

CASE STUDY

Pressure Drop Case Study

Properly designed and maintained compressed air systems can result in major energy savings and dollar savings. Mr. Tyler Currie of Van Air Systems interviewed an independent auditor regarding an example of a case in which a manufacturer was able to obtain substantial savings by addressing improper sizing of their piping system.

SITUATION: A manufacturer of commercial and residential HVAC equipment with a production facility in the southern United States needed to reduce its electricity consumption to both lower operating expenses and to take advantage of a utility rebate incentive. In cooperation with its electricity provider, the manufacturer retained energy auditors, including Chris Beals, President of a Denver-based independent compressed air consulting company.

SOLUTION: Beals conducted an audit of the compressed air system and found peak air consumption of 2,909 SCFM with an average operating pressure of 115 PSIG. Between a wet receiver tank, refrigerated air dryer with pre- and after-filters, and the distribution header, undersized compressed air piping, which causes excessive pressure drop, was observed. The undersized piping was four inches. Beals recommended that the manufacturer replace it with six inch piping.

Additionally, during the audit assessment, it was learned that a single pneumatic shear was dictating a system wide pressure approximately 15 PSIG higher than would have otherwise been necessary. The auditors recommended that the shear's pneumatic cylinders be replaced with hydraulic cylinders and upgrades to the air compressors' control system.

OUTCOME: The manufacturer replaced four inch piping during a weekend shutdown, upgraded compressor controls, and converted the pneumatically controlled shear to hydraulics. These upgrades allowed the air system to operate with one less compressor. The modifications also allowed the compressed air system to operate with a lower average discharge pressure of 96 PSIG. One year after the air system upgrades the manufacturer reported eliminating 1,380,000 Kwh of electricity use, which yielded \$216,000 of savings, including utility rebates.