



MEMORANDUM

cc: Mr. Suva - BR
Mr. Wood - BBP
Mr. Kearney - RGA

To Mr. Zilfi, RGA
From Mr. Jackson, BBH
Date 11/16/82
Subject

1983 BUSINESS PLAN

PLAINTIFF'S EXHIBIT

BIR-423

I have completed the 1983 Business Plan elements for the Roofing Group, Product Development Summary and Programs.

I went over this information with Frank Wood on November 12, 1982. Frank and I are in agreement that the attached summary sets forth the plans of this group for 1983.

JWJ/rp
Attach.

001193



MEMORANDUM

To J. W. Jackson
From J. Zilfi 83
Date November 12, 1982
Subject 1983 Business Plan

This is just a reminder of the 1983 Business Plan elements that are required from you. The required date noted below is the latest date the information or schedule should be submitted to me to allow time for review, approval, typing, printing, and inclusion in the Business Plan documentation.

<u>Schedule Name</u>	<u>Schedule Number</u>	<u>Information</u>	<u>Date Required</u>
Management Action Programs	A-1	R & D (Functional)	11/19
Research & Development Summary	F-2	See Schedule	11/20

If you have any questions, please call me or Hugh Kearney.

JZ:vc

cc: H. F. Kearney
D. R. Suva
F. W. Wood

001194

Mr. Jackson

PRODUCT DEVELOPMENT
TECHNICAL SUPPORT PLAN

The major goal in the 1983 Business Plan for the roofing group is cost reduction. Product Development has oriented its objectives for that purpose. We are organized to function in three areas at present:

1. Process Research & Development
2. Product Design & Development
3. Support Service

We plan to work in these areas to reduce costs and improve profit on our product line and/or raw materials used for their manufacture. The following pages are a summary of the areas we plan to work in.

JWJackson/rp
11/10/82

001195

PRODUCT DEVELOPMENT
TECHNICAL SUPPORT PLAN

<u>Item</u>	<u>Process Development</u>	<u>Product Development</u>	<u>Support Service</u>
SHINGLES	Conversion to sand backing. Improve handling characteristics of Norwood metric shingle.	Printed overlay shingle (substitute for Architect 80) Fast seal shingle. Improved low temperature performance of F-G shingles.	Competitive awareness testing for sales.
GRANULES	Improved coloring process study		Conversion to 3M colors (high temperature).
GLASS MAT	Evaluate reworked glass or mineral fiber as a filler in mat.	Glass ply sheet mat to meet ASTM 2178, Type IV.	Provide FK mat plant with technical service as needed in process and quality control.
ASPHALT	Determine maximum filler level consistent with good shingle performance at each plant.	Find suitable substitute for asphalt to use on glass mat with granules to make a shingle.	
ORGANIC FELT	Evaluate replacing defibrated wood with wood flour, glass fiber and/or mineral fiber on DSPM#1.		
ROOFING CEMENTS		Replace asbestos in our line to reduce Bird & Son's exposure.	
BUILT-UP ROOFING		Evaluate Jyker Systems	

001196

RESEARCH & DEVELOPMENT SUMMARY

F-2

Page 1 of 6

BUSINESS UNIT Product Development
DATE 11/10/82

PROJECT	RISK	PROFIT	TOTAL COST	WORK STAGE & COST					GOALS AND STRATEGY OUTLINE	PRIORITY
				CURRENT YEAR	YR 1	YR 2	YR 3	YR 4		
SHINGLES										
Printed Overlay Shingle	L	M	\$15,000	D \$2,000	I \$13,000	-	-	-	To design a shingle that is similar in appearance to an Architect 80 laminated shingle but can be run using an overlay print section on present roofing machines at Bird plants.	H
Sand Backing	M	M	\$8,000	D \$1,000	I \$7,000	-	-	-	To convert from talc to sand backing thereby reducing cost by replacing asphalt coating with sand without causing sticking in the bundle.	H
Improve Performance of Glass Shingles at Low Temperatures	L	M	\$11,000	-	D/I \$11,000	-	-	-	Identify and control factors that lead to poor low temperature application performance thereby reducing complaints.	L
Fast Seal Shingle	L	H	\$20,000	-	F \$10,000	D \$10,000	-	-	Develop a shingle sealing system that will seal within 8 hrs. after being applied regardless of weather but will not effect present packaging or handling.	L
Competitive Awareness Testing	L	M	\$8,200	-	I \$8,200	-	-	-	Maintain awareness of major competitors' standard products and changes being made in their quality along with its effect on performance in each division.	H

