

(SECRET)

EXTRUSION

The R&D Centre extrusion programme has been running since 1986, although a small amount of exploratory work was undertaken in 1984. It is based on the APV-Baker MPF 50:15 food extruder adapted to process tobacco or other organic or inorganic materials.

The programme has concentrated on the evolution and development of a reconstituted tobacco material derived from factory offal (Project DEER), although experimental work has demonstrated that a wide range of other materials, some combustible, can be produced e.g. for AIRBUS, for filters etc.

DEER has a formulation based mainly on tobacco waste and starch with small amounts of cellulosic binders which allows the extrusion of a thin foamed sheet of extrudate. This sheet is shredded to produce a cut product resembling tobacco for add-back at the end of the primary process. The shredded material is inherently flexible and resistant to dusting which aids its performance during cigarette manufacturing, avoiding degradation. X

Extensive testing of the product and process has revealed that little, if any, chemical change occurs to the tobacco in the extruder. Nicotine is not lost, because operating temperatures are low. In cigarettes there is little difference in smoke chemistry between cigarettes with and without DEER inclusion. This was reflected in biological testing both internally and at Hazleton laboratories. AGP approval for use of DEER at up to 20% inclusion has been given. There is no loss of firmness in cigarettes when DEER is substituted for whole blend up to 15%/17%. Ends fall-out, static burn rate and coal shape and retention are unaffected. Repeated panel testing of products containing DEER from same style offal have not revealed any detectable differences when compared with regular brands.

Worldwide patent coverage has been sought for DEER.

The DEER core-plant has a capacity of 150 Kg/hr. depending on offal density and costs in the region of £200,000. Larger scale could be used if needed. The material recipe, fixed for AGP clearance, has proven robust. Only one of twenty (20) offals evaluated has forced a slight revision. DEER cost in the U.K. is 38p/Kg ± or 35% of SRT cost.

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The first production plant has been commissioned in Montreal with full transfer of the know-how. Souza Cruz and Singapore Tobacco have plant on order, with Kenya, BAT(UK&E) and others moving swiftly to that position.

Where tobacco legislation exists, steps are being taken to ensure DEER ingredients are on approved lists. A recent submission to the ISCSH was made in the U.K.

Derivatives of DEER are being evolved under FLITE (the addition of casings and flavours) and AMTECH (effecting Maillard reactions), the latter currently aimed to produce a match for RCB in 'Belmont' (Venezuela).

One of the highest priority new projects in R&DC is EPCOT, which seeks to produce a one-piece foamed extruded cigarette in which the foam structure is substantially open-celled and can be controlled to give appropriate mechanics and physical qualities.

In this new technology unprocessed tobacco is ground then blended, mixed with starch and binders and fed directly to the extruder. Following extrusion through a small circular die and expansion, the rod is cooled, sized and fed directly to a cigarette making machine garniture for enrobing in paper and tipping if needed.

Effectively the whole of primary processing is eliminated and secondary machines much simplified. The financial implications are enormous. PP&D have already estimated that such a plant producing 2.2 billion cigarettes per annum could allow capital savings of £5.5 million. At the same time there would be a great reduction in manpower need, the elimination of tobacco waste, significant reductions in the need for space and large savings in buildings and land requirement.

Longer term development of a successful EPCOT product could be expected to include the incorporation of specific materials to reduce sidestream, Ames activity etc. or significantly alter the burning characteristics of products to meet future consumer or legislative needs.

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