

**MILLIKEN RESEARCH CORPORATION**

*Spartanburg, South Carolina*

**LABORATORY NOTEBOOK**

Name..... George McLarty..... Book No. 11238

Used from..... April 6, 2000..... To..... JUNE 10, 2002.....

Laboratory Book Nº 11238

Date Received: 4-6-00

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The procedure outlined below is required for one purpose primarily--to make the notebook acceptable as indisputable legal proof in patent proceedings of what was done, and exactly when it was done. The exact date on which a given idea was first in mind has often been the basis for awarding valuable patents. Therefore, as soon as you have any idea, even though it may seem trivial or obvious to you, you will, under the procedure outlined, put it in your notebook with complete details. This will apply whether it is a small modification in experimental procedure or apparatus design which may give improved yields or operation, or what may be a major improvement or innovation in products or processes.  
**GET IT DOWN.**

The early date of record may mean the difference between getting an important patent for the Research Corporation in your name, or losing it to some other company which can actually keep our stockholder mills from using the idea.

If after further thought and discussion, or a few experiments, you decide that the idea may have value, you may draw up a formal description, either as a memo or on the invention record form provided, for submission to the Patent Division.

It is a function of the Patent Division to review the yellow sheets in this notebook as forwarded by you and to cull from them all ideas having patentable novelty, but the invention record form submitted in this way will serve to accent those ideas considered by you to be most important.

## PROCEDURE FOR KEEPING LABORATORY NOTEBOOKS

1. Make all entries in ink and as legible and complete as possible.
2. Every pair of sheets is consecutively numbered, and all entries should be made on the white sheets with a carbon paper between the white sheet and the next succeeding yellow sheet. The yellow sheets, which are perforated for easy removal, are torn out daily and forwarded to the administrative office of the Research Corporation. No white pages (containing the original of the entry) should be torn out under any circumstances.
3. All experimental data is to be entered in this book, and as far as possible, all calculations, graphs, drawings and notes of any character should be entered herein. When patents are referred to, include patent number. When literature is referred to, include complete journal references (Author, Volume, Page, Date).
4. Make all entries in this notebook first. It is extremely important that this notebook be what the law calls a "notebook of original entry." Make your first notes about anything—weight, temperature, time, ideas for future work, drawings, sketches—in this notebook. If you want to keep a separate tabulation in special cases, do your transcribing of data from the notebook into the tabulation, but not the other way.
5. When starting a problem use the following heading:

Subject: \_\_\_\_\_ Project No. \_\_\_\_\_

Experiment No. \_\_\_\_\_ Test No. \_\_\_\_\_

If work done on the problem for the day fills more than one page, continue on next page and start heading:

Project No. \_\_\_\_\_ Continued

If work done on the problem for the day fills part of page, use the remainder of page for the next problem worked on that day and fill in the complete heading. Make all your entries in strict chronological order. If you are working on several experiments at once and making alternate observations, use the full heading at the start of each experiment each day, and for later entries on that day you need only note the experiment number beside the date.

Date and sign every page or after each problem on the same page.

The full date should be entered, e.g., July 1, 1946, not 7/1/46.

Do not leave blank spaces after experiments. If there is only a small amount of space, 1 to 2 inches, left at the end of the page when an experiment is finished, draw diagonal lines through this space.

Have an associate, if possible a superior, witness the record of the entire experiment and the signature of each experiment. He should be someone qualified to understand the record.

6. Erasures should never be made. Draw a line through the incorrect work or entry. Never make corrections on a page after signing and dating. If it is at any time observed that a cancellation or addition should have appeared in an earlier entry, a new entry should be made, stating what should be cancelled and what addition should have appeared in the earlier entry.
7. When an experiment must be started on one day and completed some days or a week later, space should not be left at the first entry for subsequent results, but when the results are finally received, the data from the original day's work may (but need not) be brought forward (with suitable reference to the page where they first occur) and the whole experiment summarized on the day on which the final data are obtained.
8. Do your thinking in the notebook. Whenever you have an idea of any kind on future experimental work, whether it bears on your own problems or those of other laboratory or research sections or of others with whom you may be engaged during the course of your work, jot it down in your notebook at once, with as much detail as possible. Do the same for proposed apparatus layouts and experimental procedures.  
After any discussion, formal or informal, that bears on the work of the Research Corporation or other organizations engaging the services of Research Corporation, note what it was about and who was present. If you watch someone else carry out an experiment, make a note of what you saw and who was there.  
In short, make this notebook a diary so that anyone can go back to it years later (five to ten years is not unusual in patent actions) and report without question what you did, what you saw, what you thought, who was present, whom you spoke to, what you discussed and when all this occurred.
9. Index experiments on index pages in front of book.
10. When describing experimental work in weekly or monthly reports, always include the notebook and page numbers on which the work can be found.
11. When a book is filled, it is checked and approved by your section or division head and returned to the Patent Division for filing, unless it is to be retained for reference. However, only one finished book may be retained, and all other finished books must be returned to the Patent Division unless specific permission for their retention is obtained from the Director of Research. If other notebooks are later needed for reference, they can be charged out.

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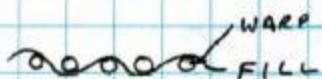
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ON 3/6 - 3/7/00 RAN TRIALS OF MONOFILAMENT PULL-TAPE WITH JAKOB MÜLLER IN CHARLOTTE, NC. I WORKED WITH RENE FREI AND BILLY EDGE OF MULLER.

THE PURPOSE OF THE TRIAL: CAN MONOFILAMENT YARN BE WOVEN AT A DENSITY SIMILAR TO MULTIFILAMENT PULL-TAPE? CAN MULTIPLE ENDS OF MONO BE DRAWN IN TOGETHER TO ACT AS A SINGLE END OF MULTIFILAMENT?

#### TRADITIONAL MONO WARP



#### NEW MONO PULL TAPE



#### SAMPLES MADE ON A MULLER NF

1. 50 ENDS OF 520 DENIER POLYESTER WARP  
3/16" WIDE TAPE  
7.2 PPI OF DOUBLE PICK 500 D MULTI FILL POLY  
100 D TEXT POLY CATCH CORD  
SYSTEM III SELVAGE
  
2. 50 ENDS OF 520 DENIER POLYESTER WARP  
3/16" WIDE TAPE  
7.2 PPI OF DOUBLE PICK 520 D MONO POLY FILL  
100 D TEXT POLY CATCH CORD  
SYSTEM III SELVAGE

PRODUCT IS VERY STIFF AND MAY BE DIFFICULT TO PUT IN A BOX.

Date 4/10/00

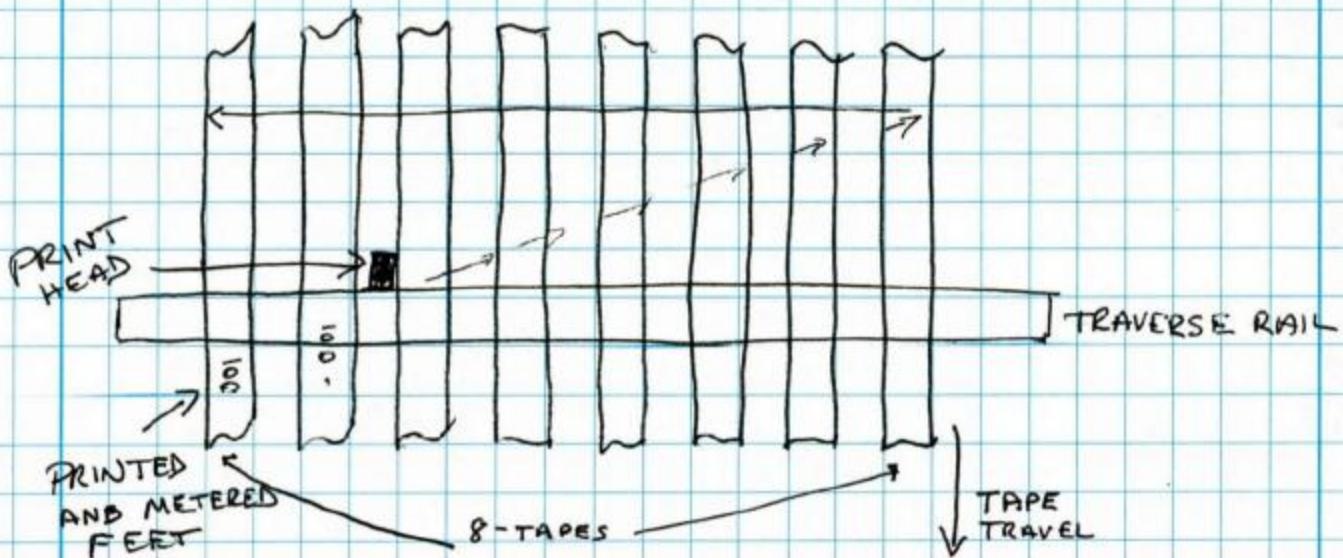
Date 5/4/00

Signature Douglas McFarley

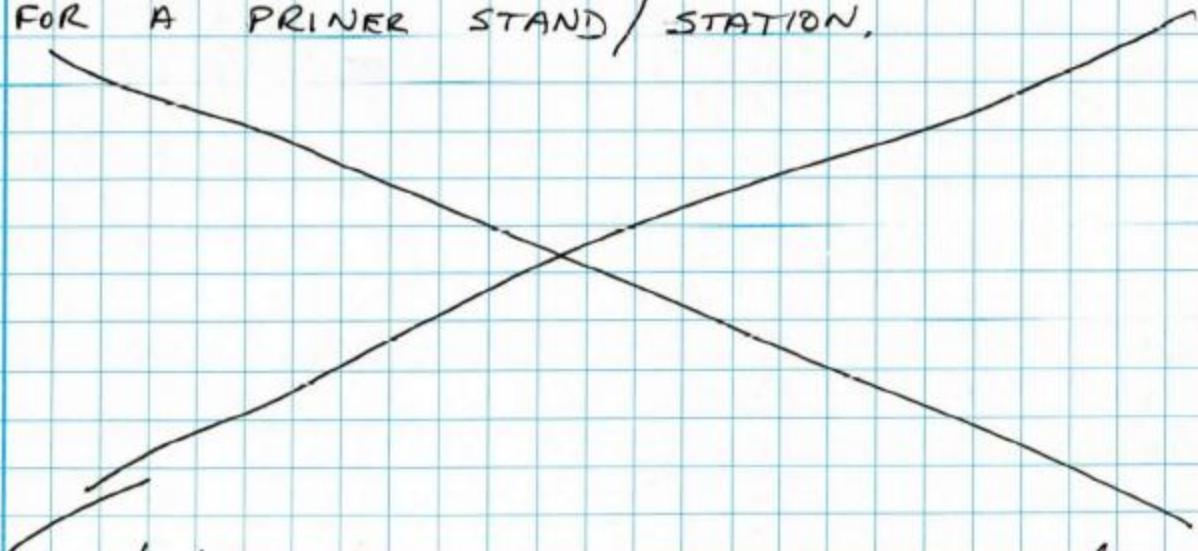
Witness Don Wilson

INK JET PRINTING PULL TAPE

ON 3/9/00 DEREK KOZLOWSKI AND MYSELF ASKED MARCONI DATA SYSTEMS FOR AN INK JET PRINTER TO PRINT ALL EIGHT TAPES OFF THE BACK OF A NEEDLE LOOM. WE HAD AN OPEN DISCUSSION W/ GREG OSBORNE OF MARCONI. OUR IDEA IS TO TRAVERSE THE HEAD ACROSS THE WIDTH OF THE LOOM.



GREG IS TO SUBMIT A QUOTE TO MILLIKEN FOR THIS SYSTEM. DEREK IS GOING TO DRAW-UP A PLAN FOR A PRINTER STAND / STATION.



Date 4/10/00  
Date 5/4/00

Signature George McFarley  
Witness Dan Wilson

ON 3/15/00 I VISITED PETER BAUER OF AMERICAN GYPSUM TO WORK ON LIGHT WEIGHT HIGH IMPACT WALL BOARDS.

WE RAN 4 STYLES WITH AMERICAN GYPSUM TO INVESTIGATE THE PERFORMANCE OF EACH. THE DETAILS ARE LISTED BELOW!

### 1/2" WALL BOARD

MILLIKEN STYLE #	LOCATION IN BOARD
7135	FACE
7135	BACK
7158	FACE
446	FACE
7150	FACE

### FLEXURAL STRENGTH

FACE-UP PERP	FACE DOWN PERP
146 lb	148 lbs
134 lb	134 lbs
139 lb	143 lbs
141 lb	140 lbs
143 lb	141 lbs

7135	FACE
7135	BACK
7158	FACE
446	FACE
7150	FACE

FACE-UP PARA	FACE DOWN PARA
50 <del>50</del> lb	43 lbs
46 <del>50</del> lb	58 lbs
48 <del>50</del> lb	47 lbs
—	—

### NAIL PULL

							Avg
7135	FACE	88	87	92	97	94	98
7135	BACK	78	80	84	80	84	87
7158	FACE	84	93	88	83	84	87
446	FACE	84	88	85	91	91	89
7150	FACE	NO DATA					
CONTROL BOARD		89	90	86	95	89	93
							90

### INDUSTRY SPECS:

NAIL PULL → 77 lbs min

FLEXURAL BREAK → PERP. 107 lbs min.  
PARA. 36 lbs min.

Date 4/10/00  
Date 5/4/00

Signature George C. McKey  
Witness Ann Wilson

ON 4/11/00 I WORKED WITH DREW CHILD AND DAVID BRIDGES TO LUBRICATE TAPE FOR THE MAXCELL PROJECT. THE TAPE WAS WOVEN AT MULLER ON 3/27 AND 3/28. THE TAPE WAS WOVEN ON AN NF MACHINE WITH BILLY EDGE OF MULLER. IT CAN BE DESCRIBED:

3 TAPES WOVEN

18 ENDS /TAPE

4,000 DENIER INTO HONEYWELL FIBER

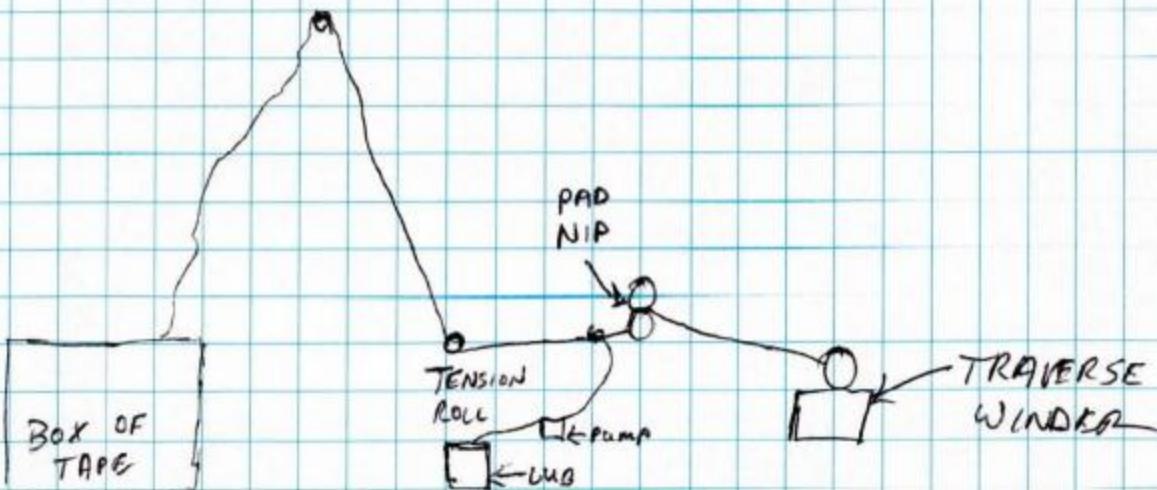
500 DENIER FILL

7.2 EPI

1600 PPM

4,000 FEET LONG

WE LUBED ONE TAPE WITH 2% SILICONE OIL FROM UNICHEM. THE OIL WAS ADDED WITH A DRIP PUMP FEEDING ON-TO THE TAPE WHILE THE TAPE PASSED UNDER THE DRIP AT A CONSTANT RATE. THE TAPE WAS THEN PASSED THROUGH A PAD TO SPREAD THE TAPE LUB INTO THE PULL LINE. THE TAPE WAS TAKEN-UP ON A SELVAGE WINDER.



