Instruction dated 24 June 2019 pertaining to microlights

NOR: TRAA1911505J

This instruction applies the amended order dated 23 September 1998 pertaining to microlights.

Its purpose is to provide the elements of the definition of microlights and their flight authorisation procedure.

Preliminary definition:

The French Civil Aviation Safety Directorate (DSAC) is the authority that executes the provisions of the amended order dated 23 September 1998, either centrally (DSAC EC) or at the inter-regional level (DSAC-IR).

In this instruction, the term: "*Organisation*" refers to the organisations authorised to perform inspections and checks in the realm of civil aviation safety by the Minister responsible for civil aviation, in application of articles L.6221-4 of the French transport code and and R.133-5 of the French civil aviation code.

The DSAC can assign certain tasks to the *Organisation*.

1. Preamble:

Microlights are characterised by:

1. a simple design,
2. a proven general robustness,
3. sufficient manoeuvrability when the engine is stopped to make a satisfactorily safe landings in open country,
4. ease of control that does not demand any exceptional qualities on the part of the pilot,
5. easy maintenance. All the parts of the microlight are easily accessible and visible. Maintenance is normally performed by the holder of the identification card, who can call on the manufacturer or a professional, if it is not competent to perform the operation.

A manufacturer that markets a machine that does not meet these criteria must inform its customers in the first paragraph of the user manual.

The design must prefer simple solutions that have already been tried and tested in use.

The design must allow for the easy inspection of the structures by simple disassembly, in particular through the use of inspection flaps. An inspection zone of the fabric coverings can be used to measure the loss of strength over time.

The strength of the critical parts (whose rupture can result in a loss of control) is substantiated either by large safety coefficients, or by substantiation tests or by safety parts (e.g., safety cables in structural elements),

The flight envelope of microlights justifies the simple rules imposed by the administration.

For sophisticated microlights using new or unusual techniques, or techniques that do not comply with the general design characteristics of microlights, the Minister responsible for civil aviation can impose special technical design conditions.

2. Definitions and abbreviations:

Reference unladen weight: the unladen weight, in a given configuration chosen by the manufacturer, enabling all users to easily and precisely deduce the unladen weight of their microlight by a simple calculation. The reference unladen weight must be determined by weighing. The configuration of the microlight when weighed must be clearly defined and easily reproducible.

Reference unladen centre of gravity: the centre of gravity of the microlight in the configuration used to determine the reference unladen weight.

Minimum weight: the minimum operational weight of class 1 and the sub-classes defined by the manufacturer, taking account of the flight qualities of microlights with a low wing loading.

V_{DF}: maximum airspeed demonstrated in flight tests.

V_{NE}: the airspeed never to be exceeded in flight. This airspeed is 0.9 times the V_{DF}.

V_A: manoeuvring airspeed (sudden application of the full movement of the control surfaces).

V_{FE}: maximum airspeed at a given setting of the flaps.

V_H: level horizontal speed at the continuous maximum power defined by the manufacturer of the microlight.

3. Identification form:

Requests for the signing of the identification form are submitted:

- for reference microlights, to the DSAC EC,
- for all other cases, to the corresponding inter-regional DSAC.

Requests must be accompanied by the descriptive elements and the declaration of compliance with the applicable airworthiness requirements, as per the description in Appendix III, or as per Appendix V for class 1 microlights.

The identification form is issued by the Minister responsible for civil aviation and contains the elements mentioned in Appendix IV.

4. Manufacturer's technical file:

The manufacturer's technical file must be made available to the members of the DSAC or of the *Organisation* tasked with checking and monitoring the airworthiness of microlights.

4.1. User manual:

4.1.1. General principles:

A user manual is mandatory for all series-produced single-seater microlights, for all two-seater microlights and whenever a microlight changes hands. It must be supplied with each machine in a clear and precise form that can easily be used by the users. It is strongly recommended for single-seater microlights that are not series produced, and is mandatory in the event of the resale of such machines.

The manual may contain spaces for successive updates, depending on the options or modifications applied after the machine comes into service.

