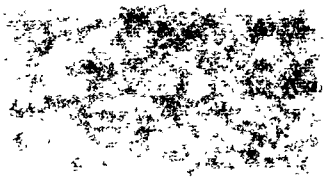
FILE NAME: Shree Digvijay (SDV)

DATE: 1969-1970

DOC#: SDV002

DOCUMENT DESCRIPTION: Johns-Manville File on Shree Digvijay Cement Co.

[redacted] CEMENT CO.
GENERAL - Nov.,1969-May,1970



September 29, 1970

Mr. V.N. Somani
Shree Digvijay Cement Company Ltd.
Ranip Sabarmati
Ahmedabad 5, India

Dear Mr. Somani:



This is to acknowledge your letter of August 31st which apparently took a long time in reaching this office.

In reference to the possibility of measuring forming pressures on your pipe machine, I would like to suggest you to install on the hydraulic line going to the press cylinders a graphic register which could amplify the forming pressure time pattern. There are several manufacturers of this type register, such as Foxboro Co. and Bristol Co. These registers are not expensive and are very helpful in relating pipe failures with forming pressure at the machine.

In reference to increasing the diameter of the rubber covered press rolls from 4-5/8" to 5", I believe your machine operation will improve substantially if you do so. However I recommend for the manufacture of pipe over 5" you should consider rubber rolls similar to the ones you are using in your RCM press section.

In reference to the drawinngs on electrolytic stripping and sandblasting equipment, they were sent to you by Mr. S.E. Jastrzemski on August 24th. I hope these [illegible] safely.

In ref[illegible] India, I would like to advise you that Mr. R.[illegible] I program my visit to your company in early Spring [illegible] few weeks at your plant to assist you in bringing your [illegible].

Kindest regards,

Sincerely,

R. Gomez

cc: R.S. Olson
S.E. Jastrzemski



September 8, 1970

Mr. V. N. Somani
Shree Digvijay Cement Co., Ltd.
Shreeniwas House
Waudby Road
Bombay 1, INDIA

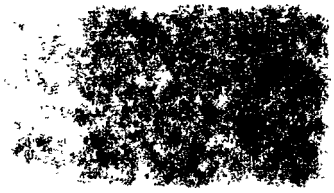


Dear Mr. Somani:

Further to my letter of September 1st, you will find attached credit to your asbestos account covering the funds due you for the J-M exhibit at the Madras Fair.

With best regards,

A. J. Steneri



Noted
Pls.

TELEPHONE OFFICE : 268241 (10 LINES)

TELEGRAMS · JAMCEMENT BOMBAY
TELEX : 2735-LOTUS BOMBAY

# Shree Digvijay Cement Company Limited

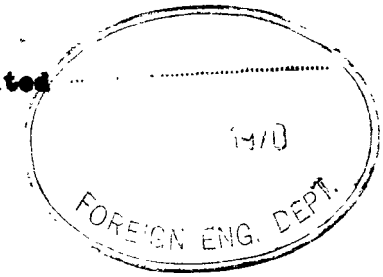
REGISTERED OFFICE : SIKKA. (GUJARAT)

Works at
SIKKA,
BOMBAY 15,
AHMEDABAD, 5.

Administrative Office :
SHREENIWAS HOUSE,
WAUDBY ROAD, FORT,
BOMBAY 1. BR.

REF._____

DATE 2nd September, 1970.




R. S. Olsen, Esq.
Johns-Manville India Limited
22 East 40th Street
NEW YORK, N.Y.10016
U.S.A.

Dear Mr. Olsen,

We are pleased to note from your letter of 24th August that you, accompanied by your wife, are planning to visit us in the month of November, and that you would be landing in Bombay on the 31st October from Hyderabad.

Arrangements have been made for an air-conditioned room for your comfortable stay at Taj Mahal Hotel for the nights indicated by you. So also, we have arranged for your going to Ahmedabad on the 2nd November and returning same day evening to Bombay. The meetings with M/s. G.B., R.B. and others have also been fixed for 3rd November. At the moment all are planning to be here on this date.

On my return from the States I found the factory faced with a labour strike, which unfortunately continued right upto the middle of July. Thereafter, the labour was adopting go-slow tactics. Things have improved only now, and I hope that whatever I learnt in my trip I would be able to implement most of it in the coming months - September/October - so that when you visit Ahmedabad you may find the factory running with good production and nice efficiency.

I wonder whether you would be accompanied by Mr.Gomes in this trip, because he also visits us once a year, and we would welcome him to be with us either in November or January/February next for a period of one week or ten days. Kindly confirm.

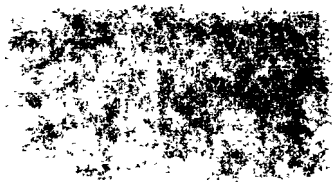
I hope this finds all of you in best of health.

With kindest regards,

Yours sincerely,

( V. N. Somani )

cc: Mr.R.Gomes.



September 1, 1970

Mr. R.D. Tripathi
Shree Digvijay Cement Co., Ltd.
Shreeniwas House
Waudby Road
Bombay 1, INDIA



Dear Mr. Tripathi:

The following is the information on Separan that you requested in your letter to G. Rudin dated August 21, 1970 (Ref: RDT:PB:1715).

There are several other materials in addition to Separan NP10 that can be used as flocculating agents to improve the asbestos-cement pipe forming operation.

We are not familiar with Separan AP30. You can use Separan NP20 but this is about twice as expensive as the Separan NP10.

The following is a list of alternates and the suppliers:

| | |
|---|---|
| Separan NP10 and NP20 | Dow Chemical Company<br>Abbott Road<br>Midland, Michigan 48640 |
| Polyhoil 295 | Stein - Hall Co. Inc.<br>605 Third Ave.<br>New York, N.Y. 10016 |
|  | Nalco Chemical Co.<br>6625 W. 66th Place<br>Chicago, Illinois |

I would suggest that you first find out if these other materials are available before you try Separan AP30.

With kindest regards.

Sincerely,

S.E. Jastrzemski

cc: V.N. Somani
R.S. Olson
R. Gomez

Noted RDJ.

TELEPHONE { OFFICE : 52921
FACTORY : 6324

TELEGRAMS { JAMCEMENT BOMBAY
JAMCEMENT AHMEDABAD
JAMCEMENT SIKKA

# Shree Digvijay Cement Company Limited.

REGD. OFFICE : SIKKA, VIA. JAMNAGAR.
(ASBESTOS PRODUCTS DIVISION)

DIGVIJAY NAGAR,
AHMEDABAD.

Ref. No. 6509

August 31, 1970.

Mr. R. Gomez,
Johns-Manville International Corporation,
22 E, 40th Street,
NEW YORK, N.Y.10016.

My dear Rod,

I have received your letter dated 10th August'70 in reply to that of mine dated 10th July and I am very thankful to you for a quick reply to my important letter.

I have given the letter for a detailed study of my Engineering Department, but would like to comment, just in brief, on some of the points for your consideration.

If it is possible for us to accurately measure the pressure at the formation of the pipes besides the one available on the Control Board, it would indicate whether there is in fact any inaccuracy in the pressure reduction because of the mechanical stoppages on the machine. I shall appreciate if you could guide me whether it is possible to measure this accurately so that the matter can be studied in depth.

In point No.2, you have mentioned that 4-5/8" diameter rubber covered press rolls are too small to withstand the forming pressure of 400 lbs.per linear inch starting.

M/s.Calzoni have already recommended to us that for manufacture of pipes upto 5", it is advisable to use a 200 mm dia press roll and we are in the process of equipping ourselves with these rolls.

I note the recommendations of your Engineering Department that it may be necessary to re-design the press to avoid knurling affect and that your Engineering Department would have to charge us for the re-design. As and when this is necessary, we shall advise you in the matter.

Your advise on R.C.M. Machine modifications is exactly in line of our own thinking and in fact we want to modify the RCM Machine using the same press beam as has been designed by you to use the hydraulic piston as used on Calzoni as also mandrel handling and extractor as per Calzoni design and indigenous parts required for this change over have already been ordered out and we expect to receive them in 2 or 3 months and we would be able to discuss this in more details during your forthcoming visit.

TELEPHONE { OFFICE : 52921
FACTORY : 6324

TELEGRAMS { JAMCEMENT BOMBAY
JAMCEMENT AHMEDABAD
JAMCEMENT SIKKA

# Shree Digvijay Cement Company Limited.

REGD. OFFICE : SIKKA, VIA. JAMNAGAR.
(ASBESTOS PRODUCTS DIVISION)

DIGVIJAY NAGAR,
AHMEDABAD.

*Ref. No.*



In respect of the advices given by your Production Departments in Manville, Long Beach and Stockton Plants, it has not been possible for us to fully experiment of the advices in view of the uncertain labour conditions that have prevailed in the Factory in the last few months. Apart from the strike, there has been other problems which we are slowly overcoming and we expect to start the experiments during next month.

I am keenly waiting the despatch of electrolytic stripper and sand blasting equipment drawings.

Have you decided about your visit to India?. If so, kindly inform me when is the programme.

Kindly convey my regards to Mrs.Gomez and love to your kids.

With kind regards,

Yours simcerely,

( V.N. Somani )

# CANADIAN Johns-Manville Asbestos LIMITED

| CREDIT NUMBER | DATE | OUR INVOICE NUMBER | CUSTOMER ORDER | CUSTOMER REQUISITION |
|---|---|---|---|---|
| A10-E- 2290 | 8/26/70 | | | |

| DEST-TAX | REC. | J. M. CUST. | TERMS – |
|---|---|---|---|
| UF | 28 | 013 847 009 | |

| SALES CREDIT | CREDIT TO | ORIGINAL SHIPMENT TO SAME UNLESS OTHERWISE INDICATED BELOW |
|---|---|---|
| A000 54 | SHREE DIGVIJAY CEMENT CO. LTD..<br>SHREENIWAS HOUSE WAUDBY ROAD.<br>BOMBAY 1, INDIA | |

## CREDIT

| QUANTITY | DESCRIPTION | ITEM | PER | PRICE | AMOUNT |
|---|---|---|---|---|---|
| | PAYABLE IN CANADIAN FUNDS | | | | |
| | TO CREDIT FOR COST OF SHIPPING THE EXPO XXX DISPLAY TO INDIA | | | | XXXX<br>3529.23 |

PHONE : 268241
CABLE : JAMCEMENT
Telex : LOTUS-2735

# SHREE DIGVIJAY CEMEN
## COMPANY LIMITED

WORKS : SIKKA - AHMEDABAD - BOMBAY.

SHREENIWAS HOUSE,
WAUDBY ROAD,
BOMBAY-1. INDIA

Ref. : RDT:PB:4715

Date : August 21, 1970

Mr. George Rudin
MESSRS JOHNS MANVILLE INTERNATIONAL CORPORATION
22 East 40th Street
New York - N.Y.10016
U. S. A.

Dear Mr. Rudin,

During the visit of Mr. V.N.Somani to the States in April last discussions were held with Mr. Gomez regarding the following :

1. Sand Blasting on the mandrels instead of knurling.
2. Electro stripping for loosening pipe on the mandrel instead of calendering.

It was indicated that necessary drawings for manufacturing equipments for the above in India would be supplied to us. As we have not heard in this matter further, we would request you to kindly look into the matter and let us know.

Mr. Somani was also acquainted with the use of Separan NP10 in the use of production of pipes and sheets. On enquiry we find that it may be difficult to obtain supplies of Separan NP10. But it may be a little easier to obtain Separan AP30. Would you kindly let us know whether Separan AP30 could be used in place of Separan NP10 ?

Thanking you and with kindest regards, I remain,

Yours sincerely,

R.D.TRIPATHI

NOTE : All contracts shall be subject to the exclusive jurisdiction of the C

Good Now a Closed Book 9/8/70

A.F.D. Asbestos
August 31, 1970

A. J. Steneri N.Y.

THE EXPO 1970 DISPLAY - INDIA

As recommended by D. Poutiatine in his letter of July 9, attached is our credit E-2290 for $3,529.23.

This value representing the Canadian equivalent of US $3,458.65 has been deducted from Shree Digvijay's outstanding account with A.F.D. No doubt you will wish to inform them accordingly.

D. B. HOBSON

DBH:ka
enc:1
cc: D. Poutiatine Int'l N.Y.
R. S. Olson
G. Read
D. J. Colwell

Noted
R.G.

# JOHNS-MANVILLE INDIA LIMITED

22 EAST 40th STREET • NEW YORK, N. Y. 10016 • CABLE ADDRESS "JOHNMANVIL"

August 3, 1970

Mr. S. K. Somani
Shree Digvijay Cement Company Limited
Shreeniwas House
Waudby Road
Bombay - 1
INDIA

Dear Mr. Somani:

This will acknowledge and thank you for your letter of July 28, 1970 ref. RDT:A:1611 and we will be looking forward to the visit of Mr. G. N. Somani towards the end of this month.

With kindest regards.

Sincerely,

R. S. Olson

RSO/lvr

bcc: D. Poutiatine
R. Gomez
A. J. Steneri
D. G. Colwell
G. Read



PHONE : 268241
CABLE : JAMCEMENT
Telex : LOTUS - 2735

# SHREE DIGVIJAY CEMENT
COMPANY LIMITED

WORKS : SIKKA . AHMEDABAD . BOMBAY.

SHREENIWAS HOUSE,
WAUDBY ROAD,
BOMBAY-1. INDIA

*Ref.* : RDT:A:1611

*Date* : 28th July 1970
29

THE JOHNS MANVILLE INTERNATIONAL CORPORATION
22 East 40th Street
New York - N.Y.10016
U. S. A.

Attn: Mr. R.S.Olson

Dear Sirs,

We have pleasure in informing you that our Mr.G.N.Somani is proceeding on a business tour to the U.K. and continent as well as to the U.S.A. and Canada.

Mr. Somani would be in New York towards the end of next month for a stay of about one week. Hotel and other arrangements are being made by us direct.

During his stay in New York Mr. Somani will contact you for discussions regarding our requirements of asbestos fibre as well as for promoting exports of our products so that the outstanding loan amount could be settled at the earliest.

Thanking you,

Yours faithfully,

For Shree Digvijay Cement Co. Ltd.

S.K.SOMANI

rdt/pb

NOTE : All contracts shall be subject to the exclusive jurisdiction of the Courts in Bombay, and to the Arbitration law as in force in India.

# JOHNS-MANVILLE INDIA LIMITED

22 EAST 40th STREET • NEW YORK, N. Y. 10016 • CABLE ADDRESS "JOHNMANVIL"

August 3, 1970

Mr. S. K. Somani
Shree Digvijay Cement Company Limited
Shreeniwas House
Waudby Road
Bombay - 1
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With kindest regards.

Sincerely,

R. S. Olson

RSO/lvr

bcc: D. Poutiatine
R. Gomez
A. J. Stener
D. G. Colwell
G. Read

PHONE : 268241
CABLE : JAMCEMENT
Telex : LOTUS - 2735

SHREE DIGVIJAY CEMENT
COMPANY LIMITED
WORKS : SIKKA . AHMEDABAD . BOMBAY.

