



DYNA GUARD™

Dynamic Ceiling Radiation Dampers



PATENT PENDING

Dynamic Ceiling Radiation Damper
EXCLUSIVELY FROM

METAL-FAB INC.
An OLYMPIC STEEL Company

What's The Code?



The 2015 International Mechanical (IMC) and Building (IBC) Codes provided new and clear guidance for ceiling radiation dampers (CRDs) that affect architects, engineers, specifiers, contractors and building inspectors. If not recognized and addressed from the beginning of a project, these code revisions could result in confusion, design changes, delays and costly rework for project managers and other stakeholders.

CRDs serve a critical safety element where HVAC ducting penetrates a fire-rated ceiling. When elevated temperatures are detected by a CRD, the damper activates to close off the area of the open ceiling and in doing so maintains the fire-rated integrity of the ceiling. CRDs are typically subjected to air flow movement, which is considered a **DYNAMIC** condition, not **STATIC**.

For decades, UL engineers have discussed this disconnect of test lab results versus real world conditions with engineers of damper manufacturers. Because of this disconnect between lab testing methods and real world conditions that result in an air handler continuing to operate while a ceiling damper has activated due to the event of a fire, Underwriters Laboratories made a significant change to UL555C in January 2011. New language was added to evaluate ceiling radiation dampers for dynamic fire exposures.

During the next cycle change, the International Code Council (ICC) approved language in the IMC and IBC that reflected the changes Underwriters Laboratories published in UL555C regarding ceiling dampers approved for "static" or "dynamic" applications. In short, the IMC and IBC revision required that only "dynamic" ceiling radiation dampers be allowed for applications when air movement is not deactivated at the start of a fire.

Specific code language to be aware of per the 2015 ICC publications include:

- 2015 IMC – Section 607.3.1 was revised to specify that "Only fire dampers and ceiling radiation dampers labeled for use in dynamic systems shall be installed in heating, ventilating and air-conditioning systems designed to operate with fans on during a fire".
- 2015 IBC – Section 717.3.1 was revised to specify that "Only fire dampers and ceiling radiation dampers labeled for use in dynamic systems shall be installed in heating, ventilation and air-conditioning systems designed to operate with fans on during a fire".

Furthermore, changes proposed to the 2021 IBC and IMC have been generally accepted to clarify "other options" to that of a Dynamic CRD due to the lack of such a product being available to the market. Solutions such as smoke detection, control switching means (similar to what is currently offered on fire dampers), and other sensing mechanisms that can be wired electrically from each ceiling damper to control a dedicated air handler (i.e. forced air furnace) are solutions that can meet the most recent national code requirements.

Why DynaGuard?

What makes a dynamic ceiling register damper unique from the typical UL555C dampers currently available on the market is the ability to protect a ceiling membrane from total collapse while air is being pulled or forced through the ceiling. One can imagine the excessive heat above a ceiling membrane that results from pulling air out of a full-scale test furnace that is generating temperatures in excess of 1,700°F. The heat radiating from the damper/plenum box and ducting located between the ceiling and floor assembly can be quite severe when compared to a static condition.



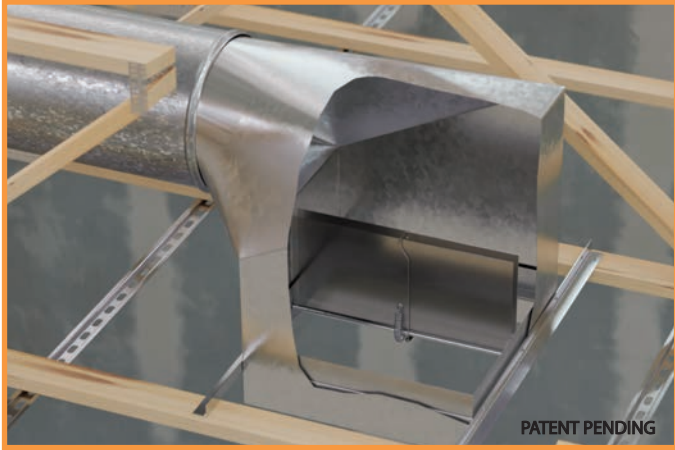
PATENT PENDING

Likewise, for cooler air temperatures that are forced into a room engulfed in flame, a new source of oxygen to fuel the fire under a dynamic condition raises further concerns that cannot be simply swept away without thorough investigation provided by the UL555C damper test standard. Another concern would be whether the ceiling damper activates immediately (say within the first minute of a fire) or remains open for the duration of the test! Cooler air forced across the damper will most certainly change the typical closure time of a damper when compared to the traditional static pressure tests performed in past decades. Underwriters Laboratories was justified in revising the UL555C standard so that fire-resistance-rated floor/ceiling designs could be investigated for such a condition if provisions to turn off an air handler are not part of the building design.