Date 4/24/00  
Date 5/04/02

Signature

Witness

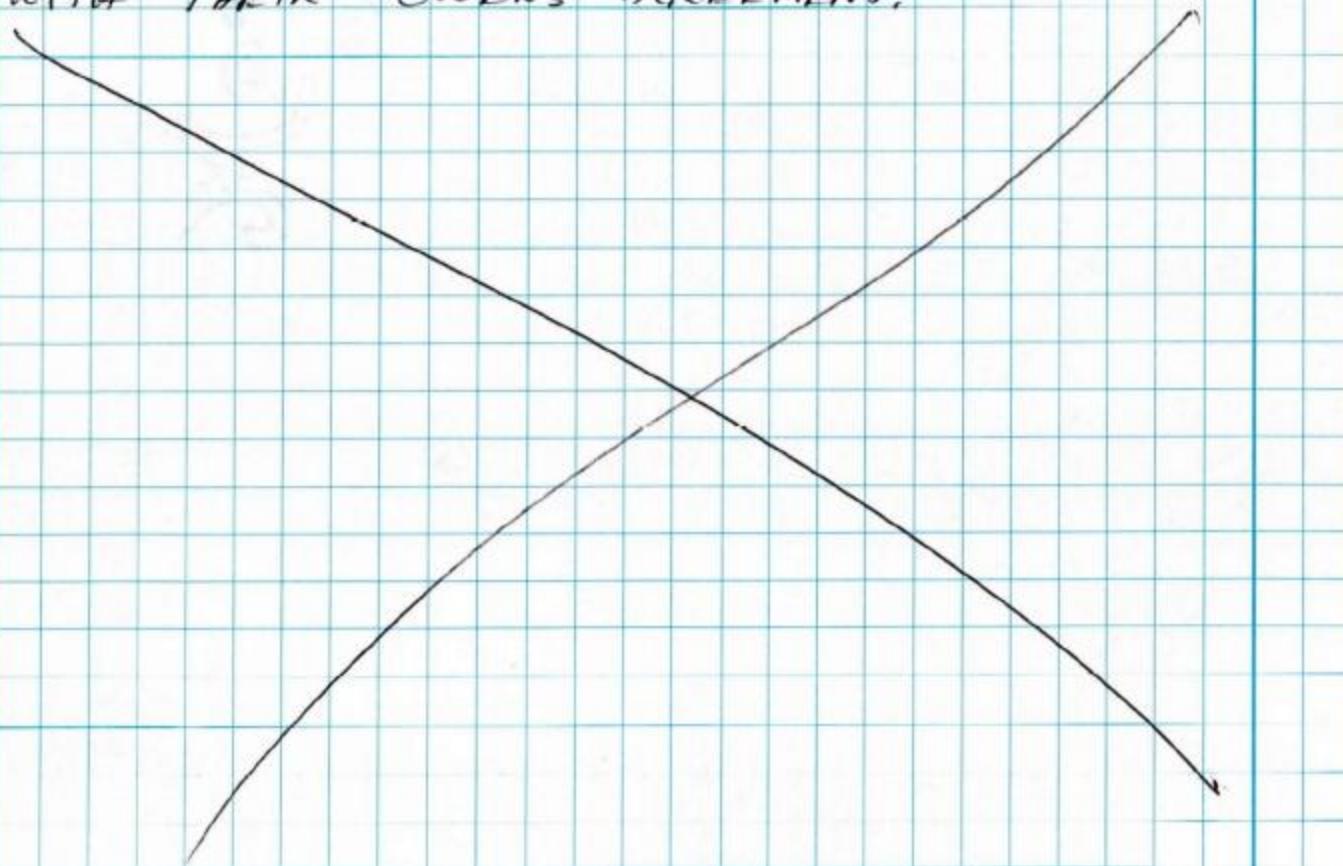
*J.C. Miller*  
*Chris Wilson*

4/18/00

AGY VISIT

ON TUESDAY AFTERNOON I MET WITH EDDIE MCDONALD AND GREG ROBINSON OF AGY (ADVANCED GLASS YARNS). THE PURPOSE OF THE MEETING WAS TO REVIEW THE QUALITY OF THE YARNS BEING SHIPPED TO MILLIKEN'S GILLILAND PLANT.

DURING THE DISCUSSION I ASKED FOR ASSISTANCE UNDERSTANDING THE ROLE OF THE FINISH ~~TO~~ ON THEIR YARNS WHEN USED IN COMPOSITES. GREG IS TO CHECK ON WHAT THEY CAN SHARE WITH US ABOUT USING GLASS IN GYPSUM COMPOSITES. THEY MUST CONFIRM THERE IS NOT A CONFLICT WITH THEIR OWNERS AGREEMENT.



Date 4/24/00  
Date 5/4/00

Signature George C. McLaughlin  
Witness Chas Wilson

4/19/00

## MARCONI DATA TRIAL / VISIT

PURPOSE: PRINT WOVEN TAPE FROM MULLER w/  
MARCONI SYSTEM FOR EVALUATION.

INVOLVED: DEREK KOZLOWSKI  
GEORGE McLARTY  
GREG OSBORNE

TRIAL LOCATION: MARCONI IN ATLANTA

RAN 1000 + FT TOTAL

PRINTED "MILLIKEN" ABOUT EVERY 1 FOOT w/INK # 4510  
THE TAPE WAS RUN OUT OF A BOX WITH MANUAL  
**TENSION** CONTROL. THE PRINTING WAS CONTROLLED  
BY A UHS ~~28~~ PRINTER. THEY RECOMMEND USING  
A 178 FOR OUR PROJECT. THE SPEED OFFERED BY  
A UHS IS NOT NECESSARY FOR THIS APPLICATION. NEED  
TO TEST THREE ITEMS

1. REACTION OF INK WITH LUBRICANT (DREW CHILD)
2. DURABILITY OF CROCKING ON INK "
3. UV STABILITY OF PRINTED TAPE "

MARCONI TO FOLLOW-UP ON THREE ITEMS:

1. NEW QUOTE FOR PRINTER
2. SPECS TO DEREK FOR TRAVERSE w/ DRAWINGS
3. ENCODER / SIGNALS REQUIRED FOR PRINTING TAPE

GREG TO ENSURE THIS HAPPENS

Date: 4/24/00  
Date: 5/4/00

Signature: George C. McLaury  
Witness: Ginn Wilson

PULL TAPE STRENGTH

~~4/22~~ ON 3/30/00 I TESTED PULL TAPE STRENGTH WITH BETTY McCARTY AT RMC.

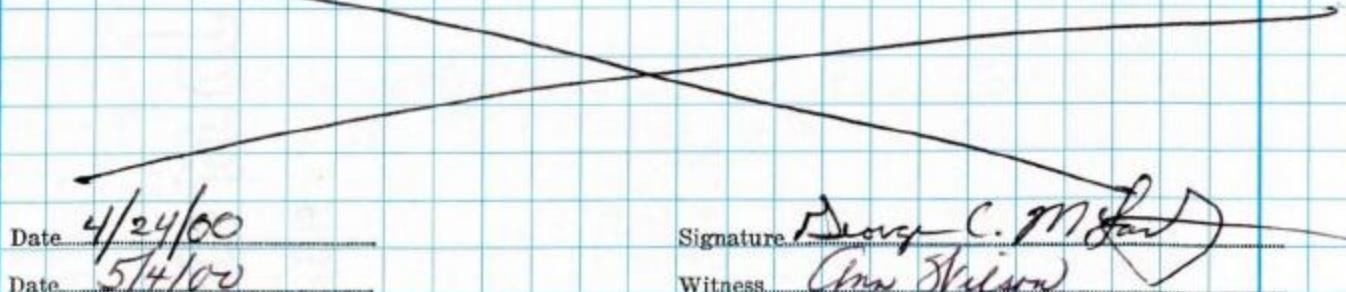
WE USED HE SIMTECH TO TEST THE ELONGATION AT BREAK AND BREAKING STRENGTH.

TRADITIONAL JAWS

		<u>BREAKING LOAD</u>	<u>% ELONG</u>
①	0.22 MONO WARP w/ 180 END 420 DTEX FILLING	582 lbs	38 %
②	0.22 MONO WARP w/180 ENDS 28 167 DTEX FILLING	558 lbs	36 %
③	MULLER / MILLIKEN TAPE 18 ENDS OF 4000-D WARP 7.2 PPI OF 500D POLY	711 lbs	14 %
④	NEPTCO 1250 (MULHERMEI)	839 lbs	18.63 %
⑤	NEPTCO 1250	870 lbs	16.06 %

COG JAWS

		<u>BREAKING LOAD</u>	<u>% ELONG</u>
①	SEE ABOVE	758 lbs	208 %
②	"	754 lbs	229 %
③	"	1264 lbs	102 %
④	"	DID NOT TEST	
⑤	"	13.50 lbs	94 %



4/26/00

SUBJECT: AKALI RESISTANT COATINGS FOR FIBER GLASS

MEETING: REYNOLDS GROUP VISITED TO DISCUSS THEIR NEW COATINGS FOR AKALI RESISTANT

EDDIE SHIRLEY AND LEO LINDSEY CAME TO DISCUSS SOME OF REYNOLDS NEW DEVELOPMENTS. ATTENDING FROM MILLIKEN WERE R. HYDEN, P. ALLEN, T. THOMPSON, R. BREWER, G. MCLARTY,

REYNOLDS IS NOW OFFERING A LINE OF COMPOUNDS FOR THE EIFS AND BACKER BOARD MARKETS. THEIR COMPOUNDS ARE BLENDS OF ACRYLICS AND SYNTHETIC RUBBERS. THEY ARE ALSO CROSS-LINKING. THEY USE A 28 DAY SOAK TEST TO EVALUATE THESE COATINGS ON GLASS. THE CURE REQUIRES 300°F BUT CAN BE LOWERED WITH ADDITIVES. THE VISCOSITY IS ~ 500 CPS WITH 50-60% SOLIDS IN THE MIX. THEIR CURRENT CUSTOMERS CAN GET ~ 13% DRY SOLID ADD-ON WITH ONE PASS AND ALSO PASS THE STRENGTH TEST. THE COST IS A BIG DEAL... THEY HAVE GOT THEM DOWN TO \$1.32/DRY LB IN TOTES. PH IS AROUND 9. SHELF LIFE IS ~ 3 MONTHS AND MUST PREVENT FREEZING. BLENDS CONTAINS ABOUT 0.1 - 0.2% SOLVENT (ESTER TYPE).

SENT REQUEST FOR SUPPLIER AGREEMENT TO ANN WILSON ON 4/26/00.

Date 4/26/00  
Date 5/4/00

Signature George McFarland  
Witness Ann Wilson

## WALLBOARD REVIEW TEAM MTG.

ON 4/25/00 DREW CHILD, BOB SMITH, AND GEORGE MCLARTY  
MET TO REVIEW OUR PROGRESS ON STRENGTHENING WALLBOARD.

## REVIEW OF 4/17/00 ACTION ITEMS:

1. GEORGE SENT YARN SAMPLE TO DREW FOR LAB WORK (comp)
2. DREW TO ORDER RAW MATERIAL (GYPSUM) AND UNDERSTAND COST
  - RECEIVED GYPSUM AND CAN MIX BOARD CORE IN LAB
  - COST OF GYPSUM = #11.20 / TON
3. DREW TO MAKE A CORE BLOCK FOR BOB TO TEST MODULUS.
  - DREW MADE A BLOCK, BUT BLOCK WAS TOO SMALL TO TEST
  - BOB FOUND SOME WALLBOARD IN WASTE CAN AND IS GOING TO USE THESE TO TEST MODULUS.
4. BOB TO DETERMINE MODULUS
  - TO TEST BY 5/4/00
5. DREW TO DETERMINE THE EFFECT OF AMINOSILANE ON THE ADHESION OF GLASS TO CORE
  - MOLD TO ARRIVE 4/27/00
  - YARN AT RMC NOW
  - TEST BY W/E 5/5/00
6. GEORGE WAS TO VISIT AGY TO ASK ABOUT THE ADDITION OF YARN ADDITIVES TO INCREASE ADHESION ON GLASS.
  - AGY TO CONTACT GEORGE BY 5/2/00

FOLLOW-UP BY 5/4/00 AT 8:30

Date

4/27/00

Date

5/4/00

Signature

George C. McLarty

Witness

Ann Wilson

11238-10

## MALLIWATT MAXCELL FOLDING / LAYOUT

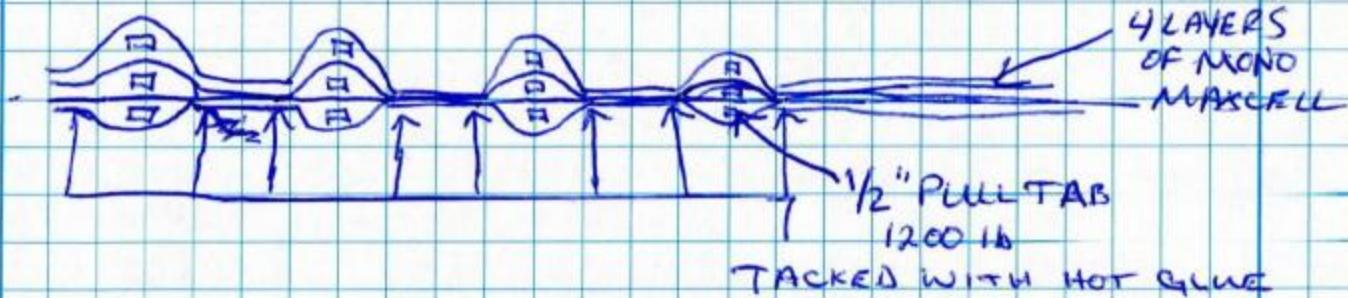
ON 4/28/00 AND 5/1/00

WE LAYED OUT THE MALLIWATT SAMPLE AT RMC w/  
BOB SMITH AND DAVID BRIDGES

### FLAT SAMPLE LAYOUT



### BALLOONED FABRIC



Date: 4/28/00  
Date: 5/1/00

Signature: *DCM*  
Witness: *Gen Wilson*

## WALLBOARD REVIEW MEETING

HELD 5/4/00

PRESENT: SAM GRAHAM, BOB SMITH, AND DREW CHILD

PURPOSE: REVIEW PROJECT STATUS

GOALS:- DETERMINE THE OPPORTUNITIES FOR TEXTILES  
IN WALL BOARD

- INVESTIGATE THE OPTIMUM BUSINESS STRATEGY TO ENTER THE WALL BOARD-MARKET.

## REVIEW OF PAST ACTION ITEMS:

1. BOB TESTED MODULUS OF EXISTING WALLBOARDS.

RESULTS - MODULUS OF WALLBOARD IS 100 TIMES LESS THAN GLASS.

- GLASS IS 20 TIMES MORE DENSE
- THE LOCATION OF GLASS IN CORE IS A 3RD ORDER FUNCTION.

2. DREW IS WORKING ON THE ADHESION OF GLASS TO THE CORE. HE IS ALSO ANALYZING THE GLASS FOR FINISH TO PROMOTE ADHESION.

RESULTS / FINDINGS: LOWERING CORE DENSITY REDUCES ADHESION

CORE DRYING METHOD IS KEY TO FINAL CORE STRENGTH.

## ACTION ITEMS FROM MEETING:

- ① VOC WITH SUB-CONTRACTOR
- ② DREW TO COMPLETE STUDY / ANALYSIS OF YARN CORE ADHESION
- ③ SET-UP BRIAN STORMING SESSION w/ TOM TAYLOR AND DICK STROUPE FROM MILLIKEN ENGINEERING
- ④ GEORGE TO SEND INVENTION RECORDS TO DREW / BOB / SAM
- ⑤ REVIEW INTELLECTUAL PROPERTY DURING EACH MTG.

Date 5/4/00

Signature George C. McFarland

Date 5/18/00

Witness Guy Watson

## WALLBOARD REVIEW MEETING ON 5/8/00

ON 5/8/00 WE MET WITH DICK STRAUP, TOM TAYLOR, SAM GRAHAM, DREW CHILD, DAVID BRIDGES, AND BOB SMITH.

WE FIRST DISCUSSED WALLBOARD NEEDS / REQUIREMENTS

## 1. BOARD INSTALLATION

- A. TOO HEAVY
- B. BOARD BREAKS DURING HANDLING & INSTALLATION
- C. CORNERS ARE HARD TO MAKE AND REQUIRE CORNERS BEADS

2. WHAT IS THE DIFFERENCE IN WALLBOARDS / CEILINGS  
NONE, MAYBE SCREWS OR FASTNERS3. WHAT PROBLEMS DO YOU FACE DURING FINISHING  
JOINTS / CORNERS

## 4. WHAT CAUSES WALLBOARD FAILURES

MOISTURE, PUNCTURE, TERMITES CAN EAT PAPER

5. WHY IS WALLBOARD USED THROUGHOUT THE INDUSTRY  
CHEAP, EASE TO USE, WORKS WELL6. WHAT BRANDS DO YOU USE OR PRODUCTS YOU SPECIFY?  
DENS DECKING ON ROOFS

MOISTURE RESISTANT (MR) IN DAMP AREAS

7. WHAT DO YOU USE TO HANG WALLBOARD  
POWER DRIVER / DRYWALL SCREWS8. IS SOUND TRANSMISSION A FACTOR  
STC (SOUND TRANSMISSION COEFFICIENT)

TEST FOR ENTIRE COMPOSITE OR COMPOSITION

9. WHAT WOULD THE ULTIMATE WALLBOARD LOOK LIKE?  
ELIMINATE CORNER BEADS

LIGHTWEIGHT

LOOKS LIKE DENS PRODUCT AND WEIGHS 1/2 AS MUCH

Date 5/8/00

Signature

*Dick Straup*

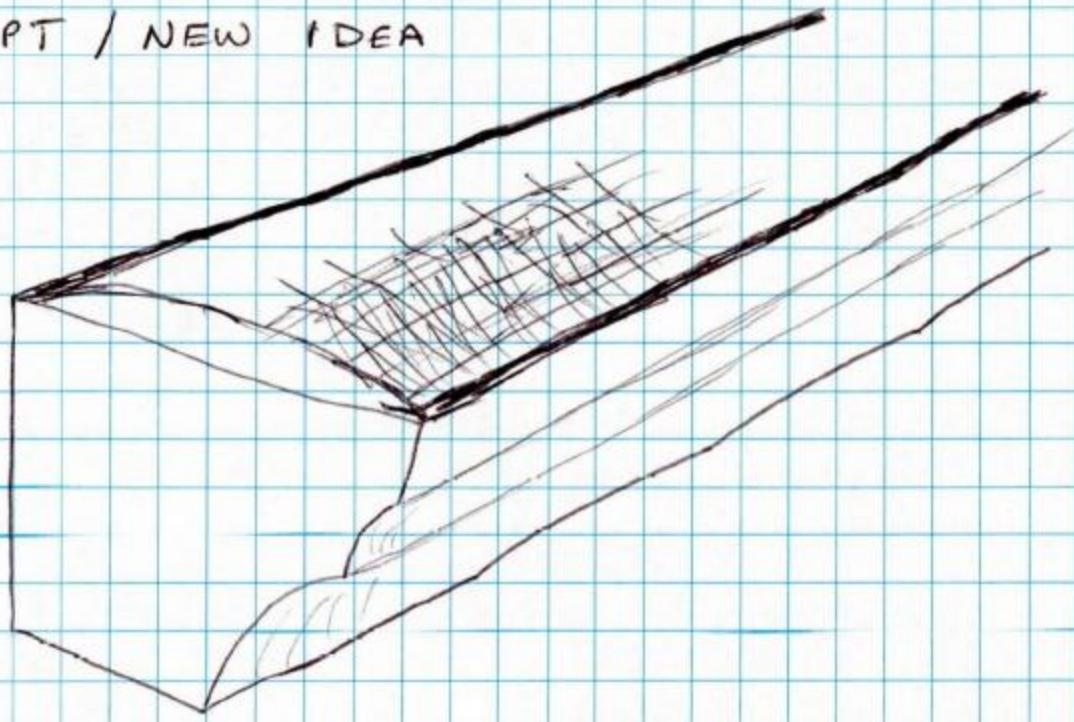
Date 5/18/00

Witness

*Don Wilson*

SUBJECT: WOVEN GUTTER COVER

CONCEPT / NEW IDEA



WHY WOULD A WOVEN MONO-~~FILAMENT~~ FILAMENT YARN NOT WORK AS A MESH TO COVER GUTTERS?

