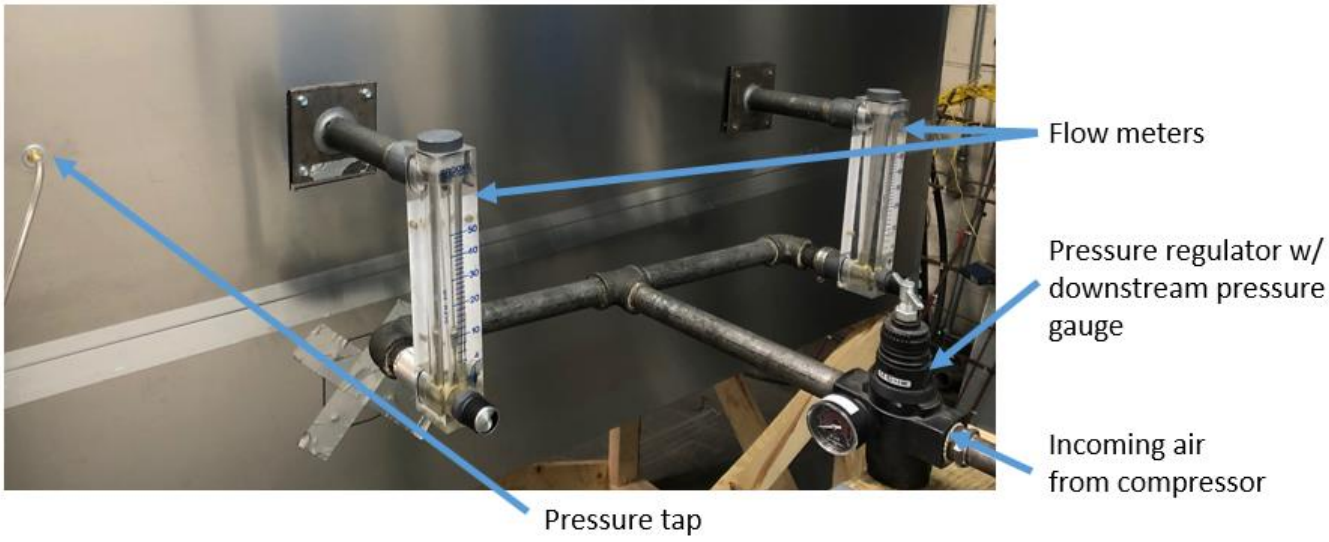
Channel Blender Damper Allowable Leakage and Torque Requirements

CB-Tech Bulletin-113
Rev: 00

Damper Allowable Leakage:
Internal testing at Blender Products has shown the leakage through the blades of the Channel Blender to be less than 3 CFM per ft^2 of damper area at a pressure differential of 1" wc.

The leakage was determined with the test set up described and shown below. Plant compressed air is provided by a Kaeser air compressor model SK20T with a maximum output of 78 CFM at 125 PSIG. Plant air is delivered to a Norgren 5-50 PSI range air-pressure regulator with a maximum flow rate of 360 SCFM to reduce the pressure. The flow is then split through two Brooks Instruments High-Accuracy Flow meters with a 4-50 SCFM range and an accuracy of +/-2%, arranged in a parallel flow configuration and delivered to one of the chambers (OA or RA) of the Channel Blender that has been enclosed using some additional walls. A pressure tap installed on enclosing wall provides a means to measure static pressure. Static pressure is measured using a Dwyer Instruments Analog Magnahelic with a 0 - 2" wc range.



Airflow through the flow meter(s) is then adjusted such that the pressure in the chamber is 1.0" wc.

This testing has shown that leakage through the dampers is approximately 2 SCFM per ft^2 of damper area.

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Damper Torque Requirements:
Testing has shown that 8 in-lb per ft^2 of damper area is sufficient to actuate the dampers and to provide the torque needed to provide the leakage performance stated above.

Testing was done using an Interface Model TS14-12 Torque Transducer that is connected to an Interface Model 9860 Digital Indicator. A special fitting is used to connect the Transducer to the jackshaft of the Channel Blender to measure the total torque required to actuate the damper assembly.

Measurements taken to determine the amount of torque needed to actuate the dampers from an open to closed and/or closed to open position is approximately 2 in-lb per ft^2 of damper area when the units are new. This value was determined to be the same if the blades are oriented vertically or horizontally relative to the ground. As the units are cycled and the bearing surfaces wear in this requirement is reduced slightly. An 8% reduction in actuation torque was observed after approximately 180,000 full open and close cycles.

Torque measurements taken as described above in the Damper Allowable Leakage Section showed that 8 in-lb per ft^2 is needed to provide < 3 SCFM of leakage per ft^2 of damper area.