

MEETING: JOHNS-MANVILLE, MANVILLE, NEW JERSEY

FEBRUARY 23, 1968

SUBJECT: FILTER PRESS PROCESS - MANUFACTURE OF CALCIUM SILICATES

JOHNS-MANVILLE PERSONNEL:

Ward Burleson, Vice President
Joe Kelley, Patent Department
Ev Truax, Prod. Engineer
Larry Blair (Dr.), Research and Development

OCF PERSONNEL:

Dick Grant
Mike Hardwick
Dick Shannon
Carl Staelin

1. J-M (Blair) has always been fascinated by OCF's pan pouring process, because of its extreme flexibility. It saves on warehouse space, orders can be produced and shipped in two to three days. J-M's filter press process is not flexible like OCF's process.
2. Ward Burleson asked whether OCF's Marketing Division would accept two types of products (pan pouring and filter press) if we chose to go only part way in adopting the filter press process. (For instance: If we made only large size sectional by filter press.)
3. If we decide to proceed with negotiations, J-M would want us to see the Long Beach plant. It is much more mechanized than the Manville plant.
4. Thermobestos contains only chrysotile asbestos. No amosite asbestos is used, because of (1) costs and (2) health problems. Amosite is on the list of 'bad actors' from a health standpoint according to J-M.
5. In recent years J-M has developed new methods for opening chrysotile. They use only one grade of chrysotile - 4T grade in the amount of 7%wt. The new method of opening asbestos permits them to use less asbestos than we do at substantially less cost.
6. J-M does not dry open asbestos anymore.
7. J-M describes their process for opening asbestos as wet processing. They point out it differs from wet grinding. The processed asbestos dispersion looks like jello and contains 10% fiber/wt. (Note: We noted this change in summer 1966. Their product became extremely laminar, heavier and lower in strength.)
8. J-M has a relatively large R & D group working full time on Thermobestos. The R & D group also benefits from 'fall out' from other areas working on asbestos, cement pipe, etc. For instance, the wet processing technique for dispersing asbestos fibers came out of the R & D area working on asbestos fibers in general.
9. J-M has for the past ten years had a major R & D effort directed toward improving the properties of Thermobestos and especially for automating the process. R & D is a continuing program on Thermobestos. (Note: OCF support to Kaylo during this same period was minimal - four people at most, with no program between 1962 and 1965.)

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- J-M does not use trim lost. They consider trim as inert. It would only increase density. They would just be selling and shipping more weight.
- J-M hedged when they were asked what the present batch costs as percent of total manufacturing costs were. They agreed to supply this information later.
2. J-M asked us whether we still used Sillex (silica flour) in our product. Our answer was we used silica flour, but not Sillex. (Note: Check on who makes Sillex.) They then asked whether we still used a combination of diatomaceous earth from Eagle Picher and silica flour. Our answer was yes.
13. J-M uses all salt water diatomaceous earth in their product (from California). They use no silica flour. They now have a fresh water source of diatomaceous earth. It is in Mexico. They don't use diatomaceous earth from this source in Thermobestos. (Note: Check soluble chloride content of current Thermobestos. Can they meet AEC requirements?)
14. J-M can use either hydrated lime or quicklime in the Thermobestos process.
5. Staelin suggested we reconsider what J-M products we could use in Kaylo. They were aware I cut them off back in 1961, because of the high chloride content of their asbestos.
- J-M's mixing procedure -- shake the lime first, pump to a premix tank, then to the gel tank, then directly to the filter presses.
17. J-M uses one formulation for all products.
18. Gel tanks - six tanks - are 5-6000 gallons in size and are hooked up in parallel. Quality control is maintained at the gel tank. If the gel does not meet specs, it is dumped immediately (two mixes in 1967 at the Manville plant).
19. It takes 1.5 hours to prepare the gel. Maximum holding time is 4 hours. They normally don't use gel if it gets more than 4 hours old. They get a 98 percent overall job efficiency (on piece basis) although pounds in to pounds out is somewhat lower.
20. J-M would not answer as to how many people they had in their mixing area. All they would say was the process can be automated and they have been able to reduce manpower substantially in this area during the past 10 years.
21. Biggest problem J-M says they have in the mixing area is bag opening - dust - housekeeping.
22. The gel tanks are insulated (out doors in California) and are maintained under low pressure.
23. The J-M process is a closed system. Water removed at the filter press is reused as mix water.
24. All measurements are volumetric. Amount of material required per mold box (single and/or twin cavity) is measured volumetrically for each cycle.

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25. Only one mold box (may contain multiple cavities) is placed in each press.
26. J-M says density of their product will not vary unless the volume of gel placed in the mold box is varied. Any variations in wall thickness is due to shrinkage.
27. J-M's filter press molds are not highly precision molds. They do vary slightly (thousandths of an inch).
28. The press operator can manually adjust the press to handle gels, which are slightly off spec.
29. J-M has no problem of batch set up in their lines. Also, they have no build up in their lines.
30. J-M made a point they don't pump batch from the gel tank to the volumetric measuring tank to the presses themselves. They would not say how they moved batch. They do use a ball check steam pump to transfer from the premix tank to the gel tank, but once the gel is formed (looks like oatmeal), they do no pumping.
31. To prevent getting air into the volumetric measuring tank and filter press, they switch from one gel tank to another gel tank before they start moving air through the lines (tank gets too low). Any residual gel (about 10 gallons) is transferred to the next gel tank. No wash out of the gel tank is required.
32. For mixing in the gel tank, they use an agitator and steam coils. Gel is held at temperature (not stated) until used up. Air is used to transfer gel through the system.
33. J-M hedged as to the size of their mold box. They said many improvements have been made since OCF's last visit. They now filter from all sides.
34. The largest size sectional they make is 24 x 3. They could make larger sizes, however, they cost too much to ship. The sales value per mold hour is highest for 24 x 3, however, they get very low volume production on these larger sizes and shipping costs are high.
35. It takes 5 to 6 hours to change a mold box, cores can be changed in less than one hour. Changes are made by skilled craftsmen. Assembly is precise. It takes 5 to 6 hours to get an exact fit as the mold is assembled piece by piece.
36. Mold costs -- for one of the larger sizes a complete set, which includes a mold box and several sizes of cores, will cost \$5,000 to \$10,000.
37. One complete set of all sizes from 1/2 inch to 24 inches will cost about one quarter million dollars.
38. Each man operates several presses -- J-M would not say how many presses per man.
39. The press operator does not handle the ware. It is all moved by equipment either automatically or by the press operator, who manually operates the equipment.