The manufacturer of the microlight, which writes the manual, explains the conditions of use of the aircraft. Regarding the performances, controllability and stability, it may dispense with providing nominal values, on the condition that it provides the pilot with the elements required to appreciate the conditions of use guaranteeing that he does not leave the specified flight envelope.

The conditions of use and the associated limits must remain within the framework of the flight conditions demonstrated by the manufacturer.

4.1.2. Class 1 microlights:

The conditions of use and the associated limits, in particular of the weights, are characteristic of a given wing system, without considering a specific type of trike, harness or engine. The manufacturer mentions any other conditions of use or limits that it deems necessary (characteristics of the anchor points, engine, etc.).

4.1.3. Class 2 microlights:

The conditions of use and the associated limits may be characteristic of a given wing system, without considering a specific trike, provided that the manufacturer defines either the acceptable types of trike, or the characteristics to be imposed on the trike (and in particular the weight limitations, the

characteristics of the hooking points, the engine) and guarantees that the indications in the manual are adapted to these types of characteristics.

4.1.4. Microlights in sub-classes:

The maintenance manual also constitutes the user manual if it includes at least the following information:

- the reference unladen weight,
- the maximum weight,
- the minimum weight,
- the wing surface,
- the acceptable types of trikes or harnesses, or the characteristics to be imposed on the trike or the harness, and in particular the weight, the hooking point(s) and the engine.

4.1.5. Other cases:

The user manual must contain at least the information contained in the template described in Appendix VI.

4.2. Maintenance manual:

a) The maintenance manual covers the following parts of the microlight, which can be treated separately:

- the wing system, the enclosure or the rotor(s),
- the structure,
- the engine and, where appropriate, the propeller,
- the clutch, reduction gear and transmission systems for class 6 microlights.

b) The maintenance of a microlight depends essentially on its conditions of use (environment, type of use) and storage. The manual must define the maintenance for typical conditions and advise the user on how to take account of harsher conditions.

c) The maintenance manual must contain:

- general advice on the maintenance of the microlight,
- the simple periodical operations. It is advisable to group these operations together after 25 hours of flying time or 3 months of use (the first of the two that is reached).
- The list of maintenance operations defined by the manufacturer that must be performed in a workshop designated by the manufacturer.
- the important operations requiring advanced inspections, such as annual services. All the settings should also be checked after the first 10 hours.
- checks to be made after removal from storage, in particular when the microlight has been out of use during the winter.

d) A simple presentation in tabular format is recommended. This table contains the type of inspection and the frequency and must enable the holder of the identification card to add his signature and the date of the inspection. The content of each inspection can be grouped together in a single chapter. Additional forms can be used to help the user to identify any problems, describe the solutions and indicate when parts must be replaced.

In this case, it contains the criteria applying to the evaluation and inspection of the component parts of the microlight (it is strongly recommended to prefer means of inspection that are not too costly and easily affordable for most users), the acceptable tolerances on the parts and components and those tolerances that require the imperative replacement of these parts and components.

drawings or cutaways showing the assembly of the various parts that can normally be removed, and their installation, and any precautions to be taken when installing (tightening torques, seals to be replaced, etc.). If possible, these drawings must indicate the references and quantity of the parts.

These criteria may also be taken into consideration by the manufacturer of the propeller.

e) for powered paragliders, the maintenance manual indicates the above points for each of its constituent parts:

- the wing,
- the engine,
- the trike or harness,
- the attachments.

The manual may be made up of individual parts supplied by the manufacturers of these parts.

5. Changes to the technical characteristics of a microlight:

Any changes to a microlight that modify one of the descriptive elements in its identification form (major modifications) suspend its permit to fly. This suspension remains effective until the holder of the identification form:

1. amends the descriptive part of the identification form and the affected elements in the manufacturer's technical file, or obtains the modified documents from the manufacturer,
2. checks and declares the compliance of the modified microlight with the applicable technical conditions, or obtains this declaration from the manufacturer,
3. sends the descriptive part of the amended identification form and the declaration of compliance to the DSAC-IR.

