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To: .Mr. D. B. Knudson Date: May 25, 1988

From: .H. Alonso H. Alonso/a

C88-08075

Subject: .MONTHLY DEVELOPMENT SUMMARY - MAY 1988

1. PROJECT ART

Supercritical Fluid Process Development - Preliminary optimization of absorber column efficiency vis a vis potassium-citrate application level, was completed. The process meets the 97% extraction target at 12% potassium-citrate application level and 35% OV. This represents a significant reduction from the previous target of 17% potassium-citrate add-on. Flavor evaluation of extracted filler gave acceptable subjectives. The impact of this optimization on post-ART stem processing (i.e., RL sheetmaking, direct inclusion) is being evaluated.

A test with CRS absorber at 38% OV and no potassium-citrate addition gave only 76% nicotine reduction at standard operating conditions with DL blend tobacco. This confirms that acidified stems are important in the removal of nicotine from supercritical CO_2.

Heat transfer data on a "cooling" heat exchanger was obtained in the pilot plant. Design information was conveyed to Engineering for final design and price quote. This heat exchanger is expected to increase the absorber efficiency by using a cooler temperature stem bed, compared to the extractor temperature.

A series of runs was completed to investigate the level of nicotine extraction obtained at M/M of 100, 140 and 200. DL blend tobacco and CRS absorber were used at standard conditions, i.e., 2.5% AB, 12% K-citrate, 3800 psi, 140°F. Extraction efficiencies of 95, 96, and 97 percent were reached at the respective m/m levels.

Filler Process - Trials were conducted utilizing a VT separator in the MC to separate clumps from post-ART filler for potential treatment as a sidestream. After determining the proper air flows, an excellent separation of clumps was achieved, as the heavy fraction contained almost no free filler. Testing will continue in this area to determine scale-up factors for possible installation of a VT separator installation in the commercial facility. Also, evaluation of a treatment method (steam cylinder) for the separated clumps will be conducted.

2. AB-TREATED DIET

Expansion runs were conducted using DIET feedstock cased with 0 (control), 2, and 3% ammonium bicarbonate to determine analytical and

subjective effects. Chemical results showed similar alkaloid reductions for the three trials (from approximately 2.9% nicotine to 2.1%). Soluble ammonia levels were reduced from .40 to <0.1 percent through the expansion process for the 2% AB add-on run, and from 0.70 to .16% for the 3% AB run. Cigarettes have been made for subjective evaluation.

3. BINDER DEVELOPMENT

A meeting was held with L. Gregory, J. Nepomuceno, and P. Martin to discuss R&D support for the foam bound ends project in the area of binder formulation. To date, a 4% NaCMC/2% licorice binder has been used successfully to reduce loose ends. However, the foam appears to take several minutes to collapse which would cause problems in the pack. This collapse should be directly related to foam stability. The lab will begin to manipulate binder composition and evaluate foam stability with the intent of setting up a suitable testing procedure at the foamer in the Engineering lab.

In support of the foamed bound rod process, cigarettes were injected with solutions of maltodextrins from three different manufacturers (Staley, Grain Processing, and Amaizo) for subjective evaluation. Each manufacturer utilizes different processing techniques involving acid, enzyme, or a combination of acid/enzyme hydrolysis.

4. HUMECTANTS

Casing/aftercut formulations for G-free blends are in the process of being reformulated prior to remake of POL cigarettes.

Production PG/glycerin-free RL and RCB sheets have been made into 100% cigarettes for subjective screening. PG/glycerin-free casings and aftercut are being formulated for Semiworks blend evaluations.

Pilot RL sheets containing individual humectants (PG, glycerin, isosweet and no humectant) have been made in quantities sufficient for Semiworks survivability runs.

5. RL PROCESS DEVELOPMENT

Dry Flavor Replacement - New liquid flavor samples from the two preferred suppliers show analytical differences. Additional samples have been requested to address this question, and for shelf life determination.

6. ASTA RECONSTITUTED TOBACCO

Trials began in Tarragona the week of May 9, 1988. The TMCI plant has made sheet with favorable physical properties using the PM RCB formulation. Results to date have shown a significant impact of ground particle size on proper sheet formation. Dust ground to less than 200

mesh made a more uniform, less coarse sheet, when compared to the normal particle size of 60 mesh. The test program will conclude the first week of June. An intermediate particle size (120 mesh) will be evaluated, in addition to aging vs non-aging comparisons. Also, sheet will be made with alternative flavor systems for use in Spanish brands.

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