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INTER-OFFICE MEMO **TENNECO CHEMICALS, INC.**

TO M. W. Williams (10) AT Piscataway DATE October 30, 1969
FROM H. B. Carr AT Flemington COPY TO
SUBJECT GELATIN FOR PROMINSA

Reference: Memo, MWW to HBC,
dated 8/27/69,
titled Gelatin Sample

As requested in the referenced memo, two gelatin samples from Prominsa designated as Duché "A" and Duché "B" have been evaluated as possible substitutes for Atlantic Gelatin's product. Quality Control has completed normal specification tests and has obtained additional characterization test data through arrangements made with Atlantic Gelatin. The results of this testing are shown on the attached table.

Conclusions based on this data and on discussions held with Polymerization Research and Process Development are as follows:

1. The two samples apparently are the same type but show considerable variance in particle size (46% versus 11% +40).
2. With an adjustment in particle size, the Mexican gelatin would be a suitable substitute for the Atlantic 275A product.
3. While the Mexican gelatin may be substituted for Atlantic 275A gelatin, it is not suitable as a total replacement of the gelatin utilized in Tenneco copolymer formulations for the following reasons:
 - a. Tenneco Plastics prepares a 1:1 blend of 225B (B type) and 275A (A type) gelatins. Prominsa currently receives a 1:1 preblend from Atlantic. To our present knowledge, a B type gelatin is not produced in Mexico.
 - b. This 1:1 blend of A and B type gelatins is required in Tenneco copolymer formulations to assure that a proper balance of isoionic pH is maintained in the protective colloid during the course of the polymerization. The polymerization formulation will initially have a pH in the 6.5 to 7.5 range. As hydrochloric acid is liberated during the course of the polymerization, the pH will drop off to approximately 4 at the completion of the polymerization. As shown in the data, the 1:1 blend of type A and type B covers this pH range and assures that protective colloid properties and hence control of particle size is maintained throughout the polymerization. Specifications for the 1:1 blend are listed under Process Requirements in the table of data.

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- c. As a demonstration of the importance of isoionic pH balance, the pilot plant conducted experiments in February, 1968 utilizing different levels of Grenatina DEIA Type A gelatin in the 389 copolymer formulation. The resulting resins were lower in bulk density than 389 resin made with the 1:1 blend of A and B type gelatins. (25 to 32 versus 39 to 46 required). This resin was unsuitable for customer handling and processing requirements.

The overall conclusion of this evaluation is that Prominsa should maintain a 1:1 blend of A and B type gelatins in their copolymer manufacture in accordance with the specifications shown in the table of data. The purchase of Atlantic's preblend will give assurance that this necessary requirement is met. An alternative solution would be to import the type B gelatin from Atlantic until a domestic source is available and then blend it with the Gelatina Duché type B gelatin.

H. B. Carr
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HBC:em

Att.

TEST RESULTS

	<u>Gelatina Duché "A"</u>	<u>Gelatina Duché "B"</u>	<u>Atlantic 225B Spec.</u>	<u>Atlantic 275A Spec.</u>	<u>Process Requirement 1:1 Blend Spec.</u>
pH (1% aqueous solution)	4.6	4.2	5.5-6.4	4.2-4.8	4.9-5.7
% Volatiles, Max. (30 min. @ 105°C)	6.9	4.1	12.0	11.0	12.0
Contamination, Max.	17	26	50	50	50
Screen +40, % Max.	46	11	5	5	5
Bloom AOAC (run by Atlantic)	270	275	225±5	275±5	265±5
Viscosity, Mps. (run by Atlantic)	51.0	55.5	53±5.0	53±5.0	53±5.0
Isoionic pH* (run by Atlantic)	8.2	8.3	4.7-5.1	7.0-9.0	5.2-5.6
Ash, % Max. (run by Atlantic)	0.39	0.45	1	1	1

*Isoionic pH is the pH of dialyzed and ash free gelatin in water. It is in the same pH range as the isoelectric point which is the pH at which the net charge on the gelatin is zero. At pH values lower than the isoionic pH, the gelatin will have a different surface charge which will drastically alter its protective colloid properties.