When flight tests are necessary to validate the planned modification, the applicant can obtain a provisional identification card under the conditions set forth in paragraph 6.2.

6. Identification card:

The request for the identification card is submitted to the corresponding DSAC-IR with the items specified in Appendix I.

The identification card request must be accompanied by the original of signed the identification form, or a copy of the identification form of the reference microlight, certified as authentic by the manufacturer.

6.1. Manufacturer identification card:

The Minister responsible for civil aviation issues a manufacturer's identification card notifying the identification markings of the manufacturer and authorises the use of a reference microlight for in-flight tests, ferry flights or demonstration flights.

The identification marking of the manufacturer is made up of the letter W, followed by the manufacturer's pre-fix proposed by the applicant and accepted by the DSAC, and two numbers.

At each operation, the manufacturer enters the marking in a register, the corresponding machine, its characteristics and the type of operation. In the event of ferry flights, it also enters the place and date of departure and arrival, and the reference of the manufacturer's technical file. This register must be kept at the DSAC's disposal.

The validity of the manufacturer's identification markings is limited to 1 year, but can be increased to 5 years, renewable, if the manufacturer deposits a first manufacturer technical file.

6.2. Provisional identification card:

The DSAC IR issues provisional identification cards and gives notice of the provisional identification markings.

Provisional identification markings are those defined in article 5.2 of the order dated 23 September 1998, preceded by the letter W.

For soft-wing microlights (classes 1 and 5) and sub-classes, the letter W on the wing system is optional.

These markings can only be used for in-flight tests with a view to constituting or modifying the manufacturer technical file.

Provisional identification markings are valid for 1 year and are not renewable, unless the Minister responsible for civil aviation grants an exception.

6.3. Identification card:

The identification card is issued by the Minister responsible for civil aviation and contains the elements mentioned in Appendix II.

7. Applicable technical conditions and the associated demonstration of compliance:

7.1. General principles:

Demonstration programmes must demonstrate the compliance of the aircraft with the airworthiness conditions imposed by the Minister responsible for civil aviation.

The programme covers the airworthiness of the microlight in the entire intended domain of use of the microlight.

The demonstrations are grouped together in a document entitled "Compliance demonstration programme" that gives details of the acceptable means of compliance chosen by the applicant for each requirement. They may be constituted by combining a design file with ground and flight tests, in accordance with the principles set forth in paragraphs 7.1.1 and 7.1.2.

The manufacturer of the microlight performs the tests and makes a record of the results in a report that gives details of the date and place of the tests and any parameters that may have influenced the results.

However, if the manufacturer modifies a microlight that already complies with the regulations, and for which it has the compliance demonstration programme, the manufacturer can simply proceed with the additional compliance, depending on the modification made.

7.1.1. General principles of in-flight tests:

The minimum in-flight test programme determines:

1. the weight limits mentioned in the user manual,
2. the performances at maximum weight described in the user manual,
3. the controllability and stability of the machine in all the weight and centre of gravity configurations in the demonstrated flight envelope, during the following flight phases:
    - take-off, landing (with or without power), up to the cross-wind limits, including on water for microlights intended to be operated on water,
    - transition to hovering (if applicable),
    - hovering (if applicable),
    - forward flight (if applicable),
    - climbing,
    - level flight,
    - diving,
    - turning,
    - autorotation (if applicable).

The results are converted to standard conditions (15°C, 1013,2 hPa).

The speed V_{SO} (if applicable) is measured during flight tests, in the following configuration : engine stopped or at lowest idling speed, minimum power control, propeller in normal take-off configuration, landing gear down, flaps in landing position, worst possible centre of gravity, maximum weight.

V_{SO} is determined by following the procedure below :

- the speed of the microlight must be reduced by means of the elevator until it is slightly above the stall speed, then
- the elevator control shall then be operated so that the aircraft's deceleration does not exceed 1.9 km/h (1 knot) per second until the aircraft has stalled, or, if it has not stalled, until the elevator control reaches its stop position.