SHREENIWAS HOUSE,
WAUDBY ROAD,
BOMBAY-1. INDIA

*Ref.*: RDT:A:1611

*Date*: 28th July 1970

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22 East 40th Street
New York - N.Y.10016
U. S. A.

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Thanking you,

Yours faithfully,

For [illegible]

S.K.SOMANI

rdt/pb

NOTE ; All contracts shall be subject to the exclusive jurisdiction of the Courts in Bombay, and to the Arbitration law as in force in India.

PHONE : 268241
CABLE : JAMCEMENT
Telex : LOTUS-2735

SHR ' DIGVIJAY CEMENT
COMPANY LIMITED
WORKS : SIKKA . AHMEDABAD . BOMBAY.

SHREENIWAS HOUSE,
WAUDBY ROAD,
BOMBAY-1. INDIA

*Ref.*: RDT:A:1611

*Date*: 28th July 1970
29

THE JOHNS MANVILLE INTERNATIONAL CORPORATION
22 East 40th Street
New York - N.Y.10016
U. S. A.

Attn: Mr. R.S.Olson

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Thanking you,

Yours faithfully,

for

S.K.SOMANI

rdt/pb

NOTE : All contracts shall be subject to the exclusive Jurisdiction of the Courts in Bombay, and to the Arbitration law as in force in India.

Noted R.G.

TELEPHONE { OFFICE : 52921 / FACTORY : 6324

TELEGRAMS { JAMCEMENT BOMBAY / JAMCEMENT AHMEDABAD / JAMCEMENT SIKKA

# Shree Digvijay Cement Company Limited.

REGD. OFFICE : SIKKA, VIA. JAMNAGAR.

(ASBESTOS PRODUCTS DIVISION)

DIGVIJAY NAGAR.
AHMEDABAD.
(India)

*Ref. No.* VNS: 5766

July 10, 1970

Mr. R. Gomez,
Johns Manville International Corpn.,
22 East, 40th Street,
NEW YORK (U.S.A)

Dear Mr. Gomez,

I would recall our discussions at Stockton when we discussed atlength about the pressure forming system in the pipe machines here and it was agreed that I would send a detailed drawing of the Calzoni pipe machine about the pressure formation and how it is transmitted at various points of the beam including the rollers for the formation of the pipe. Enclosed please find a press beam drawing which you may kindly send to your friend at Stockton. You will kindly observe from the drawing that the pressure generated at two ends of the machine is transmitted throughout the length of the beam and further to the rollers helping the formation of the pipe. I would like to get some information from you as to whether it could be possible for us to measure the pressure transferred at the roll end for the formation of the pipe, besides the one available here on the Control board which indicates to us the pressure applied.

Secondly, whether there could be any way to measure whether the beam is in a straight line, so as to ensure that pressure is uniformly applied throughout the length. If some more details are required by your friend in Stockton, kindly write to us so that we will be able to furnish the same.

Further, it was agreed that you will kindly send us the detail of the Electro-stripper so as to avoid the calendering and help easy extraction of the mandrels from the pipes. You were also to give the details of Sand-blasting system to do away with the knurling of the mandrels. I have checked up here and find there were discussions on this subject in the past, but unfortunately sufficient technical details were not given to us to enable us to fabricate this here and to use this for improvement in the plant.

With kind regards,

Yours sincerely,

(V.N. Somani)

Encl: Drawing

Noted
PLJ.

[redacted]

June 17, 1970

3

Mr. V. N. Somani
Shree Digvijay Cement Company Limited
Ranip, Sabarmati
Ahmedabad 5,
INDIA

Dear Mr. Somani:

I regret the delay in completing my analysis of the da[redacted] you gave me, but it became a more complex assignment t[redacted] I originally believed.

Attached is a report on my findings covering the follo[redacted]

I. Statistical Estimate of Product Conformance With Specifications
II. Analysis of Relationships Between Various Product Strengths
III. Analysis of Fiber Blends Used in 1969
IV. Fiber Strength Units in Mix Vs. Product Properties

I wish I could report that my analysis indicated an overall major cost reduction through lower fiber usage. Unfortunately, this was not the case. However, in Part III I have indicated some areas where reduced fiber might be possible if you are completely satisfied with your present product quality. Please note that these should be confirmed by trial runs [redacted]my estimates as final manufacturing pro-

[redacted] major problem is to increase your overall [redacted]p as to improve the percentage of your pipe [redacted]g the minimum requirements. If this is to be improved, higher fiber contents, modified machine operations, product densification or more realistic specifications will be probably required. These items are discussed separately in each portion of my report.

Mr. V. N. Somani

[redacted]

I hope the analysis I have made is of interest and help to you. As you will note, I have copied Mr. Gomez and Mr. Poutiatine in the event that they might have additional comments to pass along.

Very truly yours,

W. C. Streib
Manager,
Asbestos Fiber &
International Departments

[redacted]

v

cc: Mr. D. Poutiatine, JM New York
Mr. R. Gomez, JM ~~New York~~

bcc: Mr. D. T. Colton, JM New York

[redacted]

[redacted]

[redacted]

# ANALYSIS OF 1969

# SHREE DIGVIJAY FIBER

# AND PRODUCTION DATA

[redacted]

ANALYSIS OF 1969 SHREE DIGVIJAY
FIBER AND PRODUCTION DATA

## I. 1969 SHREE DIGVIJAY PRODUCT STRENGTHS

STATISTICAL ESTIMATE OF PRODUCT CONFORMANCE WITH SPECIFICATIONS
CLASS 3 PRODUCTS

The overall average results for the Calzoni and RCM Class 3 products were analyzed to determine the properties required to obtain various product recoveries as measured by the percentage passing the various specifications. While this was not done in a rigorous statistical manner, it is believed that the general conclusions reached are valid and that the specific numbers calculated are reasonable estimates.

The average 1969 results for Class 3 products may be summarized as follows:

| | Ave. Calzoni Products | | Ave. RCM Products | |
|---|---|---|---|---|
| | $kg/cm^2$ | % Passing Spec. | $kg/cm^2$ | % Passing Spec. |
| Burst Strength | 208 | 59.5 | 209 | 58.1 |
| Bending Strength | 359 | 94.0 | 329 | 90.6 |
| Crush Strength | 589 | 88.0 | 535 | 93.0 |

Obviously, the major recovery problem lies in the product burst strengths.

Figure 1 illustrates a statistical estimate of the Calzoni burst strength histogram assuming a normal distribution of values. On this basis, it is obvious that the overall average burst strength must be materially raised to provide increased production recovery.

From these statistical estimates, Figure 2 was prepared upon which were plotted the actual values observed on average blends and

FIGURE 2

1969 PRODUCTION
SHREE DIGVIJAY CLASS 3 PIPE
Average Burst Strength Vs. % Passing Specification
Calzoni Machine

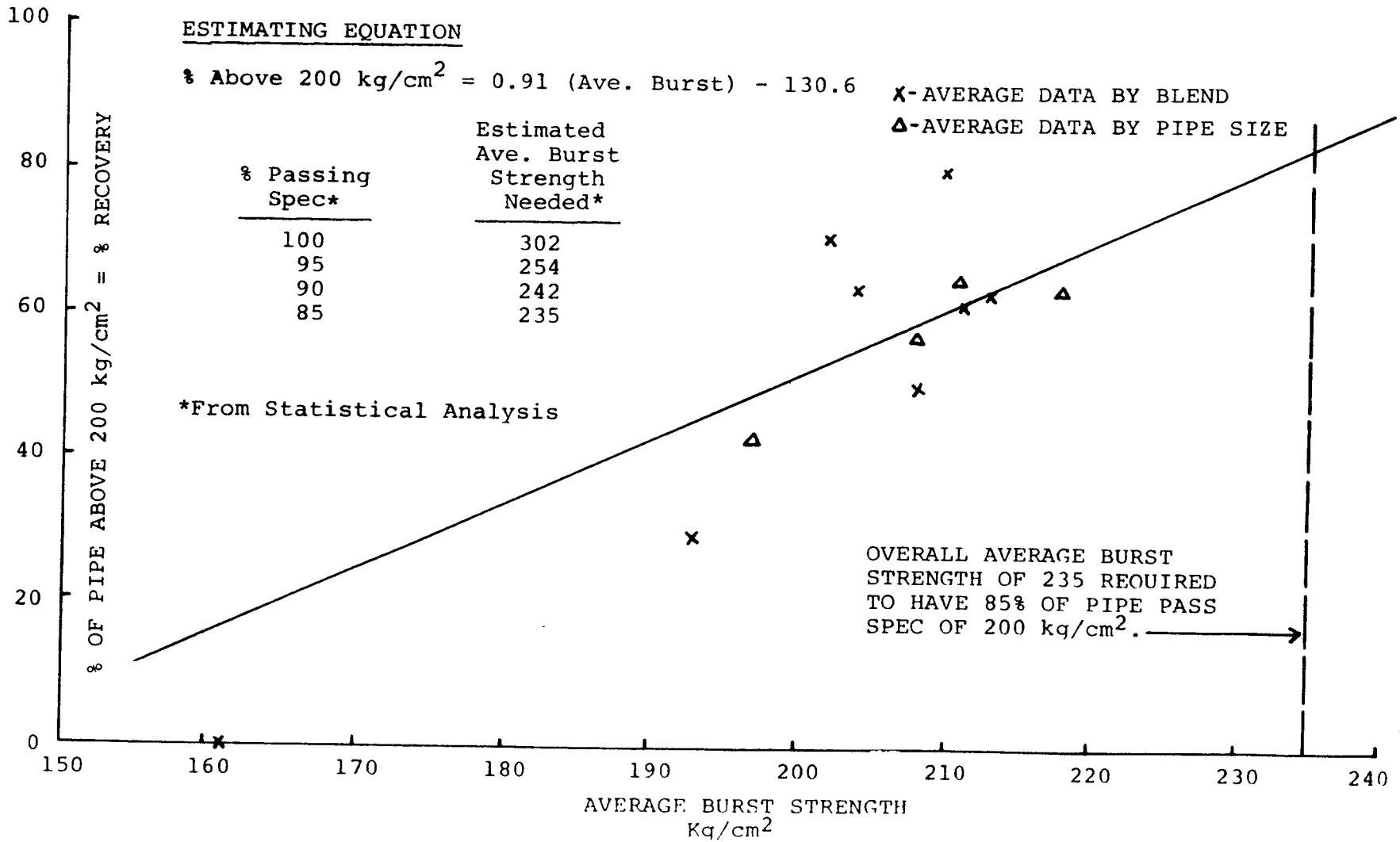
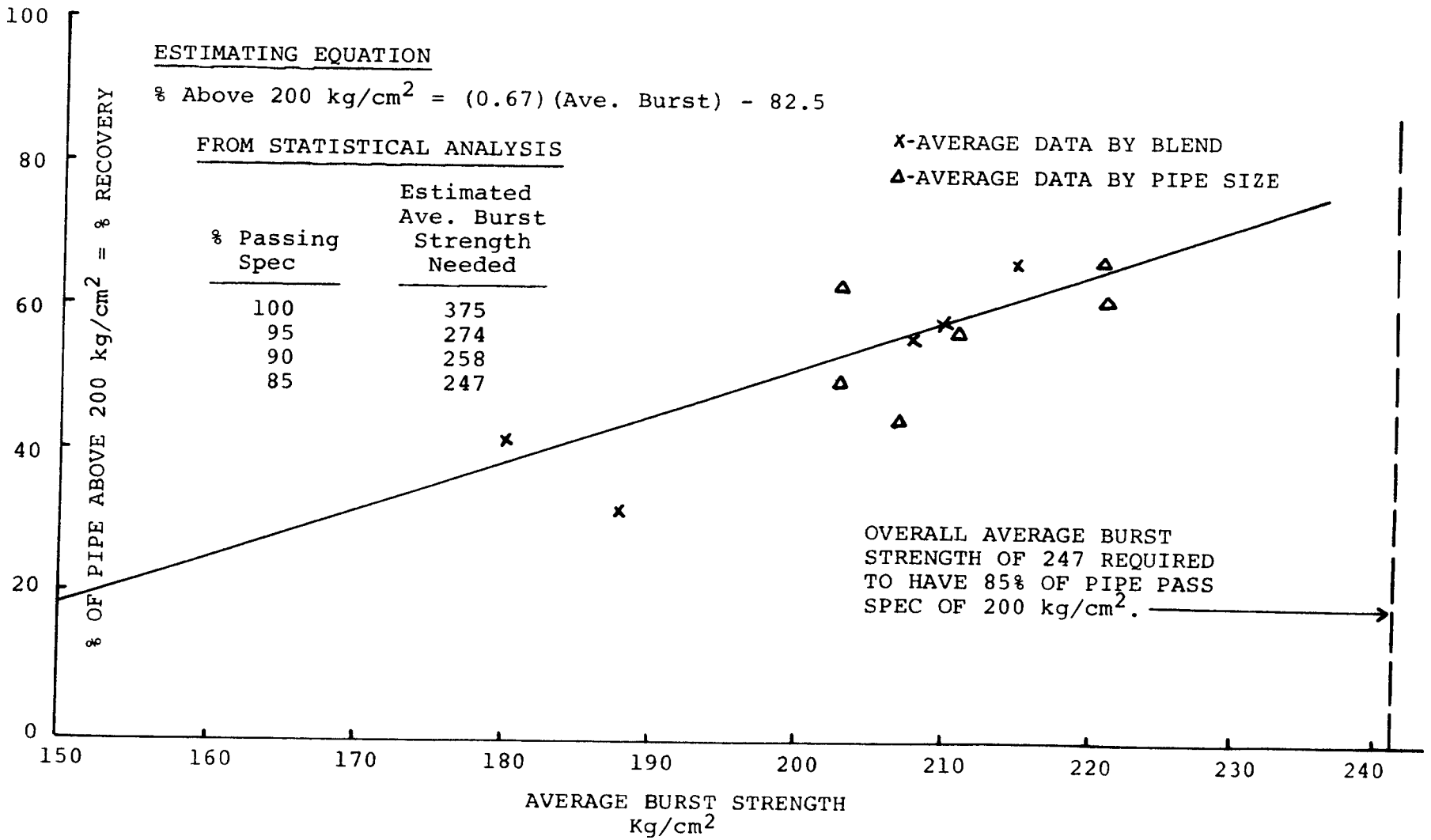


FIGURE 3

1969 PRODUCTION
SHREE DIGVIJAY CLASS 3 PIPE
Average Burst Strength Vs. % Passing Specification
RCM Machine



[redacted] sizes. The actual data distribute themselves around the theoretical line, again indicating the need for overall improved average burst strength and the general validity of the assumptions made.

Figure 3 provides a similar analysis for the RCM machine products.

Note that, based on these assumptions, in order to have [redacted] pass specifications, steps should be taken to raise the [redacted] Calzoni products to an average burst strength of 235/kg/[redacted] and RCM products to a level of 247 kg/cm$^2$.

