Emission Control Stem Packings

Today, with considerable emphasis on protecting the environment, fugitive emissions have become a source of great concern and have urged governments of various countries to produce legislation to control air polution by industrial plants.

INTRODUCTION

The USA set the pace for reducing fugitive emissions with the passing of the Clean Air Act 1990 Amendments. This requires the Environmental Protection Agencies (EPA) to develop regulations that will influence the handling of 169 toxic air pollutants. The amendment aims to limit allowable leakage levels from valves, pumps and connectors to 500ppm (parts per million) or less. At present the allowable leakage is 10,000ppm.

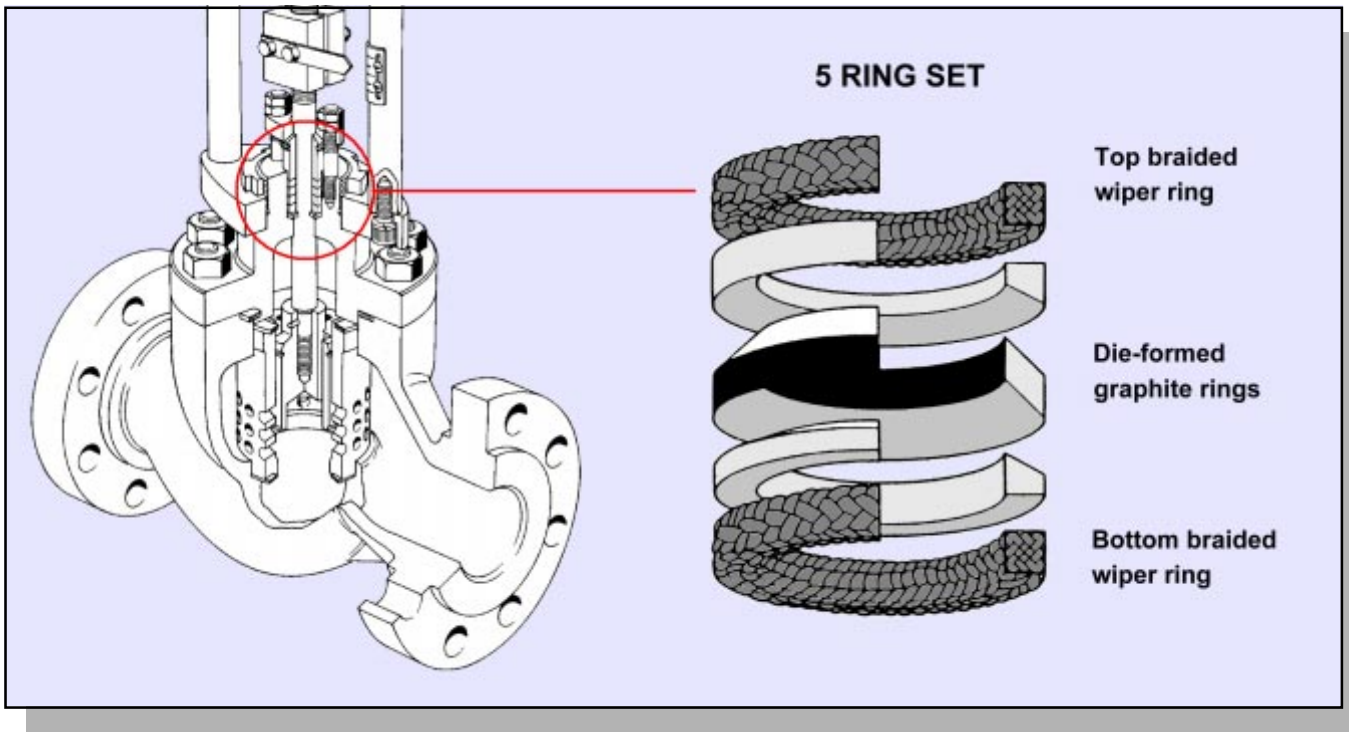
THE ENVIROGRAPH PACKING

The Envirograph packing system used by ABB satisfies the requirements of the EPA regulations, consistently meeting the 'fugitive emissions' demands of less than 500ppm. Key features of the Envirograph include:

- Reduced gland packing leakage beyond that of conventional packings.
- Extended life-cycle.
- Trouble-free operation with reduced maintenance time and cost.
- Suitable for all globe and angle valves.
- Packing configuration gives internal self-adjustment to compensate for wear.
- Can be used in some instances as an alternative to bellows sealed bonnets.
- Suitable grades available for both new and used valve stems.
- Can be retro-fitted to valves.
- Can be fitted into standard packing box dimensions.

Through its simple design, Envirograph offers flexibility of application and user friendly operation, suitable for all ABB control valves and desuperheaters. The various designs incorporate top and bottom braided rings which apart from minimising the graphitic deposit on the stem, compensates for wear in the packing.

Figure 1. Envirograph I Packing



Envirograph I is suitable for all new valves.
Envirograph II is suitable for all new and reconditioned valves.
Envirograph III has higher purity braided end rings, making this packing suitable for nuclear grade applications.

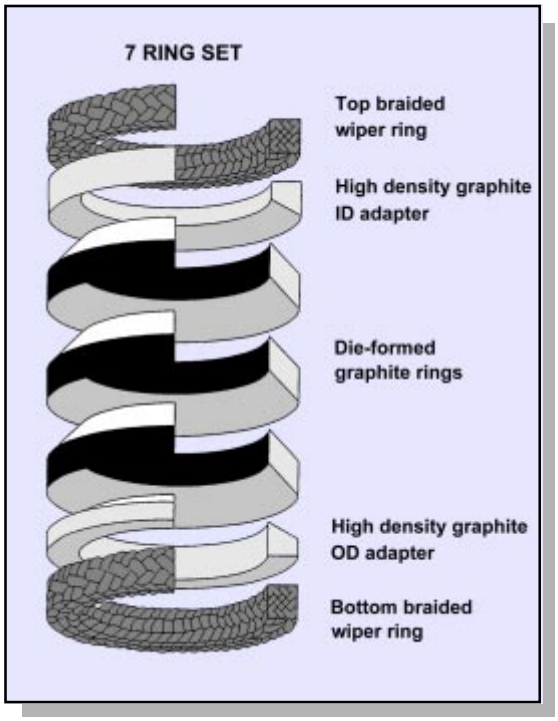


Figure 2. Envirograph II Packing

TECHNICAL DATA

Temperature Range:
-200°C to 345°C (-302°F to 679°F) Oxidising
650°C (1228°F) Steam

pH Range:
0-14 (except strong oxidiser)

Pressure:
In excess of 10,000psi (690bar)

Bonnet options:
Envirograph packings are suitable for standard, extension and cryogenic bonnet design options.

Actuation:
Envirograph packings may be used for both manual and automatic control, either with stepping or continuous movement.

ABB CONTROL VALVES FUGITIVE EMISSIONS TEST PROGRAMME

In an attempt to develop a more environmentally friendly valve, ABB has undertaken an extensive programme of Fugitive Emissions testing. This has involved subjecting various packing configurations to exhaustive cycle testing, and recording the leakage from gland and bonnet joint.

The leakage rate of Helium from these points is measured using a Mass Spectrometer. Helium is used as a test medium due to its superior 'searching' qualities.

Continuing research will also involve in-depth analysis of various packings on the performance of our valves under varying process conditions.