* LOW (L) MEDIUM (M) HIGH (H)
WSC (WORK STAGE CODE) E = EXPLORATORY, F = FEASIBILITY STUDY, D = DEVELOPMENT, I = INTRODUCTION

001192

F-2

Page 2 of 6

RESEARCH & DEVELOPMENT SUMMARY

BUSINESS UNIT Product Development

DATE 11/10/82

PROJECT	RISK *	PROFIT * REPORT	TOTAL COST	WORK STAGE & COST				GOALS AND STRATEGY OUTLINE	PRIORITY
				CURRENT YEAR	PLAN YR 1	PLAN YR 2	PLAN YRS		
Improve the Bundle and Shingle Handling Characteristics of Norwood Metric Glass Shingles	M	L	\$10,800	\$3,800 D/I	\$7,000 D/I	-	-	Make Norwood glass shingles second to none in quality in the market and improve our customer image by putting polyester tape on to reduce tearing at the cut-out, increasing amount of adhesive on the shingle, and stiffen the bundle for better handling.	H

* LOW (M) MEDIUM (H) HIGH
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001198

RESEARCH & DEVELOPMENT SUMMARY

F-2

Page 3 of 6

BUSINESS UNIT Product Development
DATE 11/10/82

PROJECT	RISK	* PROFIT	TOTAL COST	WORK STAGE & COST				GOALS AND STRATEGY OUTLINE	PRIORITY
				CURRENT YEAR	PLAN YR 1	PLAN YRS 2-3	PLAN YRS 4-5		
<u>GRANULES</u> Coloring Process Studies	L	H	\$80,000	D \$5,000	D/I \$75,000			Convert Norwood and Charleston coloring plants to a more economical coloring process that will save in pigments used, energy consumption required to produce, and increase capacity.	H
Convert to 3M Colors at Norwood and Charleston	L	H	\$5,000	D/I \$2,000	I \$3,000			Match 3M colors at Norwood and Charleston to enable us to simplify our color line, sell granules to our competitors (after completion of #1 above), and have back-up supply of granules (3M) available during color changeover (#1 above) at each mill.	H

* (L) LOW (M) MEDIUM (H) HIGH
WSC (WORK STAGE CODE) E = EXPLORATORY, F = FEASIBILITY STUDY, D = DEVELOPMENT, I = INTRODUCTION

RESEARCH & DEVELOPMENT SUMMARY

F-2

Page 4 of 6

BUSINESS UNIT Product Development

DATE 11/10/82

PROJECT	RISK	PROFIT	TOTAL COST	WORK STAGE & COST				GOALS AND STRATEGY OUTLINE	PRIORITY
				CURRENT YEAR	PLAN YR 1	PLAN YR 2	PLAN YRS 3		
GLASS MAT									
Techniques to Reduce Raw Material Cost	L	M	\$15,000	-	F/D	\$15,000		Rework waste mat broke or use low cost mineral fiber to reduce the amount of glass fiber used in mat production.	H
Glass Ply Sheet to Meet ASTM 2178, Type IV	L	M	\$7,500	-	D	\$7,500		New product for FK mat machine to fill a market need.	H
Improved Bonding Strength and Physicals	L	H	\$13,000	-	D	\$10,000	I \$3,000	Enable Bird to use a lighter wt. mat that is as strong as nominal 2.0# roofing mat.	H
Use of Synthetic Fibers with or without Glass	M	M	\$5,000	-	F	\$5,000		Determine what changes, if any, are necessary on the machine to run and what products could be made.	L
Provide mat plant with Technical Service as Needed	L	L	\$5,000	-	I	\$5,000		Monitor quality control and process during start-up year.	H

* LOW MEDIUM HIGH

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RESEARCH & DEVELOPMENT SUMMARY