The speed V_{SO} is the average of three tests.

The conventional speed value of Vso must be determined in such a way as to ensure that it is below the limits defined in Article 2 of the amended order dated 23 September 1998, and must be included in the user manual.

However, if the microlight is equipped with an anemometer, the VSO speed reported in the user manual, and on the anemometer, must be expressed as indicated speed.

7.1.2. General principles of ground tests:

a) Ground tests are used to:

- determine the technical quality of materials subjected to bending, traction and torsion in the demonstrated flight envelope, and the margins applied to allow for the dispersion of the characteristics of the materials. The characteristics guaranteed by the supplier constitute an alternative means of reaching this objective.

- check the structural strength of the machine and, consequently, validate the hypotheses used in the design file. These tests are called "static tests".

b) The following parts undergo static tests, when relevant to the class of microlight under consideration: the wing system (positive and negative in the presence of asymmetrical shrouds or spars), rotor blades and their attachments, articulations and stops, rotor masts, fins, seats, flight controls (tests performed with mobile parts locked), the engine cradle and tank supports. The presence of an independent observer, or films or photos will provide proof of the proper execution of the tests.

For series-produced microlights, tests will be made at extreme loads, and possibly to the point of rupture, in order to determine the actual safety margin of the reference microlight.

c) However, for amateur builders, the structural strength of the microlight does not have to be globally demonstrated. It may be limited to representative test samples taken from the new parts.

For kits and machines built according to drawings, no static tests are imposed, if the construction complies with that of the reference microlight.

d) The static tests required to cover the different limits of the flight envelope can be broken down into several partial tests, with the appropriate loads for each case. The application of the loads must be representative of reality, because the test can be totally falsified by incorrect loading principles.

The loads take account of the weight of the passenger(s), fuel, major items of equipment (e.g., the airframe mounted total recovery parachute), the engine thrust and inertial forces (e.g., on the belt attachments). The corresponding forces in Newtons are calculated by multiplying each identified weight by the load factor and the ground acceleration (take 9.81 m/s^2).

e) Nevertheless, a number of methods are permitted to facilitate the application of the loads, such as:

- filling the wings with balls made of very light and compression-resistant material, to apply a force to one side only (e.g., on the pressure face for positive loads, with the wing upside down),

- inserting boards between the leading and trailing edges, but with small gaps. The load on each board must then take account of its position in the wing span and the load according to the chord,

- the installation of cloths or soft panels to better distribute the forces,

- loading with bags of sand or shot, whose weight must be checked before the test.

f) The displacements of the structural elements as a function of the load can be measured using fixed plumb lines, preferably positioned at the points of maximum deflection.

g) The tests consist of applying successive loads and checking that the machine is not permanently deformed after the application of the limit loads. At the limit loads, checks can also be made to make sure that the deformations comply with the design file and that the flight controls functional normally.

7.2. Special airworthiness requirements:

a) The Minister responsible for civil aviation can impose special airworthiness conditions that take the particular characteristics of the microlight into consideration.

b) For class 3 microlights with a wing load at maximum weight greater than 30 kg/m², these conditions are established on the basis of:

- sub-parts B (flight) and C (structure) of the CS VLA, or
- the French or foreign airworthiness regulations that formed the basis for the certification of light aircraft, or
- special regulations, as proposed by the applicant, accepted by the Minister responsible for civil aviation.

c) For class 6 microlights, these conditions are established on the basis of:

- the special airworthiness requirements for ultralight helicopters (HUL code published by DGAC),
- the French or foreign airworthiness regulations that formed the basis for the certification of light helicopters, or
- special regulations, as proposed by the applicant, accepted by the Minister responsible for civil aviation.

d) For the sub-classes, the Minister responsible for civil aviation can accept tests made according to other technical safety standards as a demonstration of compliance.

