Confectionery items such as jelly bean centers, candy corn, marshmallows, starch gums, caramels, nougat, gummies and cream centers may be manufactured using starch moulding techniques. At several stages during the manufacture of these products simple holding operations are required, variously called setting, stoving, resting, curing, drying, aging or conditioning times. The amount of time spent in making a jelly bean is staggering and the work-in-progress at any one point in time monumental (O’Mara, 1994). Confectionery manufacturers are interested in reducing holding times to improve productivity and reduce work-in-progress. However, for any one product, there is no thorough understanding of the physical processes occurring during these periods. The phenomena involved may include cooling, drying (moisture removal), moisture equilibration or redistribution, gelation (setting), crystallization or a combination of these depending on the product.

The confection must be fluid enough at depositing for good shape definition and to prevent tailing. This often requires casting at a moisture content greater than desirable in the final product. Products that cannot be cast at their final solids level need a drying step following depositing, with moisture exchange between the confection and its environment. This is a dynamic process involving the candy, moulding starch and the air that surrounds them. During the period that the product is in contact with the moulding starch, moisture content and temperature are changing. The rate at which starch adsorbs moisture is comparatively slow and the dynamic relationship of the product, the starch and the atmosphere has … never been investigated (Seager, 1991). The rate determines, in economic terms, productivity of the process.

Because of their versatility, starch moulding operations are ubiquitous in the confectionery industry. However, previous authors have focused on the product, moulding starch or equipment (especially the mogul). While these papers are very good, questions still remain. This paper will emphasize the central role of water. Unlike in most foods, water is a minor constituent of confectionery — but one that has a major impact.

Most of the fundamental information on starch moulding hasn’t changed substantially since the papers of Krno (1948) and Brock (1950). In this paper we will attempt to convey an understanding of the underlying physical basis for starch moulding operations, with emphasis on dynamic (i.e., rate) processes.