WEAVE IN NEEDED STIFFNESS AND POROSITY TO ALLOW WATER FLOW AND PREVENT LEAVES AND NEEDLES FROM FILLING THE GUTTER. THE CROWN COULD BE ACHIEVED BY USING A WIDER WIDTH SLIT GOODS THAN THE OPENING ON THE GUTTER.

GAVE IDEA TO SAM GRAHAM ON 5/11/00

Date MAY. 11, 2000  
Date 5/18/00

Signature

Witness

George C. McFady  
Ana Strain

SUBJECT: MALIWATT MAXCELL®  
TRIAL AT GILLILAND

SAMPLE STYLE NUMBER: 930095/000/0000

DATE: MAY 11, 2000

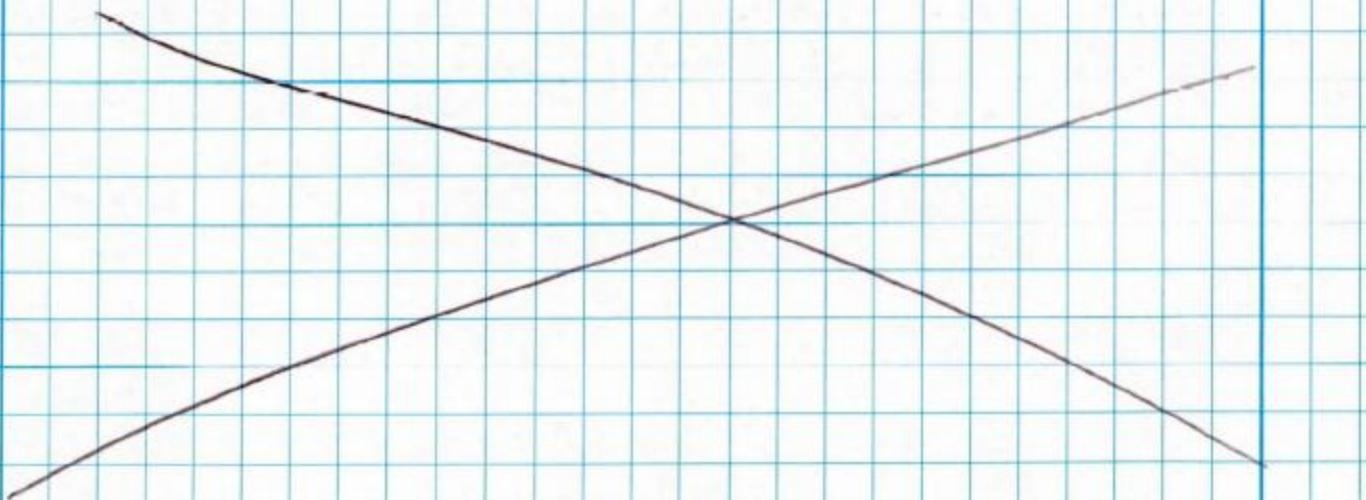
LARRY CAMPBELL RAN THE TWO FOLDED MAXCELL  
PIECES LISTED ON 11238-10.

THE SAMPLE WAS RUN ON MACHINE #704  
JUST LIKE THE CAMO AT 78'mm SPACING.

THE FLAT FOLDING WAS RUN ON THE MACHINE  
FIRST AND FOLLOWED UP WITH THE BALLOONED  
SAMPLES.

THE SAME SET-UP IS USED ON CAMO AND  
MALIWATT MAXCELL®.

FABRIC WAS SHIPPED TO BOB REYNOLDS AT  
RMC.



Date: MAY 11, 2000  
Date: 5/18/00

Signature: George (M.W.)  
Witness: Ann Wilson

SUBJECT: WALL BOARD REVIEW

DATE: MAY 17, 2000

SUBJ: ATTENDING: DREW CHILD RMC

BOB SMITH RMC

SAM GRAHAM SIB

#### ACTION ITEMS

1. BOB REVIEWED THE PROPERTIES OF POLYPROPYLENE.  
1172 MEGA PASC.  
900-910 Kg/m<sup>3</sup>
2. GEORGE SENT SAMPLES OF PVA COATED STABILON FOR BOB & DREW TO USE,
3. NATURAL GLASS HAS SUP MORE BOND TO GYPSUM THAN PVA COATED GLASS.
4. BOB SMITH IS MAKING A 3-D MOLD TO TRY A 3-D CORE FOR WALLBOARD,
5. SUB-CONTRACTOR MTG IS -TABLED-
6. INVENTION RECORDS ON FILE IN MILLIKEN LEGAL
7. TREY HAS ORDERED MARKET STUDIES IN PDF FORMAT,  
8

#### NEW ACTION ITEMS

1. DREW TO GET A SAMPLE OF AIR PRODUCTS FORMULA FOR COATING GLASS AND IMPROVING ADHESION
2. GEORGE TO GET A SAMPLE OF FIBER ROCK (USG)
3. REVIEW SAM DUNSON'S PATEN
4. DREW TO TRY ADDING SCRIM TO PAPER
5. DREW AND BOB TO BUILD A WALLBOARD JIG.
6. GEORGE TO GET A SAMPLE OF RHONDA HYDEN'S GLASS MILLAMATIC FOR DREW TO MOLD
7. NAME PROJECT AT NEXT MTG.

Date MAY 17, 2000

Date 5/18/00

Signature George C. McFay  
Witness Sam Wilson

SUBJECT: FOLDER FOR MALLIWATT MAXCELL <sup>(e)</sup>  
DATE: MAY 23, 2000

THE FOLDERS FOR MALLIWATT MAXCELL COULD BE MADE IN SECTIONS. THIS WOULD ALLOW DIFFERENT SIZED CELLS TO BE FORMED ACROSS THE WIDTH. THE PURPOSE OF THE FOLDER IS TO FEED AND FOLD THE FABRIC INTO THE MALLIWATT MACHINE TO ENABLE BALLOONED FABRIC.

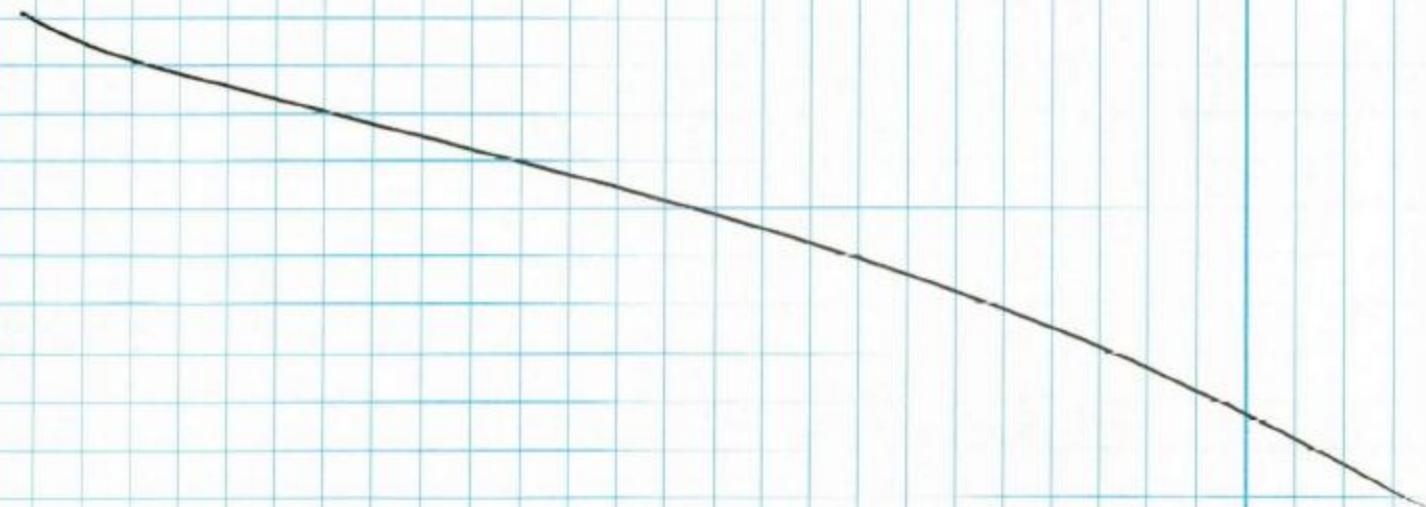
ATLANTA ATTACHMENT HAS BEEN IDENTIFIED AS A POTENTIAL SUPPLIER / MFG. OF THE FOLDERS.

FOLDED PRODUCT



A MODULAR DESIGN WITH A SIMPLE "BOLT-ON" METHOD WOULD PROVIDE LOWER COST, EASY INSTALLATION, PRODUCT FLEXIBILITY.

THESE ARE ALL ADVANTAGES OVER THE CURRENT PRODUCTS.



Date MAY 23 2000  
Date 7-11-2000

Signature George C. McFatty  
Witness Ann Wilson

SUBJECT: ~~MAXWELL~~

MAXCELL MTG w/ UPPER MANAG.

DATE: MAY 22, 2000

MEETING ATTEND: TOM MALONE, MR MILLIKEN, A. ALLEN, W. HOVEN,  
J. HEPFINGER, D. MORRIS, S. GRAHAM, D. CHILD,  
B. REYNOLDS, ETC,

MTG NOTES:

- MOVE HOT KNIFE SLITTERS FROM EXCELSIOR UNION
- ADD 13 PERIODS TO PINE MTNS WASTE CHART
- BENCH MARK OTHERS ON WASTE
- ADD # TO WASTE CHARTS
- WHY NOT USE PILOT EQ. FOR TESTING RECLAIMED POLYMERS
- WHAT # IS ASSOCIATED WITH 2% off loss due to thread breaks and needle breaks
- CAN THE THREAD BE SPLICED AT SEWING
- ARE WE USING STEP PRICING FOR LESS THAN A TRUCK LOAD
- LOOK AT MACHINE FORECAST FOR PINE MTN
- WHAT IS THE COST DIFFERENCE BETWEEN DORNIER AND SULZER
- WHAT IS IT COSTING TO SLIT AT EXCELSIOR VS UNITY
- MOVE SLITTER NOW, WHILE WE HAVE CAPACITY
- WHAT % OF OPTICAL CABLE MARKET WILL MILLIKEN GET?
- WHAT DOES IT COST TO MFG IN OTHER PARTS OF THE WORLD?
- HOW DO WE GET MAXCELL TO OTHER PARTS OF THE WORLD?
- WHAT ARE THE COSTS ASSOCIATED w/ WORLD WIDE DISTRIBUTION?

Date: MAY 23, 2000

Date: July 11, 2000

Signature:

George C. McFarley  
Ann Wilson

Witness:

SUBJECT: CELOTEX VISIT

WHERE: 5/24 ELM CITY

ATTENDING: 5/24 ROB HAUBER 5/25

LIVE OAK

MDC

RMC GUEST HOUSE

WAYNE NEWBILL X

ROBERT KLEIN 5/25

5/25 RMC

JOHN NEIL

SAM GRAHAM

GEORGE MCARTY

✓ DREW CHILD

✓ BOB SMITH

## ACTION ITEM WALLBOARD

1. ROLL OF 7131 TO CELOTEX FOR EXTERIOR GYPSUM TRIALS.

- 7131 IS A POLY/GLASS SCRIM W/ TISSUE ON THE FACE

- CELOTEX IS PLANNING TO LET THE GYPSUM FLOW THROUGH THE PAPER AND HAVE A GYPSUM FACE

- THIS WOULD COMPETE WITH DENS GLASS GOLD

2. MILLIKEN TO QUOTE DELIVERY ON 7127 TO CELOTEX FOR SAME USE.

3. COULD MILLIKEN DEVELOP A COATING FOR 7131 OR 7127 THAT WOULD BE (UV RES., /STIFF/STRENGTHEN)

4. CELOTEX TO SEND A SAMPLE OF BETA GYPSUM TO DREW

5. ROB TO SEND SPECS TO SAM

6. VISIT ST. PETE TO LEARN HOW TO MAKE WALLBOARD

7. CONTINUE TO WORK ON 3-D SHAPES FOR WALLBOARDS

8. USE ASTM C-473 TO SCREEN SAMPLES.

9. TRY USING EXISTING MILLIKEN STYLES ON CEILING TILES

- AUDIO STYLES
- ELASTIC FABRICS
- VELOURS

Date:

MAY 25, 2000

Signature:

George Mcarty

Date:

July 11, 2000

Witness:

Ana Wilson

SUBJECT: SAMPLE 930097 FOR CELTEX WALLBOARDS

DATE: JUNE 6, 2000

SAMPLE ID: S/930097  
P/ 503  
F/ 3000

POLY/GLASS STABILON<sup>®</sup> WITH TISSUE MAT  
SAME AS STYLE 7131 SLIT TO 50.25" WIDTH.

- ① BROUGHT ROLL OF 7131 FROM WAREHOUSE
- ② REROLLED INTO 1,000 YD ROLLS
- ③ WRAPPED IN SARAN BEFORE SLITTING
- ④ SLIT TO 50.25 BY CUTTING OFF BOTH SELVAGES.
- ⑤ SHIPPED

1- ROLL DREW CHILD  
1- ROLL Celotex (PACIFIC LAMINATING & COATING)  
1- ROLL Celotex (AKZOY - HIGH POINT)  
1- ROLL INVENTORY

SOLD IN 10's of YARDS.

Date:

JUNE 9, 2000

Date:

July 11, 2000

Signature:

Witness:

George C. May  
Ann Wilson

SUBJECT:

WALLBOARD REVIEW MTG. (GIBRALTAR)

REVIEW OF 6/5/00 ACTION ITEMS

DATE:

JUNE 9, 2000

- ① SAM TO UNDERSTAND THE IMPACT OF BPG'S PURCHASE OF CELOTEX'S COATING/GYPSUM DIVISIONS - NEED NEW AGREEMENT SAM
- ② GEORGE TO SHIP 7131 TO CELOTEX 930097  
SENT 1,000 YDS TO PACIFIC LAMINATING & COATING  
SENT 1,000 YDS TO AKZOY NOBEL IN HIGH POINT  
SENT 1,000 YDS TO DREW CHILD  
SENT 2,000 YDS TO WAREHOUSE
- ③ DREW TO MAKE 3-D BOARDS AND SCREEN WITH ASTM C-473  
BOB TO CUT/INSERT  
WACKER TO HELP W/MOLDING SILICONE
- ④ DREW DOING SEARCH ON 3-D FABRICS FOR BOARDS
- ⑤ DREW + BOB DOING A POWERPOINT PRESENTATION FOR JOE SALEY'S MEETING

ACTION ITEMS

- ① SAM TO GET WITH SAM DUNSON PATENT (RIGID WALL PANELS)
- ② GEORGE TO GET MILLIKEN INVOLVED W/AKZOY TRIAL AT HIGH POINT FACILITY!
- ③ DREW + BOB TO START BOARD MAKING AND SCREENING  
3-D SHAPED AND W/ 930097
- ④ PRESENTATION TO JOE SALEY ON 6/9/00
- ⑤ DREW TO FINISH AND E-MAIL FINAL PRE BY 6/9 PM.
- ⑥ GEORGE TO GET FEEDBACK ON TRIAL AT PACIFIC LAMINATING AND COATING ON STYLE 930097
- ⑦ GEORGE TO GET GYPSUM AND PAPER TO DREW
- ⑧ GEORGE TO GET BOARDS FROM 6/1 TRIAL AT CELOTEX TO DREW.

Date: JUNE 9, 2000

Date: July 11, 2000

Signature:

Witness:

George L. McFay  
Parision

SUBJECT: GIBRALTAR TEAM REVIEW

DATE: 6/19/00

ON 6/19/00 DREW CHILD, SAM GRAHAM, BOB SMITH, AND GEORGE MCLARTY MET TO REVIEW THE WALL BOARD PROJECT.

REVIEW OF 6/9/00 ACTION ITEMS:

- ① REVIEW SAM DUNSON PATENT → PENDING SAM GRAHAM
- ② GEORGE IS WORKING WITH BOB SMITH OF AKZO NOBEL TO TREAT 7131 TO INCREASE NET STRENGTH
- ③ BOB IS ALMOST COMPLETE ON SCREENING TOOL
- ④ BOB AND DREW PRESENTED TO JOE SALLEY ON 6/13/00
- ⑤ DREW COMPLETED POWERPOINT SHOW AND E-MAIL FILE,
- ⑥ TRIAL AT PACIFIC LAMINATING AND COATING → PUT OFF ONE WEEK.
- ⑦ GEORGE TO ORDER GYPSUM FROM CELOTEX (COMPLETE)
- ⑧ GEORGE TO ORDER BOARD PAPER FROM CELOTEX (COMPLETE)

ACTION ITEMS FOR NEXT MEETING 6/26/00

- ① REVIEW SAM DUNSON PATENT — SAM GRAHAM
- ② GEORGE TO CONTINUE TO WORK W/ AKZO ON 7131-GM
- ③ DREW TO SEND PATENT RESULTS TO GEORGE - DC
- ④ GEORGE TO DISTRIBUTE PATENTS TO OWNERS - GM
- ⑤ GEORGE TO ORGANIZE PATENTS IN A DATABASE - GM
- ⑥ STILL NEED GYPSUM AND PAPER FROM CELOTEX GM
- ⑦ STABILON SAMPLES TO DREW W/O PVOH → GM
- ⑧ BOB TO FINISH SCREENING TEST PROCEDURE FOR 3X11 BOARDS,

NETT MTG 6/26/00

Date 6/19/00

Date July 11, 2000

Signature

George C. McLaury

Witness

Tom Wilson

SUBJECT: CSI TRADE SHOWS

CONSTRUCTION SPECIFICATION INSTITUTE

DATE: 6/26/00

BOB SMITH AND GEORGE MCLARTY ATTENDED THE CSI SHOW IN ATLANTA TO OBSERVE TRENDS AND PRODUCTS IN THE WALLBOARD MARKETS.