7.3. Specific requirements of in-flight tests:

7.3.1. In-flight tests for class 1 (powered paragliders):

a) The powered paraglider must be assessed according to the following criteria at the maximum weight:

1. behaviour during inflation: characteristic of the elevation (smoothness, progressiveness, regularity),
2. behaviour on take-off: special take-off technique required. If this is the case, it must be specified in the user manual,
3. usability in speed in straight flight:
    a. arms up speed
    b. accelerated speed (trim and/or accelerator, where appropriate)
    c. stall speed, otherwise minimum speed,
4. behaviour when engaging in a turn,
    a. tendency when returning to straight flight (spontaneity),

b. nature of the oscillations (absorption),
c. alternative flight controls (identify the controls and their positions),

5. behaviour when landing:
   a. particular behaviour,
   b. special landing technique required. If this is the case, it must be specified in the user manual,
6. alternative flight controls. Identify them and gives details of their positions and any precautions to be taken when turning and landing in the user manual.

The powered paraglider must demonstrate:

7. pitch stability when using the controls in accelerated flight,
8. pitch stability when leaving accelerated flight.

b) During these tests, the flight controls must remain usable in order to control the wing system.

7.3.2. In-flight tests for other classes of microlight:

The machine must demonstrate:

1. satisfactory longitudinal and lateral stability under all conditions of flight and centre of gravity, while taking account of the particular conditions of use for which it was designed. For multi-axis and suspended microlights, the stick free or trapeze free static longitudinal stability must be demonstrated in stabilised horizontal flight, and the machine must return to the speed range close to the initial range, after applying a push or pull effort.
2. an absence of diverging flutter, up to a maximum demonstrated speed (V_{DF}).

From a stabilised turn at a 45° angle, it must also be possible to make a stabilised turn at 45° in the other direction in fewer than 5 seconds, at a speed equal to 120% of the maximum speed at which level flight can be maintained.

For a simple microlight, the maximum gust speed can be equal to the maximum speed in rough air V_A.

For class 3 microlights with a maximum wing load at maximum weight greater than 30 kg/m², or class 6 microlights, the requirements in terms of performance and flight qualities are described under particular conditions of airworthiness, when they are imposed by the Minister responsible for civil aviation.

7.4. Ground tests:

7.4.1. Ground tests for class 1 (powered paragliders):

For the trike and/or the harness of the powered paraglider and their mountings on the wing, the tests are only made for positive loads, attached to the normal hooking point under the wing. The trike and/or the harness and their mountings must not be damaged after the tests.

The static tests check that the wing system does not suffer any damage in a shock test and a load ramp-up test to the maximum wing load, while taking account of the load factor defined in §7.5.

The static tests check the breaking strength of the shroud lines.

Tests on the wing system that meet the standard EN-926-1 are considered to be acceptable.

7.4.2. Ground tests for other classes of microlight:

Ground resonance tests are to be made on gyrocopters and helicopters that do not used bi-blade rotors with balance bars.

For the trike of suspended machines, gyrocopters for helicopters, the tests are only made for positive loads, attached to the normal hooking point under the wing system.

The load reduction due to the wing weight can be taken into consideration for the wing systems. For suspended machines, considering that Ca is the wing load, a decrease of the linear lift from 2 C_2 towards 0, from the axis of symmetry to the wing span is applied.

The distribution of along the chord will start from the leading edge from 5 C_a towards C_a at 25%, then from Ca to 0 on the trailing edge. In the absence of precise data for multi-axis machines, it is considered that the result of the lift is applied at 25% of the chord and that the distribution on the wing span (for a rectangular wing) is constant (otherwise, refer to the CS VLA).

On each half-wing of a multi-axis machine, the torsion effect on the wing system is ignored, but the load due to the sudden movement of the aileron at the speed V_2 is always taken into consideration.

On the fins (multi-axis machines and gyroscopes), tests are conducted for:

a sudden deflection of the elevation aileron at the speed V_A,

a sudden deflection of the direction aileron at the speed V_A,

an asymmetrical load on the horizontal fin corresponding to the maximum load applied to 100% of one side and to 70% of the opposing side,

a combined load of 75% on the horizontal fin and 100% of the vertical fin.