BUSINESS UNIT Product Development

DATE 11/10/82

F-2

Page 5 of 6

PROJECT	RISK	TOTAL COST	WORK STAGE & COST				GOALS AND STRATEGY OUTLINE	PRIORITY
			CURRENT YEAR	PLAN YR 1	PLAN YR 2	PLAN YR 3		
<u>ASPHALT</u> Filler Level vs. Shingle Performance	M	\$21,500	-	D	\$21,500		Determine maximum filler level consistent with good shingle performance at each production plant.	L
Substitute for Asphalt	H	\$6,700	-	F	\$6,700		Find a suitable plastic binder that can be used in place of asphalt on shingle mat to hold granules and make a shingle with performance equal to or better than present F-G shingles.	L
<u>ORGANIC FELT</u> Replace Defibrated Wood on DSPM#1	M		-	F	\$6,000		Determine if wood flour alone or with fiber glass can replace defibrated wood in 25# and 50# Felt thereby eliminating power consumption in chipping department.	H
<u>ROOFING CEMENT</u> Replace Asbestos	L	\$5,000	-	D/I	\$5,000		Reduce exposure to asbestos by replacing with a plastic fiber - Pulplex.	M

* (L) LOW (M) MEDIUM (H) HIGH

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001204

RESEARCH & DEVELOPMENT SUMMARY

F-2

Page 6 of 6

BUSINESS UNIT Product Development
DATE 11/10/82

PROJECT	RISK	PROFIT	TOTAL COST	WORK STAGE & COST					GOALS AND STRATEGY OUTLINE	PRIORITY
				CURRENT YEAR	PLAN YR 1	PLAN YR 2	PLAN YR 3	PLAN YRS		
BUILT-UP ROOFING Evaluate Jyker Style System as One-Ply System	M	M	\$22,000	-	D	\$8,800	I	\$13,200	Simple one-ply roofing system using cold application techniques may be an entry for Bird into one-ply market.	L

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001202

MANAGEMENT ACTION PROGRAMS

A-1
Page 1 of 5

BUSINESS UNIT/FUNCTION Product Development
DIVISION/DEPARTMENT _____

PREPARED OR UPDATED AS OF 11/10/82

NO.	DESCRIPTION	INDIVIDUAL (S) RESPONSIBLE	SCHEDULED		PROGRAM IMPACT
			START	COMPLETE	
1.	<u>SHINGLES</u> Printed Overlay Shingle	C. Patenaude	10/ 15/ 82	5/ 15/ 83	This could enable Bird to make a low cost Architect 80 Shingle in FK and FS without having to build a \$600,000 in-line laminator.
2.	Sand Backing	V. Roelofs	9/ 15/ 82	5/ 15/ 83	Assuming we can control product weight, close enough to remove filled coating, we can save \$.12/sq.
3.	Improve Performance of Glass Shingles	C. Patenaude/ V. Roelofs	2/ 1/ 83	12/ 31/ 83	Reduce applicator complaints due to low temperature handling characteristics.
4.	Fast Seal Shingle	V. Roelofs	1/ 15/ 83	9/ 15/ 83	Feasibility study using adhesive consultant would determine if it is possible to do this at a reasonable cost. We would then have to determine if the market would pay for it.
5.	Competitive Awareness Testing	C. Patenaude/ B. O'Berg	1/ 1/ 83	12/ 31/ 83	Enable Bird to maintain competitive position in the market.
6.	Improve Handling of Norwood Glass Shingle	V. Roelofs	11/ 22 82	3/ 1/ 83	Improve Bird's image in the New England market.

001203

MANAGEMENT ACTION PROGRAMS

BUSINESS UNIT/FUNCTION Product Development
DIVISION/DEPARTMENT _____

PREPARED OR UPDATED AS OF 11/10/82

NO.	DESCRIPTION	INDIVIDUAL (S) RESPONSIBLE	SCHEDULED		PROGRAM IMPACT
			START	COMPLETE	
1.	<u>GRANULES</u> Coloring Process Studies	T. McShea	9/ 15/ 82	4/ 15/ 83	Increase production rates, reduce energy costs, decrease pigment usage and use lower-cost pigments (low temperature). Could produce savings of \$250,000-\$600,000/yr. at our two East Coast granule plants. This could also enable us to sell granules at a profit to our local competition at advantageous prices due to freight savings..
2.	Convert to 3M Colors at Norwood & Charleston	T. McShea	10/ 15/ 82	3/ 15/ 83	Enable Bird to decrease present color line and use 3M colors as back-up when making changes at the coloring plants. Also will enable Bird to sell granules to competitors when plant conversions are complete.