OBSERVATIONS AND LEARNINGS:

ABUSE RESISTANT AND HIGH IMPACT WALLBOARDS SEEM TO BE A NEW MARKET. BUILDERS AND SPECIFIERS USE THIS TO REPLACE INTERIOR BLOCK WALLS OR TRADITIONAL SHEET ROCK WALLS. THEY ARE MARKETED FOR THEIR SUPERIOR RESISTANCE TO SCRATCHES, DENTS, AND CRACKS. THEY ARE MEETING FIRE CODES; AND STILL REDUCING OVERALL CONSTRUCTION COSTS.

MARKET LEADERS:

NATIONAL GYPSUM →

USG (U.S. GYPSUM) →

JAMES HARDIE →

ALL OF THESE PRODUCTS ARE MANUFACTURED DIFFERENTLY, ~~BUT~~ THEY ALL HAVE IMPROVED PERFORMANCE OVER TRADITIONAL ROCK.

Date:

6/26/00

Date:

July 11, 2000

Signature:

George L. McLarty

Witness:

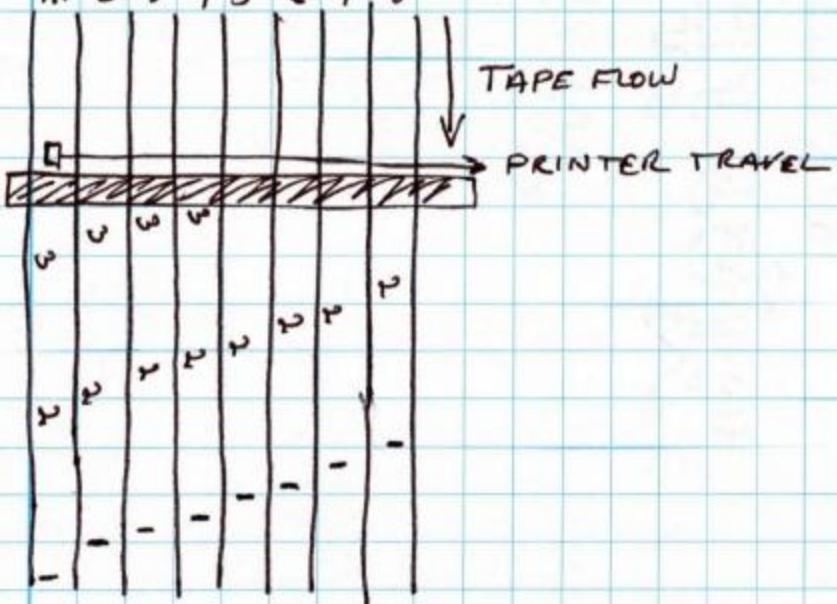
Ann Wilson

SUBJECT: INK JET PRINTING FOR MAYCELL TAPES

DATE: JUNE 29, 2000

DEREK KOZLOWSKI AND GEORGE MCILTY MET WITH GREG OSBORNE AT EASTERN FOODS IN ATLANTA TO REVIEW TRAVERSING PRINTERS FOR OUR NARROW WEAVING PROJECT.

THIS CONCEPT IS TO USE ONE PRINTER TO PRINT ALL EIGHT TAPES BY TRAVERSING THE TAPE PRINTER ACROSS THE TAPE WEB.  
#1 2 3 4 5 6 7 8



THIS SYSTEM HAS A DESIGN LIMITATION. ~~DO~~ ~~DO~~ THE PRINT HEAD CAN SPEND ONLY  $\frac{1}{8}$  OF THE TIME OVER EACH TAPE. THEREFORE, ONLY  $\frac{1}{8}$  OR LESS OF THE TAPE CAN BE PRINTED. OTHER PRINT HEADS COULD BE ADDED TO INCREASE ~~THE~~ THE PRINTED AREA ON EACH TAPE.

Date JUNE 29, 2000

Date July 11, 2000

Signature

Witness

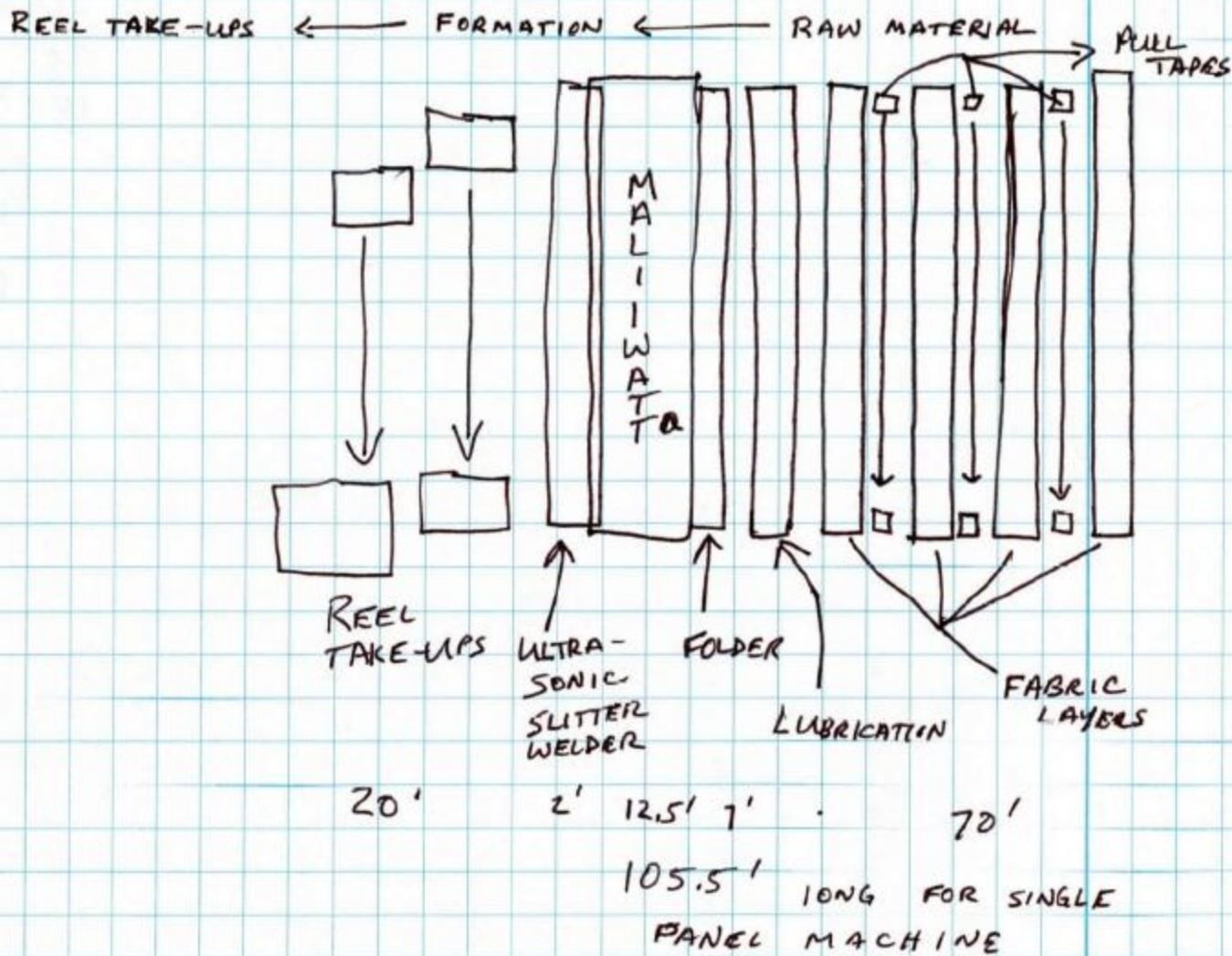
George C. McIlroy  
Grae Wilson

SUBJCT: MALIWATT<sup>®</sup> MAXCELL MACHINERY COMPARISON

DATE: 6/30/00 (JUNE 30, 2000)

MEETING: WITH WAYNE HOVEN, SAM GRAHAM, GEORGE McLARTY,  
JOHN HEPPINGER

MACHINE LAYOUT



MACHINERY COST EST.:

CONT ON NEXT PAGE →

Date JUNE 30, 2000  
Date July 11, 2000

Signature: George C. McLarty  
Witness: Jan Wilson

CONT 11238-24

MALI-(WATT) MAXCELL (R) CONT!

	<u>NARROW</u> <u>MALI-WATT</u>	<u>WIDE</u> <u>MALIWATT</u>	<u>UNITY</u>
# OF PACKS MAXCELL	14	66	1
PRODUCTION RATE	238 miles/wk	1,123 miles/wk	42.6 miles/wk
# A FRAME LET OFFS	4	16	CREEL
Length	40'	80'	12'
#	\$96,000	\$384,000	\$30,900
FULL TAPES	42	198	3
Length	30'	60'	0'
#	\$0	\$0	\$0
LUBRICATION	4	16	4
Length	0'	0'	0'
#	\$41,000	\$149,000	\$4,500
FOLDERS	14	66	1
Length	0'	0'	0'
#	\$10,000	\$45,000	\$1,300
MALIWATT	1	1	SEWING
Length	12.5'	13.2'	5'
#	\$148,000	\$325,000	\$11,100
ULTRA SONIC	15	67	TBD
Length	2'	2'	TBD
#	\$255,000	\$1,139,000	TBD
TAKE-UPS	14	66	1
Length	\$160,000 20'	80'	10'
#	\$160,000	\$640,000	\$58,700
TOTAL #	\$710,000	\$2,682,000	\$106,500
Length	105'	236'	27'
WIDTH	10.5'	21.7'	5'

CONT. →

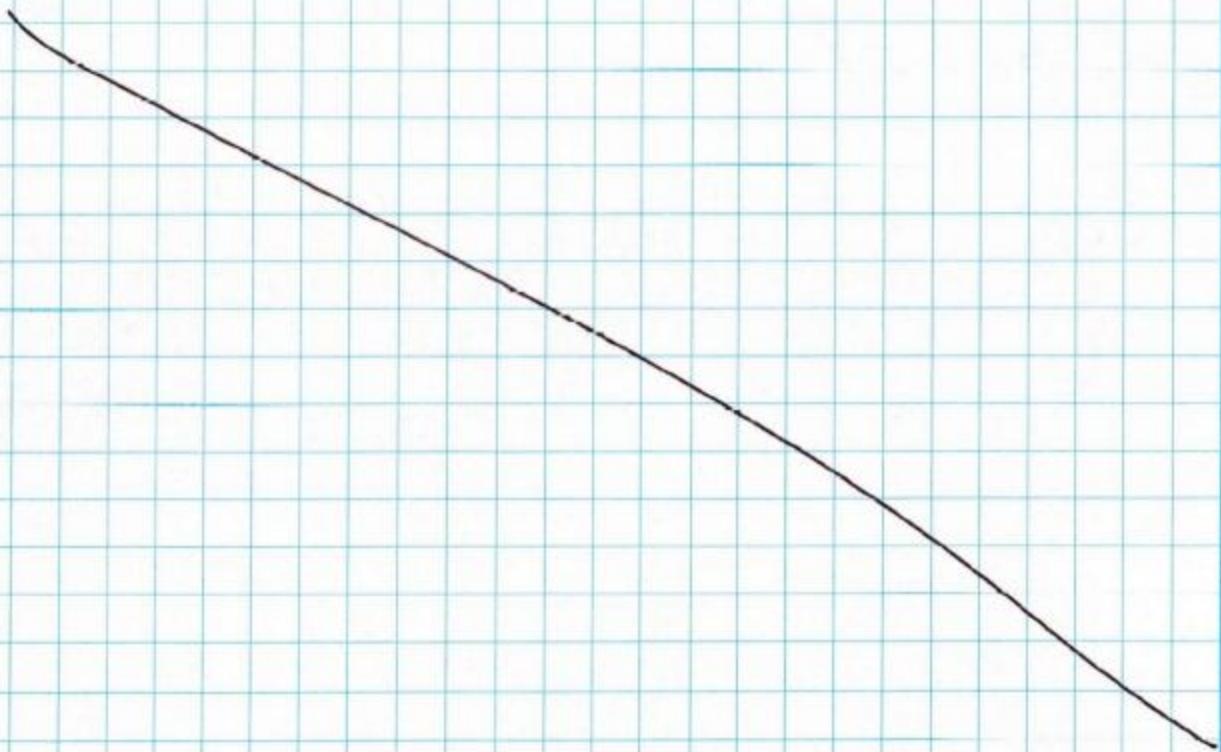
Date: JUNE 30, 2000  
 Date: July 11, 2000

Signature: George C. McJunkin  
 Witness: Ann Strison

CONT. 11238-25  
MALI-WATT MAXCELL®

MALI-WATT MAXCELL ATTRIBUTES:

- ① HIGH PRODUCTION RATES
- ② RELIABILITY (HIGH) → LOW MAINTENANCE
- ③ NON-SLIT MULTI-CELL UNITS
- ④ FLEXIBLE MACHINE WIDTH
- ⑤ LOCK STITCH WITH TWO BAR KNITTING
- ⑥ ELIMINATES OFFLINE SLITTING
- ⑦ REDUCED LABOR



Date JUNE 30, 2000  
Date July 11, 2000

Signature

Witness

George C. Miller  
Ann Wilson

SUBJECT: GIBRALTAR REVIEW

DATE: JULY 5, 2000

MEETING WAS ATTENDED BY BOB SMITH AND GEORGE  
MCCLARTY

REVIEW OF 6/19/00 ACTION ITEMS

- ① SAM DUNSON PATENT STILL NOT REVIEWED
- ② AKZO LAB TRIALS ARE COMPLETE AND NO. PRODUCTION IS SCHEDULED
- ③ GEORGE HAS PATENTS AND THEY ARE DISTRIBUTED TO THE OWNERS.
- ④ SEARCH RESULTS ARE GOING IN DATABASE (OWNERS)
- ⑤ GYPSUM AND PAPER ON ORDER
- ⑥ SAMPLE OF NON PVAGH ARE WITHDREW CHILD

NEW ACTION ITEMS

- ① BOB TO REVIEW THE ACTUAL BROKEN BOARDS FROM NON PVAGH SAMPLE BOARDS
- ② OWNERS NEED TO REVIEW PATENTS FOR NEXT MEETING SEND DATA TO GM
- ③ TEST 7125 IN CROSS MACHINE DIRECTION DREW
- ④ BOB TO MAKE A COMPARISON MOLD WITH A SQUARE WAVE. CAN THIS MOLD BE 2' X 2' PER CELOTEX'S REQUEST? ALSO NEED A TOP TO HOLD FABRIC IN PLACE DURING FORMING.

NEXT REVIEW IS SCHEDULED FOR 7/2/00 @ 8:30

Date:

July 5, 2000

Date:

July 11, 2000

Signature:

Witness:

George C. McClarty  
Ann Wilson

SUBJECT: MILLER NARROW LOOM START-UP  
PINE MTN PLANT DEBUG/START-UP

DATE: JULY 25 - 27<sup>th</sup>, 2000

ATTENDING: GEORGE McLARTY, DES PARSONS-MULLER, SAM GRAHAM

MACHINE - MULLER NF-57

8/27 EIGHT SPACE 27 MM WIDTH

REED 6.5 DPI

WARPS USED → ① MILLIKEN 520 D PET MONO  
180 ENDS

② ALLIED/HONEYWELL 4000 D  
4/1000/D WARP  
18 ENDS

FILLING USED → ① 520 DENIER MONO PET  
② 500 DENIER MULTIFIL PET

SAMPLE #1 180 ENDS OF 520 DENIER PET MONO  
7.2 PPI 500 D PET MULTI  
210 D. NYLON CATCH CORD  
1400 RPM  
3,000 FT  
SYSTEM III SELVAGE

SAMPLE #2 18 ENDS 4000 DENIER PET MULTIFIL  
7.2 PPI 500 DENIER PET MULTIFIL  
210 DENIER NYLON CATCH CORD  
1400 RPM  
3,000 FT  
SYSTEM III SELVAGE

CONT →

Date JULY 31, 2000  
Date Sept. 15, 2000

Signature: George C. McLarty  
Witness: Sam Graham

SUBJECT: CONT. MULLER NARROW LOOM

SAMPLE # 3    180 ENDS OF 520 DENIER PET MONOFILAMENT  
7.2 PPI 520 DENIER PET MONO FILLING  
210 NYLON CATCH  
1400 RPM  
3,000 FT TOTAL  
SYSTEM JH

SAMPLE # 4    18 ENDS OF 4000 DENIER MULTIFIL PET (HONEYWELL)  
7.2 PPI OF 520 DENIER MONO FILAMENT  
210 DENIER NYLON CATCH CORD  
3000 FT  
1400 RPM  
SYSTEM JIP SELVAGE

Date JULY 31, 2000

Date Sept. 15, 2000

Signature JCM

Witness Tom Wilson

SUBJECT: STYLE 930098 /010 ton /3145  
 GLASS REINFORCEMENT FOR WALLBOARDS

DATE: AUGUST 2, 2000

PURPOSE: THE PURPOSE OF THESE SAMPLES IS TO TEST  
 OUR LEARNINGS ON THE GIBRALTAR PROJECT

SAMPLE A 930098 / 595 / 3145

MACHINE #26 4 ENDS X 4 PICKS G-150  
 2 OVER 2 WARP  
 64 PACKS FILLING  
 12 YDS / MIN (BECAUSE OF FILLING)  
 12 % ACRYLIC BINDER  
 1/2 oz POLY MAT  
 8 END / INCH CONSTRUCTION ROLLS  
 BFG 3145N 20% SOLIDS ACRYLIC  
 200 YDS

SAMPLE B 930100 / 595 / 3145

MACHINE #26 4 ENDS & 4 PICKS G150  
 2 OVER 2 WARPS  
 64 PACKS OF FILLING  
 12 YDS / MIN (BECAUSE OF FILLING)  
 12 % ACRYLIC  
 NO MAT  
 4 ENDS / INCH CONSTRUCTION ROCK  
 BFG 3145 20% SOLIDS  
 200 YDS

CONT.

