

Report on the

BURGESS TITANIUM DIOXIDE PROCESS

by

E. E. WARE

September 28, 1957

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To be of value as a basis for the acceptance or rejection of the Burgess titanium process, a report must cover all four phases of the proposition: Engineering design, Chemical feasibility, Economic efficiency, and Patent protection.

ENGINEERING DESIGN

The present design has its defects; some of them glaring but most of them amenable to correction by changes based on sound engineering principles. The less easily corrected defects need considerable study, and may perhaps necessitate a major change in plant design, but will involve no insurmountable difficulties and can probably be accomplished by the proper assembly of standard chemical engineering apparatus. It has however, been proven beyond question that special materials of construction must be used for practically all of the apparatus. This one feature will probably give us more trouble than any other for the few materials such as rubber, Bakelite, and Havg, that have been proven resistant to solutions demanded by the process, do not lend themselves to use under all of the conditions of temperature and pressure under which this process is at present designed to operate.

CHEMICAL FEASIBILITY

The basic chemical reactions of the process are well established and quite thoroughly understood. There are, however, still weaknesses in a number of details of purification, concentration and precipitation that

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need study. Each one of these is vitally important in that it affects either economy of operation or quality of final product or both.

The study of the physical characteristics of the pigment has progressed rather rapidly in the past few weeks until it now seems certain that we may expect a final product equal to competition, although we must acknowledge that we have not as yet produced such a product.

ECONOMIC EFFICIENCY

The economics of the process is the feature of greatest concern. My preliminary report of September 20th covers the situation rather ~~freely~~ ^{fully} and I shall not repeat the details here. I do, however, want to point out that I purposely tried to keep on the high side, primarily in an attempt to partially compensate for our gamble in assuming an ability to exercise reasonable control over the raw material losses pointed out in the Hougan report. These losses have never been entirely accounted for and are no more nearly eliminated in the revamped pilot plant than in the old one.

It is quite probable that in my further conferences with Mr. Weiss we shall both make adjustments so that the differences between the two sets of figures upon which you and Mr. Weiss will base your discussion will not be as great as was pointed out in my report of September 20th.

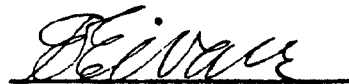
PATENT PROTECTION

Mr. Fairbank will no doubt approve the patent situation as reasonably satisfactory if no radical change in process be necessary and if proper settlement of the Glay Reduction Company cross-licensing difficulty can be arranged. The patent situation is none too favorable

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if changes such as wet milling or chemical treatment become necessary, or if it ever seems advisable to acidify the hydrate before calcination. These features are already patented and other embarrassingly limiting features will also be covered unless we expedite the plugging of the loopholes in the present patent structure. This particular phase of the work has not been as energetically handled as I should have liked.

I believe we can make an entirely satisfactory pigment by the Burgess process and that we can make a profit at the present market price. I recommend therefore that you close with Burgess if you can do so realizing that all of our reports are based upon what our past experience leads us to believe we can do, rather than upon what we have actually proven through operation of the Burgess pilot plant.


E. E. WARE

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