Fluid Sealing Association

STANDARD

FSA-HIPD-803-10
HEAVY INDUSTRY PROCESS DAMPERS
TERMS AND DEFINITIONS

994 Old Eagle School Road, Suite 1019
Wayne, Pennsylvania 19087-1866
Phone: (610) 971-4850
Fax: (610) 971-4859
www.fluidsealing.com
Email: info@fluidsealing.com

For a complete list of FSA publications, please contact:

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HEAVY INDUSTRY PROCESS DAMPERS
TERMS AND DEFINITIONS

ACCESSORY: An accessory is an item purchased by the damper manufacturer And either mounted on the DAMPER at the factory or supplied with the damper for field installation by others. An accessory is generally an item used to enhance or improve the performance of a damper. An accessory may be an ACTUATOR, a SEAL AIR system, a PURGE AIR system, a limit switch, a flow sensor (or system), positioning equipment, or some other item associated with power, sensing or signaling.

ACTUATOR: A mechanical accessory item attached to a DAMPER for the purpose of moving the damper BLADE (s) to either the open position the closed position, or to an intermediate position to achieve flow modulation. An actuator may be manually, electrically, pneumatically or hydraulically powered. The output force of an actuator is delivered in either a linear or a rotary direction.

ACTUATOR OUTPUT: The maximum rated torque capability of a rotary ACTUATOR or the thrust capability of a linear ACTUATOR.

ADJUSTABLE LINKAGE: Drive components whose lengths can be modified without disassembly.

AIRFOIL (BLADE): A double-skinned DAMPER BLADE designed for the purpose of influencing PRESSURE DROP.

AREA OF RESRICTION: The total CROSS-SECTIONAL area of DAMPER components which are permanently located within the gross FREE AREA provided for gas flow through the DAMPER frame. The RESTRICTIVE CROSS-SECTIONAL area of each component is determined by its position when the damper is fully open. Generally, in the full open position, a component will present the smallest area to the direction of the gas flow.

BLADE: The positionable component within the DAMPER FRAME.

BLADE ENTRY SEAL: In a GUILLOTINE DAMPER, the sealing arrangement through which the damper BLADE passes.

BLADE SUPPORT: A structural member inside the duct section of a GUILLOTINE DAMPER frame. The member supports a portion of BLADE when the damper BLADE is in the closed position.

BONNET, OPEN: The portion of a GUILLOTINE DAMPER frame, which supports the BLADE when the damper blade is in the open position

BONNET, FULLY ENCLOSED (OR SEALED): The enclosed portion of GUILLOTINE DAMPER frame, which houses the BLADE when the DAMPER BLADE is in the fully open position.
BUTTERFLY DAMPER: A LOUVER DAMPER having a single BLADE.

CHAIN DRIVE: An arrangement of chain and sprockets for the purpose of bi-directional transmission of force to the BLADE(S) of a GUILLOTINE DAMPER.

CONTROL DAMPER: A DAMPER which has the purpose of modulating or regulating one or more gas flow parameters such as PRESSURE DROP, rate of gas glow, or flow distribution.

DAMPER: A self-contained device for the control and/or isolation of gas flow from one portion of a duct system to another portion of that system; consisting of a FRAME and one or more linked moveable BLADE sections.

DESIGN CONDITIONS: The specified pressure, temperature, and volume the DAMPER is expected to cycle through without a safety factor.

DRIVE FORCE: The force or torque required to move the DAMPER BLADE(S) under specified conditions. The force consists of the dead load, which is the force required to move the DAMPER BLADE(S) in the ambient condition and the live load, which is the additional force required to move the DAMPER BLADE(S) in the OPERATING CONDITIONS.

DRIVE SYSTEM: The ACTUATOR and all components through which force is transmitted to the damper BLADE (S) for the purpose of positioning the BLADE (S).

EXCURSION CONDITIONS: The most extreme conditions a DAMPER can be exposed to. A DAMPER is not required to perform under EXCURSION CONDITIONS. However, the DAMPER shall maintain structural integrity under EXCURSION CONDITIONS.

FABRICATED BLADE: The BLADE shall have a structural steel reinforced membrane with a channel around the edge. BLADE skins shall be attached to the structural members.

FLOW DISTRIBUTION: The pattern of gas flow variation in a duct, usually expressed in terms of gas velocity across a representative cross-section area of the duct.

FRAME: Of a DAMPER, the external portion of the assembly, which supports the BLADE (s), the means of attachment to the duct and provides the means of attaching other specified ACCESSORIES.

FREE AREA: Of a DAMPER, the internal cross-section area of the DAMPER less the area of restriction.

GOGGLE DAMPER: A DAMPER having a single sliding BLADE in which there is a cut-out area matching the inside dimensions of the duct. The DAMPER is open when the cut-out area is moved to a position in line with the duct, and closed when the solid portion of the BLADE is

positioned in line with the duct. The overall construction is similar to that of the GUILLOTINE DAMPER.

GUILLOTINE DAMPER: A DAMPER having a sliding BLADE. The DAMPER is closed when the BLADE slides into position over the duct cross-section area; it is open when the BLADE slides out of the duct area and into the BONNET.

