I. Introduction

Vacuum is classified by the American Vacuum Society as follows:

Atmospheric Pressure:	760 mm Hg (absolute) or 0 inches Hg (vacuum) or 14.7 psi (absolute)
Low Vacuum:	From "Atmospheric Pressure" to 25 mm Hg (absolute) or 28.95 inches Hg (vacuum) or .484 psi (absolute)
Medium Vacuum:	From "Low Vacuum" to .001 mm Hg (absolute) or 1 x 10^{-3}Torr or 1 micron
High Vacuum:	From "Medium Vacuum" to 1 x 10^{-6} mm Hg (absolute) or 1 x 10^{-6}Torr or 1 x 10^{-3}micron
Very High Vacuum:	From "High Vacuum" to 1 x 10^{-9} mm Hg (absolute) or 1 x 10^{-9}Torr or 1 x 10^{-6}micron

II. Design Features

The inherent design features of the Bray/McCannalok valve make it ideally suited to vacuum service.

Seating - Tha cam action of the offset stem drives the disc tightly into the TFE seat, compressing a completely encapsulated O-ring. The TFE terminates in a washer face clamped firmly between the body and seat retainer to effectively gasket the body to retainer joint.

Stem Seals - Multiple TFE stem seals provide tight seal under vacuum conditions.

Completely Unlined - No plastic or elastomeric liners are used. Potential outgassing or ballooning of such liners is eliminated.

Single Seat - There is virtually no internal cavity space. Rapid pump down and blank off are assured, with the valve in the open or closed position. Standard off-the-shelf Bray/McCannalok valves with TFE seats are recommended for vacuum service down to .02 mm Hg absolute pressure, or 20 microns. This pressure level covers many industrial vacuum services without special preparation.

Specially prepared valves are recommended for vacuum service down to 1 x 10^{-3} mm Hg or 1 micron absolute pressure. Under favorable conditions these valves serve well in the high vacuum range, down to 1 x 10^{-6} mm Hg absolute pressure. The retainer end of the valve should be placed on the high vacuum side of the line. On specially prepared valves all surfaces in contact with the seat or stem seals are carefully selected to be free of nicks, scratches, dents or other imperfections. Special stem seals are employed.

After selection, the parts are degreased and protected from further contamination until assembled in a clean area. No lubricants are allowed on "wetted" parts. Testing is performed with a freon-nitrogen mixture introduced into the valve through a specific fixture. Each valve is checked for leakage with a halogen snifter. Seat, stem seals, and metal surfaces are checked with the valve pressurized in each

direction in turn. No leakage is allowed. A helium mass spectrometer test with certificate may be ordered at additional cost.

III. Ordering

Specify "preparation for vacuum service." Common construction would be carbon steel body, TFE seats and 316 trim. Other metals may be used where chemical factors may require more special materials. Specify vacuum level and/or other conditions that may aid in preparation and proper material selection.