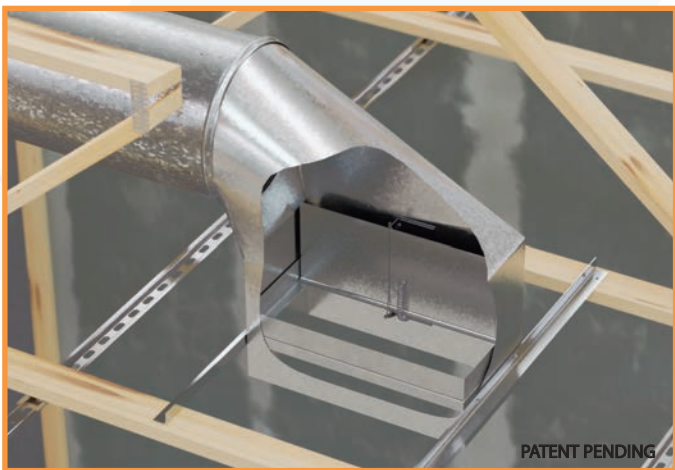


Typical Applications

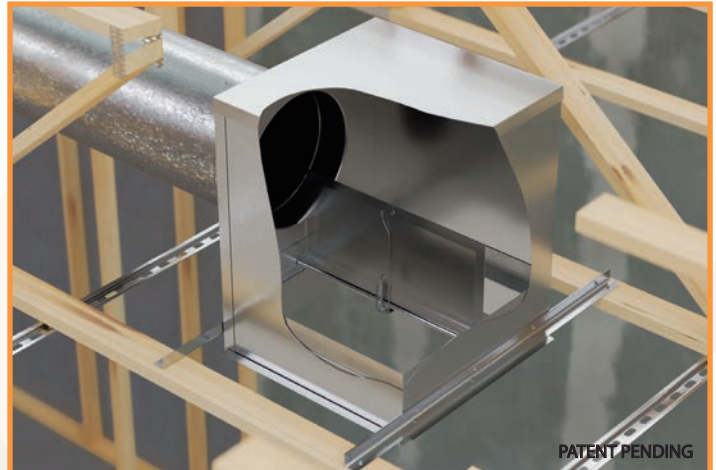
SAME BOOT ALL NEW DAMPER



90° Boot Assembly with Butterfly Blade Design



End Style Assembly with Single Blade Design



Box Assembly with Butterfly Blade Design



The illustration above represents a typical installation of a DynaGuard dynamic ceiling radiation damper.

The

DynaGuardTM

Advantage

Code Requirements

2015 IBC & IMC codes require dynamic ceiling radiation dampers for all applications that operate with continuous blower usage in an event such as a fire.

Cost Savings

Reduces the amount of materials, time and labor used on site. Costs can be reduced by up to 60%.

Saves Time

DynaGuard reduces labor and installation time wiring back to the appliance by offering a passive mechanical answer to a complex electrical control question.

Safety

DynaGuard is the GOLD Standard for dynamic ceiling radiation damper installations that provides an additional level of safety for continuous blower applications.

DAMPER LISTINGS AND ASSEMBLIES

MODEL: DGCD & DGCDSB

Ceiling Radiation Dampers in boot assemblies for use in UL fire resistance floor-ceiling & roof-ceiling designs as listed in the UL fire resistance directory. Metal-Fab ceiling radiation damper assemblies are classified and compliant to ANSI/UL263 testing requirements.