001204

MANAGEMENT ACTION PROGRAMS

BUSINESS UNIT/FUNCTION Product Development
DIVISION/DEPARTMENT _____

PREPARED OR UPDATED AS OF 11/10/82

A-1

Page 3 of 5

NO.	DESCRIPTION	INDIVIDUAL (S) RESPONSIBLE	SCHEDULED		PROGRAM IMPACT
			START	COMPLETE	
1.	<u>GLASS MAT</u> Techniques to Reduce Raw Material Costs	R. Jagocki	2/ 15/ 83	12/ 31/ 83	Raw material cost amounts to 78% of mat costs. Reduction in the amount of fiber glass used will improve profit provided we maintain mat quality.
2.	Glass Ply Sheet to Meet ASTM	R. Jagocki	11/ 15/ 82	6/ 15/ 83	A supplemental product for the mat machine.
3.	Improved Resin Bonding Strength & Physicals	R. Jagocki	3/ 15/ 83	6/ 15/ 83	Using silane esters and longer fiber lengths to reduce mat weight without loss of strength. Each 0.1 lbs. per 100 sq. ft. = \$.16/sq. of shingles.
4.	Use of Synthetic Fibers With or Without Glass	R. Jagocki	4/ 15/ 82	12/ 31/ 83	Study would determine whether or not we could use and what type of products could be made.

001205

A-1

Page 4 of 5

MANAGEMENT ACTION PROGRAMS

BUSINESS UNIT/FUNCTION Product Development
DIVISION/DEPARTMENT _____PREPARED OR UPDATED AS OF 11/10/82

NO.	DESCRIPTION	INDIVIDUAL (S) RESPONSIBLE	SCHEDULED		PROGRAM IMPACT
			START	COMPLETE	
1.	<u>ASPHALT</u> Filler Level vs. Shingle Performance	V. Roelofs/ G. O'Berg	12/ 1/ 82	10/ 15/ 83	Maximum filler level, minimum cost; however we must determine levels at each plant that must not be exceeded from a performance standpoint-weathering, granule adhesion, and handling.
2.	Substitute for Asphalt	V. Roelofs	2/ 1/ 82	12/ 31/ 83	Is there a candidate that can compete with asphalt if the price doubles? Feasibility study.
1.	<u>ORGANIC FELT</u> Replace Defibrated Wood on DSPM#1	R. Jagocki	12/ 1/ 82	5/ 15/ 83	Study to reduce energy cost at Shreveport felt mill.

001206

A-1

Page 5 of 5

MANAGEMENT ACTION PROGRAMS

BUSINESS UNIT/FUNCTION Product Development
DIVISION/DEPARTMENT _____PREPARED OR UPDATED AS OF 11/10/82

NO.	DESCRIPTION	INDIVIDUAL (S) RESPONSIBLE	SCHEDULED		PROGRAM IMPACT
			START	COMPLETE	
1.	<u>ROOFING CEMENT</u> Replace Asbestos	V. Roelofs	11/ 1/ 82	6/ 15/ 83	Determine best way to reduce asbestos exposure at Bird Shreveport plant.
1.	<u>BUILT-UP ROOFING</u> Evaluate Jyker Style System as One-Ply	T. McShea	2/ 1/ 83	10/ 15/ 83	Keep abreast of the latest advances in the one-ply market. Test those systems that may make a logical product for Bird to market in the future.

001207

PRODUCT DEVELOPMENT
TECHNICAL SUPPORT PLAN

The major goal in the 1983 Business Plan for the roofing group is cost reduction. Product Development has oriented its objectives for that purpose. We are organized to function in three areas at present:

1. Process Research & Development
2. Product Design & Development
3. Support Service

We plan to work in these areas to reduce costs and improve profit on our product line and/or raw materials used for their manufacture. The following pages are a summary of the areas we plan to work in.

