCLOSURE D

Thermobestos Pipe Covering
Forecast Breakdown

Total Sections - 100,000 List Value $422,000
Total Board Measure - 1,244,000

Thickness	Pipe Sizes 1/2 - 12" % BM	Pipe Sizes 1/2 - 12" % Sections	Pipe Size 14" - 30" % BM	Pipe Size 14" - 30" % Sections
1	12.5	46.5	.2	.1
1-1/2	5.6	10.2	1.2	.6
2	9.5	11.7	1.9	.8
2-1/2	3.6	2.9	.1	-
3	12.6	8.2	.2	-
3-1/2	24.5	11.7	7.1	1.3
4	15.5	4.9	4.8	.8
4-1/2	.6	.2	-	-
5	-	-	.1	.1
	84.4%	96.3%	15.6%	3.7%

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