to control the sensible cooling apparatus. Functionally, the relative humidity control may consist of one of the following:

1. *Stop—Start*—Where the humidistat starts the dehydrator on rising humidity and stops it on falling humidity.

2. *By-pass*—Where the humidistat modulates face and by-pass dampers located at the wet air inlet of the dehydrator. Thus the quantity of air passing through the dehydrator is proportioned in accordance with the change in latent heat load.

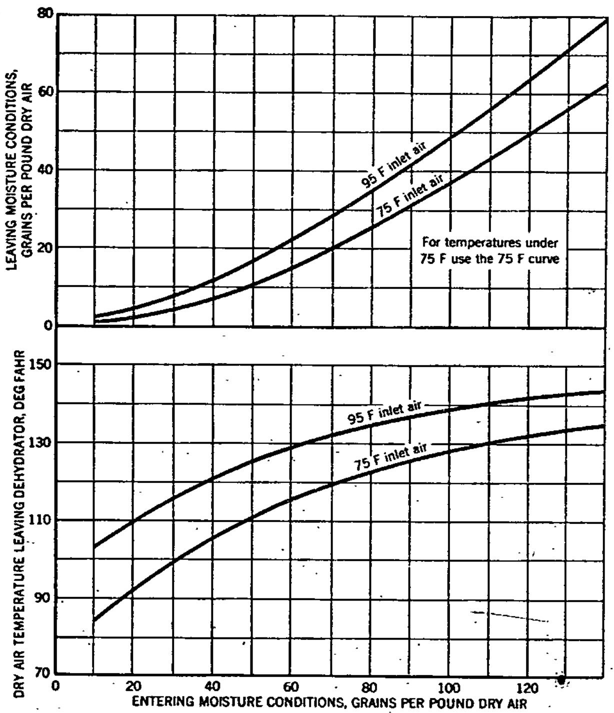

FIG. 7. ROTATING BED DIRECT GAS FIRED TYPE SILICA GEL DEHYDRATOR PERFORMANCE DATA

3. *Vapor Pressure Control* (used with liquid absorbents)—Where the humidistat directly controls the temperature or concentration of the contacting solution, thereby matching the latent heat removal to the load requirement.

EQUIPMENT PERFORMANCE

It is recognized that, whereas the curves relating temperature and vapor pressure of the several dehydration agents (Figs. 1, 2 and 3) accurately define the equilibrium limits for these materials, these curves cannot be used for predicting performance of available equipment. This

occurs because (*a*) the materials themselves can only be utilized efficiently within certain ranges of moisture concentration, and (*b*) the degree to which the vapor pressure of the air being treated approaches that at the surface of the material depends upon the completeness of the contact. It is obvious, for example, that the thickness of a bed of solid adsorbent for a given air flow will have a profound effect upon the degree of moisture removal attained. However, it will have an inverse effect upon the power required to drive air through the bed. It must also be borne in mind that the moisture removal efficiency of all solid adsorbents and absorbent solutions is related to the temperature of the medium as well as to its state of unsaturation. On the other hand, it will be noted that the lower limits of dehydration, which can be obtained with absorbent solutions, are likely to be controlled by the equilibrium dew-point at the lowest temperature at which the solution will resist freezing or crystalization. For this reason, actual moisture removing capacity is determined from performance curves of the several materials under practical conditions of temperature, concentration and contacting efficiency as shown in Figs. 7, 8, 9 and 10. While these curves by no means explore all the

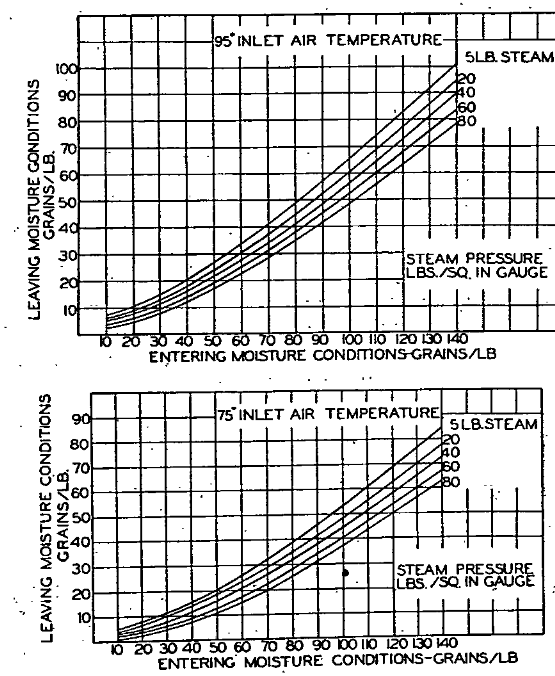

FIG. 8. SILICA GEL DEHYDRATOR PERFORMANCE DATA STEAM ACTIVATION TYPE