UL Designs - M557 & P581

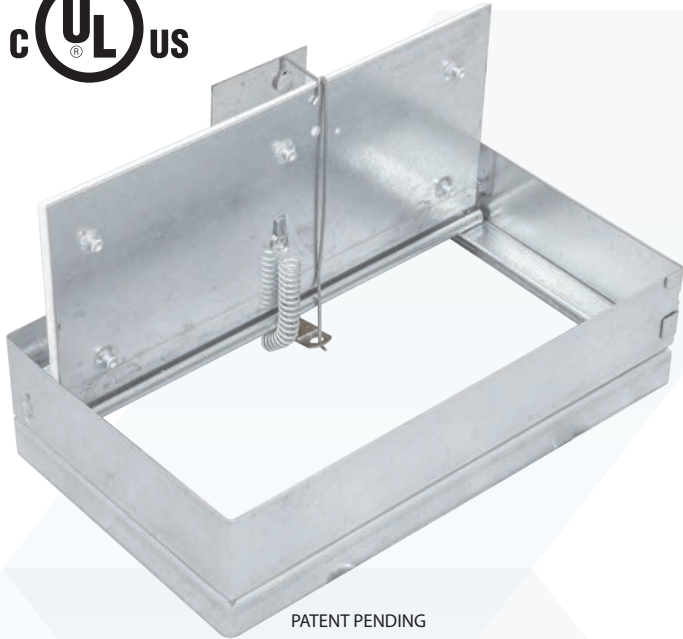
Metal-Fab ceiling radiation dampers are 1-hour fire rated as a Dynamic Ceiling Radiation Damper for the following UL approved ceiling/floor and ceiling/roof assemblies - M557 & P581

Boot/Register Box (Provided by others)

28 GA. Galvanized Steel minimum (sizes up to 14" x 16"). Standard drywall flange supplied by others (optional extended length). Insulation pre-installed or supplied by contractor/installer. Exterior insulated 3-1/2" R 11 minimum thickness fiberglass.

MODEL: DGCDSB
DYNAMIC CEILING RADIATION DAMPER
SINGLE BLADE DESIGN

UL 555C LISTED FOR 1 HOUR



Standard Construction

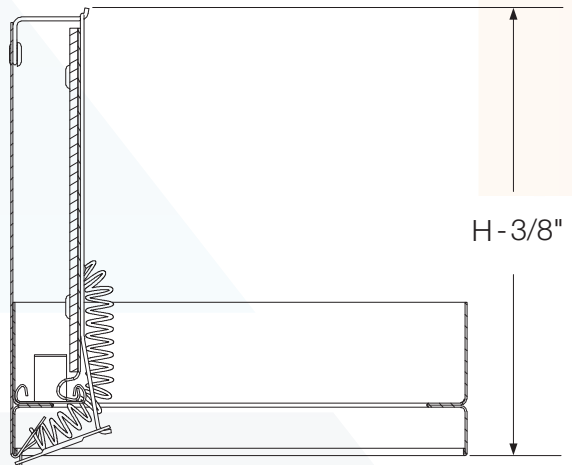
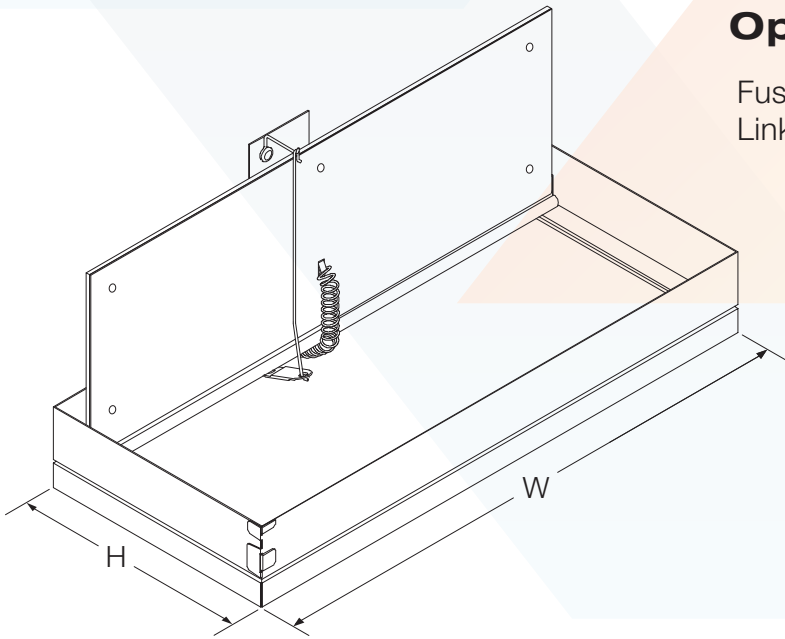
- Frame: Roll Formed, 22 Ga. galvanized steel
- Blades: 22 Ga. galvanized steel
- Blade Insulation: Non-asbestos, ceramic blanket on blades
- Spring: Corrosion resistant steel spring
- Finish: Mill galvanized

Size Limitations

- Sizes: Minimum: 3.75" W or 3.75" H
- Minimum Area: 24 sq. inch (nominal)
- Maximum 16" W x 7" H