Date: AUGUST 2, 2000  
 Date: Sept. 15, 2000

Signature:

Witness:

J C McFarland  
 Anna Wilson

SUBJECT: CONT. DEV OF WALLBOARD REINFORCEMENT

DATE: AUGUST 3, 2000

SAMPLE: 930101/595/3145

8X8 G-150 STABILON SAMPLE  
4 OVER 4 TRIAX.  
12% ACRYLIC (3145 BFG)  
1/2 oz MAT PET  
0.149 oz/yd  
476 ENDS  
64 PACKS FILLING CREEL  
250 YDS

SAMPLE: 930102/595/3145

8X8 G-150 STABILON SAMPLE  
4 OVER 4 TRIAX  
12% ACRYLIC (3145 BFG)  
NO MAT  
0.0834 oz/yd  
476 ENDS AGY G-150 WARP  
64 PACKS FILLING CREEL  
250 YDS  
RUN BY JAMES PINSON

Date: AUGUST 3, 2000

Sept. 15, 2000

Signature

Witness

J.C. McFatty  
Don Wilson

SUBJECT: GIBRALTAR SAMPLE TESTING

930098, 930100, 930101, 930102  
7/  
GM

DATE: AUGUST 8, 2000

TESTED BY: SADIE ABRAMS &amp; GENEVA

(LAB TECHS)

	930098 4x4 G-150 $\frac{1}{2}$ oz MAT ACRYLIC	930100 4x4 G-150 $\frac{1}{2}$ oz MAT ACRYLIC	930101 8x8 G-150 $\frac{1}{2}$ oz MAT ACRYLIC	930102 8x8 G-150 ACRYLIC
WIDTH	59.625"	59.625"	59. <sup>25</sup> <sub>.375</sub> "	59.50"
ENDS	4.0	4.0	8.0	8.0
PICKS	4.0	4.0	8.0	7.8
WARP TEN. 1" lbs	19.5	31	34	25
FILLING TEN 1" lbs	39	26	68	40
CALCULATED PICK-UP	11.255%	17.38%	10.74% H.82%	19.49%
WEIGHT (oz/sq yd)	LEFT 0.922 oz/sq yd RIGHT 0.926	0.385 0.38	1.30 1.24	0.78 0.77

Date AUGUST 8, 2000  
Date Sept. 15, 2000

Signature

Witness

George C. McLean  
Ann Wilson

SUBJECT: RETEST / CONFIRM TEST RESULTS

DATE: AUGUST 8, 2000

STYLE 930100

1" GRAB TENSILE	20.17 lbs
WARP	20.18 lbs
	21.80 lbs
	<hr/>
	Avg 20.72 lbs

1" GRAB TENSILE	23.46 lbs
FILLING	20.50 lbs
	25.00 lbs
	<hr/>
	Avg \$ 22.99 lbs

STYLE 930098

1" GRAB TENSILE  
WARP

12.49

12.95  
10.03  
16.07  
10.90

1" GRAB TENSILE  
FILLING

28.1

28.04  
32.80  
22.42  
29.12

Date AUGUST 9, 2000  
Sept. 15, 2000

Signature: J. C. McFarland  
Witness: John Wilson

## FRICTION TEST ON PULL-TAPE

AUGUST 18, 2000

TESTED BY SHULONG LI

	<u>MAXCELL LUBED</u>	<u>MAYCELL NON-LUBED</u>
520 Mono X	0.074	0.08
520 MONO		
No LUBE		
520 mono x	0.18	0.17
MULTI	0.17	0.20
No LUBE		
<del>520-MULTI</del>		
MULTI WARP	0.20	0.18
MULTI FILL		
MULTI WARP	0.21	0.20
MONO FILL		
MULLER		
MULTI - MULTI	0.18	
NO LUBE		
MULLER		
MULTI - MULTI	0.19	
W/ LUBE		
NEPTCO	0.18	
LUBED		
Date AUGUST 18, 2000		
Date Sept. 15, 2000		

Signature

Witness

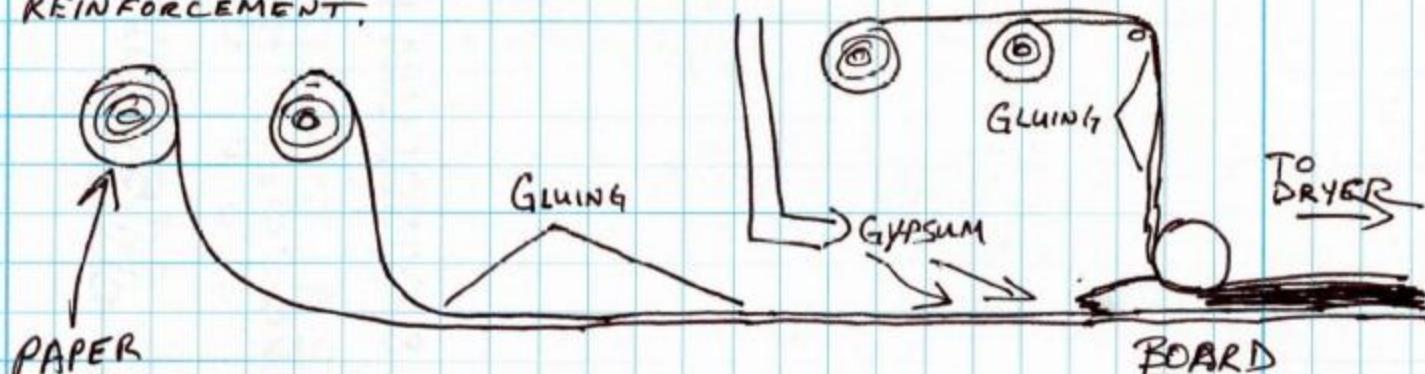
George C. McJ.  
Ann Wilson

# GIBRALTAR (WALLBOARD REINFORCEMENT)

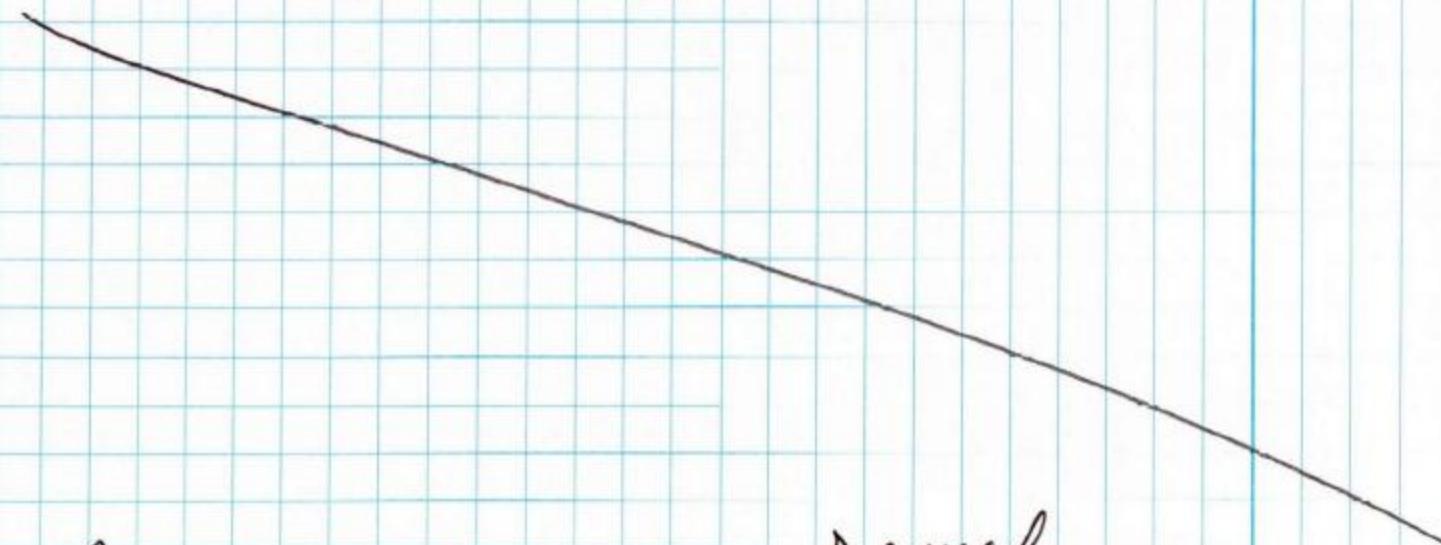
DATE: AUGUST 31, 2000

OUR WORK HAS FOCUSED ON ADDING SCRIMS TO THE CORE OF WALLBOARDS OR REPLACING THE FACE AND BACK PAPER W/ FABRIC.

DURING OF REVIEW MEETING TODAY WE DISCUSSED GLUING A SCRIM TO THE PAPER. THIS COULD BE ADDED ON THE SIDE NEAR THE CORE OR ON THE BACK SIDE OF WALLBOARD AS A REINFORCEMENT.



PAPER  
OR  
FABRIC  
DEPENDING  
ON SEQUENCING  
DESIRED



Date: AUGUST 31, 2000  
Sept. 15, 2000

Signature: *DCM*  
Witness: *Ann Wilson*

GIBRALTAR  
SAMPLE FOR CELOTEX  
AUGUST 31, 2000

STYLE 930101 AND STYLE 930098  
WERE SLIT TO 50.5" & 47.75" IN  
PREPARATION TO RUN IN CODY WY w/ ROB  
HAUBER OF CELOTEX AS AN EXTERIOR BOARD,

THESE TWO ROLLS WILL BE CARRIED TO  
CODY WY ON 9/20/00 FOR A PLANT  
TRIAL,

Date August 31, 2000  
Date Sept. 15, 2000

Signature J.C. McDaniel  
Witness Ann Wilson

TEMPLE INLAND VISIT 9/12/00  
 GIBRALTAR PROJECT  
 TRIAL AT FLETCHER, OK, PLANT  
 ATTENDING: MIKE MOORE - TEMPLE  
 DEXTER STOCKSTILL - TEMPLE  
 RANDY SMITH - TEMPLE  
 GEORGE MCLARTY - MILLIKEN

TRIALS: - RAN 930100 IN 5/8" FIRE RATED  
 BOARD, ABOUT 100'  
 - LET-OFF A 45" ROLL AGAINST THE  
 BACK PAPER AT THE FORMING ROLL  
 - RAN 210'/MIN

#### FLEXURAL RESULTS

PARA FU	103.4 lbs
PARA FD	88.1 lbs
PERP FU	251.9 lbs
PERP FD	221.1 lbs

- RAN 930102 IN 5/8" FIRE BOARD JUST AS  
 STATED ABOVE, RAN ABOUT 600'.

#### FLEXURAL RESULTS

PARA FU	144.7
PARA FD	83.9
PERP FU	227.6
PERP FD	225.0

Date SEPTEMBER 15, 2000  
 Date Sept. 15, 2000

Signature J.C. McLarty  
 Witness Anne Wilson

GIBRALTAR SAMPLE FOR TEMPLE INLAND

OCTOBER 10, 2000

STYLE 930100 / 450 / 3145

REINFORCEMENT FOR TRADITIONAL WALLBOARD

REQUESTED BY MIKE MOORE OF TEMPLE / FLETCHER OK

RAN WARP → G150 AGY BEAM 4 ENDS / INCH

FILL → G150 AGY 4 ENDS / INCH

PATTERN 4X4 TRIDIRECTIONAL

MIX BFGOODRICH ACRYLIC 3145

TARGET PICK-UP 20% Actual 17.3 - 18.4

NO MAT

MACHINE 22

SPEED 28.8 FT/MIN.

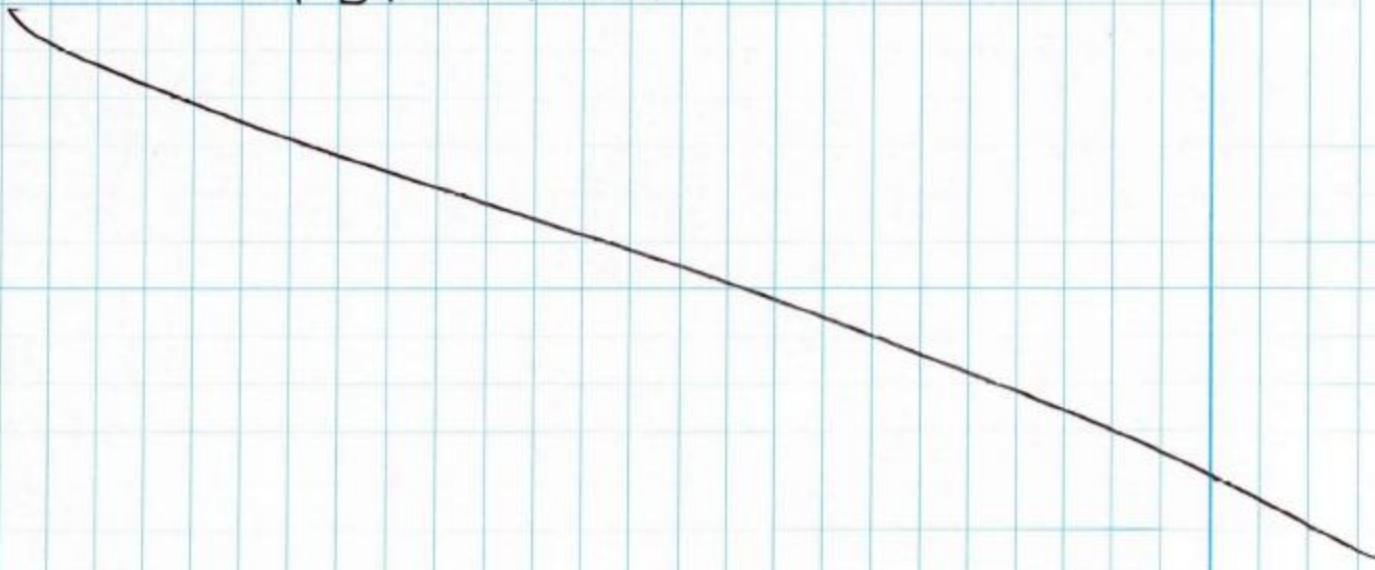
8 ROLLS 200 YDS 600 FT

4 ROLLS 33 YDS 100 FT

PACKED OUT AS 930100 / 450 / 3145

SLIT WASTE PANNELS OFF EACH SIDE ON MACHINE

SAMPLE RUN BY JAMES PRINSON



OCTOBER 10, 2000

Date 10/10/2000

Date 3/1/2001

Signature

*George C. Fletcher*

Witness *Ann Wilson*

GIBRALTAR SAMPLE FOR EXTERIOR/MR BOARDS  
 PURPOSE: RUNNING REPLACEMENTS FOR PAPER  
 FACERS IN GYPSUM WALLBOARD

DATE: OCTOBER 11, 2000

SAMPLE: STYLE 930098

PATTERN 505 + 478  
 FINISH 3145

DESCRIPTION: WARP G-150 AG4 4 EPI  
 FILL G-150 AG4 4 EPI  
 2 OVER 2 TRIDIRECTION  
 28.8 FEET/MIN  
 BF GOODRICH ACRYLIC 3145  
 PICK-UP TARGET 20%  
 Actual ~ 7.06 to 12.63  
 NEED TO RETEST AT DOFF

RAN FOR BPB CELOTEX TRIALS AT CODY PLANT

USED AMERICAN NON-WOVEN 1/2 oz CARDED POLY  
 MAT

SLIT FULL PANNEL DOWN TO NECESSARY WIDTHS  
 47.75" + 50.5"

RAN APPROX 4,000 YDS / PATTERN 1 ROLL

OCTOBER 11/2000  
 Date \_\_\_\_\_

March 1, 2001  
 Date \_\_\_\_\_

Signature George C. McFarland  
 Witness Anne Wilson

SUBJECT: FLAME RESISTANT MAXCELL® FOR  
HVAC DUCT APPLICATIONS

DATE: JANUARY 5, 2001

PURPOSE: IDEA ON METHOD / MATERIALS TO  
MAKE AN FR MAXCELL PRODUCT

CURRENTLY MAXCELL IS MADE FROM MONOFILAMENT POLYESTER AND NYLON. THE POLYMERS WORK WELL TO PRODUCE A PRODUCT THAT HAS LOW FRICTION, GOOD STRENGTH, SELF INFLATING, FOLDABLE, AND MEETS THE NEEDS FOR AN EXTERIOR PRODUCT.

NEW IDEA: OUR CUSTOMER HAS EXPRESSED INTEREST IN A HIGHER FLAME RESISTANT PRODUCT. THE IMPROVED FR WOULD ALLOW MAXCELL TO BE UL CERTIFIED FOR USE IN DUCT WORK AND OTHER CRITICAL AREAS. ADDITIVES TO THE MONOFILAMENT ARE ONE METHOD, BUT ANOTHER METHOD IS TO USE A FIBER GLASS FABRIC INSTEAD OF THE TRADITIONAL MONOFILAMENT FABRIC. THIS GLASS FABRIC SHOULD BE AN OPEN CONSTRUCTION WITH A BINDER APPLIED FOR STABILITY AND PROTECTION OF THE FRAGILE GLASS YARNS. THE BINDER SHOULD NOT CAUSE THE FINAL PRODUCT TO FAIL THE FLAME TESTING.

Date: JANUARY 5, 2001

Date: March 1, 2001

Signature: George C. McElroy  
Witness: Ann Wilson

SUBJECT: IDENTIFICATION PULL TAPE FOR FIBER OPTIC CABLE

DATE: JANUARY 8, 2001

PURPOSE: PULL-TAPE IS USED DURING THE INSTALLATION OF FIBER OPTIC CABLE, AND OTHER TYPES OF CABLE. THESE PULL TAPES CAN BE USED TO INSTALL MOST ANY KIND OF CABLE. IF THE PULL TAPES WERE IDENTIFIED WITH COLOR, THE INSTALLATION OF CABLE COULD BE SIMPLIFIED.