CONCLUSIONS

1. Average burst strengths have to be increased about 12 to 18% above their present levels in order to have in excess of 85% of the total pipe production pass the present 200 kg/cm$^2$ burst strength.

2. [redacted] strength deficiencies may be due to one or [redacted] lowing: 1) machine operation; 2) fiber [redacted] excessively high specification values - particularly in the smaller sized pipe. These will be discussed separately in following sections.

## II. [redacted]ONSHIPS BETWEEN VARIOUS PRODUCT STRENGTHS

### A. [redacted] Vs. Crush Strength

The relationships between burst strength and crush strength are illustrated in Figures 4 and 5, which respectively describe the Calzoni and RCM products.

While the data scatter, there is an apparent relationship between these two types of product strength.

At the present time, 88% of the Calzoni products m[redacted] the crush specification while 83% of the RCM meet i[redacted] Note, however, if the average burst strengths were set at the estimated levels to achieve 85% burst recovery, 95% of the products would pass the crush specification.

### B. Burst Strength Vs. Bend Strength

The relationship between burst strength and bend strength [redacted] as the previous analysis. Note in [redacted] the point scatter does not permit a separation of the Calzoni and RCM data as was previously the case.

However, once again, note that if the average burst strength were raised to an 85% recovery level, the bend strength recovery would be probably well in excess of 95%.

FIGURE 4

BURST STRENGTH Vs. CRUSH STRENGTH

CALZONI MACHINE
CLASS 3 PIPE

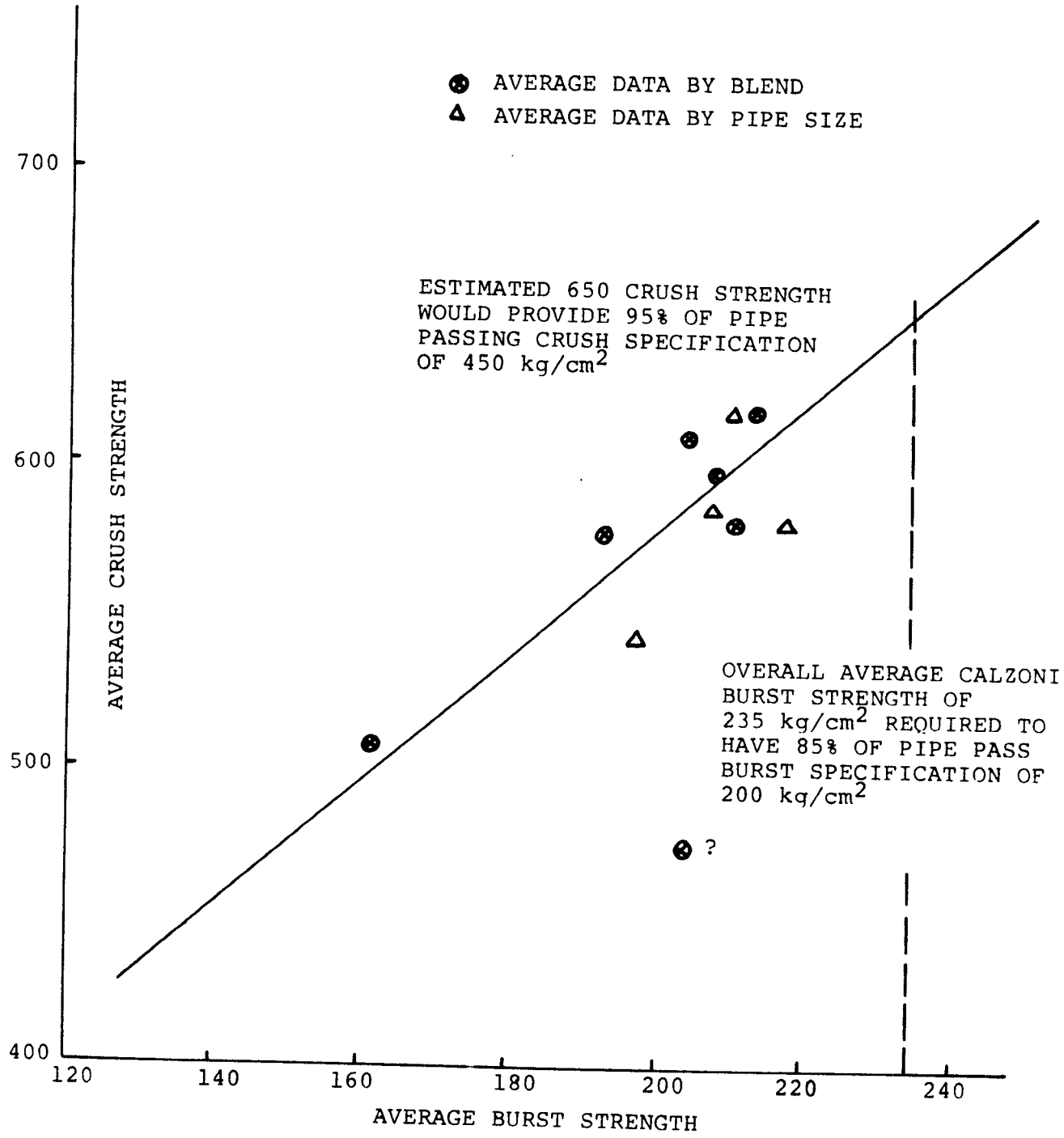


FIGURE 5

BURST STRENGTH Vs. CRUSH STRENGTH
RCM MACHINE
CLASS 3 PIPE

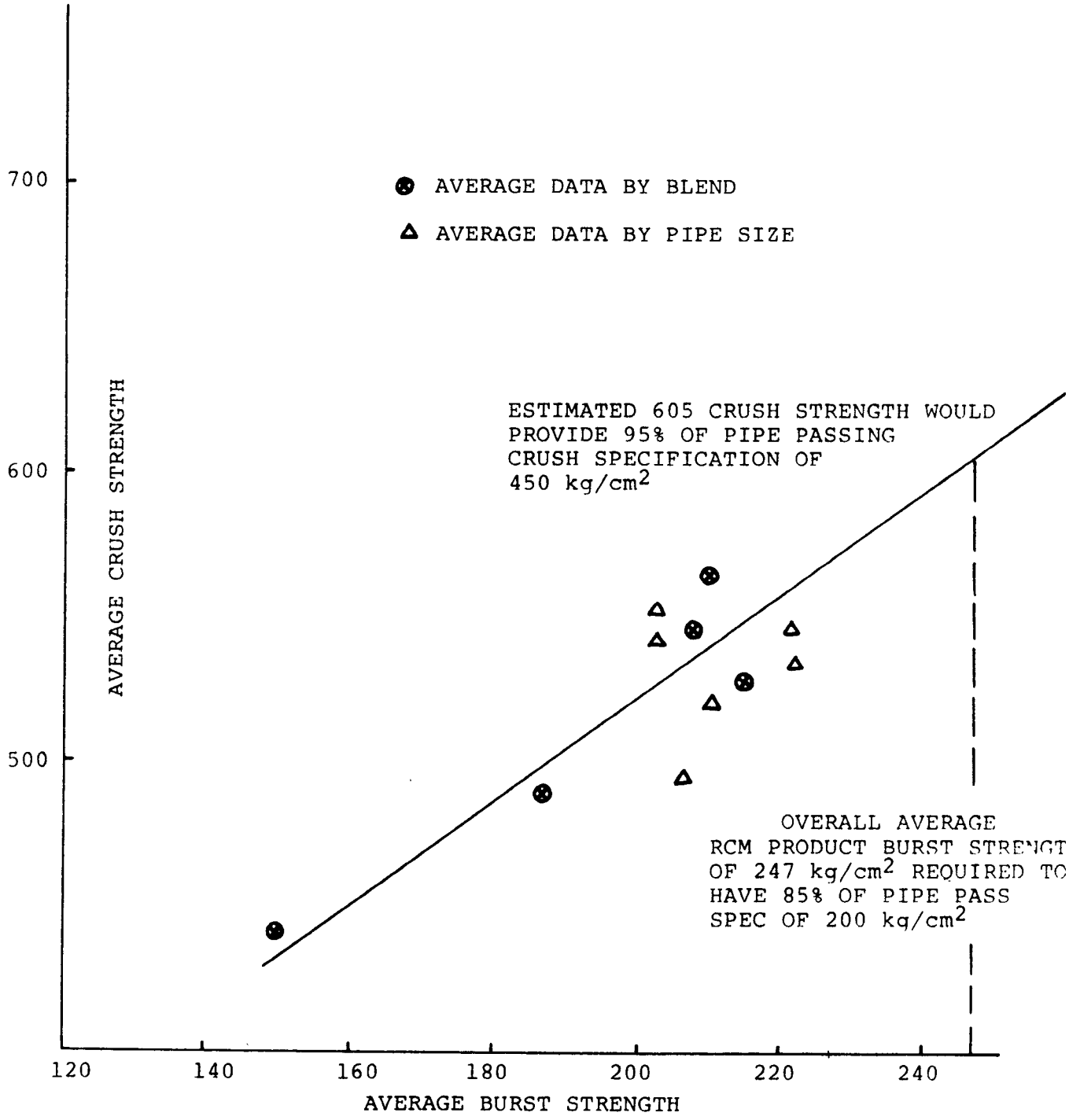
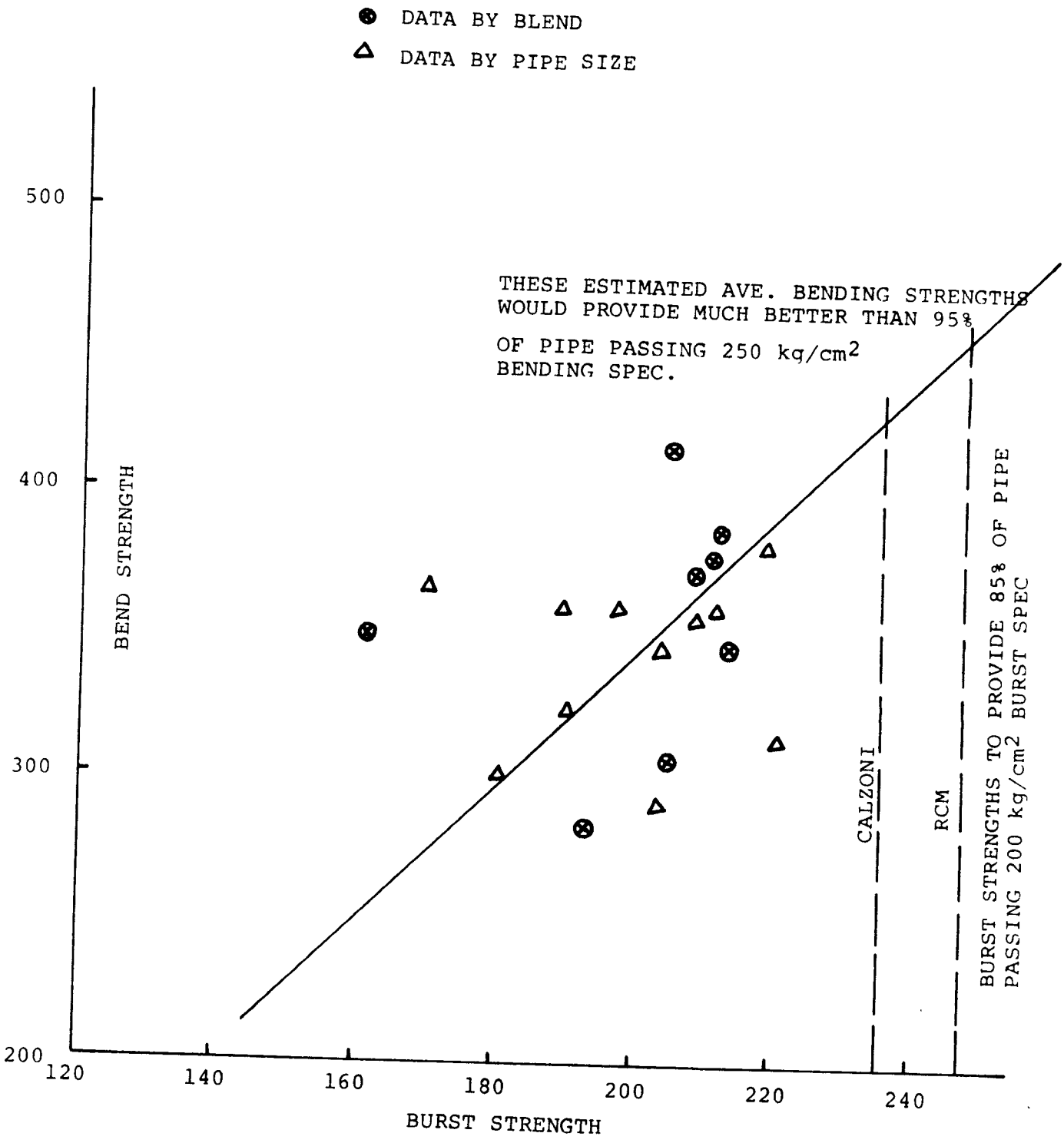


FIGURE 6

BURST STRENGTHS Vs. BENDING STRENGTHS
CALZONI & RCM DATA COMBINED



An interesting point is raised by this analysis which might be helpful in improving the overall burst strength values. Note the following from the Shree Digvijay data:

| RATIO: | Calzoni | RCM | Specs. |
|---|---|---|---|
| Bend Strength / Burst Strength | 1.72 | 1.58 | 1.25 |

This is a most unusual situation. Normally, the ratio of U.S. pipe bend strength to burst strength is less than 1, and in this case the Shree products even exceed [illegible] the ratio allowable under Indian specifications.

Since burst strength is in part controlled by the degree of fiber orientation around the periphery of the pipe, it may be possible that a portion of the bend strength excess could be transferred into burst strength if machine operations were altered. Perhaps, reduced vat agitation or increased machine speed might achieve this end. Mr. Gomez may have some comments or suggestions to [illegible] these lines.

[illegible]

## III. [redacted]R BLENDS USED IN 1969

[redacted] Digvijay fiber blends were analyzed to determine if there were any outstanding deviations in their usage. Table 1 provides a summary of the estimated strength unit values of each blend and an estimated fiber strength unit content of each mix for each pipe size. In this case, the fiber strength units used in pipe = (fiber strength units of the blend)(% fiber blend used in mix).

For a given pipe size, there should be approximately [redacted] same quantity of fiber strength units in the mix. By [redacted] large, this is the case and the fiber blends have been [redacted] fairly well balanced. However, certain blends have a tendency to be over rich and others look a little on the lean side.

If Shree Digvijay wishes to try reducing the fiber contents of their mixes, recommended fiber usages are given in the [redacted] following table. However, Shree Digvijay should note care- [redacted] changes are not designed to improve product [redacted] ery. They are made solely in an attempt to [redacted] improve [redacted] furnish costs. Furthermore, major reductions in fiber usage such as in Blends 1, 3, and 10 should be examined in trial runs before using as final manufacturing procedures since it is quite possible that the estimates given may require further modification.