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40. Green strength of the ware goes up with density. Production goes up with higher density, since the ware can be handled faster. Management tries to prevent this because it also increases product weight and materials cost.
41. Filtering is done under constant pressure. When the press bottoms out, the cycle is completed.
42. Production rates - one hundred cycles per hour per press for 1/2 inch twins (2 pieces per cycle or 200 pieces per hour per press).
43. Production rates for large sizes - 40-50 cycles per hour for 24 x 3.
44. J-M does not like to go beyond twins. Engineering problems exist in attempting to go to 3 or 4 cavities, although they have experimentally tried up to 4 cavities in the past.
45. It is not desirable to vary pipe size in twin molds (such as a 4 x 1 and a 3 x 1-1/2). It tends to distort the press.
46. Breakpoint from twins to singles is 6 inches OD.
47. J-M was asked their cost of maintenance. They said they didn't know, but would check for us. Mold changes to be separated from general maintenance costs.
48. Normally J-M expects a 100 percent job efficiency at the press. The only time they have a problem is from bad gel near the end of a run, which sometimes produces defective ware. The press operator more or less just watches the operation. He does not press any buttons to cycle the press. Everything is handled and cycled automatically.
49. Operating efficiency is now running about 65 percent. For presses producing the more popular sizes, they run almost continuously, whereas, molds in other presses are changed quite frequently.
50. J-M is now getting \$2,000 list price (sales value) ware per mold (press) per day. They say they could theoretically get \$3,000 list price of ware per press per day if operating efficiency was 100 percent.
51. J-M places their green strength ware on flat surfaces (trays). No supports are used to prevent the ware from collapsing.
52. J-M estimates tooling costs (not counting presses) for all three plants is less than 1.5 million dollars.
53. Press prices (no automation included):
 - A. Small reciprocating presses, which handle ware up to 20 inches OD cost \$35,000.
 - B. Large presses for ware 21 inches OD and larger cost \$60,000.
54. Presses are automated in groups of two. Cost to automate is \$40,000 (\$20,000 per press).

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5. J-M's autoclaves are all one door.
 - J-M can mold special shapes, but they don't. They have in the past produced extended leg ware (for steam tracers).
 - 57. J-M still trims the legs to get good fit. (Ware is not completely precision molded.) However, they do no end trimming. The latter means they must have good control over process shrinkage.
 58. J-M does no trimming or sanding of block. It is molded to final shape.
 59. Length specifications vary according to pipe size. They permit a maximum of 1/4 inch shrinkage. Their specs call for +0, -1/4 inch.
 60. All of the J-M presses are completely overhauled once per year. The rebuild can be completed in a week if they have an urgent need for extra production capacity. J-M did not know cost of rebuild. Will obtain and submit to OCF.
 61. There are some solids in the filtered water. They do not compensate, however, for any solids in the water. Water from the presses is returned to the premix tank. It is used mainly for temperature and as a source of mix water (closed system).
 62. J-M produces by the filter press process Marinite panels 48" x 96", up to 4" thick.
 63. J-M said they didn't want to make a stress corrosion product. It costs them too much to make. Can't make any money.
 64. Everyone agreed the B-E-H product is an extremely poor product even if it is stress corrosion rated.
 65. J-M said their biggest process problem and cause for rejects was man handling. Transfer of ware from one operation to another. All ware is handled by vacuum (vacuum stripping).
 66. J-M said that the minimum plant size would be 3 million dollars of product list (sales value of production). They didn't say what such a plant would cost to build. They will work up for us a list of capital equipment costs. We can then estimate total plant costs.
 67. J-M suggested the possibility of a deal where we would supply (private brand) J-M with filter press ware from our plant in Texas and they would private brand an equal amount from their Long Beach, California plant for our west coast requirements.
 68. J-M is thinking about building a plant in Texas. They asked us where we planned to build our plant. Staelin said in Texas, probably at Waxahachie.
- J-M said that even though their product is laminar, their percent packed is extremely high. Product loss due to trimming of legs is almost non-existent.

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- J-M has a new plant almost designed. It will operate with a handful of people. They are going to the SID process. They plan to use oil instead of Dowtherm. They are currently waiting on a quote from the autoclave people for SID cylinders.
71. J-M does not have automatic canvas wrapping. They do have a 'jigged' method of metal wrapping.
 72. J-M makes a bonded aggregate product called Superex (probably diatomaceous earth and clay). It is extremely fragile.
 73. J-M doesn't think much of the Careytemp bonded aggregate product. They said they have no interest in the product, because of its poor handling characteristics.
 74. Biggest problem of J-M in the field is meeting OCF prices and still making money (if the filter press process is so much more economical than pan pouring why the problem?).
 75. J-M said they wondered why OCF never came out with a glass fiber high temperature insulation. They touched on what we are doing and planned to do with our Multi-Temp type product. All we said was it wasn't dead.

R. F. Shannon

R. F. Shannon

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