WEAVING COLOR FOR IDENTIFICATION INTO PULL-TAPES.

PULL-TAPES ARE WOVEN FROM STRONG FIBERS WITH CONTROLLED ELONGATION. THE WOVEN TAPES ARE THEN PRINTED WITH YARDAGE OR FOOT INCREMENTS FOR USE IN THE FIELD. DURING INSTALLATION OF THE CABLE THERE IS A CHANCE FOR ERROR IF MORE THAN ONE PULL TAPE IS ALREADY IN THE CONDUIT. THE CREW COULD ACCIDENTLY ATTACH THE CABLE TO THE WRONG PULL-TAPE OR PULL THE WRONG PULL-TAPE.

THE PULL-TAPE IS WOVEN ON A NARROW WEAVING MACHINE. THE TAPE COULD BE COLOR CODED FOR IDENTIFICATION IN THE FIELD. THE COLOR COULD BE ADDED ~~TO~~ VIA FOUR DIFFERENT METHODS

- ① PRINTED WITH COLOR OR PATTERN
- ② WEAVE WITH COLORED SELVAGE
- ③ WEAVE WITH COLORED FILLING
- ④ WEAVE WITH COLORED END OR WARP

Date: JANUARY 8, 2001

Date: March 1, 2001

Signature:

*Douglas C. Moyer*

Witness:

*John Wilson*

EXTERIOR WALLBOARD TRIAL FOR STYLE 930098  
FEBRUARY 5<sup>th</sup>, 2001

MEETING: AT AMERICAN GYPSUM IN ALBUQUERQUE, NEW MEXICO  
MILLIKEN: SAM GRAHAM, DREW CHILD, GEORGE MULROY  
AMERICAN GYPSUM: PETER BAUER, LEX DOMINEY, DAVID ACKLAND  
JOHN THOMAS

## TRIAL PLAN:

FABRIC: 930098 / 47.75 / 3145 FINISH AS BACK LAYER  
930098 / 50.5 / 3145 FINISH AS FACE LAYER

1. TENSION ON FACERS IS KEY TO BOARD WARPING AFTER CUTTING
2. TENSION CAN BE CONTROLLED WITH BUTTERFLY BARS.
3. W.F. STARTED THE TRIAL WITH A DRIVEN LET-OFF FOR THE FACE PAPER, BUT THE PHOTO EYE DID NOT "SEE" THE FABRIC AND CAUSE HIGH TENSION. THE FINAL SET-UP WAS TO RUN A 3,500 YD ROLL DOWN TO THE CORE WITH THE LINE PULLING THE FABRIC OF THE ROLL.
4. LINE SPEED 180 FT/MIN
5. BOARD 5/8"
- 4.7 lbs CHOPPED GLASS / 1000 sq ft
- 12 lbs STARCH / 1000 sq ft
- 68 lbs STARCH / 1000 sq ft
6. NO SKIM COATS WERE USED
7. 12' BOARDS
8. INVERT BOARDS GOING INTO THE LINE
9. TARGET CORE DENSITY 2,500 lbs / 1000 sq ft
10. USED EDGE GUIDES w/ 1" SHOES
11. RAN ABOUT 45 MINUTES TOTAL WITH MODIFIED THREAD UP AT ENTRANCE

Date FEBRUARY 5, 2001

Date March 1, 2001

Signature George C. M. J.

Witness Ann Wilson

EXTERIOR BOARD TESTING  
 AMERICAN GYPSUM EXTERIOR BOARD TRIAL  
 RAN AT A.G. ON 2/5 - 2/6/01 WITH P. BAUER.

RESULTS:

	Avg	Std
<u>WEIGHT</u> 5/8" EXTERIOR	2481 lbs/1000 sq ft	31.8
<u>CALIPER</u> 0.623		0.002
<u>HARDNESS</u> 25		2.7
<u>PERPENDICULAR</u> 81 lb		8.5
<u>PARALLEL</u> 63 lb		6.9
<u>NAILPULL</u> 101		14.5
<u>CORE ABSORPTION</u>		
30.09 %		

Date MARCH 9, 2001  
 Date March 9, 2001

Signature George C. McFarland  
 Witness Ann Wilson

SUBJECT: FACER FOR EXTERIOR BOARDS

SAMPLE: EXTERIOR / NON PAPER FACED GYPSUM

DREW CHILD TRIED MOLDING 930098

WITH THE SCRIM TOWARDS THE OUTSIDE

AND COMPARED THIS TO CONTROL BOARDS

AND BOARDS WITH THE SCRIM TO THE INSIDE.

RESULTS:

CONTROL FLEX 20 lbs

4x4 930098 SCRIM TOWARD GYPSUM 21.4 lbs

4x4 930098 SCRIM AWAY FROM CORE 29.4 lbs

Date MARCH 9, 2001  
Date March 9, 2001

Signature

Witness

George C. May  
Anne Wilson

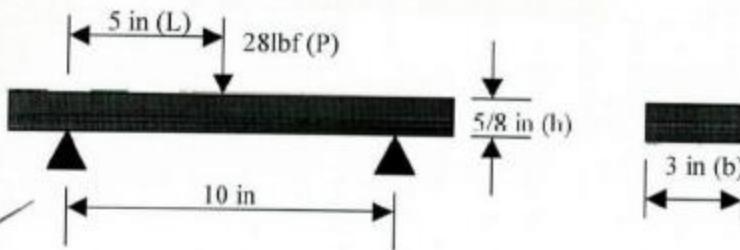
## SUBJECT: WALLBOARD TESTING

ASTM VS MILLIKEN FLEXURAL TESTING

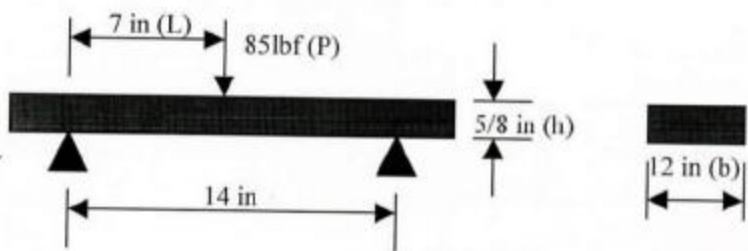
DR. BOB SMITH COMPARED THE TWO METHODS

SEE BELOW

Milliken Test



Other Test



$$= \frac{My}{I}$$

Normal stress [lbf/in<sup>2</sup>] equals the moment times the distance from the origin divided by the moment of interia

$$I = \frac{bh^3}{12} \quad \text{Moment of inertia [in}^4\text{]}$$

$$M = PL \quad \text{Moment [lbf*in] equals force multiplied by length}$$

## Results

Date April 3, 2001  
Date April 11, 2001

$$\sigma_{\text{Milliken}} = 717 \text{ lbf/in}^2$$

$$\sigma_{\text{other}} = 762 \text{ lbf/in}^2$$

Signature George C. SmithWitness Gra Skelton

SUBJECT: SAMPLE 930112 100% GLASS STABILON®  
2 oz/50 yd G-37 x H-18

DATE: APRIL 3, 2001

SAMPLE 930112 WAS DESIGNED FOR WALLBOARD (GYPSUM) CORE REINFORCEMENT. THIS SAMPLE IS MADE WITH HEAVIER YARNS, BUT SIMILAR OPENNESS TO 930100.

DESCRIPTION: WARP G-37 225 ENDS 5EPI  
FILLING H-18 2.7 PPF  
WIDTH 45"  
WEIGHT 2.797 oz/1.1 yd  
CHEMICAL BFG. 3145 N ACRYLIC

PROCESSING: MACHINE # 26  
SPEED TARGET 74 ACTUAL 32 RAN 1/2 CIRCLE  
WIDTH 45"

TESTING: 45.8"  
1.9 oz/50 yd  
TENSILE 100 x 100 lbs  
PICK-UP 15.5%

Date APRIL 4, 2001  
Date April 11, 2001

Signature George C. McFarland  
Witness Ann Wilson

SUBJECT: NARROW WOVEN PULL-TAPE AT UNITY

DATE: APRIL 4, 2001

THE NARROW WEAVING LINE IS NOW INSTALLED AT UNITY. THE 144 POSITION CREEL IS IN PLACE, ALONG W/ THE NF 53 8/27 MULLER LOOM, MILLIKEN PRINT TABLE, AND 8 MARCONI PRINERS.

FABRIC DESCRIPTION: 57.9 yds/16

0.28 oz/11.2 yd

4,000 DENIER HT POLY WARP

500 DENIER HT POLY FILL

CATCH CORD 150D TEXT POLY

OR DYED ID YARN

MACHINE SET-UP: 18 ENDS

5.6 ~~16.2~~ PPI

1400 RPM

5.12 Dents/cm

4 HARNESSES

1 END HEDDLE EYE

STRAIGHT DRAW

PLAIN WEAVE

APRIL 4, 2001  
George L. McFarland

April 11, 2001  
Gwen Wilson

## SUBJECT: NARROW WOVEN SPEC FOR UNITY

DATE: APRIL 4, 2001

SPE ATTACHED MACHINE SPEL BELOW!

Style	<b>Milliken &amp; Company</b> <b>Specialty Industrial Business</b> <b>Narrow Fabric Specification</b>			Product Name	Pull-Tape	
Pattern	125	Development Engineer	G McLarty	End Use	MaxCell®	
Weave Plant	Unity	Market Manager	J Henfinger	Process Engineer	K Sorrels 362-5852	
Date Issued	4/2/01	Yarn Description	1,250 lb tape	Phone		
Revision Number	1.2	Yarn Description	1/500/132 Poly	Phone		
<b>Raw Materials</b>						
Warp	5754 MRP #	Filling	5755 MRP #	MRP	Catch Cord	
MRP	5754 MRP #	Yarn Description	1/500/132 Poly	MRP	MRP T MRP #	
Yarn Description	4/1000/494 Poly	Total Yarn Denier	515 g/9000 m	Yarn Description	1/150/34 Text Poly	
Total Yarn Denier	4,060 g/9000 m	Total Yarn Denier	515 g/9000 m	Total Yarn Denier	150 g/9000 m	
Yarn Yield	1,097 yds/lb	Yarn Yield	8,648 yds/lb	Yarn Yield	29,692 yds/lb	
Package Size	22.05 lbs	Package Size	22.05 lbs	Package Size	12 lbs	
Yarn Tenacity	8.7 g/denier	Yarn Tenacity	8.7 g/denier	Yarn Tenacity	5 g/denier	
<b>Fabric Construction</b>						
Individual Tape	Entire Machine					
Warp	18	Total Ends	144	Total Ends		
Warp	36	EPI	36	EPI		
Wert	5.6	Double PPI	5.6	Double PPI		
Width	0.5	Inches	4	Inches		
Swage	System					System
<b>Weaving Machine Set-Up</b>						DCMCHT APRIL 4, 2001
Type Machine	NF - 53 / 8 Space					Warp Draw-In
Machine Speed	1400 RPM					Total Harnesses 4 Harnesses
Reed Width	2.5 cm					Draw Repeat 1-4 Harness #1 is closest to reed
Reed Height	6 cm					Ends Heddle Eye 1 Ends
Reed Air Space	65 %					Ends Reed Dent 2 Ends
Reed Density	5.12 Dents / cm					Total Dents 9 Dents
Warp Contraction	2.7 %					Warp Sheet Tension Drum 30 Lbs
<b>Tape Physicals</b>						
Yields		Avg.	Min.	Max.		
Tape Yield	58.2 yds/lb	Width	0.5			inches
Tape Yield	0.27 oz/in. yd	Width	12.7			mm
Warp Yield	62.6 yd tape / lb warp	PPI	5.6			
Filling Yield	1,073.5 yd tape / lb filling	Weight	0.27			oz/in. yd.
Catch Cord Yield	3,777.6 yd tape / lb catch cord	Tensile	1,250			lbs
Doff Size	120,000 feet/box	Elongation	15			% at break
Total Doff Yield	960,000 feet/8 boxes	Elongation	3%			% at 600 lbs
		Crocking Resistance	Readable			200 Cycles
<b>Print Set-Up</b>						4/4/01 GC McLarty 4/4/2001
Print Units	Feet	Air Pressure	40 psi	Clutch Tension	20	%
Print Text	1,250 lb MaxCell			Air Pressure	Maximum	PSI
Font Size	7 x 9 Single Line					
Print Ink	Black Std					
Print Logo	MaxCell					

Date: APRIL 4/2001  
Date: April 11, 2001

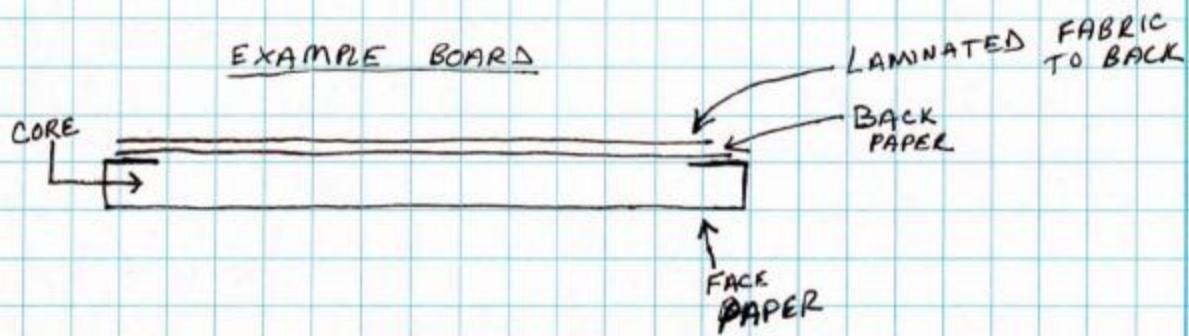
Signature: George C. McLarty  
Witness: Gina Wilson

SUBJECT: REINFORCING WALLBOARD w/ A LAMINATE FABRIC

DATE: APRIL 9, 2001

MILLIKEN'S PROJECT GIBRALTAR HAS FOCUSED ON REFORCING WALLBOARD WITH MILLIKEN FABRICS. MOST OF OUR WORK HAS CENTERED AROUND ADDING FABRICS TO THE CORE TO IMPROVE IMPACT RESISTANCE OR FLEXURAL STRENGTH.

IDEA: FABRIC COULD BE LAMINATED TO THE BACK OF AN EXISTING WALLBOARD TO PROVIDE REINFORCEMENT



THIS CHANGE WOULD ALLOW THE BOARD MFG TO RUN REGULAR BOARD AND THEN RUN AN OFF-LINE PROCESS TO APPLY A LAMINATE OF FABRIC TO THE BOARD. THESE FABRICS COULD BE MOST ANY CONSTRUCTION DEPENDING ON THE REQUIRED / NEEDED REINFORCEMENT.

Date APRIL 9, 2001  
Date April 11, 2001

Signature George C. Miller  
Witness Gma Wilson

SUBJECT: SAMPLES FOR GEORGIA-PACIFIC FOR LAMINATION  
TO WALLBOARDS

DATE: APRIL 10, 2001

ON APRIL 10, 2001 SAM GRAHAM, RANDY HURSEY, AND  
GEORGE MCLARTY VISITED WITH BRIAN RANDALL AND  
HOWARD FANNING AT GEORGIA PACIFIC'S DECATUR GA  
FACILITY.

THE PURPOSE OF THE VISIT WAS TO SHOW G-P  
SOME EXISTING POLYESTER STABILON FABRICS THAT  
WOULD BE SUITABLE FOR LAMINATION TO WALLBOARD.

WE LEFT

WE LEFT SAMPLES OF STYLES 7171, 458, 7162, 459  
WITH G-P.

G-P REQUESTED SAMPLES TO COMPARE  
GLASS VS POLY  
TRI DIRECTIONAL VS SQUARE  
LIGHT VS HEAVY WEIGHT

SAMPLES WILL BE SENT TO BRIAN / HOWARD.

Date APRIL 10, 2001  
Date April 17, 2001

Signature

Witness

George C. McLarty  
Sam Graham

SUBJECT: TEMPLE INLAND TRIAL ON STYLE 930112

DATE: APRIL 11, 2001

ON APRIL 11, 2001 RANDY HURSEY AND GEORGE MCCLARTY VISITED TEMPLE INLAND IN FLETCHER OK. THE PURPOSE OF THE VISIT WAS TO RUN 930112 IN WALLBOARD AS A REINFORCEMENT. WE MET WITH MIKE MOORE, CAMERON BRATTON, LEROY ROWE, RANDY SMITH AND DEXTER STOCKSDALE.