TABLE 1

PRESENT SHREE DIGVIJAY FIBER BLENDS

Estimated S.U. of Blends
& Estimated Fiber S.U. in Mixes for Various
Sized Class 3 Pipe

| Blend # | Estimated SU of Blend | FIBER S.U. USED IN PIPE* | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 2" 50 mm | 3" 80 mm | 4" 100 mm* | 5" 125 mm | 6" 150 mm | 8" 200 mm | 10" 250 mm | 12" 30 mm |
| 1 | 110 | 18.9 | 18.9 | 19.8 | 19.8 | 19.8 | -- | -- | -- |
| 2 | 112 | 17.6 | 17.6 | 17.6 | 18.1 | 18.1 | -- | -- | -- |
| 3 | 115 | 18.0 | 18.0 | 18.0 | 18.6 | 18.6 | 18.6** | 18.6** | 18.6** |
| 4 | 111 | 17.4 | 17.4 | 17.4 | 17.9 | 17.9 | -- | -- | -- |
| 5 | 112 | 17.1 | 17.1 | 17.1 | 17.6 | 17.6 | -- | -- | -- |
| 6 | 112 | 17.1 | 17.1 | 17.1 | 17.6 | 17.6 | -- | -- | -- |
| 7 | 111 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | -- | -- | -- |
| 8 | 108 | 16.4 | 16.4 | 16.4 | 17.0 | 17.0 | 17.0** | 17.0** | -- |
| 9 | 111 | 17.0 | 17.0 | 17.0 | 17.0 | 18.5 | 18.5** | -- | -- |
| 10 | 111 | 18.5 | 18.5 | 18.5 | 19.2 | 19.2 | -- | -- | -- |
| 12 | 114 | 17.3 | 17.3 | 17.3 | 17.9 | 17.9 | 19.0 | 20.0 | -- |

*Fiber strength units in pipe = (strength units of blend)(% fiber used in mix)
**Estimates since fiber usage for these sized pipes not given.

ESTIMATED FIBER USAGES
(Not Designed to Improve Product Quality
But to Supply Possible Cost Reductions)

| Fiber Blend No. | Pipe Sizes | Current % Fiber Used* | Proposed % Fiber Usage | |
|---|---|---|---|---|
| 1 | 2" - 5" | 17.2-18.0 | 16.5 | CHECK WITH |
| | 5" & Greater | 18.0 | 17.0 | TRIAL RUNS |
| 2 | 2" - 4" | 15.7 | 15.7 | |
| | 5" & Greater | 16.2 | 16.2 | |
| 3 | 2" - 4" | 15.7 | 15.2 | CHECK WITH |
| | 5" & Greater | 16.2 | 15.8 | TRIAL RUNS |
| 4 | 2" - 4" | 15.7 | 15.7 | |
| | 5" & Greater | 16.2 | 16.2 | |
| 5 | 2" - 4" | 15.2 | 15.7 | |
| | 5" & Greater | 15.7 | 16.3 | |
| 6 | 2" - 4" | 15.2 | 15.6 | |
| | 5" - 6" | 15.7 | 16.2 | |
| | 8" | 16.7 | 16.7 | |
| | 10" | 17.5 | 17.5 | |
| 7 | 2" - 8" | 16.4 | 16.4 | |
| 8 | 2" - 4" | 15.2 | 16.2 | |
| | 5" & Greater | 15.7 | 16.8 | |
| 9 | 2" - 5" | 15.2 | 15.8 | |
| | 6" & Greater | 15.7 | 16.7 | |
| 10 | 3" - 4" | 16.7 | 16.0 | |
| | 5" - 6" | 17.3 | 16.5 | CHECK WITH |
| | 8" - 12" | 19.0 | 18.5 | TRIAL RUNS |
| 11 | 3" - 4" | 15.2 | 15.7 | |
| | 5" - 6" | 15.7 | 15.7 | |
| | 8" | 16.7 | 17.0 | |
| | 10" - 12" | 17.5 | 17.5 | |

*Information supplied by Mr. Somani.

## IV. [redacted] IN MIX Vs. PRODUCT PROPERTIES

The [redacted] strength units in the furnish mixes for the various blends (Table 1) have been correlated with the average burst strength (Table 2) and with the average bend strength (Table 3) for various pipe sizes. These data have also been plotted graphically in Figures 7 and 8.

From Figure 7, it is very evident that the estimated fiber strength units in the various mixes correlate with produ[redacted] burst strength. While the data scatter, there is a part[redacted] larly good relationship for the 50 mm pipe while all oth[redacted] sizes seem to disperse around another curve. In a simil[redacted] manner, Figure 8 depicts the relationship between fiber strength units in the mix and bend strength. No suitable relationship was found between strength units and crush strength.

As indicated in Part I, at the present time only 58-60% of the Class 3 products meet the burst strength specification. To reach an [redacted]ct acceptance level, it would be necessary t[redacted] products having an average burst strength o[redacted]CM products having an average burst strength of 247 $kg/cm^2$.

Deficiencies in burst strength may be due to:

1. Insufficient fiber strength units in mix
2. Insufficient densification of the products as they are formed.

TABLE 2

SHREE DIGVIJAY

Correlation Between Estimated Fiber Strength Units
In Mix Vs. Shree Product Burst Strength (Class 3 Pipe)

| Est. Strength Units in Pipe | AVERAGE PIPE BURST STRENGTH, $kg/cm^2$ (10 or more samples) | | | | | | | OVERALL AVERAGES (Weighted) | |
|---|---|---|---|---|---|---|---|---|---|
| | 50 mm | 80 mm | 100 mm | 125 mm | 150 mm | 200 mm | 250 mm & 300 mm | 50 mm | All Other Sizes |
| 16.4 | 204 | -- | -- | -- | -- | -- | -- | 204 | -- |
| 17.0 | 208 | 180 | -- | -- | -- | -- | -- | 208 | 180 |
| 17.1 | 210 | -- | -- | -- | -- | -- | -- | 210 | -- |
| 17.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 17.4 | 214 | 212 | 177 | -- | -- | -- | -- | 214 | 204 |
| 17.6 | -- | 208 | -- | -- | -- | -- | -- | -- | 208 |
| 17.9 | -- | -- | -- | 207 | -- | -- | -- | -- | 207 |
| 18.0 | -- | -- | 219 | -- | -- | -- | -- | -- | 219 |
| 18.5 | -- | -- | -- | -- | 222 | 214 | -- | -- | 220 |
| 18.6 | -- | -- | -- | 221 | -- | 207 | 203 & 222 | -- | 213 |
| 18.9 | 219 | 213 | -- | -- | -- | -- | -- | 219 | 213 |
| 19.8 | -- | -- | 218 | 190 | -- | -- | -- | -- | 209 |
| 20.0 | -- | -- | -- | -- | -- | -- | 231 | -- | 231 |

TABLE 3

SHREE DIGVIJAY

Correlation Between Estimated Fiber Strength Units
In Mix Vs. Shree Product Bending Strength (Class 3 Pipe)

| Est. Strength Units in Pipe | AVERAGE PIPE BENDING STRENGTH, $kg/cm^2$ (10 or more samples) | | | | OVERALL AVERAGES (Weighted) | |
|---|---|---|---|---|---|---|
| | 50 mm | 80 mm | 100 mm | 125 mm | 50 mm | All Other Sizes |
| 16.4 | 307 | -- | -- | -- | 307 | -- |
| 17.0 | 331 | 269 | -- | -- | 331 | 269 |
| 17.1 | -- | -- | -- | -- | -- | -- |
| 17.4 | 382 | 335 | 361* | -- | 382 | 343 |
| 17.6 | -- | 373 | -- | -- | -- | 373 |
| 17.9 | -- | -- | -- | -- | -- | -- |
| 18.0 | -- | -- | 326* | 248* | -- | 301 |
| 18.5 | -- | -- | -- | -- | -- | -- |
| 18.6 | -- | -- | -- | 302* | -- | 302 |
| 18.9 | 445 | 356 | -- | -- | 445 | 356 |
| 19.8 | -- | -- | 383 | 361 | -- | 376 |
| 20.0 | -- | -- | -- | -- | -- | -- |

*RCM Machine Products

FIGURE 7

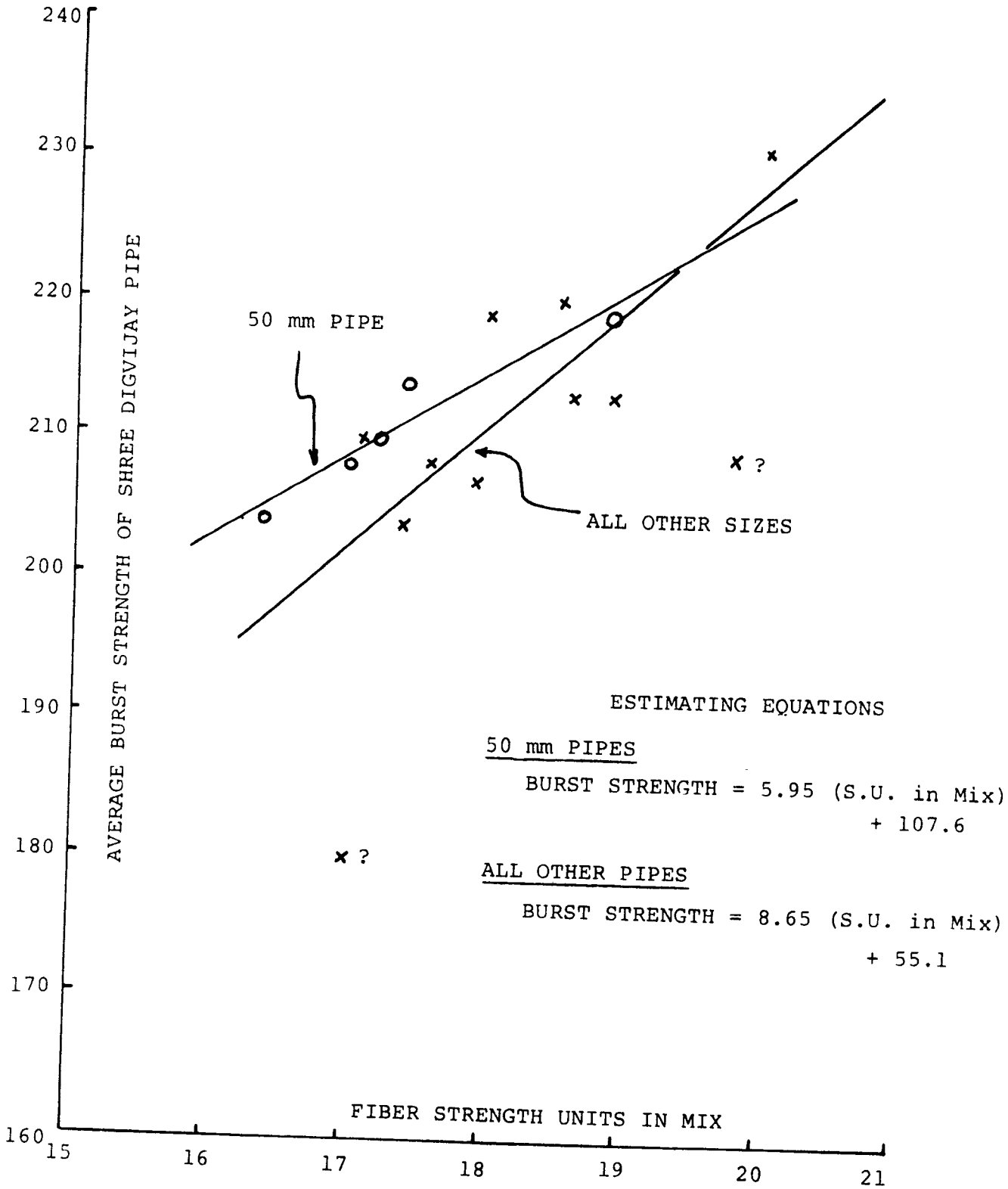
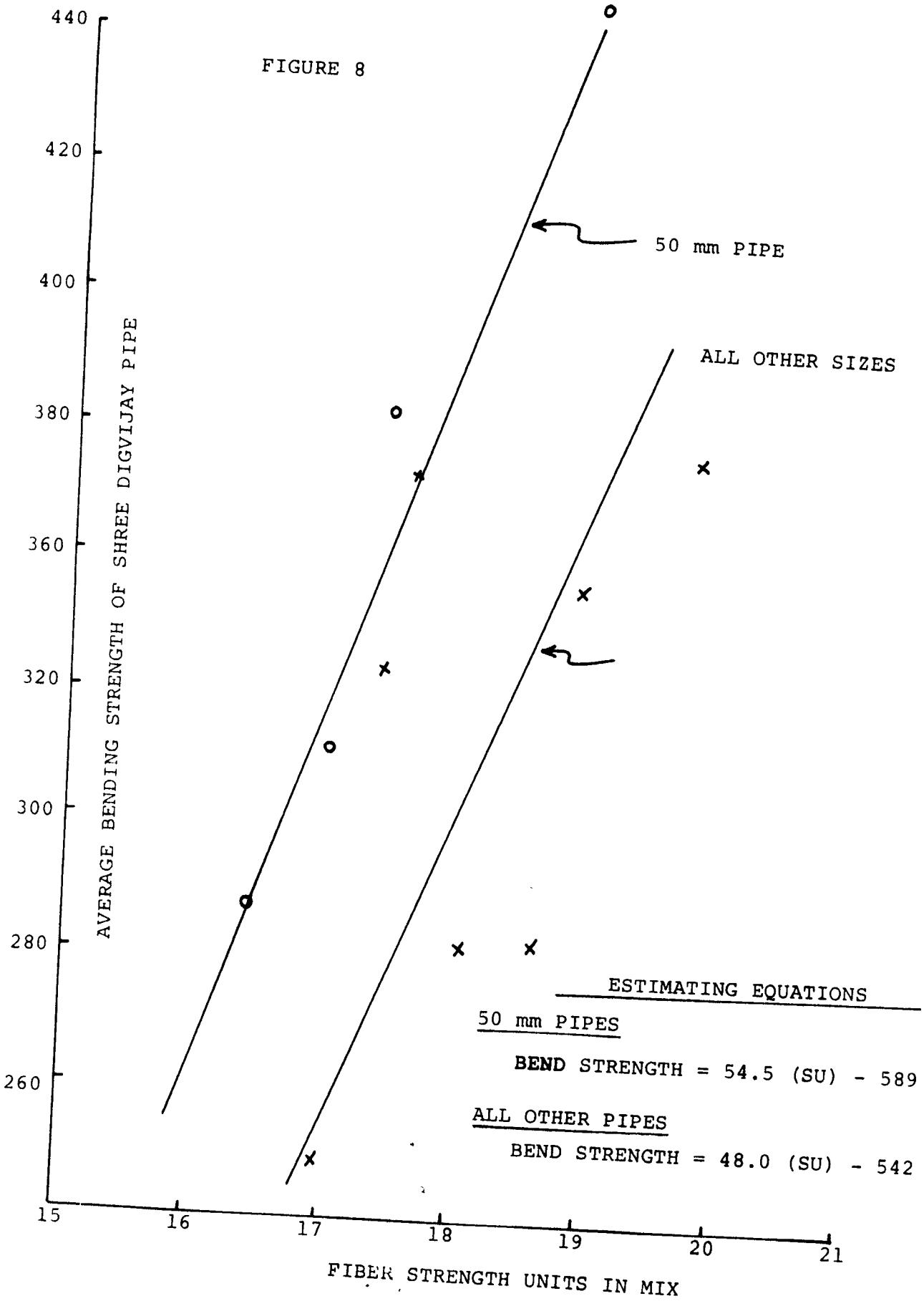

240
230
220
210
200
190
180
170
160
AVERAGE BURST STRENGTH OF SHREE DIGVIJAY PIPE
50 mm PIPE
ALL OTHER SIZES
?
?
ESTIMATING EQUATIONS
50 mm PIPES
BURST STRENGTH = 5.95 (S.U. in Mix) + 107.6
ALL OTHER PIPES
BURST STRENGTH = 8.65 (S.U. in Mix) + 55.1
FIBER STRENGTH UNITS IN MIX
15
16
17
18
19
20
21

FIGURE 8


440
420
400
380
360
320
300
280
260
AVERAGE BENDING STRENGTH OF SHREE DIGVIJAY PIPE
50 mm PIPE
ALL OTHER SIZES
ESTIMATING EQUATIONS
50 mm PIPES
BEND STRENGTH = 54.5 (SU) - 589
ALL OTHER PIPES
BEND STRENGTH = 48.0 (SU) - 542
15
16
17
18
19
20
21
FIBER STRENGTH UNITS IN MIX

3. [redacted]ber orientation around pipe. (See remarks [redacted]

4. [redacted]oduct specification for smaller diameter pipes.