JWJackson/rp
11/10/82

001208

**PRODUCT DEVELOPMENT
TECHNICAL SUPPORT PLAN**

<u>Item</u>	<u>Process Development</u>	<u>Product Development</u>	<u>Support Service</u>
SHINGLES	Conversion to sand backing. Improve handling characteristics of Norwood metric shingle.	Printed overlay shingle (substitute for Architect 80) Fast seal shingle. Improved low temperature performance of F-G shingles.	Competitive awareness testing for sales.
GRANULES	Improved coloring process study		Conversion to 3M colors (high temperature).
GLASS MAT	Evaluate reworked glass or mineral fiber as a filler in mat.	Glass ply sheet mat to meet ASTM 2178, Type IV.	Provide FK mat plant with technical service as needed in process and quality control.
ASPHALT	Determine maximum filler level consistent with good shingle performance at each plant.	Find suitable substitute for asphalt to use on glass mat with granules to make a shingle.	
ORGANIC FELT	Evaluate replacing defibrated wood with wood flour, glass fiber and/or mineral fiber on DSPM#1.		
ROOFING CEMENTS		Replace asbestos in our line to reduce Bird & Son's exposure.	
BUILT-UP ROOFING		Evaluate Jyker Systems	

001209

MANAGEMENT ACTION PROGRAMS

BUSINESS UNIT/FUNCTION Product Development
DIVISION/DEPARTMENT _____

A-1
Page 1 of 5

PREPARED OR UPDATED AS OF 11/10/82

NO.	DESCRIPTION	INDIVIDUAL (S) RESPONSIBLE	SCHEDULED		PROGRAM IMPACT
			START	COMPLETE	
1.	<u>SHINGLES</u> Printed Overlay Shingle	C. Patenaude	10/15/82	5/15/83	This could enable Bird to make a low cost Architect 80 Shingle in FK and FS without having to build a \$600,000 in-line laminator.
2.	Sand Backing	V. Roelofs	9/15/82	5/15/83	Assuming we can control product weight, close enough to remove filled coating, we can save \$.12/sq.
3.	Improve Performance of Glass Shingles	C. Patenaude/ V. Roelofs	2/1/83	12/31/83	Reduce applicator complaints due to low temperature handling characteristics.
4.	Fast Seal Shingle	V. Roelofs	1/15/83	9/15/83	Feasibility study using adhesive consultant would determine if it is possible to do this at a reasonable cost. We would then have to determine if the market would pay for it.
5.	Competitive Awareness Testing	C. Patenaude/ B. O'Berg	1/1/83	12/31/83	Enable Bird to maintain competitive position in the market.
6.	Improve Handling of Norwood Glass Shingle	V. Roelofs	11/22/82	3/1/83	Improve Bird's image in the New England market.

001210

MANAGEMENT ACTION PROGRAMS

BUSINESS UNIT/FUNCTION Product Development
DIVISION/DEPARTMENT _____

PREPARED OR UPDATED AS OF 11/10/82

NO.	DESCRIPTION	INDIVIDUAL (S) RESPONSIBLE	SCHEDULED		PROGRAM IMPACT
			START	COMPLETE	
1.	Coloring Process Studies <u>GRANULES</u>	T. McShea	9/15/82	4/15/83	Increase production rates, reduce energy costs, decrease pigment usage, and use lower-cost pigments (low temperature). Could produce savings of \$250,000-\$600,000/yr. at our two East Coast granule plants. This could also enable us to sell granules at a profit to our local competition at advantageous prices due to freight savings.
2.	Convert to 3M Colors at Norwood & Charleston	T. McShea	10/15/82	3/15/83	Enable Bird to decrease present color line and use 3M colors as back-up when making changes at the coloring plants. Also will enable Bird to sell granules to competitors when plant conversions are complete.

001211

MANAGEMENT ACTION PROGRAMS

BUSINESS UNIT/FUNCTION Product Development
DIVISION/DEPARTMENT _____

A-1

Page 3 of 5

PREPARED OR UPDATED AS OF 11/10/82

NO.	DESCRIPTION	INDIVIDUAL (S) RESPONSIBLE	SCHEDULED		PROGRAM IMPACT
			START	COMPLETE	
1.	<u>GLASS MAT</u> Techniques to Reduce Raw Material Costs	R. Jagocki	2/15/83	12/31/83	Raw material cost amounts to 78% of mat costs. Reduction in the amount of fiber glass used will improve profit provided we maintain mat quality.
2.	Glass Ply Sheet to Meet ASTM	R. Jagocki	11/15/82	6/15/83	A supplemental product for the mat machine.
3.	Improved Resin Bonding Strength & Physicals	R. Jagocki	3/15/83	6/15/83	Using silane esters and longer fiber lengths to reduce mat weight without loss of strength. Each 0.1 lbs. per 100 sq. ft. = \$.16/sq. of shingles.
4.	Use of Synthetic Fibers With or Without Glass	R. Jagocki	4/15/82	12/31/83	Study would determine whether or not we could use and what type of products could be made.