7.5. Design file and design precautions:

7.5.1. Load factors:

The limit loads for class 2 and 3 microlights are equal to +4 g and -2 g, and +3.5 g for class 1, 4 and 6 microlights. At these values, the flight controls must remain free and the structure must not be permanently deformed after the application of the limit loads.

A global safety coefficient of at least 1.5 (in general cases, and sometimes higher, depending on the materials used) will be applied to the limit loads for the calculation of extreme loads. At these values, the structure must not break, but it can show signs of deformation after the application of the loads. The structure must resist to the extreme loads for at least 3 seconds.

The calculation file must take all the foreseeable cases of use of the machine into consideration.

7.5.2. Choice of materials:

Materials of aeronautical origin will be preferred, whose characteristics are guaranteed and whose quality is checked before delivery. The compliance of the materials must be declared.

7.5.3. Safety coefficients:

The selected materials must guarantee a breaking stress greater than or equal to 1.5 times the stress at the elastic limit in the calculation file and specified by the supplier.

For certain parts, this safety coefficient of 1.5 is multiplied by 2, i.e., a safety coefficient of at least 3 relative to the limit loads:

- cast parts,
- parts that are frequently removed (e.g., for transportation purposes),
- structural or flight control cables, flight control parts,
- parts submitted to high fatigue.

For working parts made of composites, this safety coefficient may be adjusted to 2, if the substantiating parts, the quality of the materials, the conditions of use and the inspections of the quality of the parts are guaranteed by manufacturing management.

7.5.4. Bearing factor:

Meeting this criterion avoids the ovalisation of threads or the crushing of parts when they are in use. A bearing coefficient at the assembly part (e.g., a bolt) of 1.33 is verified for parts subjected to rotation, shocks or vibrations (the stress on the projected surface of the bolt-part contact must not exceed the design yield stress divided by 1.33).

For other assemblies, the bearing pressure must not exceed the limit yield stress.

7.5.5. Assembly by several bolts, rivets, clips or other means:

The forces are never divided uniformly by the total number of linkage parts. Except in the case of a substantiation test, the first bolt is considered to bear a greater load in assemblies made of two bolts in line (e.g., the shrouds).

7.5.6. Absorbing zones:

Zones are required to absorb energy in the event of an impact in order to protect the occupants and avoid any deformation to the structure.

7.5.7. Stress concentration:

Holes in parts or abrupt changes in cross-section can reduce strength by a factor of 3 or even more (e.g., thickness index). Tables exist showing these concentrations of stress.

7.5.8. Corrosion:

Preferably, materials should be used that resist corrosion, or sufficient protection must be provided. Incipient corrosion can cause stressed part to yield at values well below the expected values (phenomenon of corrosion under tension).

7.5.9. Galvanic couples:

The assembly of different natures of metals incurs the risk of galvanic corrosion, which is made worse by saline environments. Materials of aeronautical origin usually have protection that reduces these risks (e.g., anodic chrome oxidation on aluminium alloys). Contact between metals of different natures with any protection is to be avoided, for example by inserting a washer or a plastic shield.

7.5.10. Main flight controls:

No cables with a diameter of less than 2 mm must be used for the flight controls. All the pulleys must have a protection device to prevent the cables from derailing. A safety analysis must explain the consequences of the breakage of one of the parts of the flight controls, indicate the precautions to be taken to prevent the flight controls from jamming (e.g., foreign bodies in the cockpit) and, for class 6 microlights, the precautions to be taken to make sure that the flight controls can withstand alternating stresses and vibrations.

7.5.11 Ball joints:

The use of ball joints poses numerous fatigue-related problems. The use of ball joints must be avoided in critical linkages subjected to bending forces, as must the rotation of the threaded end piece of a ball joint.

7.6. Miscellaneous provisions:

7.6.1. Equipment for special activities:

If necessary, the passenger seat in a two-seater microlight can be removed to allow for the installation of equipment for special activities.

7.6.2. Belts:

If the microlight has seats, they must be equipped with a belt.