Anything that could be done to improve any or all items 2, 3, and 4 would have a beneficial effect upon the economics of fiber usage. However, with the data available, it is not possible to make any assessment as to what could be achieved by changes in machine operation. Actually, Mr. Gomez is best qualified to make such process recommendations. Hence, the following [redacted] will restrict themselves to the possible modifications [redacted] content required to provide the necessary product proper[redacted] raise the recovery level from 58-60% to 85%. These estimates assume that increased fiber content would not lower product density significantly below their current levels. Such decreases in density would further decrease product strengths. A few plant trials would be required to check this point out.

Solely on the assumption that product strength can be improved o[redacted]e 4 illustrates the estimated fiber quantities o[redacted]d to provide an 85% product recovery. These v[redacted]erages of several analyses of the strengths achieved in each pipe size and for each fiber blend.

Obviously, increasing fiber content in the mix is a severe economic disadvantage. However, it is recommended that a few short trials be made at the elevated fiber contents to determine

TABLE 4

ESTIMATED FIBER QUANTITIES TO REACH 85% PASSING
200 $kg/cm^2$ Burst Strength Specification

| Fiber Blend No. | 1969 FIBER USED AND RESULTS | | | ESTIMATED FIBER % TO REACH 85% RECOVERY |
|---|---|---|---|---|
| | Pipe Sizes | % Passing 200 $kg/cm^2$ | % Fiber Used | % Fiber |
| 1 | 2"-5"<br>6" & Greater | 68<br>51 | 17.2-18.0<br>18.0 | 18.7<br>19.9 |
| 2 | 2"-4"<br>5" & Greater | 50<br>ND | 15.7<br>16.2 | 18.5<br>18.8 |
| 3 | 2"-4"<br>5" & Greater | 90 (?)<br>64 | 15.7<br>16.2 | 17.4<br>18.4 |
| 4 | 2"-4"<br>5" & Greater | 63<br>80 | 15.7<br>16.2 | 18.6<br>18.7 |
| 5 | 2"-4"<br>5" & Greater | 80 (?)<br>ND | 15.2<br>15.7 | 18.1<br>18.7 |
| 6 | 2"-4"<br>5"-6"<br>8"<br>10" | ND<br>ND<br>ND<br>ND | 15.2<br>15.7<br>16.7<br>17.5 | 17.2<br>17.9<br>19.4<br>20.4 |
| 7 | 2"-8" | 55 | 16.4 | 18.5 |
| 8 | 2"-4"<br>5" & Greater | 62<br>75 | 15.2<br>15.7 | 18.4<br>19.4 |
| 9 | 2"-5"<br>6" & Greater | 23<br>46 | 15.2<br>16.7 | 18.3<br>19.9 |
| 10 | 3"-4"<br>5"-6"<br>8"-12" | ND<br>ND<br>ND | 16.7<br>17.3<br>19.0 | 18.3<br>18.6<br>20.2 |
| 12 | 3"-4"<br>5"-6"<br>8"<br>10"-12" | 27<br>67<br>57<br>68 | 15.2<br>15.7<br>16.7<br>17.5 | 17.0<br>17.3<br>19.3<br>19.5 |

ND = No Data Available.

[redacted] recovery does, indeed, reach the calculated [redacted] the 200 kg/cm$^2$ burst level. If they do not, the major problem lies outside the scope of fiber utility and is probably more related to machine operation, product specifications or cement quality.

[redacted]

[redacted]

Analysis of Bursting Rupture - Carbon ...

Specification:- Min. 200 kg/cm²

| Dia/Class | Blend I | Blend II | Blend IV | Blend V | Blend VI | Blend VII | Blend VIII | Blend IX | Overall |
|---|---|---|---|---|---|---|---|---|---|
| 50/3 | 49 (green) 219 (blue) 73.5 | | 16 214 60.0 | 10 210 80.0 | | | 61 204 63.9 | 10 208 30.0 | 140 211 6[illegible] |
| 65/3 | — — → No bursting rupture tests → | | | | | | | | |
| 80/3 | 63 213 63.5 | 34 208 50.0 | 47 212 63.8 | | 4 161 0 | 7 204 71.4 | | 11 180 27.3 | 166 208 5[illegible] |
| 100/3 | 36 218 63.9 | | | | | | | | 36 218 63.[illegible] |
| 125/3 | 16 190 31.2 | | 5 220 80.0 | | | | | | 21 197 42.[illegible] |
| 150/3 | 5 211 0 | | | | | | | | 5 211 ~~127~~ 0 |
| Overall | 169 211 61.5 | 34 208 50.0 | 62 213 63.2 | 10 210 80.0 | 4 161 0 | 7 204 71.4 | 61 204 63.9 | 21 193 28.6 | 368 208 59.5 |

Green figure — no. tested
Blue figure — Average of the tests.
Red figure — % above 200 kg/cm².

Analysis of Bursting Rupture. - KCM Trading

Specification - Minimum 200 kg/cm²

| Dia/Class | Blend III | Blend VII | Blend VIII | Blend IX | Blend X | Blend XI | Blend XII | Overall |
|---|---|---|---|---|---|---|---|---|
| 100/3 | 38<br>219<br>89.5 | 15<br>203<br>40.0 | 4<br>161<br>25.0 | 4<br>196<br>25.0 | | | 15<br>177<br>26.7 | 66<br>203<br>63.6 |
| 125/3 | 19<br>221<br>68.4 | 4<br>153<br>0 | 4<br>178<br>25.0 | 5<br>184<br>0 | | | 10<br>207<br>70.0 | 42<br>203<br>59.0 |
| 150/2 | | 4<br>247<br>100.0 | | | | | 4<br>175<br>25.0 | 8<br>211<br>62.5 |
| 150/3 | 28<br>222<br>57.1 | | | 9<br>186<br>55.6 | 3<br>150<br>0 | | 7<br>227<br>85.7 | 47<br>211<br>57.4 |
| 200/2 | 25<br>242<br>88.0 | | 27<br>219<br>77.8 | | | | | 52<br>230<br>82.7 |
| 200/3 | 14<br>207<br>36.4 | | | 4<br>190<br>25.0 | | | 11<br>214<br>57.1 | 29<br>207<br>44.8 |
| 250/3 | 19<br>203<br>57.9 | | 8<br>247<br>87.5 | | | | 19<br>231<br>68.4 | 46<br>222<br>67.4 |
| 300/3 | 13<br>222<br>61.5 | | | | | | | 13<br>222<br>61.5 |
| Overall | 156<br>220<br>69.9 | 13<br>201<br>60.0 | 43<br>215<br>69.7 | 22<br>188<br>31.8 | 3<br>150<br>0 | | 66<br>208<br>56.1 | 303<br>213<br>62.7 |

Analysis of Bending Rupture - Calzona Production 1964.

Specification - Minimum 250 kg/cm

| Dia/Class | Blend I | Blend II | Blend IV | Blend V | Blend VI | Blend VII | Blend VIII | Blend IX | Overall |
|---|---|---|---|---|---|---|---|---|---|
| 50/3 | 445 | | 382 | 379 | | | 307 | 331 | 151 360 |
| [illegible]/3 | 38[illegible] | | | | 351 | 416 | | 216 | 27 352 |
| [illegible]/3 | 356 | 373 | 335 | | | | | 269 | 190 356 |
| [illegible]/3 | 38[illegible] | | | | | | | | 50 383 |
| [illegible]/3 | 361 | | 356 | | | | | | 20 360 |
| [illegible]/3 | — | | | | | | | | |
| Overall | 385 | 373 | 347 | 379 | 351 | 416 | 307 | 283 | 418 359 |

Green — [illegible]

Blue — Average of [illegible]

Red — [illegible] kg/cm²

Analysis of Bursting Rupture. RCM Production 1969.

Specification. Min. 250 kg/cm²

| Dia/Class | Blend III | Blend VII | Blend VIII | Blend IX | Blend X | Blend XI | Blend XII | Overall |
|---|---|---|---|---|---|---|---|---|
| 100/3 | 25<br>326<br>93.1 | 9<br>375<br>100·0 | 7<br>364<br>100·0 | 6<br>326<br>100·0 | | | 24<br>361<br>100·0 | 71<br>348<br>97.2 |
| 125/3 | 20<br>302<br>90·0 | 12<br>248<br>50·0 | 4<br>375<br>100·0 | | | | | 36<br>292<br>77.8 |
| Overall | 45<br>315<br>91.1 | 21<br>302<br>71.4 | 11<br>368<br>100·0 | 6<br>326<br>100·0 | | | 24<br>361<br>100·0 | 107<br>329<br>90.6 |

Green fig indicates no of tests.
Blue fig indicates average value of tests.
Red fig indicates percentage above minimum limit

Analysis of Crushing Strength - [illegible]

Specification - Minimum 450 kg/cm²

| Dia / Class | Blend I | Blend II | Blend IV | Blend V | Blend VI | Blend VII | Blend VIII | Blend IX | Overall |
|---|---|---|---|---|---|---|---|---|---|
| 50/3 | 44<br>574<br>54·1 | | 10<br>673<br>100·0 | | | | 78<br>616<br>93·6 | 20<br>682<br>100·0 | 152<br>616<br>92·1 |
| 65/3 | 23<br>568<br>82·6 | | | | | | | 5<br>467<br>40·0 | 28<br>550 |
| 80/3 | 66<br>602<br>93·9 | 47<br>596<br>91·4 | 50<br>611<br>94·0 | | 2<br>508<br>~~482~~<br>75·0 | 18<br>472<br>~~539~~<br>15·3 | | 12<br>539<br>~~508~~<br>90·9 | 241<br>585<br>89·6 |
| 100/3 | 25<br>579<br>88·0 | | | | | | | | 25<br>579<br>88·0 |
| 125/3 | 14<br>537<br>55·4 | | 5<br>559<br>100·0 | | | | | | 19<br>543<br>59·5 |
| 150/3 | 5<br>431<br>20·0 | | | | | | | | 5<br>431<br>20·0 |
| Overall | 177<br>580<br>56·4 | 47<br>596<br>91·4 | 65<br>617<br>95·4 | | 8<br>508<br>~~482~~<br>75·0 | 18<br>472<br>~~539~~<br>15·6 | 78<br>616<br>93·6 | 47<br>578<br>59·4 | 440<br>584<br>88·4 |

Green figure - No of tests
Blue figure - Average test value
Red figure - % above 450 kg/cm²

Analysis of Crushing Rupture - RCC Pipe Production

Specification - Minimum 450 kg

| Dia/Class | Blend III | Blend VII | Blend VIII | Blend IX | Blend X | Blend XI | Blend XII | Overall |
|---|---|---|---|---|---|---|---|---|
| 100/3 | 29<br>533<br>94.7 | 11<br>491<br>81.8 | 13<br>576<br>92.3 | 6<br>523<br>83.3 | | | 24<br>568<br>95.8 | 83<br>544<br>90.4 |
| 125/3 | 20<br>533<br>90.0 | | 4<br>539<br>75.0 | 7<br>483<br>85.7 | | | 5<br>547<br>100.0 | 36<br>554<br>88.9 |
| 150/2 | | 4<br>575<br>100.0 | | | | | 4<br>656<br>100.0 | 8<br>615<br>100.0 |
| 150/3 | 17<br>571<br>88.2 | | | 14<br>498<br>92.9 | 6<br>442<br>66.7 | | 5<br>510<br>80.0 | 42<br>521<br>85.7 |
| 200/2 | 28<br>551<br>84.3 | | 42<br>542<br>92.9 | | | 5<br>443<br>40.0 | | 75<br>539<br>88.0 |
| 200/3 | 13<br>525<br>92.3 | | | 8<br>451<br>75.0 | | | 18<br>500<br>77.8 | 39<br>498<br>82.0 |
| 250/3 | 20<br>463<br>60.0 | | 11<br>512<br>90.9 | | | | 21<br>642<br>90.5 | 52<br>546<br>78.8 |
| 300/3 | 19<br>535<br>84.2 | | | 4<br>407<br>25.0 | | 15<br>590<br>100.0 | | 38<br>543<br>84.2 |
| Overall | 146<br>531<br>84.9 | 15<br>513<br>86.6 | 70<br>543<br>91.5 | 39<br>480<br>79.5 | 6<br>442<br>66.7 | 20<br>553<br>85.0 | 77<br>572<br>88.2 | 373<br>538<br>84.2 |

