(iii) The highest weight at which compliance with each applicable flight requirement is shown, and
(2) Not less than the weight with—
(i) Each seat occupied, assuming a weight of 170 pounds for each occupant for normal and commuter category airplanes, and 190 pounds for utility and acrobatic category airplanes, except that seats other than pilot seats may be placarded for a lesser weight; and
(A) Oil at full capacity, and
(B) At least enough fuel for maximum continuous power operation of at least 30 minutes for day-VFR approved airplanes and at least 45 minutes for night-VFR and IFR approved airplanes; or
(ii) The required minimum crew, and fuel and oil to full tank capacity.

(b) Minimum weight.
The minimum weight (the lowest weight at which compliance with each applicable requirement of this part is shown) must be established so that it is not more than the sum of—
(1) The empty weight determined under §23.29;
(2) The weight of the required minimum crew (assuming a weight of 170 pounds for each crewmember); and
(3) The weight of—
(i) For turbojet powered airplanes, 5 percent of the total fuel capacity of that particular fuel tank arrangement under investigation, and
(ii) For other airplanes, the fuel necessary for one-half hour of operation at maximum continuous power.

§ 23.31 Removable ballast.
Removable ballast may be used in showing compliance with the flight requirements of this subpart, if—
(a) The place for carrying ballast is properly designed and installed, and is marked under §23.1557; and
(b) Instructions are included in the airplane flight manual, approved manual material, or markings and placards, for the proper placement of the removable ballast under each loading condition for which removable ballast is necessary.

§ 23.33 Propeller speed and pitch limits.

(a) General.
The propeller speed and pitch must be limited to values that will assure safe operation under normal operating conditions.

(b) Propellers not controllable in flight.
For each propeller whose pitch cannot be controlled in flight—
(1) During takeoff and initial climb at the all engine(s) operating climb speed specified in §23.65, the propeller must limit the engine r.p.m., at full throttle or at maximum allowable takeoff manifold pressure, to a speed not greater than the maximum allowable takeoff r.p.m.; and
(2) During a closed throttle glide, at \( V_{NE} \), the propeller may not cause an engine speed above 110 percent of maximum continuous speed.

(c) Controllable pitch propellers without constant speed controls.
Each propeller that can be controlled in flight, but that does not have constant speed controls, must have a means to limit the pitch range so that—
§ 23.45 Performance

(a) Unless otherwise prescribed, the performance requirements of this part must be met for—

(1) Still air and standard atmosphere; and

(2) Ambient atmospheric conditions, for commuter category airplanes, for reciprocating engine-powered airplanes of more than 6,000 pounds maximum weight, and for turbine engine-powered airplanes.

(b) Performance data must be determined over not less than the following ranges of conditions—

(1) Airport altitudes from sea level to 10,000 feet; and

(2) For reciprocating engine-powered airplanes of 6,000 pounds, or less, maximum weight, temperature from standard to 30 °C above standard; or

(3) For reciprocating engine-powered airplanes of more than 6,000 pounds maximum weight and turbine engine-powered airplanes, temperature at which compliance with the cooling provisions of §23.1041 to §23.1047 is shown, if lower.

(c) Performance data must be determined with the cowl flaps or other means for controlling the engine cooling air supply in the position used in the cooling tests required by §§23.1041 to 23.1047.

(d) The available propulsive thrust must correspond to engine power, not exceeding the approved power, less—

(1) Installation losses; and

(2) The power absorbed by the accessories and services appropriate to the particular ambient atmospheric conditions and the particular flight condition.

(e) The performance, as affected by engine power or thrust, must be based on a relative humidity:

(1) Of 80 percent at and below standard temperature; and

(2) From 80 percent, at the standard temperature, varying linearly down to 34 percent at the standard temperature plus 50 °F.

(f) Unless otherwise prescribed, in determining the takeoff and landing distances, changes in the airplane’s configuration, speed, and power must be made in accordance with procedures established by the applicant for operation in service. These procedures must be able to be executed consistently by pilots of average skill in atmospheric conditions reasonably expected to be encountered in service.

(g) The following, as applicable, must be determined on a smooth, dry, hard-surfaced runway—

(1) Takeoff distance of §23.53(b);

(2) Accelerate-stop distance of §23.55;

(3) Takeoff distance and takeoff run of §23.59; and

(4) Landing distance of §23.75.

NOTE: The effect on these distances of operation on other types of surfaces (for example, grass, gravel) when dry, may be determined or derived and these surfaces listed in the Airplane Flight Manual in accordance with §23.1583(p).

(h) For multiengine jets weighing over 6,000 pounds in the normal, utility, and acrobatic category and commuter category airplanes, the following also apply:

(1) Unless otherwise prescribed, the applicant must select the takeoff,