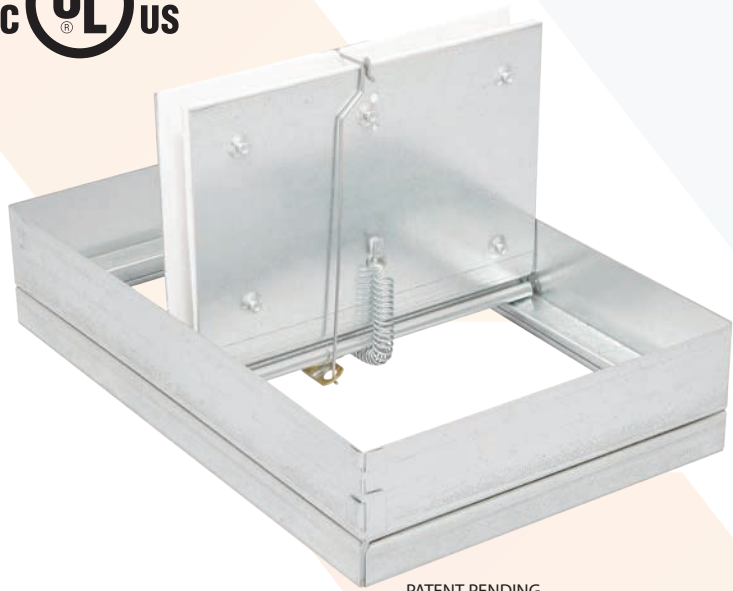
Options

- Fusible Link: Replacement 165° F



MODEL: DGCD
DYNAMIC CEILING RADIATION DAMPER
BUTTERFLY TYPE BLADE DESIGN

UL 555C LISTED FOR 1 HOUR



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Standard Construction

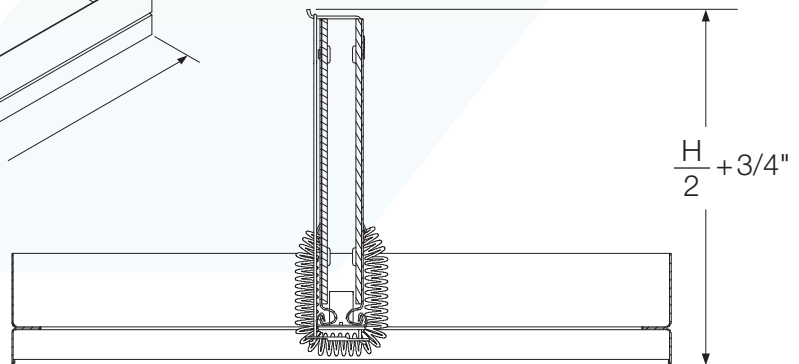
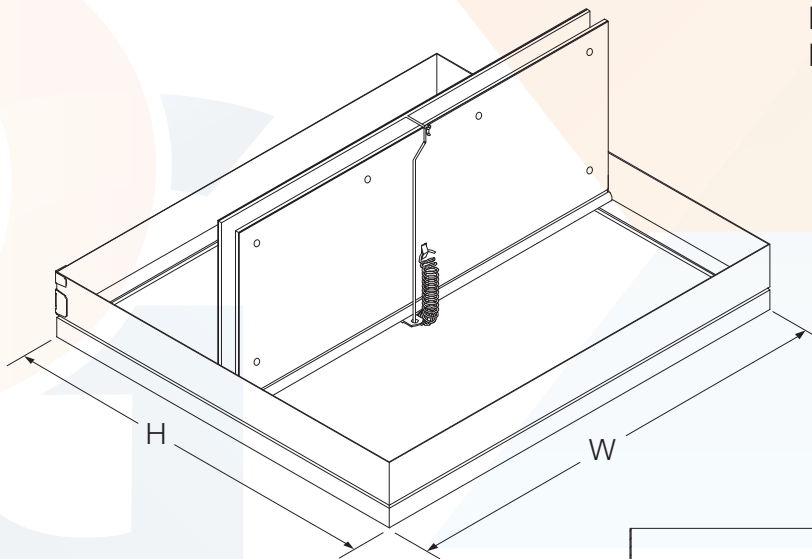
- Frame: Roll Formed, 22 Ga. galvanized steel
- Blades: 22 Ga. galvanized steel
- Blade Insulation: Non-asbestos, ceramic blanket on blades
- Spring: Corrosion resistant steel spring
- Finish: Mill galvanized

Size Limitations

- Sizes: 4.25" W or 5.75" H
- Minimum Area: 24 sq. inch (nominal)
- Maximum 16" W x 14" H

Options

- Fusible Link: Replacement 165° F





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