

FOR COMPANY USE ONLY

File - spray drying

DATE June 1, 1972

TEST AUTHORIZATION NO. TA-C-72-415

OFFICIAL PRODUCT NAME Choline Chloride

PRODUCT CODE NO. 147 156 1000 POUNDS PRODUCT PROPOSED 2,800

AREA "Ponsol" BUILDING NAME Spray Dryer #2 PROCESS FILE

TITLE Spray Drying

PREPARED BY: A. H. Pagano A.H.P. RESPONSIBLE FOR TEST AND TEST CONCLUSION: A. H. Pagano H. W. Heath, A. C. Stein

PURPOSE OF TEST: To demonstrate the feasibility of spray drying purchased choline chloride 70% solution to achieve cost savings in the manufacture of Du Pont Basic Yellow BL, a potentially high volume yellow paper dye.

DURATION OF TEST: One charge

STANDARD INVOLVED: TMR-C-72-15

ANALYTICAL CONTROL: ☒ No change ☐ Change described under Test Details

TECHNICAL BASIS FOR CHANGE: OCNB 3001-79, 85; OCNB 2096-33

TEST DETAILS: See attachment.
(Include Safety and Waste Disposal)

Safety: There are no unusual hazards associated with this trial. The procedure has been reviewed with the Area and conforms to area safety practices.

Hazards:

Choline chloride (2-hydroxyethyl trimethyl ammonium chloride) is colorless as white crystals or white crystalline powder. It is hygroscopic and is very soluble in water or alcohol. It is biologically active with the human body requiring 1.5 - 3.0 g. per day.

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SUPERINTENDENT, ANALYTICAL (When Required) DATE

SUPERINTENDENT, DYE QUALITY CONTROL (When Req'd) DATE

AUTHORIZED BY:

JEC <i>JEC</i> 6/1/72	DATE
SUPERINTENDENT, MANUFACTURING (Or Delegates)	DATE

SUPERINTENDENT, TECHNICAL (If Any)

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MU-1752-B-R6

N32971

DUP050467634

It is used functionally in food as a nutrient or dietary supplement.

Dust Explosion Potential

Dry material (200 mesh) did not detonate when tested in Azo Laboratory's spark box. The material did explode at Carneys Point (0.77 g./l. at 10 KU arc) but much less than the "Duponol" ME standard. The material was considered safe and no additional testing was deemed necessary.

	Explosion Pressure <u>ΔP, PSI</u>	(dp/dt) Max <u>PSI/Sec.</u>	($\Delta P/\Delta T$) Avg. <u>PSI/Sec.</u>
"Duponol" ME Standard	95	4000	1800
Choline Chloride Powder	72	1420	515

Waste Disposal

Dust Emission - A negligible amount of dry product is expected to be released to the atmosphere in the building since it is being loaded as a 70% aqueous solution. Because of the extreme hygroscopicity of choline chloride, any dust passing through the Aerodyne separation after drying will be picked up by the water scrubber.

Liquid Wastes - Minor amounts of choline chloride will be washed to the ditch during water clean-up of equipment.

Test Details

1. With agitation on, charge the spray dryer feed tank with the weight of choline chloride 70% solution specified by supervision.
2. Dry the solution under the following conditions:

Drying air: Will be determined by slurry feed rate per normal operating procedure.

Outlet air temperature: Start run at 200°F. and raise as necessary to 250°F. to get product to less than 2% moisture content.

Steam pressure: Adjust as necessary to get desired slurry atomization conditions.

Choline chloride 70% solution was satisfactorily dried at 572°F. inlet and 257-268°F. outlet temperature in a laboratory spray dryer. Product quality was satisfactory in that it was successfully converted to good quality (spectral and dyetest results) Du Pont Basic Yellow BL.

The m. p. of choline chloride is ~464-472°F.

Since choline chloride is hygroscopic, it is necessary to dry to $\leq 1.5 \pm .5\%$ moisture. The product is a free flowing solid at this moisture content.

3. Pack out the dry product in foil/polythene lined open head drums (FDF-303-9030) at 200 lbs. net. Add a bag of CP-16 desiccant (137-925-1000) after filling to net weight and just before closing drum lid. Label drums as

Choline Chloride, Dry

Lot _____

"Desiccant Bag Inside"

HYGROSCOPIC - DO NOT OPEN UNTIL READY TO USE

4. Collect sample by following standard sampling procedures for drying dyes. Hold 8 oz. sample for J. L. analysis.

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