930112 WAS DESIGNED TO PROVIDE SUPERIOR IMPACT RESISTANCE FOR TRADITIONAL WALLBOARD. WE LAID A 45" PANEL OF FABRIC NEXT TO THE BACK PAPER AS THE BOARD WAS FORMED. THE RESULTING BOARDS LOOKED LIKE NORMAL BOARDS, BUT TESTED AS FOLLOWS:

	5/8" SHEATHING (CONTROL)	5/8" SHEATHING W/ 930112
BOARD WT	2382 lbs/1000 sq ft	2516 lbs/1000 sq ft
WEIGHT AT FAILURE	31.7 lbs	64.2 lbs
IMPACT ENERGY	43.1 JOULES	87.3 JOULES

Date APRIL 11, 2001  
Date April 17, 2001

Signature George C. McClarty  
Witness Don Wilson

SUBJECT : TESTING MILLIKEN PULL TAPE

DATE : APRIL 18, 2001

BETTY McCARTY IN TEXTILE TESTING  
 COMPARED THE STRENGTH AND ELONGATION OF  
 MILLIKEN'S PULL TAPE TO NEPTCO'S

GAGE 10"  
 CROSSHEAD SPEED 10"/MIN  
 GRIP JAWS (CAM TYPE)

SAMPLE #	NEPTCO		MILLIKEN	
	lbs	% ELONG	lbs	% ELONG.
1292		38	1184	35
1209		37	1138	34.8
1294		38	1194	35.6
1346		38	1200	36.5
Avg	1291	37.4	1170	35.2
STDV	31.7	0.99	31.7	0.99
	50.7	0.95		

Date APRIL 18, 2001  
 Date April 19, 2001

Signature George C. McHarg  
 Witness Tom Stinson

SUBJECT: SAMPLE 930116 FOR BATTERY FABRIC

DATE: APRIL 26, 2001

SAMPLE 930116

WARP G-37 FIBERGLASS  
FILLING G-75 FIBERGLASS

CONSTRUCTION 4 EPI 1 OVER 1  
2 PPI

#27 MULTI-WEFT SQUARE PATTERN

3145 W ACRYLIC

TESTING :      WARP TENSILE      70 lbs  
                  FILL TENSILE      25 lbs  
                  WARP EPI          4 / INCH  
                  FILLING PPI       2 / INCH  
                  WEIGHT            0.97 L / 0.96 R oz/sg yd  
                  PICK-UP           18.55% left  
                                    17.70% RIGHT

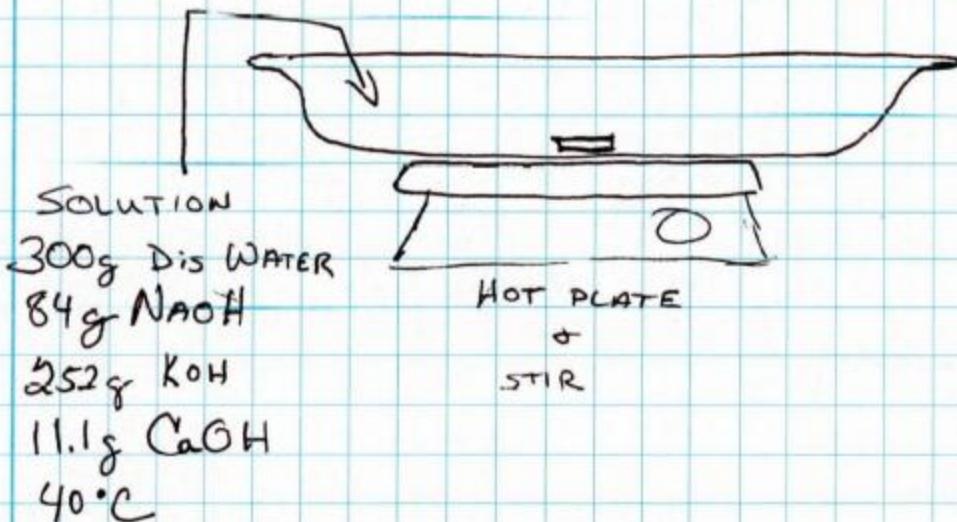
Date APRIL 26, 2001  
Date April 30, 2001

Signature George C. Mihalich  
Witness Anne M. Wilson

SUBJECT: AR PROTECT TESTING

DATE: MAY 4, 2001

TRI - HYDROXIDE TESTING



1 SOAK SAMPLES FOR 24 HOURS

2 RINSE

3 TEST

Date May 4, 2001  
Date May 7, 2001

Signature George C. Melt  
Witness Ann Wilson

SUBJECT: TRI-HYDROXI TESTING AR GLASS

DATE: MAY 10, 2001

24 HOUR SOAK       $40^{\circ}\text{C}$   
 4 Hour DRY @       $80^{\circ}\text{C}$       (NO RINSE)

## SAMPLE ID

BAYEX 8ENDS

CONTROL  
 96.5 lbs  
 89.5 lbs

SOAKED  
 28.6 lbs  
 24.5 lbs

MILLIKEN STEAM CAN ONLY  
 690 GLASS - PVC (2 DIPS)

99.6 lbs  
 85.8 lbs

34.2 lbs  
 34.4 lbs  
 31.2 lbs

MILLIKEN INFRARED + STEAM CANS  
 690 GLASS w/ PVC 2 DIPS

92.7 lbs  
 81.7 lbs  
 95.75 lbs  
 87.0 lbs

29.46 lbs  
 32.3 lbs  
 31.4 lbs  
 28.5 lbs

Date MAY 10, 2001  
 Date May 10, 2001

Signature

George C. McLean

Witness

John Wilson

SUBJECT: PULL TAPE TESTING

DATE : MAY 23, 2001

SAMPLE ID:

	TENSILE (1bs)
18 ENDS OF 4,000 D HT POLY	1,215
19 ENDS OF 4,000 D HT POLY	1,303
20 ENDS OF 4,000 D HT POLY	1,312
21 ENDS OF 4,000 D HT POLY	1,367

Date MAY 23, 2001  
Date May 24, 2001

Signature George C. McFarland  
Witness Don Nation

## SUBJECT: PULL TAPE TESTING

DATE: JUNE 6, 2001

NEPTCO  
WEIGHT oz/in<sup>2</sup> .35347MILLIKEN(18)  
.29865MILLIKEN(19)  
.3245MILLIKEN(21)  
.34200

WIDTH

11 mm

12 mm

12 mm

12 mm

## KNOT STRENGTH

DOUBLE KNOT 856.2

822.2

861.5

942.0

WATER KNOT

TENSILE

1214.6

1206

1288.42

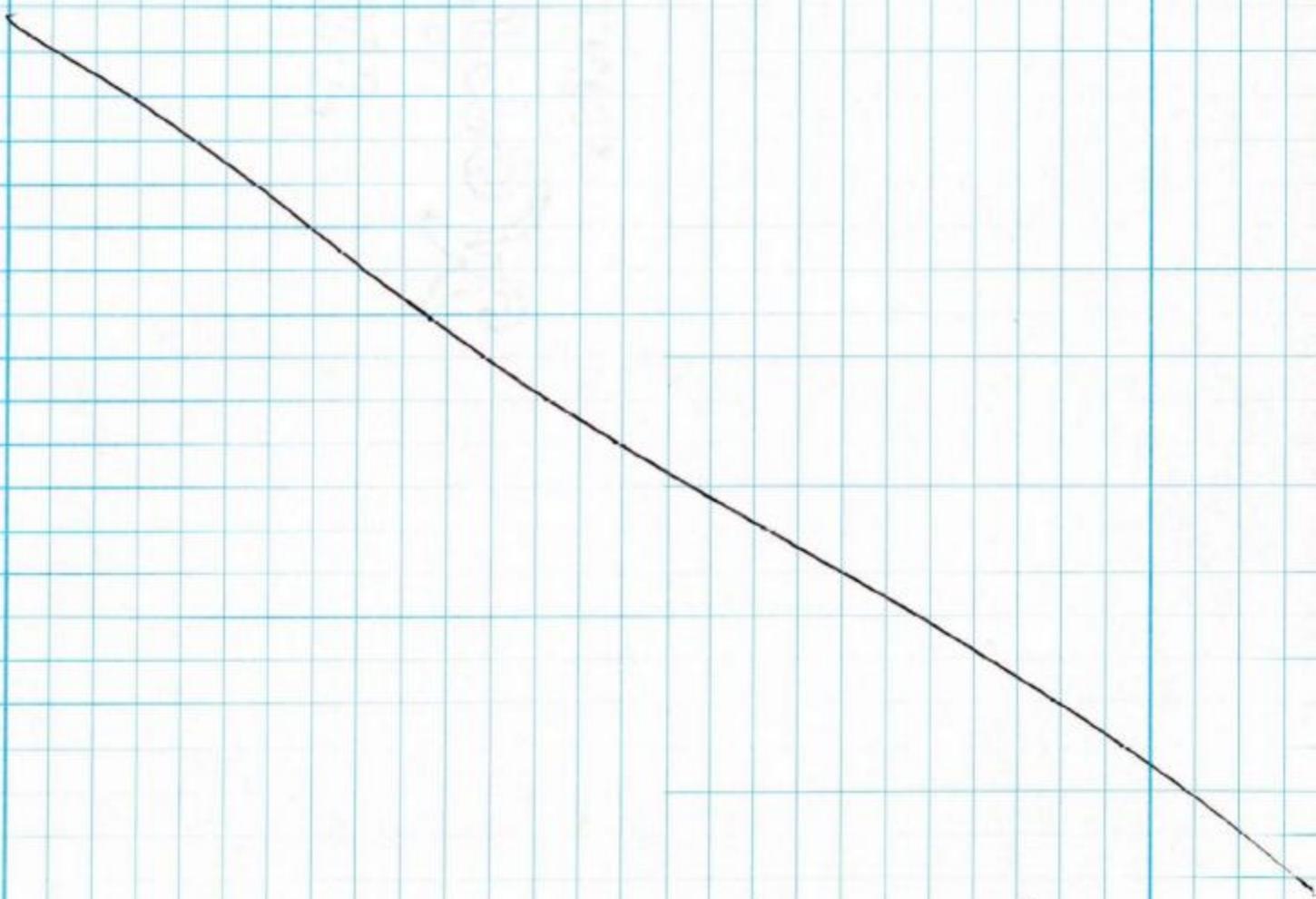
1343.8

ELONGATION @ 600 lbs 7.32%

7.40%

7.08%

7.14%



Date MAY JUNE 6, 2001

Date June 7, 2001

Signature

Peter C. Melt

Witness

Ana Wilson

11238-58

SUBJECT: SBR SAMPLE STABILON® w/ PPG 75's

DATE: JUNE 11, 2001

RAN 2 HOURS ON STABILON MACHINE

WARP 4 / INCH G-75 PPG 690

FILL SAME 1 / END / LENGTH

SBR COATING

6.5 PSI STEAM

2.8 SPEED

2 HOURS

SENT TO DIRK VAN HYNING  
FOR LAB TRIALS !

Date: JUNE 13, 2001

Date: JUNE 14, 2001

Signature

Witness

George C. Miller  
Ann Wilson

SUBJECT: STABILON® FOR HIGH IMPACT WALLBOARD

SAMPLE STYLE: 930120 - 450-3145

DATE: JUNE 29, 2001

SAMPLE DESIGN:

G - 37- WARP

H - 18 - FILL

1000 D POLY SELVAGE

ACRYLIC 3145 CHEMICAL BINDER

## CONSTRUCTION

10 EPI G-37

2.68 x 2.68 PPI H-18

20% ACRYLIC

0.1231 # YARN/yd cloth

0.1396

0.2630 0.0657~ 0.3287 #/yd cloth

RAN ON MACHINE 26 /TRI-AXE

800 YDS / 200 YDS / ROLL

WIDTH 45.20

EPI 10.0

PPI 5.4

OZ/Sq YD 3.87 OZ/SQ YD

TENSILE 176 W

211 F

% PICK-UP 14.70% of total wt

RAN PAIRED WARP ENDS TOP AND  
BOTTOM IN AN ALTERNATE CONSTRUCTION

Date: JUNE 29, 2001

Date: JUNE 29, 2001

Signature

Witness

George C. Miller  
Ann Th. Johnson

SUBJECT: SAMPLE STABILON® FOR EXTRUSION COATING

DATE: AUGUST 3, 2001

PURPOSE: RUN COATED SCRIM FOR BERNIE ZEICER TO USE IN HIS EVALUATION OF HOT MELT COATERS.

RAN THREE ROLLS FOR BERNIE:

G-75 WARP

G-75 FILLING

SAMPLE MACHINE

ALT CONSTRUCTION

SBR (BFG MW 3330)

STEAM CANS 85 PSI

4 SPEED

48 TOTAL ENDS /4 EPI

SHIPPED SAMPLES TO BERNIE ON ~~8/6/01~~ AUGUST  
3, 2001 FOR USE IN COATER EVALUATION.

Date AUGUST 3, 2001

Date August 7, 2001

Signature

Witness

George C. May  
Anna Wilson

SUBJECT: FIBERGLASS JOINT MESH FOR HVAC MASTIC SEAMS

DATE: AUGUST 15, 2001

PURPOSE: MEETING WITH GARY ALLEN, BOB TURNER (SHURTAPE)  
AND GEORGE McLARTY

ON AUGUST 10, 2001 GARY, BOB, AND GEORGE MET TO DISCUSS  
THE FIBERGLASS TAPE MARKET FOR HVAC MASTIC SEAMS. THE  
FOLLOWING NOTES WERE MADE:

- TAPE IS APPLIED TO RIDGID METAL DUCTING SEAM AND THEN COATED WITH A MASTIC
- SOME CODES REQUIRE THIS TYPE OF SEAM
- CURRENTLY BUY READY TO USE FROM BEDFORD WEAVING IN GREENVILLE, SC
- ROLLS ARE 3" X 150' AND SHURTAPE BUYS FOR \$1.85/ROLL
- SHURTAPE DISTRIBUTES THESE FOR \$2.50/ROLL
- COST TO APPLY PRESSURE SENSITIVE ADHESIVE IS ~ \$0.5834/ROLL
- COST TO SLIT AND SPOOL IS ~ \$0.532/ROLL
- FABRIC IS ~ \$0.7346/ROLL

MILLIKEN WOULD NEED TO PRODUCE AND SELL A 58" ROLL OF BONDED GLASS FOR \$0.279/1in yd TO COMPETE WITH THEIR CURRENT SUPPLY. (POTENTIAL)

Date: AUGUST 15, 2001

Date: AUGUST 15, 2001

Signature:

Witness:

George C. McLarty  
Early J. R. Rebello

SUBJECT: IMPROVED METHOD OF PRODUCING PRESSURE  
SENSITIVE FABRICS

DATE: AUGUST 15, 2001

PURPOSE: ALTERNATIVE METHOD TO PRODUCE FABRICS  
FOR APPLICATIONS REQUIRING ADHESIVE ON  
ONE SIDE. EXAMPLES: DRY WALL TAPE, LEAD BATTERY  
SUPPORT, HVAC RIDGID DUCT SEAM REINFORCEMENT.

MOST FABRIC REINFORCED TAPE TYPE PRODUCTS ARE LENO  
WOVENS. THIS FABRIC CONSTRUCTION GIVES THE FABRIC  
STABILITY TO GET <sup>EM 8/15/2001</sup> TO THE GEOMETRY STABLE. THE FABRIC

WOULD THEN GO THROUGH A TWO STEP ADHESIVE APPLICATION.  
THE FIRST STEP IS A BASE COAT TO FULLY STABILIZE THE  
FABRIC. THE SECOND COAT IS USUALLY A KISS COAT OF  
AN ACRYLIC TYPE PRESSURE SENSITIVE ADHESIVE. THE  
TOTAL PROCESS IS A THREE STEP PROCESS OF FORMING  
FABRIC, BOND, APPLY PRESSURE SENSITIVE ADHESIVE.

THIS INVENTION / IDEA IS AN IMPROVED METHOD OF FORMING A  
FABRIC WITH A PRESSURE SENSITIVE ADHESIVE. MILCIKEN COULD  
FORM A FABRIC WITH THEIR STABILON PROCESS. THEN APPLY  
A KISS COAT OF PRESSURE SENSITIVE ADHESIVE ALL IN-LINE.  
THIS IS A LOWER COST AND COMPLEXITY METHOD OF  
PRODUCING A SIMILAR PERFORMANCE PRODUCT. FILM OR  
NON-WOVENS COULD ALSO BE ADDED TO THE FABRIC MESH  
TO PRODUCE A FULL FACED PRODUCT.

Date August 15, 2001

Date August 16 2001

Signature

George C. Myer

Witness

Carly f. Lubatto

SUBJECT: REDUCED CONTACT FRICTION FABRIC

DATE: SEPTEMBER 18, 2001

PURPOSE: ON PAGE 11238-01 I DESCRIBE PRODUCING A MONOFILAMENT PULL TAPE FOR INSTALLING CABLE. I STATE TEST RESULTS FOR THE LOWER FRICTION OF THESE TAPES ON PAGE 11238-34. THE PURPOSE OF THIS EXPERIMENT IS TO REDUCE THE CONTACT FRICTION ON A MULTI-FILAMENT PULL TAPE.

HONEYWELL FIBERS <sup>GM 9/18</sup> HAVE MADE TWO SAMPLE TAPE FABRICS FOR MILLIKEN TO EVALUATE. ~~THEY~~ ARE IDENTIFIED AS SAMPLE 22261-611 #2 AND ~~22261-611 #3~~ <sup>GM 9/18</sup> 22261-611 #3. THEY ARE CONSTRUCTED OF A MULTI-FILAMENT <sup>GM 9/18</sup> ~~NES OR PE-ES~~ YARN FROM HONEYWELL. THIS YARN NAME STANDS FOR PE(POLYESTER) ES(ENGINEERED SURFACE).

THESE YARNS WERE USED TO FORM A PULLING TAPE SIMILAR TO THOSE CURRENTLY AVAILABLE IN THE MARKET. THEY WERE COMPARED TO EXISTING PRODUCTS FOR FRICTION PERFORMANCE.

<u>SAMPLE ID</u>	<u>STATIC FRICTION</u>	<u>KINETIC FRICTION</u>
NEPTCO Multi- Fill POLY LUBED	0.21	0.16
MILLIKEN MULTI-FILL POLY UNLUBED	0.24	0.17
HONEYWELL 22261-611 #2	0.21	0.17
HONEYWELL 22261-611 #3	0.20	0.16

Date: SEPTEMBER 18, 2001

Date: September 18, 2001

Signature

Witness

George C. McRae  
Larry J.A. Gibbitts

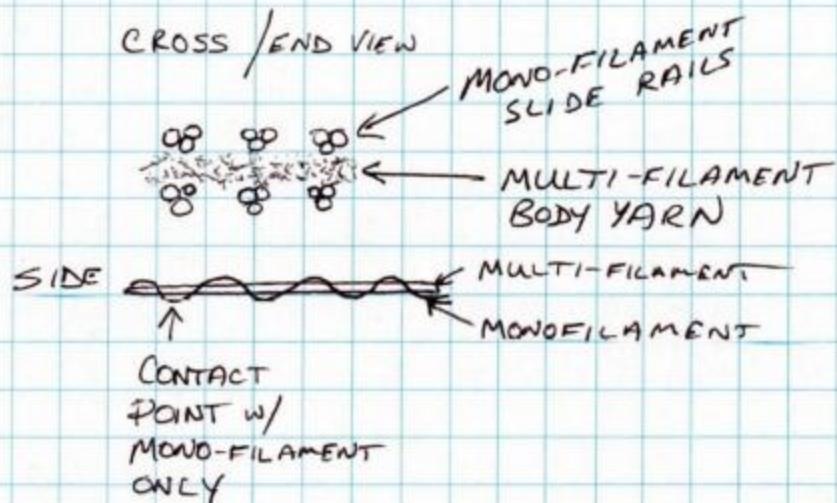
SUBJECT: LOWER FRICTION PULL TAPE

DATE: SEPTEMBER 21, 2001

PURPOSE: MANUFACTURE A CABLE PULLING TAPE  
FOR THE TELECOMMUNICATION MARKET WITH  
LOW OR MINIMAL FRICTION

MILLIKEN IS CURRENTLY WEAVING A PULL TAPE  
AT UNITY UNDER STYLE # 073400. THIS MULTI-FILAMENT  
TAPE WORKS WELL, BUT COULD THE FRICTION OF THIS  
TAPE BE LOWFERED TO DECREASE CONTACT FRICTION DURING  
CABLE INSTALLATION?

