

mm. Freezing rain is rain that exists at air temperatures less than 0 °C (supercooled), remains in liquid form, and freezes upon contact with objects on the ground or in the air.

Freezing Precipitation

Freezing precipitation is freezing rain or freezing drizzle falling through or outside of visible cloud.

Freezing Drizzle (FZDZ)

Drizzle is precipitation at ground level or aloft in the form of liquid water drops which have diameters less than 0.5 mm and greater than 0.05 mm. Freezing drizzle is drizzle that exists at air temperatures less than 0 °C (supercooled), remains in liquid form, and freezes upon contact with objects on the surface or airborne.

Icing in Precipitation

Icing occurring from an encounter with freezing precipitation, that is, supercooled drops with diameters exceeding 0.05 mm, within or outside of visible cloud.

Icing in Cloud

Icing occurring within visible cloud. Cloud droplets (diameter < 0.05 mm) will be present; freezing drizzle and/or freezing rain may or may not be present.

Supercooled Large Drops (SLD)

Liquid droplets with diameters greater than 0.05 mm at temperatures less than 0 °C, i.e., freezing rain or freezing drizzle.

Supercooled Drizzle Drops (SCDD)

Synonymous with freezing drizzle aloft.

Supercooled Drops or /Droplets

Water drops/droplets which remain unfrozen at temperatures below 0 °C. Supercooled drops are found in clouds, freezing drizzle, and freezing rain in the atmosphere. These drops may impinge and freeze after contact on aircraft surfaces.

Appendix C Icing Conditions

Appendix C (14 CFR, part 25 and 29) is the certification icing condition standard for approving ice protection provisions on aircraft. The conditions are specified in terms of altitude, temperature, liquid water content (LWC), representative droplet size (mean effective drop diameter [MED]), and cloud horizontal extent.

Disposition of Comments

1. Request for Statement That Icing Certification Does Not Imply Unlimited Safe Flight in All Icing Conditions

One commenter requested that the FAA include in the final notice emphasis that certification for flight in icing conditions does not imply that an aircraft has the capability for unlimited safe flight in all icing conditions.

The FAA concurs. The discussion section of the notice has been revised accordingly.

2. Drop Proposed New Icing Intensity Definitions

The arguments in favor of dropping the icing intensity definition are as follows:

(a) Any changes in the definitions would be too confusing (to pilots).

The FAA does not concur. The FAA 1996 international icing conference concluded that the existing icing terminology is confusing. Reasons for this conclusion include:

- The present definition of severe is contradictory to 14 CFR 91.209(c) and 135.227(c) which allow icing-certificated airplanes to fly into severe (uncontrollable, by definition) icing conditions.

- The definitions give no objective standard or rules for pilots to decide which icing intensity the aircraft is experiencing at the moment, or for distinguishing one intensity level from the next.

- With the present definitions, icing intensities are neither measurable nor forecastable, because the definitions contain no quantitative relationship to anything that is calculable or observable, nor any connection at all to the icing atmosphere.

- There is presently no way to relate the icing intensity reported by one aircraft make and model to another.

The proposed terminology responds to the conclusions reached by the 1996 conference.

Icing intensities are of interest to pilots and forecasters, of course, but also to icing engineers, each group having its own experiences, needs, and perspectives. But the present icing definitions are useless to forecasters and engineers because the definitions contain nothing that can be measured or calculated, and they are of questionable value to pilots for the reasons bulleted above. During development of the proposed definitions, it became clear that the three groups often have difficulty comprehending the viewpoints of the others, and this contributes to the confusion. The public comments on the proposals were almost

exclusively from the viewpoint of pilots, and the comments reflect their perspective. The proposed changes were intended to accommodate all three groups and to help overcome at least some of these problems.

To minimize confusion on the part of the pilots, it was decided to keep some of the familiar wording while adding a quantifiable aspect to make the definitions more useful for engineering and forecasting purposes.

(b) The definitions are intended to be reporting definitions and nothing else.

The FAA does not concur. The original intent of the definitions was that they be used by pilots and flight crews to report encountered icing conditions. However, the pilot reports are now being used also by meteorologists to diagnose and forecast icing conditions. If a quantitative relationship between the intensity levels and something measurable and calculable is established, the definitions can be used for reporting, forecasting, and engineering purposes, and their utility can therefore be markedly improved.

(c) The proposal to relate icing intensities to both the wing and tailplane, each with their own icing rates, will give rise to two icing intensities for the airplane instead of just one.

The FAA concurs. The most icing-critical components of the aircraft are, of course, the ones to be concerned about. In the absence of any more critical components, the outer wing is now suggested in the interest of establishing a meaningful and uniform reference location for ice accretions on all airplanes. Typically, the outer wingspan, being the thinnest part of the wing, has the greatest droplet collection efficiency for the wing.

(d) Large airplanes will report lesser icing intensities than small airplanes in the same icing conditions.

The FAA concurs. This is already true with the existing definitions, and will remain true no matter what the definitions may be. However, because of this issue, the proposed definitions identify the leading edge as the reference surface and the PIREP format for icing is being revised to ensure reporting of the airplane type. This information can be interpreted by other pilots relative to anticipated ice accretion and flying quality effects for their aircraft and can meteorologically define the encountered icing environment. The new, quantified definitions are designed to take advantage of the difference in response between large and small airplanes and enable icing intensities to actually be