| | Furnish | % | Dia/class | % fibre |
|---|---|---|---|---|
| 1 | S4T. | 100.0 | 2"&5"/3 | 17.2 & 18 |
| | | | 6"/3 | 18 |
| 2 | S4T | 69.4 | 2"&4"/3 | 15.73 |
| ✓ | P3 70 | 20.4 | 5"&6"/3 | 16.20 |
| | P4 35 | 10.2 | | |
| 3 | S4T | 61.0 | 2"-4"/3 | 15.7 |
| | P3 70 | 39.0 | 5"&6"/2 | 15.7 |
| | | | 5"&6"/3 | 16.2 |
| | | | 5"-6"/1 | 13.8 |
| 4 | S4T | 85-90 | 2"-4"/3 | 15.7 |
| ✓ | Blue | 10-15 | 5"-6"/3 | 16.2 |
| | | | 5"-6"/2 | 15.2 |
| 5 | S4T | 75.0 | 2"-4"/3 | 15.2 |
| | Blue | 25.0 | 5"-6"/3 | 15.7 |
| 6 | S4T | 57.9 | 2"-4"/3 | 15.2 |
| | Blue | 24.0 | 5"-6"/3 | 15.7 |
| ✓ | P4-30 | 12.8 | 8"/3 | 16.7 |
| | | | 8"/2 | 13.2 |
| | C Sp | 5.3 | 10"/3 | 17.5 |
| | | | 10"/2 | 15.7 |
| | P3 70 | 29.0 | 2" to | |
| | P4-30 | 29.0 | 8"/3 | 16.4 |
| | Blue | 27.4 | 2"-8"/2 | 15.2 |
| | P5 50 | 14.6 | 10"-12"/3 | 17.5 |
| | | | 12"/2 | 16.2 |
| 8 | S4T | 71.1 | 2"-4"/3 | 15.2 |
| | Blue | 10.8 | 5"-6"/3 | 15.7 |
| ✓ | P4-30 | 12.0 | 5"-6"/3 | 15.2 |
| | P5-50 | 6.1 | | |
| 9 | S4T | 62.1 | 2"&5"/3 | 15.2 |
| | P3 60 | 18.4 | 6"/3 | 16.7 |
| | P4 30 | 13.8 | 6"/2 | 15.7 |
| | P5 50 | 5.7 | 6"/1 | 13.2 |
| 10 | S4T | 61.4 | 3-4"/3 | 16.7 |
| | P3 70 | 18.2 | 5-6"/3 | 17.3 |
| ✓ | P4 35 | 9.1 | 8-12"/3 | 19.0 |
| | CSP | 11.3 | | |
| 11 | S4T | 61.0 | 5-6"/3 | 17.3 |
| | P.7A | 19.0 | | 19 |

| | Furnish | % | Dia/class | % Fibre |
|---|---|---|---|---|
| 12 | S4T | 71.2 | 3-4"/3 | 15.2 |
| | P3 70 | 13.5 | 5-6"/3 | 15.7 |
| | Blue | 15.3 | /2 | 14.8 |
| | | | /1r | 13.3 |
| | | | 8"/3 | 16.7 |
| | | | 8"/2 | 15.2 |
| | | | 8"/1r. | 13.8 |
| | | | 10"-12"/3 | 17.5 |
| | | | 10"-12"/2 | 15.7 |
| | | | 10-12"/2 | 14.1 |
| 13 | S4T | 61.2 | 4"/3 | 15.2 |
| | P3 70 | 13.5 | 5"-6"/3 | 15.7 |
| | Blue | 25.3 | 5-6"/2 | 14.8 |
| | | | 8"/3 | 17.1 |
| ✓ | | | 8"/2 | 15.2 |
| | | | 8"/1r | 13.2 |
| | | | 10"/3 | 18.2 |
| | | | 10/2 | 15.7 |
| | | | 10/1r. | 14.1 |
| | | | 12"/3 | 18.5 |
| | | | 12"/2 | 16.2 |
| | | | 12"/1r. | 14.1 |

Notes
Rej.

June 17, 1970

Mr. V. N. Somani
Shree Digvijay Cement Company Limited
Ranip, Sabarmati
Ahmedabad 5,
INDIA

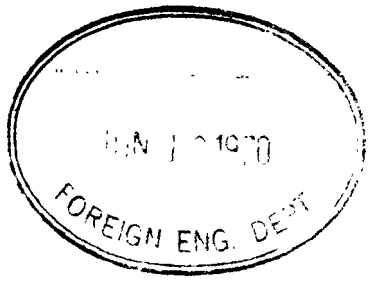
Dear Mr. Somani:

My analysis of the data you gave me is being typed and will be in the mail before the end of the week. However, at this time I am passing along my recommendation as to the evaluation of the five-ton shipment of the new ST4T grade.

You will recall that this particular fiber grade has been developed to provide increased production rates. Therefore, in its evaluation it should merely be substituted in your formulations for JM S4T and determine if it provides improved production rates. Next, it should be evaluated 100% as your Blend I and compared in performance with your Blend 4 which contains 10-15% Blue and 85-90% S4T. If your available fiber supplies do not permit this type of evaluation, I would suggest substituting it for the combined Blue and S4T in Blend 8 or Blend 12.

We will be interested in the results you obtain. To date, we and others have had very interesting results with this new fiber grade.

Very truly yours,




W. C. Streib
Manager,
Asbestos Fiber &
International Departments

v

bcc: D. Poutiatine, JM Int'l
R. Gomez, JM Int'l

C H. THAKER
7B. Satyvadi Society.
Ashram Road.
AHMEDABAD.

June 13, 70

Dear Mr Gomez.

I hope this letter will find you in a very good state of health. We all are o.k here and wish happiness to all members of your family.

I told you about my wish and planning for States when you last visited our plant. fortunately I am successful in securing Immigrant VISA and will be proceeding to Newyork very shortly. I will be leaving Bombay on 18.6.70 and reaching Newyork on 20.6.70 at 13.15 (saturday) by flight LH 400 (Lufthansa) at J.F.K air port.

FOREIGNING DEPT

I heard the present condition of state, and prevailing of recession. but due to limited time of visa I can not postpone this opportunity hence I am coming. I am sure I will get some valuable guidance ~~expected~~ help from you. I wish to develop my carrer only in Asbestos branch and your help is very important and useful. You know me very well and will not hesitate in recommanding me for some suitable place. I shall be highly greatful for this favour and will not forget you for ever

Yours

noted
Pg.

# RESUME

Name: C.H. Thaker

Age: 40 years Date of Birth: July 17, 1930

Nationality: Indian

Type of Visa Holding: Immigration Visa (Permanent Residence)

Registration No. A30 233 169

Educational Qualifications:

| Institution | Period of Study | Exam Passed | Division Obtained |
|---|---|---|---|
| Shree Fellowship High Ahmedabad, India | '44 - '48 | Matriculation | Second |
| Faculty of Technology and Engineering M.S. University of Barode | '48 - '52 | Diploma in Electrical Engineering | Second |
| (Same) | '52 - '53 | Diploma in Mechanical Eng'g. | First |
| P.W.D. Bombay, India | Permit | Competency certificate of First Class Electrical Supervisor | |
| State Government of Gugarat | 1962 | First Class Proficiency Examination for Mechanical Engineers | |

I can speak, read and write English, Gugareti, Hindi

Professional background -

| Organization | Position Held |
|---|---|
| 1) Calico Mills, Ahmedabad, India | Engineering Supervisor (6 yrs) |
| 2) Arbuda Mills, Ahmedabad, India | Assistant Engineer (1-1/2 yr) |
| 3) Cellulose Products of India, Ltd. Ahmedabad, India | Assistant Engineer (2-1/2 yr) |
| 4) Shree Digvijay Cement Co. Asbestos Division | Pipe Plant Superintendent (7 yrs.) |

Details of Experience:

1) Calico Mills & Arbuda Mills -

Erection of Textile Machinery in different process, their repairs and maintenance.

Installation of Electrical cables, transformers, switch gears and automatic control panels of different machines.

Maintaining and controlling the heating and humidification plant in spinning and weaving department.

Supervising the fire tube and water tube boilers.

2) Cellulose Products of India Ltd. -

Carried out erection of the complete plant put that into commission and looked for the repairs and maintenance of the plant.

3) Shree Digvijay Cement Co.

In my last job I was responsible for running the entire pipe making plant from its raw material feeding section to the finishing stage. Ours is a completely automatic system where the fibre treatment, feeding and mixing are done automatically and slurry formed out of asbestos fibre, cement and water is passed to the vat from the material is conveyed by an endless felt and pipes are formed on the steel mandrels in lamination system. The pipes are made under heavy pressure capable of withstanding all the rigorous tests specified in Standard Specifications like B.S.S., I.S.S., A.S.T.M. etc. The whole circuit in the process is automatic and every operation is handled at the control board. This involves highly complicated electrical systems such as relays, micro-switches, etc. Pressure required in the formation of the pipe is obtained by a hydraulic system. I am fully conversant in operating this circuit.

When the factory commenced in 1962 we were having one pipe machine and one sheet machine supplied by R.C.M. of Italy. In 1966 during expansion of the plant a second pipe machine was completely built with the help of many Indian companies under my supervision. This was completed with the small portion of machinery imported from Calzoni, Italy. Complete erection was done by me and I put the whole second pipe plant in production.

We installed pipe turning and cutting lathes in pipe finishing section of Gebr-Wehran. Also we have put the coupling machine in working condition with the modified automatic circuit as per our required design and with more output.

We have a steam curing system wherein the pipes are autoclaved for better strength and early delivery.

I have gained thorough knowledge in the choice of best quality fibre for quality production and economic fibre formulation.

During this period of service I had the opportunity to work under the technicians deputed by our Collaborators in USA and also with the engineers of the machinery suppliers.

Foreign Visits

In January 1967 I was selected from a group of Engineers in my company for the study of the working of asbestos plants in Malaysia, with Messrs. Hume Industries at Kuala Lumpur. I spent one month in their Asbestos Cement factory for better understanding. Also I visited their Singapore plant.

This has enriched my technical knowledge and working of asbestos industry in different conditions.

J-M International
New York, N.Y.
June 11, 1970

W.C. Streib - Finderne

I am enclosing herein the analysis I made some years ago to establish the pipe thickness for Shree Digvijay Cement Co.

I hope this information will be of help to the analysis you are making on Shree Digvijay fibre formulations.

Please let me know if you need any other information.

R. Gomez

Enc.

1. PRESSURE PIPE CLASSES APPLICABLE TO VARIOUS STANDARD SPECIFICATIONS:

(a) - Pipe classes (2), (3), (4) and (5) meet the following specifications:

(1) - Indian Standard Specification No : IS 1592-1960
(2) - ISO Draft Recommendation No : 219

(b) - In addition pipe classes (3) and (4) meet specifications.

(3) - American Water Works Association No C 400-53T
(4) - American Standards of Testing Material
(5) - Federal Specifications No : SS-P-35[illegible]

(c) - Classes (2) and (5) do not satisfy specifications (3), (4) and (5)

2. DIMENSIONS AND DESIGN PRESSURE:

Pipes are designed to satisfy the requirements of the Indian Standard Specification in the most economical way, that is to the required quality however at the lowest cost.

2.1 Pressure Ratio

| Number | Corresponding | | | Bursting Pressure |
|---|---|---|---|---|
| Standard | U.S. American | Working | Test | for Corresponding |
| Class | Standard Class | Pressure | Pressure | Kg/cm² Diameter |
| | | Kg/cm² | Kg/cm² | Up to 200 mm / From 225 to 250 mm / Above 300 mm |
| 1 | -- | 2.5 | 5 | 10 / 8.75 / 7.5 |
| 2 | -- | 5 | 10 | 20 / 17.5 / 15 |
| 3 | 200 | 7.5 | 15 | 30 / 26.25 / 22.5 |
| 4 | 150 | 10 | 20 | 40 / 35 / 30 |
| 5 | -- | 12.5 | 25 | 50 / 43.75 / 37.5 |

-2- $T_3$ Values and [illegible] for Bursting Pressure Test

The $T_3$ Values are calculated [illegible] formula:

$$T_3 = \frac{2 \cdot P \cdot R_b}{f \times ID}$$

Legend:
Indian Standard Specifications

$P$ = $T_3$ & d = ID [illegible]

$T_3$ = Thickness of pipe [illegible]

$R_b$ = Unit stress at rupture [illegible]

ID = Inside Diameter [illegible]

$P$ = Bursting [illegible]

See Table No. 1, $T_3$ Values for Bursting Pressure Test and $T_3$ Chart No. 1

-3- Maximum thickness for T [illegible] Specification: $T_3$ = [illegible]

-4- $T_3$ limit adopted for purpose of machining the ends of pipe, and over run allowance.

$$T_3 = 10 \text{ mm}$$

Because of this minimum, $T_3$ , hydrostatic testing of pipe requiring less than 10 mm are eliminated. Consequently all of class (1) and parts of other classes are eliminated.

-5- Tolerance

The Tolerances are fixed by the Indian Standard Specifications.

TABLE No. 1

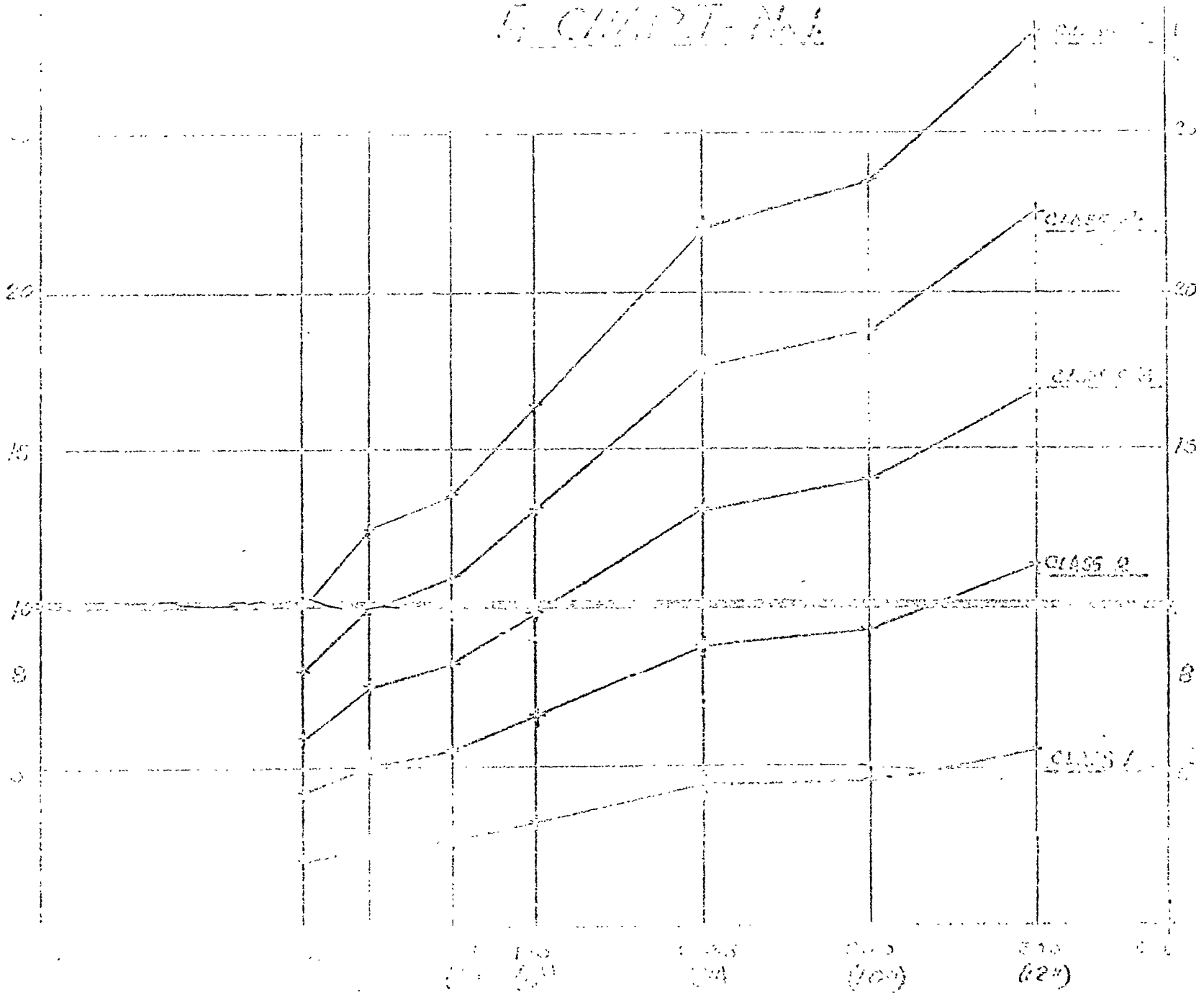
## $T_3$ VALUES FOR BURSTING PRESSURE TEST
(CALCULATED WITH FORMULA No. 1)

| PIPE SIZE | | CLASS 1 | CLASS 2 | CLASS 3 | CLASS 4 | CLASS 5 |
|---|---|---|---|---|---|---|
| mm | IN. | | | | | |
| 80 | 3 | 2.1 | 4.0 | 6.0 | 8.0 | 10.1 |
| 100 | 4 | 2.5 | 5.0 | 7.5 | 10.0 | 12.5 |
| 125 | 5 | 2.7 | 5.5 | 8.2 | 10.9 | 13.7 |
| 150 | 6 | 3.4 | 6.6 | 9.8 | 13.1 | 16.4 |
| 200 | 8 | 4.4 | 8.8 | 13.2 | 17.5 | 21.9 |
| 250 | 10 | 4.7 | 9.4 | 14.1 | 18.7 | 23.4 |
| 300 | 12 | 5.6 | 12.5 | 16.9 | 22.5 | 28.1 |