7.6.3. Series production, excluding subclasses 2A and 3A:

The following additional precautions must be taken:

- an acceptance procedure of the materials and components must allow their quality to be checked (supplier data sheet) and must allow them to be stored in a way that avoids mixes and assembly errors (e.g., markings with colours or labels) and to be used on a given series of machines to limit verifications in the event of anomalies,
- the type and the serial number of the machines must be clearly identified in order to perfectly understand the delivery standard (problems ordering spares),
- the manufacturer must guarantee the reproducibility of series-produced machines, so that they remain compliant with the model used for qualification purposes (e.g., for composites, resins, fabrics and their direction, the number of layers and the temperatures),
- the manufacturer will establish inspection procedures, even simplified, to check the final quality of the product.

- When the microlight includes critical structural parts specifically designed for the machine and with a limited lifespan, they must have a reference and a serial number, so that they can be monitored during use.

7.6.4. Direction of movement of ancillary controls:

These controls must always be actuated in the forward direction (e.g., the engine speed is increased by pushing the control lever forwards). The switches are cut off when the control is moved downwards. The colour codes used in general aviation should be applied.

7.6.5. Propeller shatter:

Propeller shatter remains possible after impacts with a foreign body or the ground or the failure of a blade. If propeller shatter could damage vital parts, then the latter must be reinforced (e.g., reinforcement of the trailing edge on suspended machines by several seams on a reinforcing strip).

Shatter can also occur when the propeller comes too close to the structure, causing resonance in the propeller.

7.6.6. Assembly errors:

Parts that can be inverted must be marked or equipped with fool-proof devices (e.g., mixing up the left- and right-hand parts of a leading edge).

7.6.7. Propulsion:

The fuel tank must be equipped with filters and a drain system to prevent the fuel from being polluted.

7.6.8. Changing the original materials:

The materials used to build the microlight must comply with those defined in the technical file. Changes can only be made after tests or substantiating calculations that prove the equivalence of the structural strength of the microlight. The person that makes the changes always remains responsible for them.

7.6.9. Minor changes during use:

Users' attention must be drawn to changes that may appear to be insignificant, but that can have serious consequences. For example, adding fairing can make the machine difficult to pilot, drilling a shroud can lead to its destruction in flight, changing the wing of a suspended machine without checking its deflection relative to the propeller.

7.6.10. Designation of a machine:

The identification card specifies the type of microlight, engine and wing system. The manufacturer must provide a name and a reference to avoid any ambiguity or resemblance with another existing machine. Changes to the profile or the aerofoil of a wing system require a different reference.

The manufacturer must also define successive versions of the machine's reference to clearly identify any significant changes made to the machine (e.g., a different engine, changes to the aerofoil, and changes to the material).

8. Applicability overseas

The instruction, including its appendices, is applicable in Wallis and Futuna Islands and in French Polynesia.

9. Execution:

The instruction dated 21 February 2012 pertaining to microlight aircraft is abrogated.

The director of civil aviation safety and the general director of overseas are responsible for executing this instruction.

This instruction will become applicable on the applicability date of the order amending the order dated 24 June 2019 modifying order dated 23 September 1998 pertaining to microlight aircraft.

Signed on 24 June 2019

APPENDIX I - Constituent elements of a request for a microlight identification card

1) An applicant's request for a microlight identification card must be accompanied by:

- for series produced machines, a copy of the identification form, certified as authentic by the manufacturer (serial number and compliance of the machine with the form),
- in other cases, the original of the identification form.

and includes a declaration by the applicant stating the following:

- the identity of the applicant,
- the home port of the microlight,
- the reference of the corresponding identification form,
- a list of any particular activities,
- the possession of the user file (when necessary).

For classes 1 and 2, the serial number is the serial number of the wing system.

2) Upon reception of the completed form, the Minister responsible for civil aviation issues an identification card for the applicant, accompanied by a note stating that:

1. the card is issued on the strength of the applicant's declaration and the previous declaration of the holder of the identification form, without these declarations having been verified by the civil aviation department, which means that the applicant takes all associated responsibilities,
2. in the event of a false declaration, the applicant is subject to the provisions of article 441-1 of the French penal code,
3. the Minister responsible for civil aviation can ask accredited persons or organisations to monitor the compliance of the microlight with the regulations, if it deems that this is necessary.