IDEA:



MONO-FILAMENT YARNS HAVE LOWER FRICTION THAN  
MULTI-FILAMENT.

Date SEPTEMBER 21, 2001

Date September 24, 2001

Signature

Witness

George C. McHale

Carly F. Rabbette

SUBJECT: REINFORCED PAPER FOR WALLBOARD

DATE: OCTOBER 15, 2001

PURPOSE: ALTERNATIVE METHOD TO REINFORCE  
WALLBOARD

PAPER OR OTHER SUITABLE MAT COULD BE  
REINFORCED WITH MILLIKEN'S MALIMO TECHNOLOGY.  
STITCHING A SET OF YARNS TO THE PAPER  
WILL IMPART INCREASED STRENGTH IN THE FINAL  
PRODUCT. ONE POTENTIAL USE IS HIGH IMPACT  
WALL BOARD.

Date OCTOBER 15, 2001

Date October 15, 2001

Signature

Witness

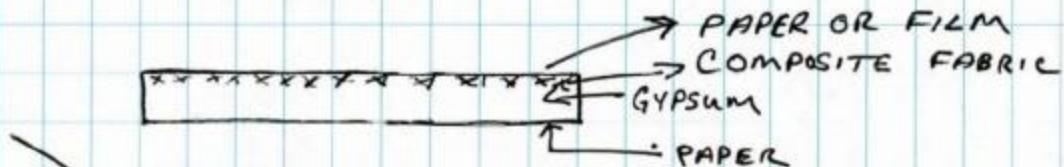
*J.C. Mefert*  
*Early J.C.P. Gibetta*

SUBJECT: ALTERNATIVE METHOD TO REINFORCE  
WALLBOARD WITH FABRIC

DATE: OCTOBER 15, 2001

PURPOSE: REINFORCING TRADITIONAL WALLBOARD  
WITH MAT / STABILON® COMPOSITES

MILLIKEN HAS MADE FABRIC STYLE 930098 AS  
A REPLACEMENT FOR TRADITIONAL PAPER FACED  
GYPSUM BOARD. ANOTHER ALTERNATIVE IS TO ADD  
A PAPER LAYER ON TOP OF THE FABRIC REINFORCEMENT.  
THIS WOULD GIVE THE REINFORCED BOARD THE  
LOOK OF A TRADITIONAL BOARD, BUT WOULD HAVE A  
FABRIC REINFORCED CORE. THE OUTER LAYER COULD  
BE PAPER, OR OTHER CONTINUOUS FILM.



Date: OCTOBER 15, 2001

Date: October 15, 2001

Signature:

George C. McLean

Witness:

Carly J. P. Bellotti

SUBJECT: REINFORCED FACER FOR DRYWALL OR  
GYPSUM PANELS

DATE: JANUARY 11, 2002

PURPOSE: FABRIC ENGINEERED TO REPLACE TRADITIONAL  
FACERS IN GYPSUM PANELS

MILLIKEN HAS RUN POLYESTER MATS WITH FIBERGLASS REINFORCEMENT AS TEXTILE FACERS FOR GYPSUM PANELS. PAST SAMPLES HAVE NOT MET THE STRENGTH REQUIREMENTS OF THE INDUSTRY. SAMPLE 930121 WAS DESIGNED TO HAVE MORE REFORCEMENT TO THE MAT.

930121 / 475 / 3145

WARP PPG G-37 BEAMS 2 BEAMS 14 ENDS/BEAM  
6 ENDS / INCH WITH PAIRED ENDS

FILLING PPG H-18 LARGE PACKAGES 64 PACKAGES/CRATE

MAT 1/2 OZ / SG YD POLY MAT FROM AMERICAN NON-WOVENS

CHEMICALS MW 3145 ACRYLIC

CONSTRUCTION 6 ENDS / INCH  
1.5 x 1.5 FILLING TRI-DIRECTIONAL  
MAT 48"  
0.2597 lb/yd  
47.5" WIDE  
4.155 TARGET WEIGHT oz/yd

WARP TENSILE 94.8 lbs / INCH

FILLING TENSILE 148.2 lbs / INCH

WARP ENDS / INCH 6.0 EPI

FILLING PICKS / INCH 3.0 PPI

PICK UP 16.77 % PICK-UP

MACHINE 22

SPEED 27.3

KISS MAT

WIDTH 47.653"

RAN 4 ROLLS 5,000 yds  
1,000 yds  
600 yds  
400 yds

Date JANUARY 11, 2002

Date January 11, 2002

Signature

Witness

George C. McLean  
Larry J.C. Petrucci

SUBJECT: PVC COATED YARN

DATE: JANUARY 23, 2002

PURPOSE: EVALUATE THE EFFECT OF TEMPERATURE  
ON THE ALKALI RESISTANCE OF GLASS YARN

MATERIALS: AGY G-75 FIBERGLASS YARN  
MILLIKEN CHEMICAL PVC 891 PLASTISOL

EQUIPMENT: STABILON® SAMPLE MACHINE AT GILLILAND

RAN WARP ENDS OF AGY-G-75 THROUGH A PRO DIP OF  
MILLIKEN CHEMICALS PVC 891.

CONDITION #1 CURED ON STEAM CANS AT 290°F  
CONDITION #2 CURED ON STEAM CANS AT 327°F

SAMPLES WERE GIVEN TO DAVID GREEN OF MILLIKEN  
CHEMICAL FOR TESTING.

Date JANUARY 23, 2002  
Date JANUARY 23, 2002

Signature

Witness

George C. McLean  
Phillip Ode

SUBJECT: EASIER LOADING AND UNLOADING  
OF GREIGE FABRIC FORMATION CREEL

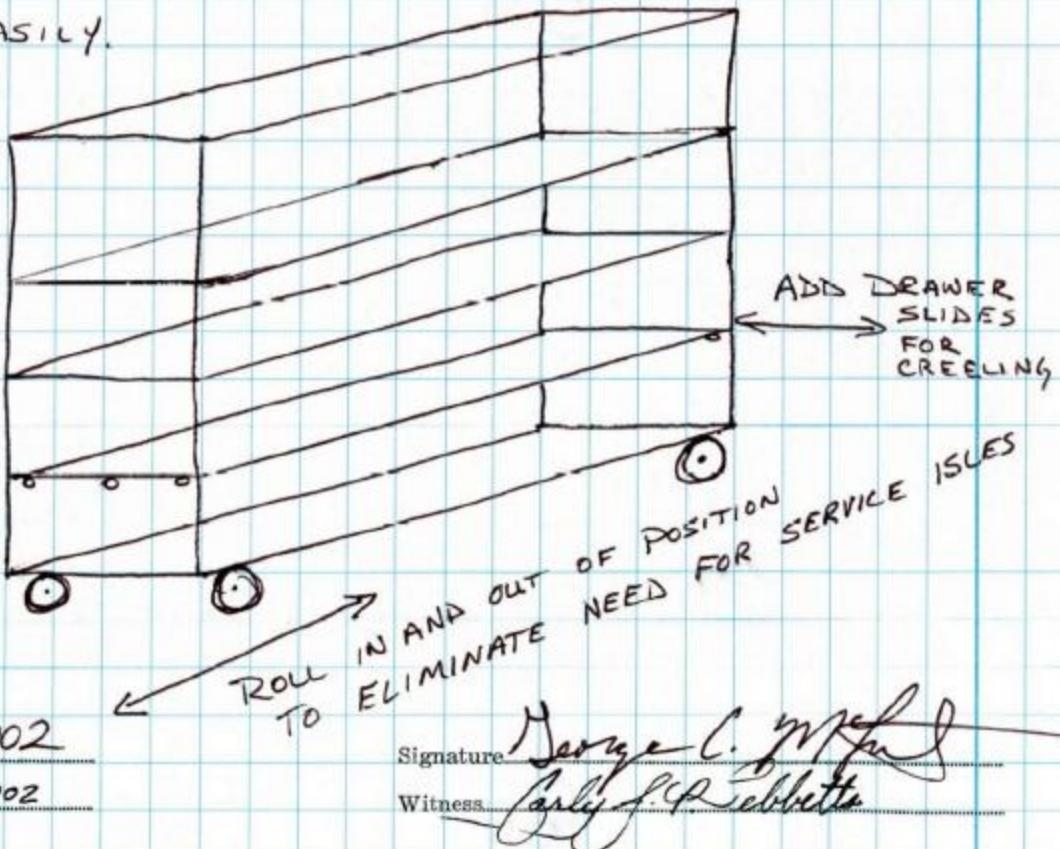
DATE: FEBRUARY 15, 2002

PURPOSE: - INCREASE YARN PACKAGES / Sq.ft. OF  
FLOOR SPACE  
- IMPROVE SPEED TO CREEL YARN

BACK GROUND: GILLILAND PLANT IS WORKING TO  
RUN WARP YARNS FROM A NON-  
CONVENTIONAL CREEL.

IDEA: ADD WHEELS TO CREEL SECTIONS TO  
ELIMINATE SERVICE ISLES BETWEEN SECTIONS.  
THE CREEL SECTIONS CAN BE INDEXED OUT  
TO ALLOW SERVICING.

THE SHELVES IN THE CREEL COULD BE  
MODIFIED TO ENABLE THEM TO ACT LIKE  
DRAWERS, THE SHELF CAN BE PULLED OUT  
AND ALLOW PACKAGES TO BE LOADED  
EASILY.



SUBJECT: INVESTIGATE REINFORCING CONCRETE

DATE: FEBRUARY 15, 2002

PURPOSE: START MARKET RESEARCH FOR  
TEXTILE REINFORCED CONCRETE

THE SPECIALTY INDUSTRIAL BUSINESS IS STARTING  
AN OFFICIAL INVESTIGATION INTO THE POTENTIAL  
USES OF TEXTILES TO REINFORCE CONCRETE.

THE STUDY WILL INCLUDE CEMENT COMPANIES,  
CONCRETE COMPANIES, AND ALL CEMENTITIOUS  
PRODUCTS.

EXAMPLES INCLUDE: CONCRETE BLOCK  
PAVING  
PRE-STRESSED  
TILT UP PANELS  
PIPE  
CULVERTS  
CEMENT BACKER BOARDS

Date: FEBRUARY 15, 2002

Date: February 15, 2002

Signature

Witness

J.C. McFarland  
John J. Rubatto

SUBJECT: UV CURING ADHESIVES

DATE: APRIL 9, 2002

PURPOSE: ALTERNATIVE METHOD FOR DRYING  
LAID SCRIM FABRICS

TODAY ALL OF MILLIKEN'S STABILON PRODUCTS REQUIRE DRYING OR CURING OF THE ADHESIVE WITH STEAM CANS. COULD MILLIKEN UTILIZE UV CURING CHEMICALS TO ELIMINATE ~~GM~~ OUR CURRENT DRYING COST AND TIME?

Date: APRIL 9, 2002

Date: April 9, 2002

Signature:

Witness:

George C. McLean  
Larry J. Cullotti

SUBJECT: AN INNOVATIVE FACER FOR GYPSUM PANELS

DATE: APRIL 22, 2002

PURPOSE: DEVELOP A FACER FOR USE IN GYPSUM PANELS THAT PROVIDES SUPERIOR PERFORMANCE OVER TRADITIONAL PAPER FACERS

MILLIKEN HAS WORKED TO DEVELOP FABRICS FOR USE AS A FACER IN EXTERIOR GYPSUM SHEATHING. THESE FABRICS HAVE ALL HAD THREE COMPONENTS:

1. NON-WOVEN MAT
2. STABILON REINFORCEMENT
3. ADHESIVE.

THIS TECHNOLOGY COULD BE EXPANDED BY SUBSTITUTING A POLYMERIC FILM FOR THE NON-WOVEN MAT. THE POLYMERIC FILM COULD BE APPLIED OR ADHERED TO THE STABILON GRID. THE FILM COULD BE PERFORATED TO ENHANCE THE BOARD DRYING. THE FILM COULD ALSO BE APPLIED IN-LINE IN THE BOARD MAKING PROCESS. IT COULD BE APPLIED AS A FACE LAYER AS THE BOARD IS FORMED OR POST APPLIED AS A TOP OR FINISH LAYER.

Date APRIL 22, 2002

Date April 22, 2002

Signature

Witness

*George C. Miller*  
*Carly J. C. Miller*

SUBJECT: TRIAL OF FILM FACER FOR GYPSUM  
PANELS

DATE: APRIL 29, 2002

PURPOSE: EVALUATION OF LOW DENSITY  
POLYETHYLENE FILM IN MILLIKEN LAB

PROCEDURE: ADD 335 g WATER TO MIXER  
ADD 450 g GYPSUM TO MIXER  
MIX ON LOW (1) FOR 30 SECONDS  
STOP  
MIX ON MED (2) FOR 30 ADDITIONAL SECONDS  
POUR INTO MOLD  
STAND 15 MINUTES  
REMOVE FROM MOLD  
DRY IN 150°C MOLD FOR 15 MIN OR  
50° C OVERNIGHT

FACER MATERIAL: TRADITIONAL BOARD HAVE PAPER  
FACER ON THE FRONT AND  
BACK. THIS TRIAL SUBSTITUTED  
A 1 1/2 mil THICK LOW DENSITY POLY-  
ETHYLENE FILM FOR THE PAPER.  
THE FILM WAS PERFORATED TO  
ASSIST WITH LETTING THE  
MOISTURE OUT OF THE CORE  
IN THE DRYING STEP.

Date APRIL 29, 2002

Date April 30, 2002

Signature

Witness

*George C. McLean*  
*Carlyle C.R. Roberts*

SUBJECT: REINFORCED FILM FOR CONCRETE BACKER BOARDS

DATE: MAY 16, 2002

PURPOSE: REINFORCED CONCRETE PANEL FOR TILE  
UNDERLAYMENT AND A SMOOTH SURFACE

IDEA: MANY FABRICS HAVE BEEN USED TO REINFORCE CONCRETE PANELS. TODAY, THE MAJORITY OF THESE PANELS ARE REINFORCED WITH FIBERGLASS FABRICS. THESE FABRICS ARE COATED WITH ALKALI RESISTANT POLYMERS TO REDUCE THE DEGRADATION OF YARNS IN THE HYDROLYSIS OF THE CONCRETE. THE CONCRETE PANELS ARE FORMED WITH A LAYER OF FABRIC ON THE OUTSIDE OF THE BOARD. THE FABRIC INCREASES THE FLEXURAL STRENGTH OF THE PANELS.

THIS IDEA INVOLVES COMBINING A POLYMERIC FILM WITH A REINFORCING FABRIC. THE POLYMERIC FILM WILL PROVIDE A SMOOTH SURFACE ON THE OUTSIDE OF THE BOARD. EXAMPLES OF FILMS MAY INCLUDE BUT ARE NOT LIMITED TO:

1. PET
2. PBT
3. NYLON
4. POLYPROPYLENE
5. LOW DENSITY POLYPROPYLENE
6. PERFORATED
7. PVA

Date: MAY 16, 2002

Date: May 16, 2002

Signature

Witness

George C. McRae  
Carly J. Rabbe

SUBJECT: LOAD CELLS ON STABILON PAD

DATE: JUNE 10, 2002

PURPOSE: IDEA TO MEASURE PAD SET-UP IN STABILON

MILLIKEN HAS HAD DIFFICULTY WITH EVEN CHEMICAL APPLICATION IN THEIR STABILON PROCESS.

IDEA: PUT LOAD CELLS AND READ OUTS ON THE STEEL ROLL BEARINGS FOR THE STABILON PAD. ADD PAD PRESSURE TO PRODUCT SPECIFICATIONS FOR PROCESSING.

Date JUNE 10, 2002

Date June 10, 2002

Signature

George C. Miller

Witness

Carly J.C. Rabbette

SUBJECT: CONVECTION DRYER FOR LAID SCRIM

DATE: JUNE 10, 2002

PURPOSE: IMPROVED METHOD OF DRYING LAID SCRIM

IDEA: TODAY ALL OF MILLIKEN'S LAID SCRIM FABRICS ARE DRIED WITH STEAM CANS. SOME OF THE FABRIC'S PROPERTIES ARE EFFECTED BY THIS DRYING METHOD.

CONVECTION DRYING HAS NOT BEEN UTILIZED IN THIS PROCESS BECAUSE IT IS BELIEVED THE CURRENT CONTACT WITH THE STEAM CAN IS REQUIRED TO ACHIEVE THE BEST FABRIC QUALITY.

THIS IDEA IS TO COMBINE BOTH CONVECTION AND CAN DRYING. WHY NOT PUT A CAN INSIDE A DRYER? THE CAN WOULD BE HEATED BY THE CONVECTION HEAT AND ALLOW THE FABRIC TO BE IN CONTACT WITH THE CAN. THE CONVECTION DRYER WOULD ALLOW FABRICS TO REACH HEAT LEVELS UNATTAINABLE BY STEAM.

Date JUNE 10, 2002

Date June 10, 2002

Signature

Witness

George C. McFarlan  
Carlyle G. Riehotta