GUILLOTINE DAMPER, DOUBLE BLADE: A GUILLOTINE DAMPER having two parallel blades which operate in tandem, and a separating air space (AIR CHAMBER) which may be pressurized by a SEAL AIR SYSTEM to prevent LEAKAGE of high pressure upstream system gas when the damper is closed.

HEIGHT: A dimensional reference to DAMPER size. In a GUILLOTINE DAMPER, the height is the inside duct dimension which is parallel to the direction of the BLADE movement (draw). In a LOUVER DAMPER, the height is the duct inside dimension that is perpendicular to the axis of the BLADE(S).

ISOLATION: The restriction of system gas flow across the DAMPER size. The extent of ISOLATION provided by a damper varies greatly with application requirements and the nature and type of DAMPER. The extent of ISOATION is usually expressed as LEAKAGE.

ISOLATION DAMPER: A DAMPER having the primary function of ISOLATION.

LEAKAGE: The volume of system gas which can pass through the various flow paths around the components of a closed DAMPER. LEAKAGE shall be defined in terms of Actual Cubic Meters per Second (ACMS), Actual Cubic Feet per Minute (ACFM), kilograms of gas per hour, and pounds of gas per hour.

LEAKAGE AREA: The total area of the various flow paths between the component parts of a fully closed DAMPER.

LEAKAGE, ZERO: A condition in which no system gas passes from the higher pressure side of a duct system through a closed DAMPER to the lower pressure side of the duct system.

LINKAGE: Of a DAMPER, includes the BLADE shaft lever arms and connecting assemblies, which accept operating force transmitted from an ACTUATOR.

LOAD BAR: See BLADE SUPPORT.

LOUVER DAMPER: A DAMPER having one or more BLADE(S) permanently in the gas stream; said BLADE(S) may be rotated between the open and closed position or to some intermediate position.

MODULATE: In a DAMPER, to vary the gas flow rate or pressure drop, or both, across a DAMPER by changing the restrictive effect of the BLADE(S).

OPERATING CONDITIONS: The specific pressure, temperature, and volume when the DAMPER is open or in a modulating condition.

OPERATOR: See ACTUATOR

PACKING: Sealing material used to minimize or eliminate LEAKAGE at a shaft penetration through a damper frame. It is contained in a STUFFING BOX and retained by a packing gland, which may be bolted to or threaded into the body of the stuffing box.

PRESSURE DROP: The change in pressure across a DAMPER under specific operating conditions.

RACK AND PINION DRIVE: A DAMPER DRIVE SYSTEM in which rotary effort applied to a toothed wheel causes linear motion of a mating bar having a compatible tooth form.

RACKING: The twisting of a DAMPER frame out of its intended planar arrangement.

RUNNING TORQUE: Torque required to move the DAMPER BLADE(s) in any intermediate position.

SCREWJACK: A GUILLOTINE DAMPER DRIVE SYSTEM, which uses the principle of the screw to change rotary motion into linear motion in applying opening/closing force.

SEALS: In a DAMPER; any component located on a DAMPER BLADE or FRAME and having the purpose of limiting the amount of LEAKAGE AREA between the mating surfaces of a closed damper.

SEAL AIR: Air introduced into the air chamber of a DAMPER at a pressure higher than that of the system gas. SEAL AIR thus provides a barrier to the passage of system gas across the closed DAMPER.

SEATING TORQUE: Torque required to bring the DAMPER BLADE(s) to their final closed position including overcoming any dead, live, and compression loads of sealing components.

SHAFT: In a LOUVER DAMPER, the component about which the BLADE(S) rotates. In a GUILLOTINE DAMPER, the round bar or tube through which actuation force is transmitted between components of the DRIVE SYSTEM.

SHUT-OFF CONDITIONS: The specific upstream and downstream pressure and temperature conditions when a DAMPER is closed.

SHUT-OFF DAMPER: A DAMPER, which is not intended/used at any intermediate position between fully open or fully closed; sometimes referred to as “on-off” service.

SLIDEGATE DAMPER: See GUILLOTINE DAMPER.

SOLID BLADE: The BLADE shall have a single homogeneous plate without attached stiffeners or braces.

STALL TORQUE: This is the maximum ACTUATOR output under any condition.

STUB SHAFT: A short, non-continuous shaft which extends through, as applicable: the LINKAGE, bearing, STUFFING BOX, or DAMPER fame and into the BLADE of a LOUVER or BUTTERFLY DAMPER.

STUFFING BOX: A chamber surrounding a shaft penetration through a DAMPER FRAME and into which PACKING may be installed to provide a gas-resistant seal around a SHAFT.

SPROCKET: A gear-like disk having teeth shaped to engage a drive chain or rack for the purpose of operating a GUILLOTINE DAMPER.

THROAT SEAL: See BLADE ENTRY SEAL.

UNSEATING TORQUE: Torque required to initiate opening the DAMPER BLADE(s) including overcoming any dead, live, and compression loads of sealing components.

UPSET CONDITIONS: See EXCURSION CONDITIONS.

WIDTH: A dimensional reference to DAMPER size; in a GUILLOTINE DAMPER, the duct inside dimension, which is perpendicular to the direction of BLADE movement. In a LOUVER DAMPER, the duct inside dimension parallel to the SHAFT axis.