TABLE No. 2.- ROUND FIGURES FOR $T_3$ VALUES.

| PIPE SIZE | | CLASS 1 | CLASS 2 | CLASS 3 | CLASS 4 | CLASS 5 |
|---|---|---|---|---|---|---|
| mm | IN. | | | | | |
| 80 | 3 | — | — | — | — | 10 |
| 100 | 4 | — | — | — | 10 | 12.5 |
| 125 | 5 | — | — | — | 11 | 14 |
| 150 | 6 | — | — | 16 | 15.5 | 16.5 |
| 200 | 8 | — | — | 13.5 | 18 | 22 |
| 250 | 10 | — | 10 | 14 | 19 | 23.5 |
| 300 | 12 | — | 12.5 | 17 | 22.5 | 28.5 |

Note: $T_3$ = actual pipe t


CHART-No.1
CLASS A
CLASS B
20
15
10
8
5
20
15
8

noted P.S.

TELEPHONE OFFICE : 268241 (10 LINES)

TELEGRAMS · JAMCEMENT BOMBAY
TELEX : 2735-LOTUS BOMBAY

# Shree Digvijay Cement Company Limited

REGISTERED OFFICE : SIKKA. (GUJARAT)

Works at
SIKKA,
BOMBAY 15,
AHMEDABAD, 5.

Administrative Office :
SHREENIWAS HOUSE,
WAUDBY ROAD, FORT,
BOMBAY 1. BR.

DATE 29th May, 1970.

REF.

JUN 2 1970
FOREIGN ENG. DEPT.

R. Gomez, Esq.
Johns-Manville International Corporation
22 East 40th Street
NEW YORK N.Y. 10016
U.S.A.

Dear Mr. Gomez.

I did enjoy your excellent company for the entire tour of mine in the States and I am really thankful to you to have spared your time and to have given me an opportunity to see your Asbestos operations. I feel that it was a very good opportunity and an excellent education for me. Please accept my very sincere thanks for this.

On my return, I found there has been a strike in the plant. Now things are being sorted out and I hope in the next few days the plant will start operations on three shift basis. Because of the strike we have lost almost six to eight weeks production and this has also put the plant out of gear for the next 2 months.

Please convey my regards to your wife and my thanks for the excellent dinner she had prepared. I am really sorry that we had not to rush for the bus though I very much liked to spend some time at home.

With kind regards,

Yours sincerely,

( V. N. SOMANI )

TELEGRAMS JAMCEMENT BOMBAY
TELEX 2738-LOTUS BOMBAY

# Shree Digvijay Cement Company Limited

REGISTERED OFFICE : SIKKA. (GUJARAT)

Works at
SIKKA,
BOMBAY 18,
AHMEDABAD. 8.

Administrative Office :
SHREENIWAS HOUSE,
WAUDBY ROAD, FORT,
BOMBAY 1. BR.

REF.

DATE 29th May, 1970.

RECEIVED
JUN 5 1970
ASBESTOS FIBER DEPARTMENT

W. C. Streib, Esq.
Research Manager
Asbestos Fiber & International Depts.
Johns-Manville
Research & Engineering Centre
P.O.Box 159
Manville, N.J.08835
U.S.A.

Dear Mr. Streib,

Very nice of you to have written me a letter on the 10th April, which I could only see after my return from the round-the-world tour.

I would say that I did enjoy the time spent with you in the Research Centre. It was quite interesting to discuss with you the fibre problems. By now, you may have analysed the various data given to you, and I look forward with keen interest to receiving a detailed report from you as to how my operations are and how can they be improved upon. I would also be glad to have your recommendations on the evaluation of the five-ton shipment of the new ST4T grade.

You would be pleased to note that new allocation of foreign exchange has been just released by the Government of India and in the next few weeks I hope to get the import licence and to place firm orders on the suppliers.

Yours sincerely,

( V. N. SOMANI )

May 27, 1970

Mr. K.V. Ramaseshan
Shree Digvijay Cement Company Limited
Ranip Sabarmati
Ahmedabad 5, INDIA

Dear Mr. Ramaseshan:

This is to acknowledge your letter of May 2nd with reference to the manufacture of 50 mm diameter asbestos-cement couplings.

We definitely advise you to use C.I. joints for your asbestos-cement pressure pipe on 50 mm diameters. We feel there will be some difficulties in the manufacture of this small diameter coupling.

In the U.S. we produce a very small amount of 2" diameter asbestos-cement pipe. However the utilization of this pipe is not for high pressure but normally used as an electrical conduit. The couplings we produce for this non-pressure pipe are only sleeves manufactured in special coupling lathes.

We will advise you to convince your customers to accept C.I. joints in orders of 2" diameter pressure pipe.

With kindest regards.

Yours sincerely,

R. Gomez

Research & Engineering Center
May 7, 1970

R. S. Olson, Int

Specifications for
Shree Digvijay Cement C[redacted]

Request of R. Gomez [redacted]

A. C. Pennewell relayed request of Mr. Somani, Managing Director of Shree Digvijay Cement Co., for Manufacturing Specifications and Finished Product Specifications during R. Gomez' recent visit with him to Pittsburg plant in a letter to W. M. Rogers dated April 23, 1970. I reviewed this request with R. Gomez on May 6 and he stated that this was in accord with our technical assistance agreement with Shree Digvijay Cement Co.

In compliance thereto, I enclose copies of the following specifications requested by Mr. Gomez:

| | | | |
|---|---|---|---|
| MS | 4211 | Standard Asbestos FLEXBOARD | - Pages 1 and 2 |
| [redacted] | 4222 | Corrugated TRANSITE | - Pages 1, 2, 3 |
| | 4211 | Standard Asbestos FLEXBOARD | - Pages 1 through 8 |
| | 4222 | Corrugated TRANSITE | - Pages 1 through 9 |

C. L. Meserve

mp

Attachments

cc: R. Gomez, Int - GH
A. C. Pennewell, Ptsbg Plt
W. H. Graham
W. C. Streib

[redacted]

TELEPHONE { OFFICE : 52921
FACTORY : 6324

TELEGRAMS { JAMCEMENT BOMBAY
JAMCEMENT AHMEDABAD
JAMCEMENT SIKKA

# Shree Digvijay Cement Company Limited.

REGD. OFFICE : SIKKA, VIA. JAMNAGAR.
(ASBESTOS PRODUCTS DIVISION)

DIGVIJAY NAGAR,
AHMEDABAD.
(India)

*Ref. No.* KVR:TECH:303

May 2, 1970

Mr. R. Gomez,
Johns Manville International Corp.
22 East,40th Street,
New York
U. S. A

Dear Mr. Gomez,

As you know we are manufacturing 50mm dia. pipes on the Calzoni machine. One of the States in India - U.P - have asked us to supply even 50mm dia pipes only with A.C. Coupling. With this very small diameter, the thickness of A.C.coupling to be manufactured is very high and there will be innumerable difficulties in manufacture. We have therefore suggested to the Chief Engineer of U.P to accept C.I.Joints but he has made a request that we should ask Johns Manville Corporation whether it is practically possible to manufacture 50mm A.C.coupling.

I am aware that JM do not manufacture this size of pipes but shall appreciate if it would be possible for you to write to us an appropriate letter so that we can ask the Chief Engineer, U.P to use only C.I.Joints with A.C.pipes.

Thanking you,

Yours sincerely,

(K.V.Ramaseshan)

noted
PSJ.

Pittsburg Plant
April 23, 1970

W. M. Rogers - REC

cc:
R. Gomez - GHQ - Int'l.

REQUEST FOR SPECS

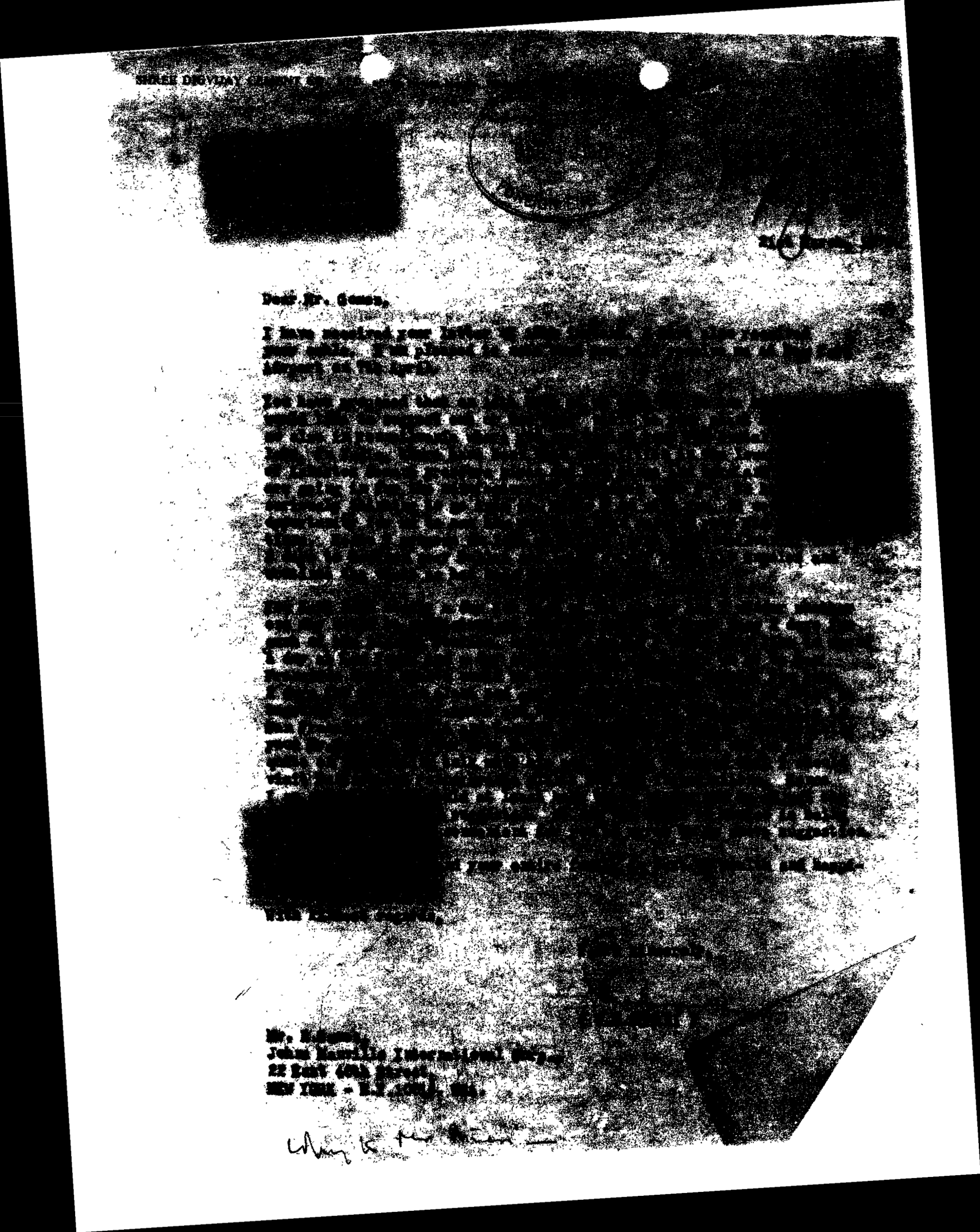
On April 22 V. N. Somani, Managing Director of Shree Digvijay Cement Co., Ltd, Bombay, India and R. Gomez, Group Foreign Project Engineer of the International Division visited Pittsburg to review the wet machine operation.

I understand we have a full technical assistance agreement with Mr. Somani's firm for asbestos cement pipe and sheets. Mr. Somani requested a copy of all our Flexboard and Corrugated manufacturing and finished product specifications. We tried to copy our specs on our Xerox machine but it would not reproduce the purple ditto print on the spec sheets; therefore, we are requesting that you furnish one copy of all the subject specs to:

V. N. Somani, Managing Director
Shree Digvijay Cement Co., Ltd.
Shreeniwas House,
Waudby Road, Fort
Bombay, India

Please advise if you cannot meet this request for any reason.

A. C. PENNEWELL



Asbestos de México, S.A.

Apartado Postal No. 4 Tlalnepantla, Edo. de México

February 5, 1970.

DIRECCION GENERAL

Mr. V. N. Somani
Shree Digvijay Cement Company Ltd.
Shree Niwas House
Waudby Road, Fort,
Bombay - 1
INDIA

Dear Mr. Somani:

As you are aware, Asbestos de Mexico, S.A. has been for many years associated with Johns-Manville Corporation in the U. S. A. and is a licensee of J-M for the production of asbestos-cement pipe, sheets, and hand moulded products.

We have developed over the years a substantial business in the production of asbestos-cement hand moulded products which business is quite profitable. There certainly should be a large market in India for similar products.

In addition we are one of the early producers, under a licence from Johns-Manville Corp., for the patented asbestos-cement extrusion process (ACE). We produce a variety of specialized asbestos-cement building materials with this new extrusion process.

Johns-Manville has indicated to me that they consider it very important that you familiarize yourself with hand moulded production of asbestos-cement products as well as "ACE" to increase production and sales for your company. This, in their opinion, could best be done by having you visit our factory. We are happy to invite you to make this visit.

Yours cordially.

