



Belco
2303 Taylor's Valley Road
Belton, TX 76513
(800) 251-8265
FAX (254) 939-2644
E-Mail: Belco@vvm.com
Internet: <http://www.belco-mfg.com>

FIBERGLASS REINFORCED PLASTIC (FRP) DAMPERS

Introduction:

This Document provides information for specifying FRP Isolation and balancing dampers for the water / waste water industry. There are two key criteria for a high quality damper: 1) performance and 2) design and construction. Performance can be measured by testing to ensure that the damper meets published leakage rates. Good structural design and construction methods will result in a damper that provides long term performance at specified pressures and a long service life. This document provides guidance in selecting dampers that meet these criteria.

Performance

To ensure that a damper will perform as intended, it should be tested by a third party to an established and industry accepted performance standard.

AIR MOVEMENT AND CONTROL ASSOCIATION INTERNATIONAL, INC. (AMCA) Standard 500D-98, *Laboratory Method of Testing Dampers for Rating*, is the ONLY standard for testing round fiberglass dampers. This standard requires that dampers be tested in BOTH directions for leakage and in one direction for pressure drop.

If testing is done by AMCA, then the manufacturer is licensed to bear the AMCA Seal. For a manufacturer to retain their license, the product must be re-tested every three years.

All fiberglass dampers supplied should be licensed to bear the AMCA Seal.

Q: Who is AMCA?

A: AMCA was formed in response to concerns over product performance by buyers, specifiers and users of air movement and control devices. More detailed information can be found at www.amca.org

Q: Why should I require dampers on my project be Licensed to bear the AMCA seal?

A: Isolation and balancing dampers are critical to the proper operation of an odor control system. Fiberglass tanks and ductwork have applicable ASTM and ASME standards, which include quality and construction requirements to insure product performance. There are no applicable design standards for fiberglass dampers. AMCA provides such a standard to help ensure consistent quality and performance.

Q: Why not just require AMCA leakage tests be part of the submittal? Why is licensing so important?

A: In the manufacturing process, many things can change over time including materials, methods and most importantly construction personnel. Periodic testing provides assurance that changes have not been made by the manufacturer that result in changes in product performance. Requiring that the dampers be licensed to bear the AMCA seal means that the dampers have been tested within the past 3 years.

Q: How do I make it clear in a specification that all dampers are to be licensed by AMCA?

A: Simply state that "all dampers must be licensed to bear the AMCA seal and current leakage tests are to be submitted". Belco's standard Specification for fiberglass ductwork and dampers can be used as an example.

Design and Construction

Good structural design and construction methods and materials are just as important as performance. This includes two key elements: 1) Corrosion resistance and 2) Durability.

Resin:

For general water/ wastewater applications, most resin suppliers recommend a vinyl ester resin be used and that all exposed surfaces have a 100-mil corrosion barrier. Belco recommends a higher quality and more corrosion resistant brominated fire-retardant vinyl ester resin with antimony trioxide (Hetron 992 or equal) for long service life and a class 1 flame spread rating.

Corrosion Barrier:

The corrosion barrier should begin with either a nexus or c-veil followed by two layers of 1.5 oz chopped strand mat.

Shaft:

Shafts should be Pultruded Vinyl-Ester Rod for dampers below 24" and 316 Stainless Steel for 24" Diameter and larger

Blade and Shaft Seal:

Belco Manufacturing recommends EPDM seals. In our experience, Neoprene seals can become gummy in higher temperature applications and deteriorate over time. Other alternative seals can be substituted. Viton is the most commonly substituted and provides a high corrosion resistant alternative at a premium price.

Bearings:

Bearings should be Graphite filled Telfon

Internal Fasteners:

Belco uses 316 Stainless Steel fasteners. Other alternatives are available, including Hasetlloy, Isoplast, but may add significant cost.

Flanged Ends:

Flanged ends should be sized to match the connecting ductwork. In the case where dampers will attach to HDPE or other ANSI flanges, damper flanges can be sized (OD and drilled) to match those dampers while still meeting the thickness requirements of "duct" flanges (Table 2 of PS 1569).

Actuation:

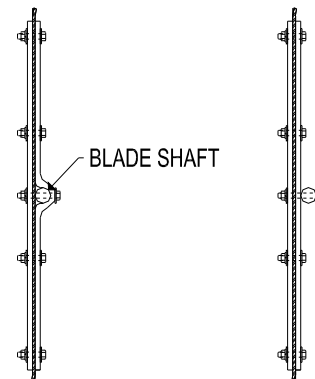
Dampers less than 24" in diameter can be supplied with 316 SS locking quadrant hand lever, worm gear, electric, or pneumatic operators. Torque requirements for these dampers are low enough to provide easy operation with hand lever operators. Dampers 24" in diameter and larger will not seal properly as the operator requires more force. For these sizes, Belco recommends worm gear operators.

Exterior Finish:

Damper exterior finish should be consistent with connecting ductwork. Belco specifies Gel-coat with UV-9.

Shaft to Blade Attachment (Very Important)

The damper shaft should be sandwiched between a two-part blade and some form of support provided to the blade so that the blade does not try to "twist away" from the shaft. Some manufacturers bolt the blade to one side of the shaft. In Belco's experience, when supports are bolted to the blade, the repeated application of torque to operate and close the damper will elongate the boltholes and result in the damper operating improperly. In more serious cases, shaft to blade fasteners have sheared causing complete failure. (See illustration)



SHAFT BETWEEN 2 PART
BLADE

ENTIRE BLADE BOLTED
TO ONE SIDE OF SHAFT