

30 years  
1982-2012

## Case Study: Better Valves, Better Performance

*Since our founding over 30 years ago, Colt's customers have experienced outstanding service life and continuous reliable performance from our MAXIM family of industrial air pollution control technologies.*

Regenerative Thermal Oxidizer manufacturers today utilize a variety of valve designs to control air flow into and out of the RTO system chambers. For maximum performance and efficiency, Colt's two chamber MAXIM II Regenerative Thermal Oxidizers (RTO) utilizes twin HTP Poppet Valves. This Case Study outlines the design advantages of Colt's proprietary HTP Poppet Valves. The outstanding performance and service life of the HTP valves are a result of years of operational experience and development.

A poppet valve consists of four basic components in either a horizontal or vertical shaft configuration:

1. **Housing**
2. **Seats**
3. **Sealing Disc and Shaft**
4. **Inlet and Outlet Manifold**

Colt's HTP Poppet Valves are a horizontal shaft design, manufactured from a variety of materials based on the application requirements, including A-36 carbon steel, 304 and 316 stainless steel, as well as more exotic alloys such as Hastalloy, and Titanium for corrosive applications.

**Valve Housings** are standard 1/4" A-36 mild steel, with external stiffeners designed for +/- 40" of pressure or vacuum and

continuous operating temperatures to 1000°F. For applications that may require periodic washout of the heat transfer media, bottom drains are provided in the valve boxes. A large bolted access door is provided for annual internal inspections or access to the shaft rollers, discs, and valve seats.



**The Valve Seats** are standard in 1/4"- 2" x 2" A-36 mild steel rolled angle. Any alloy can be provided as an option. The valve seats are fabricated, CNC machined and drilled for the required bolt pattern, and the sealing edges are precision ground to +/- .005". The seats are installed in the centerline of the valve shaft on each side of the valve housing with parallel tolerance of 0.05". The seat spacing varies with the RTO design flow rate, and ranges from 4" for very small- 1,500 scfm process exhaust volumes, up to 24" for 90,000-100,000 scfm flow rates. The valves come

standard as a single precision ground seat, with dual purged seats available as an option.

**The Sealing Disc** is standard in 10 Ga. A-36 mild steel, with 1/4" backing plates on each side to strengthen the disc. The disc is precision ground to our specifications, and designed to deflect upon contact with the seats to insure a leak free seal. The disc is designed for continuous operating temperatures to 1000° F.

**The Shaft Assembly** is standard as 2" diameter precision machined, mild steel. The one piece shaft utilizes dual 8" diameter x 1/2" thick machined mild steel mounting hubs secured to the shaft by dual threaded jam nuts tacked to the shaft to locate and secure the sealing disc assembly. The shaft is supported internally by two (2) 5" diameter self-lubricating guide rollers mounted on either side of the valve seats. The shaft rollers support and guide the shaft during each valve cycle. The rollers are machined from Cor-Ten steel and utilize a Delrin bushing with a 316 SS roll pin. The HTP valve assembly is designed for over 1,000,000 cycles.

For additional information on any of Colt's quality products and services, please contact us, at 972-385-7770.