Jorge Murguía Blancarte
General Director.

lms.

cc
A. G. Steneri
File
Chrono

February 4, 1970

Mr. K. V. Ramaseshan
Shree Digvijay Cement Co. Ltd.
Ranip, Sabarmati
Ahmedabad 5, India

YOUR REFERENCE: 693

Dear Mr. Ramaseshan:

We are pleased to acknowledge and comment upon your letter of January 28th providing rubber compound test results supplied by Synthad Chemicals P. Ltd. The test results appear in the appended tables with measurements expressed in English units of measure. These results are compared to Johns-Manville standard values for rubber rings. We note that report numbers 8/300/31 and 7/70 do not define the test methods employed in evaluating the rubber compounds. However if we assume that the test methods employed correspond closely with those that we employ, we conclude that the samples provided by Synthad Chemicals are entirely satisfactory.

We believe it was quite appropriate to provide Synthad with a copy of purchase specification number TR2308 which outlines the physical properties required of rubber rings used in the joints of water pipe. We believe it would be extremely helpful to them if a copy of specification TR2303 was also provided. This write-up describes the test methods employed in evaluating rubber rings. A copy of this specification should accompany rubber ring samples which are submitted to a laboratory for evaluation. The laboratory should be instructed to employ the test methods described in TR2303 and report results compared to TR2308. Departures from standard should be carefully reported by the laboratories in their reports. We have appended copies of specifications TR2303 and TR2308 for your reference.

Note it will not be possible for laboratories to conduct all of the tests described in specification TR2303 because specialized equipment is required for certain tests. We consider the following rubber test methods of TR2303 routine and well within the competence of the majority of laboritories: test method 1a or 1b, 2, 3, 5, 6, and 7. The properties determined by these test methods provide the essential data required for the evaluation of rubber rings. Best regards.

Very sincerely.

George Rudin

**LABORATORY REPORT NO. 8/300/31 DATED JANUARY 15, 1970**

| TEST | COMPOUND | ROUND CURED SLABS | JOHNS-MANVILLE TEST METHOD | JOHNS-MANVILLE REQUIREMENT |
|---|---|---|---|---|
| Tensile Strength, psi | 3,780 | 3,360 | No.1a(ASTM D412) | 2,000 minimum |
| Elongation at break,% | 600 | 575 | No.1b(ASTM D412) | 350 minimum |
| Hardness, Shore $A_2$ | 55 | 57 | No.2c(ASTM D676) | 57±5 |
| Tension Set,% | 3.125 | 3.126 | No.1e(ASTM D412) | 10%maximum |

CHANGE AFTER AGING FOR 168 HRS. AT 158°F

| | | | | |
|---|---|---|---|---|
| Tensil Strength, %change | -5.6 | -4.5 | No. 2a | -15 maximum |
| Elongation at break, % change | -22.5 | -15.5 | No. 2b | -25 maximum |
| Hardness change, Shore $A_2$ | +6 | +5 | No. 2c | +7 maximum |

[redacted]

LABORATORY REPORT NO. 7/70 DATED JANUARY 17, 1970

| TEST | SAMPLES BEFORE AGING | JOHNS-MANVILLE TEST METHOD | JOHNS-MANVILLE REQUIREMENT |
|---|---|---|---|
| Tensile Strength, psi | 3,160 | No. 1a | 2,000 minimum |
| Elongation at break, % | 598 | No. 1b | 350 minimum |
| 300% Modules | 1,220 | No. 1d | 1,200-2,300 |
| Shore Hardness | 49 | No. 1c | 57±5 |

[redacted]

| | SAMPLE AFTER AIR AGE 168 HRS. AT 158°F | | |
|---|---|---|---|
| Tensile Strength, %change | -4.42 | No. 2a | -15 maximum |
| Elongation at break, %change | -19 | No. 2b | -25 maximum |
| 300% Modulus, %change | +42.6 | --- | --- |
| Hardness change | +7 | No. 2c | +7 maximum |

[redacted]

TELEPHONE { OFFICE : 52921
FACTORY : 6324

TELEGRAMS { JAMCEMENT BOMBAY
JAMCEMENT AHMEDABAD
JAMCEMENT SIKKA

# Shree Digvijay Cement Company Limited,

REGD. OFFICE : SIKKA VIA. JAMNAGAR.
(ASBESTOS PRODUCTS DIVISION)

RANIP, SABARMATI,
AHMEDABAD-5.

FEB 2 1970
FOREIGN ENG. DEPT.

Ref. No. KVR:TECH:693

January 28, 1970

Mr. George Rudin,
Johns Manville International Corpn.,
22 East, 40th Street,
New York
U.S.A

Dear Mr. Rudin,

Kindly refer to your letter dated November 11, 1969 wherein you have mentioned that no further test need be done on the samples of M/s. Synthad Chemicals Pvt.Ltd. in view of the fact that the percent set recorded for their samples was 19.4% whereas the maximum allowable is 16% and this shows poor aging tendencies which would affect the hydrostatic performance of rubber rings joints in water pressure pipe.

Since then we have had discussions with the party and have given them speficiations of TR-2808-6 and have requested the party to maintain standards as much as possible near to specification. We attach herewith true copies of test reports received from laboratories and in view of the fact that both the laboratories are very reputed concerns and results are satisfactory, we feel that the overall performance of the rubber rings should be satisfactory.

I shall however, greatly appreciate receiving your confirmation after comparing the results with your standards and any comments your technical service division may have to make on the performance of the rubber rings from Synthad Chemicals Pvt.Ltd.

With kind regards,

Yours sincerely,

(K.V.Ramaseshan)

Encl:

SYNAPRENE SERVICE

LABORATORY REPORT

**Synthetic & Chemicals Ltd.**

---

Report No. 8/300/31-15-1-70

Inquiry Ref: Party's letter No.69-70/201 dated 19th December 1969

Name : M/s. Synthad Chemicals P.Ltd., Vallabh Vidyanagar

Subject: Evaluation of physical properties for three rubber samples.

The party desired us to test the round rubber slabs, rubber rings and a compound. The compound was cured at a temp. 141°C in a standard ASTM test slab mold. The results are as follows:

| TC/248 | Compound | Round cured rubber slabs | Rubber ring |
|---|---|---|---|
| Optimum time of cure @ 141°C. | 141° C 10' | - | - |
| T.S. in kg/cm2 | 267 | 237 | - |
| % E.B | 600 | 575 | - |
| Hardness, shore $A_2$ | 55 | 57 | - |
| % Tension set (250%) (Duration - 15' recovery time: 1 hr) | 3.125 | 3.125 | - |
| Change after Ageing @ 70°C for 7 days: | | | |
| T.S % Change | -5.6 | -4.5 | - |
| E.B % Change | -22.5 | -15.5 | - |
| Hardness, shore $A_2$ change | + 6 | + 5 | - |

Note: In case of rubber rings, other tests could not be carried out.

CONCLUSION: Since no specification valued are given, no conclusion could be drawn.

THE TEST REPORT IS FOR GUIDANCE ONLY AND CANNOT BE SUBMITTED AS A TEST REPORT FOR QUALITY TO A THIRD PARTY.

True copy/

Shree Digvijay Cement Co., Ltd.
ASBESTOS PRODUCTS DIVISION.
RANIP, SABARMATI, AHMEDABAD-5 (INDIA)

Continuation Sheet No.....

BAYER (INDIA ) LIMITED
Thana

Our reference G-35 Date 17-1-70

LABORATORY REPORT No.7/70

Party: Messrs. SYNTHAD CHEMICALS PVT.LTD.,VALLABH VIDYANAGAR
Reference: Their letter No.69/70-231 dated 25-12-1969
Subject: Testing of rubber parts.

We received two samples of test slabs marked 'before ageing' and 'after ageing' from the party.

The results of the tests carried out are given below:

| Test slab | Before ageing | After ageing |
|---|---|---|
| Tensile strength kg/cm2 | 222 | 212 |
| Elongation at break % | 598 | 485 |
| 300% Modulus kg/cm2 | 86 | 132 |
| Shore hardness | 49 | 56 |

Conclusions: The results are self explanatory.

P.S: For compression set results the test conditions required were not given by the party and hence the trial could not be carried out. Ageing 70° for 7 days.

(True copy)

cc:

A. J. Steneri
File
Chrono

January 22, 1970

Mr. K. V. Ramaseshan
Shree Digvijay Cement Co. Ltd.
Ranip, Sabarmati
Ahmedabad 5, India

254

Dear Mr. Ramaseshan:

We wish to acknowledge your inquiry of January 7, 1970 regarding a "3-anvil roll" system for Hatschek sheet machines.

We do not have any direct experience with the 3-anvil roll system but we do believe it has certain advantages over a single anvil roll. The 3 roll system unquestionably produces a harder, more dense sheet and therefore the quality of fibre in the sheet may be reduced to a certain extent without sacrificing sheet strength. We have demonstrated in the laboratory that the strength of asbestos cement is proportional to the square of the density. Therefore when the density increases the strength of the sheet increases. Higher density sheets may also be produced by repressing the sheets immediately after production to remove excess water.

A repress system is prohibitively expensive. The design and addition of a 3-anvil roll system replacing an existing single anvil roll on a sheet machine would be difficult if not impossible to justify on the basis of savings.

In regard to the production of corrugated asbestos cement sheets, we do not believe there is any advantage in producing the sheets on a Hatschek machine with 3 anvil rolls. The asbestos cement sheet must be as moist as possible when it leaves the sheet machine for corrugating otherwise crown cracks develop. Moist sheets can readily be produced on a machine with a single anvil roll.

Best regards.

Sincerely,

George Rudin

jj-10

[redacted]

January 19, 1970

Mr. V. N. Somani
Shree Digvijay Cement Co. Ltd.
Shreeniwas House
Waudby Road
Bombay - 1
INDIA

Dear Mr. Somani:

Thank you for your letter of January 13 and I note that you are interested in visiting some of our factories.

I would like very much to have Mr. R. Gomez, who is the most familiar with the plant at Ahmedabad, be available during your visit and I have asked him to handle this matter for me. Please let him know as early as possible of your proposed itinerary because, as you know, Mr. Gomez travels quite a bit and he will want to be available for your visit.

Unless you have special reasons for including so many factories, it would seem to me that we can bring you completely up to date on all our asbestos-cement manufacturing processes by visiting one or two factories. Therefore, please let Mr. Gomez know as early as possible when you plan your visit.

In accordance with your request I am sending you a formal invitation to visit us.

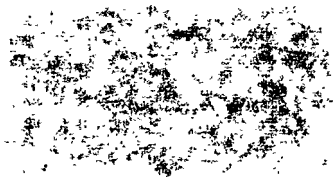
[redacted]

Sincerely,

R. S. Olson

RSO/lvr

bcc: R. Gomez
G. Read
A. J. Stener[redacted]



January 19, 1970

Shree Digvijay Cement Company Limited
Shree Niwas House
Waudby Road
Fort
Bombay - 1
INDIA

Gentlemen:

We had the pleasure of a visit of your Mr. V. N. Somani towards the last quarter of 1966. We had at that time indicated to him that he should plan to visit us towards the end of 1968 or early 1969 by which time we had expected to complete the several new modifications and improvements that we had on hand at our various plants. We had also indicated to him that we shall at that time be in a position to brief him with full technical data regarding various new items of asbestos products which you could usefully manufacture in a phased program of diversification.

For one reason or another Mr. Somani has not been able to visit us so far and we feel that a visit in the very near future is imperative if he is to take full benefit of the program we have already implemented and also of the program we are now planning for the next two years. In fact a visit towards March/April 1970 would be the most ideal time to spend about 3 to 4 weeks with us and we can assure you that this stay would enable Mr. Somani to make substantial improvements in your factory and would assist not only in your achieving more profitable out-put but would also go a long way in bringing [redacted] an up-to-date standard as compared to other industries [redacted] presently keenly competing with you in the export market.

As soon as he is able to finalize his program, please let us know well in advance [redacted] necessary arrangements would be kept ready here so as to utilize Mr. Somani's time to the maximum benefit.

Very truly yours,

R. S. Oleon
Vice President
Manager of Engineering

cc: Mr. V. N. Somani
[redacted]
File
Chrono
Desk

December 23, 1969

Mr. K.V. Ramaseshan
Shree Digvijay Cement Co., Ltd.
Ranip, Sabarmati
Ahmedabad 5, India

YOUR REFERENCE: 8295

Dear Mr. Ramaseshan:

Thank you for your letter of December 15th. I am pleased you found my letter of November 20th helpful.

The 34T fibre which is in use in Ahmedabad should definitely be silicated. In fact all grades and types of fibre such as Russian and blue fibre should be silicated using the silicate concentrations stated in my letter of November 20th. In connection with silicating there are three important practices which should be observed:

1. The silicating of asbestos fibres must be done in a hammer mill or Willow.

2. After silicating the fibres must be allowed to dry in a fibre bin.

3. [redacted] pumping system must be periodically [redacted] water.

I am [redacted] days of holiday. On my return I will send [redacted] Johns-Manville drawings covering the silicating [redacted].

Meanwhile we have today sent to you a large sample of rubber taken from one of our rubber covered press rolls. Please note the color and hardness of the sample as well as the square pattern on the roll. We suggest you retain this sample so that it may be compared to your own rubber rolls.

Kind regards,

Sincerely,

George Rudin

TELEPHONE { OFFICE : 52921
FACTORY : 6324

TELEGRAMS { JAMCEMENT BOMBAY
JAMCEMENT AHMEDABAD
JAMCEMENT SIKKA

# Shree Digvijay Cement Company Limited,

REGD. OFFICE : SIKKA. VIA. JAMNAGAR.
(ASBESTOS PRODUCTS DIVISION)

RANIP. SABARMATI.
AHMEDABAD-5.

Ref. No. KVR:TECH:8295

December 15, 1969

Mr. George Rudin,
Johns Manville International Corpn.,
22 East, 40th Street,
New York
U. S. A

Dear Mr. Rudin,

I am thankful for your very detailed letter dated 26th November 1969 which was awaiting me from leave early this month. I am grateful to you for sending the various details which are of immense help.

More than 60% of fibre that we are using on the pipe machines is S4T-30 which is a silicated fibre and I shall be grateful for your advice whether while using this large quantity of silicated fibre it would be advisable to think of injecting ~~of~~ silicate of soda solution further. Of course, the 40% of fibres vary from time to time but consist of mostly Russian fibre and small quantities of blue whenever it is available. I need hardly add that when we use blue fibre our problem of drying was much lesser as blue fibre has greater filtration but when using S4T-30 only with Russian fibres naturally filtration problem assumes importance. On receipt of your advice that in spite of using a large percentage of S4T-30 it would still be advisable to spray silicate of soda, I shall conduct further experiments and report to you my findings.

As regards rubber rollers and the composition, I have asked the local manufacturers to carefully look into the recommendations you have given and have also asked them to advise us confidentially of their composition so that it would be possible for you to examine better as to what is lacking in their composition to give a longer roll life.

With kind regards,

Yours sincerely,

(K. V. Ramaseshan)