

SYNLOOP AMMONIA PLANT HYDROGEN LINE

Blue ammonia is produced using hydrogen derived from natural gas, with the associated CO₂ emissions captured and permanently stored. In ammonia production facilities, reliable valve performance is essential to maintaining process safety, plant availability and operational continuity.

For a major 3,000 MTPD Ammonia Synloop Project in Texas, AJ Series 985 triple eccentric butterfly valves were selected for hydrogen service on a hydrogen feed line connected to the ammonia synthesis unit.

The ammonia Synloop receives hydrogen and nitrogen and converts them into ammonia under controlled process conditions. Within this application, hydrogen service places particularly high demands on sealing integrity and material selection due to the small molecular size and high diffusivity of hydrogen. The specified pressure and temperature conditions, together with stringent safety and environmental requirements, called for a dependable isolation solution capable of maintaining tight shut-off and long-term operational integrity while minimising maintenance requirements.

The AJ Series 985 triple eccentric butterfly valve was selected to meet these requirements. Its triple-offset geometry provides a friction-free sealing action, minimising contact and wear between the sealing surfaces during operation

while supporting reliable tight shut-off over time. Carefully selected materials and dedicated engineering validation further enhance the suitability of the valve for demanding hydrogen applications.

For this project, AJ Primary valves in 10" with short double flanged body, rated ASME Class 150 and manufactured in ASTM A351 Grade CF8M stainless steel, were supplied. The valves were configured according to the project-specific process requirements and equipped with pneumatic actuators.

The selected solution provides reliable isolation, reduced sealing wear, and consistent long-term performance for the hydrogen feed service within the ammonia synthesis facility.

Application

Synloop ammonia plant - Hydrogen Feed Line

Challenge

Reliable tight shut-off, hydrogen-compatible material selection and long-term sealing integrity under the specified process conditions

Solution

- AJ series 985 triple eccentric butterfly valve
- Optimised valve geometry for hydrogen service
- Materials selected for hydrogen service conditions
- Reliable tight shut-off with minimised seat wear
- Pneumatic actuation