001212

MANAGEMENT ACTION PROGRAMS

BUSINESS UNIT/FUNCTION Product Development
DIVISION/DEPARTMENT _____

PREPARED OR UPDATED AS OF 11/10/82

A-1
Page 4 of 5

NO.	DESCRIPTION	INDIVIDUAL (S) RESPONSIBLE	SCHEDULED		PROGRAM IMPACT
			START	COMPLETE	
	ASPHALT				

82	R. Jagocki	12/1/82	5/15/83	Study to reduce energy cost at Shreveport felt mill.	Feasibility study.

1.	<u>ORGANIC FELT</u> Replace Defibrated Wood on DSPM#1				
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001213

MANAGEMENT ACTION PROGRAMS

BUSINESS UNIT/FUNCTION Product Development
DIVISION/DEPARTMENT _____

PREPARED OR UPDATED AS OF 11/10/82

NO.	DESCRIPTION	INDIVIDUAL (S) RESPONSIBLE	SCHEDULED		PROGRAM IMPACT
			START	COMPLETE	
1.	<u>ROOFING CEMENT</u> Replace Asbestos	V. Roelofs	11/ 1/ 82	6/ 15/ 83	Determine best way to reduce asbestos exposure at Bird Shreveport plant.
1.	<u>BUILT-UP ROOFING</u> Evaluate Jyker Style System as One-Ply	T. McShea	2/ 1/ 83	10/ 15/ 83	Keep abreast of the latest advances in the one-ply market. Test those systems that may make a logical product for Bird to market in the future.

001214

RESEARCH & DEVELOPMENT SUMMARY

BUSINESS UNIT Product Development
DATE 11/10/82

PROJECT	RISK	PROFIT	TOTAL COST	WORK STAGE & COST				GOALS AND STRATEGY OUTLINE	PRIORITY
				CURRENT YEAR	PLAN YR 1	PLAN YR 2	PLAN YR 3		
<u>SHINGLES</u> Printed Overlay Shingle	L	M	\$15,000	D \$2,000	I \$13,000	-	-	To design a shingle that is similar in appearance to an Architect 80 laminated shingle but can be run using an overlay print section on present roofing machines at Bird plants.	H
Sand Backing	M	M	\$8,000	D \$1,000	I \$7,000	-	-	To convert from talc to sand backing thereby reducing cost by replacing asphalt coating with sand without causing sticking in the bundle.	H
Improve Performance of Glass Shingles at Low Temperatures	L	M	\$11,000	-	D/I \$11,000	-	-	Identify and control factors that lead to poor low temperature application performance thereby reducing complaints.	L
Fast Seal Shingle	L	H	\$20,000	-	F \$10,000	D \$10,000	-	Develop a shingle sealing system that will seal within 8 hrs. after being applied regardless of weather but will not effect present packaging or handling.	L
Competitive Awareness Testing	L	M	\$8,200	-	I \$8,200	-	-	Maintain awareness of major competitors' standard products and changes being made in their quality along with its effect on performance in each division.	H

• LOW (L) MEDIUM (M) HIGH (H)

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001215

RESEARCH & DEVELOPMENT SUMMARY

F-2

Page 2 of 6

BUSINESS UNIT Product Development
DATE 11/10/82

PROJECT	RISK	PROFIT	TOTAL COST	WORK STAGE & COST				GOALS AND STRATEGY OUTLINE	PRIORITY
				CURRENT YEAR	PLAN YR 1	PLAN YR 2	PLAN YR 3		
Improve the Bundle and Shingle Handling Characteristics of Norwood Metric Glass Shingles	M	L	\$10,800	D/I \$3,800	D/I \$7,000	-	-	Make Norwood glass shingles second to none in quality in the market and improve our customer image by putting polyester tape on to reduce tearing at the cut-out, increasing amount of adhesive on the shingle, and stiffen the bundle for better handling.	H

