

A New Paradigm in CO₂ Recovery



With the recent installation of its newest CO₂ recovery system, Wittemann has set a new precedent in recovering CO₂ from an ammonia (NH₃) production process. The system was designed, fabricated and commissioned for PAK ARAB in Multan City, Pakistan.

Prior to recovering carbon dioxide, an ammonia-producing plant must first convert natural gas into gaseous hydrogen by means of "steam reforming." Steam (H₂O) is mixed with natural gas, then heated and passed over a catalyst to form hydrogen (H), carbon monoxide (CO) and carbon dioxide (CO₂). Further processing yields a stream of a relatively "pure" CO₂, available as feed stock to the Wittemann CO₂ recovery system.



While the recovery system's mechanical equipment was designed to produce 192 metric tons per day (MTPD) of beverage quality CO₂, the static equipment was supplied for a future capacity expansion to 384 MTPD. The Wittemann equipment

scope of supply included a purification, compression, dehydration, liquefaction, and stripping system, 2x250 metric tons (MT) of bulk CO₂ storage, and five mobile CO₂ transport trucks. In addition to the CO₂ processing equipment, the system included a motor control center, PLC control system with SCADA (Supervisory Control and Data Acquisition), an ammonia refrigeration system, field piping, wiring, and insulation.

Though typically supplied as "stand-alone" equipment, Wittemann combined ammonia-cooled gas coolers, a CO₂ liquifier, liquid CO₂ pumps, and knock-out drums onto several prepackaged skids to minimize the equipment footprint and outdoor installation. Special consideration was also given to reducing power consumption. Unlike many

gas compression systems, which use wasteful gas recycle-and-recompression (at 100% energy use) to achieve turn-down in reduced gas through-put, Wittemann's CO₂ recovery system utilized oil-lubricated screw compressors. This offers turn-down to approximately 30% and lowers power consumption during reduced gas availability.

Not only does the liquid carbon dioxide produced by the Wittemann recovery

system meet or exceed ISBT guidelines for beverage quality CO₂, but the superb design achieves efficiency while providing operational flexibility for the customer.