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Comments on packaged rooftops

Additional submitted attachment is included below.

Daikin Applied Comments: Commercial and Industrial Fans and Blowers (CIFB)

Subject: Docket # 17 AAER-06

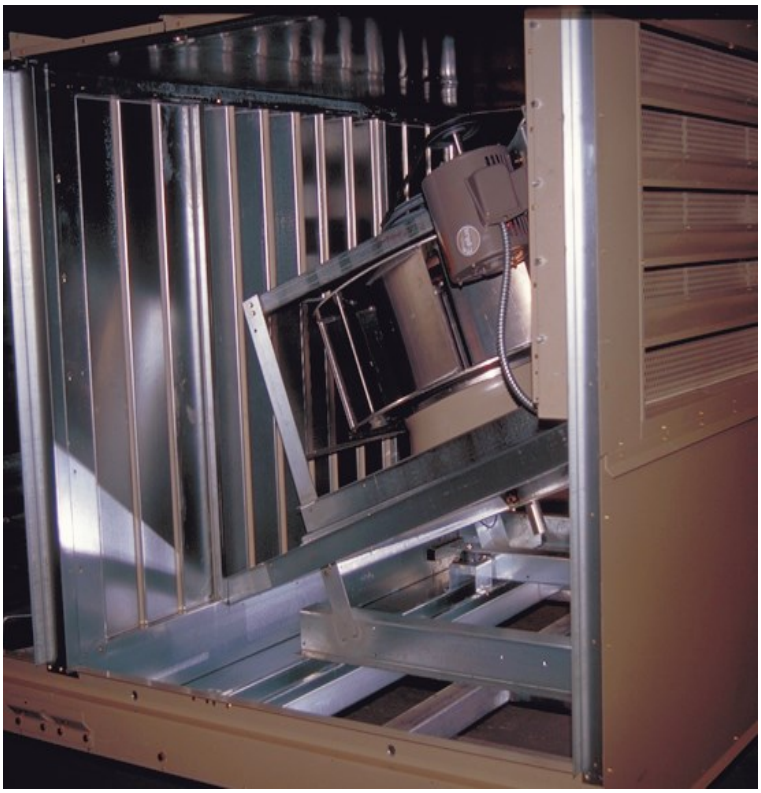
These comments are submitted by Daikin Applied in response to California's proposed appliance efficiency regulations for CIFBs. Daikin Applied is headquartered in Plymouth, Minnesota, manufactures commercial HVAC equipment, employs over 9,000 people, and is a division of Daikin Industries.

California's proposed fan regulation would impact packaged rooftop exhaust and return fans a s well as all fans in very large packaged rooftops with standard capacity > 760 MBH. These fans should be excluded from regulation for the following reasons.

- Regulating component condenser or supply air fans does not save energy, especially when regulating overall unit efficiency, as explained in our separate comments.
- The packaged rooftop, market in sizes > 760 MBH is very small and only about 1% of the commercial rooftop market.
- Changing fans in this product is extremely expensive and time consuming due to consequential issues. Fan changes normally require new seismic, acoustic, heat safety, and performance testing. Manufacturing investment for wider units is significant. Confidential pages 3-5 explain why a fan change on this product costs about $3,000,000.
- These tasks must be sequenced and takes 5 years. 1st = fan design 2nd = fan testing 3r^{d} = DX testing 4th = heat safety testing 5th = simultaneous seismic and acoustical testing, 6th = manufacturing. The heat safety and seismic testing must wait until everything else is proven because it is invalid if the design changes.
- These units are already being redesigned for better furnace efficiency and IEER, due to federal regulations affective in 2023, and A2L refrigerants due to likely California regulations. Fan changes cannot be added at this late date.
- The above-mentioned, $3,000,000 redesign costs will likely be passed on to consumers and lifetime energy savings will only total 33% of the extra cost per the Table 12A calculation on confidential page 5.
- At least service replacement fans must be excluded because any substitution is unsafe. Harmonic vibration and local condensate blow off [or any stratification problem] can only be prevented by testing. Units with gas or electric heat require extensive safety testing whenever a fan is substituted. Plus building owners cannot afford the down time associated with customized substitutions.
- Packaged rooftop EAFs and RAFs need special consideration especially above 100 tons. Compliance is typically required at 42,000 CFM and 1" TSP.
    - Fan catalog review indicates that compliance requires 49" SWSI or equal fans, and 44" SWSI fans do not comply, per confidential page 6.
    - Rooftop catalog review indicates that 1 of 6 existing product lines comply, and many use 44" SWSI fans, per confidential page 6. The rest must be redesigned to have larger fans and most need wider cabinets.
    - Wider cabinets are problematic.
        - They require shipping permits in each state which penalizes cost.
        - Future replacements will not fit on existing curbs. Curb adapters cost $5-10,000.
        - Weight is a serious concern. It is possible that replacements are not possible on some buildings and replacements will cost hundreds of thousand dollars.
    - The importance of controlling building pressure with RAFs and EAFs, their inherent lesser efficiency, and impact on rooftop physical size is submitted as a separate Power Point presentation.

This following photo shows the especially space constrained, return fan option with bottom or back return and back exhaust. Note the following.

- These plenum fans need clearances of 0.5 – 1.0 fan diameters from cabinetry or efficiency suffers. Insufficient clearance may cause a larger fan with better FEI to consume more energy than a smaller fan with lesser FEI.
- Air must discharge in 2 opposite, return or exhaust directions. An unhoused, centrifugal airfoil fan is the most efficient choice.
- There is no extra room between [the left hand, return dampers and the right hand exhaust dampers] or [the drives and the top of the unit.]



Thank you for considering Daikin Applied comments. Please contact me if you have any questions.

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