001216

LOW MEDIUM HIGH
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RESEARCH & DEVELOPMENT SUMMARY

BUSINESS UNIT Product Development

DATE 11/10/82

F-2

Page 3 of

PROJECT	RISK	PROFIT	TOTAL COST	WORK STAGE & COST				GOALS AND STRATEGY OUTLINE	PRIORITY
				CURRENT YEAR	PLAN YR 1	PLAN YR 2	PLAN YR 3		
<u>GRANULES</u>									
Coloring Process Studies	L	H	\$80,000	\$5,000	D/I	\$75,000		Convert Norwood and Charleston coloring plants to a more economical coloring process that will save in pigments used, energy consumption required to produce, and increase capacity.	H
Convert to 3M Colors at Norwood and Charleston	L	H	\$5,000	\$2,000	D/I	\$3,000		Match 3M colors at Norwood and Charleston to enable us to simplify our color line, sell granules to our competitors (after completion of #1 above), and have back-up supply of granules (3M) available during color changeover (#1 above) at each mill.	H

001217

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RESEARCH & DEVELOPMENT SUMMARY

F-2

Page 4 of 1

BUSINESS UNIT Product Development
DATE 11/10/82

PROJECT	RISK	PROFIT	TOTAL COST	WORK STAGE & COST				GOALS AND STRATEGY OUTLINE	PRIORITY
				CURRENT YEAR	PLAN YR 1	PLAN YR 2	PLAN YRS		
GLASS MAT									
Techniques to Reduce Raw Material Cost	L	M	\$15,000	-	F/D	\$15,000		Rework waste mat broke or use low cost mineral fiber to reduce the amount of glass fiber used in mat production.	H
Glass Ply Sheet to Meet ASTM 2178, Type IV	L	M	\$7,500	-	D	\$7,500		New product for FK mat machine to fill a market need.	H
Improved Bonding Strength and Physicals	L	H	\$13,000	-	D	\$10,000	\$3,000	Enable Bird to use a lighter wt. mat that is as strong as nominal 2.0# roofing mat.	H
Use of Synthetic Fibers with or without Glass	M	M	\$5,000	-	F	\$5,000		Determine what changes, if any, are necessary on the machine to run and what products could be made.	L
Provide mat plant with Technical Service as Needed	L	L	\$5,000	-	I	\$5,000		Monitor quality control and process during start-up year.	H

001218

LOW MEDIUM HIGH
MSC (WORK STAGE CODE) E = EXPLORATORY, F = FEASIBILITY STUDY, D = DEVELOPMENT, I = INTRODUCTION

F-2

Page 5 of 6

RESEARCH & DEVELOPMENT SUMMARY

BUSINESS UNIT Product Development

DATE 11/10/82

PROJECT	RISK	PROFIT	TOTAL COST	WORK STAGE & COST				GOALS AND STRATEGY OUTLINE	PRIORITY
				CURRENT YEAR	PLAN YR 1	PLAN YR 2	PLAN YR 3		
ASPHALT Filler Level vs. Shingle Performance	M	H	\$21,500	-	D	\$21,500		Determine maximum filler level consistent with good shingle performance at each production plant.	L
Substitute for Asphalt	H	M	\$6,700	-	F	\$6,700		Find a suitable plastic binder that can be used in place of asphalt on glass mat to hold granules and make a shingle with performance equal to or better than present F-G shingles.	L
ORGANIC FELT Replace Defibrated Wood on DSPM#1	M	H		-	F	\$6,000		Determine if wood flour alone or with fiber glass can replace defibrated wood in 25# and 50# Felt thereby eliminating power consumption in chipping department.	H
ROOFING CEMENT Replace Asbestos	L	L	\$5,000	-	D/I	\$5,000		Reduce exposure to asbestos by replacing with a plastic fiber - Pulpex.	M

LOW MEDIUM HIGH

WSC (WORK STAGE CODE) E = EXPLORATORY, F = FEASIBILITY STUDY, D = DEVELOPMENT, I = INTRODUCTION

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F-2

Page 6 of 6

RESEARCH & DEVELOPMENT SUMMARY

BUSINESS UNIT Product Development

DATE 11/10/82

PROJECT	RISK	PROFIT	TOTAL COST	WORK STAGE & COST				GOALS AND STRATEGY OUTLINE	PRIORITY
				CURRENT YEAR	PLAN YR 1	PLAN YR 2	PLAN YR 3		
BUILT-UP ROOFING Evaluate Jyker Style System as One-Ply System	M	M	\$22,000	-	D	\$8,800	I	\$13,200	L
Simple one-ply roofing system using cold application techniques may be an entry for Bird into one-ply market.									

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* LOW MEDIUM HIGH
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