APPENDIX II - Constituent elements of a microlight identification card

The identification card issued by the French authorities for a microlight includes the following:

- the logo of the authority,
- the name of the signatory authority,
- the date of the document,
- the identifier of the aircraft, and, possibly, its serial number,
- its home port,
- the name and the address of the applicant,
- the reference of the identification form, which must be kept with the identification card at all times.

It specifies:

- that this document is only valid in France,
- that, as per the provisions of article R.133-1-2 of the French civil aviation code, the microlight aircraft is exempt from any obligation to obtain an airworthiness certificate in order to fly,
- the expiry date of the document,
- the conditions of expiry of the document:
    - if the microlight is not airworthy,

- in the event of change of hands, one month after the date of the change.

- Procedure in the event of a change of hands of the aircraft,
- In the event of a change of hands, the new applicant must make an identification request. This request must be accompanied by the old identification card, struck through, on which the date of sale and of the declaration of airworthiness must appear. The former holder of the identification card must give the identification form and the user manual to the new applicant for an identification card, even if it is not required by the manufacturer's technical file.

Finally, a part is dedicated to the validity dates, the reception by the authority of the airworthiness certificate provided by the applicant and the authority's signature.

APPENDIX III - Constituent elements of a request for an identification form

1) Requests by an applicant for a microlight identification form consist of a declaration by the applicant specifying the following:

- the identity of the applicant,
- compliance with the enclosed descriptive elements,
- compliance with the applicable technical conditions,
- completion of a programme to demonstrate compliance with these conditions,
- possession of the manufacturer's technical file.

It is also accompanied by the following descriptive elements:

- Maximum weight,
- Reference unladen weight,
- Maximum unladen weight,
- Vso,
- VNE,
- Number of seats,
- Capacity of the tanks,
- Type of engine, hourly consumption and limitations,
- Type of propeller and limitations,
- Type of wing or rotor(s),
- Wing surface, main rotor surface or volume of the envelope,
- List of any special activities provided for by the manufacturer,
- Presence of an airframe mounted total recovery parachute,
- Ability to be operated on water,
- Reference of the maintenance manual,
- Reference of the user manual.

2) Upon reception of the completed form, the Minister responsible for civil aviation issues an identification form for the applicant, accompanied by a note stating that:

1. the form is issued on the strength of the applicant's declaration, without this declaration having been verified by the civil aviation department, which means that the applicant takes all associated responsibilities,

2. in the event of a false declaration, the applicant is subject to the provisions of article 441-1 of the French penal code,
3. the Minister responsible for civil aviation can ask accredited persons or organisations to monitor the compliance of the microlight with the applicable regulations, if it deems that this is necessary.

APPENDIX IV - Constituent elements of an identification form

The identification form issued by the French authorities for a microlight includes the following:

- the logo of the authority,
- the name of the signatory authority,
- the signature of the authority and the date of the signing,
- the reference or type of the aircraft,
- the name and the address of the manufacturer,
- the identification of the microlight, made up of the following:

  (a) Series production: (B); other cases: (A).

  (b) Single-seater: (1); two-seater: (2).

  (c) Powered paraglider: (1); suspended: (2); multi-axis: (3); gyrocopter (4); lighter-than-air aircraft: (5);

  helicopter (6); microlight with ancillary engine (2A, 3A)

  (d) Aeronautical authority code.

  (e) Order number.

  (f) Use: Leisure (L) Special activity (T) Leisure and special activity (E)
- Revision of the card

The revision specifies that the identification form must accompany the identification card of microlights built according to this type.

The card is accompanied by the following descriptive elements:

- Maximum weight,
- Reference unladen weight,
- Maximum unladen weight,
- V_{so}
- V_{NE}
- Number of seats,
- Capacity of the tanks,
- Type of engine, hourly consumption and limitations,
- Type of propeller and limitations,
- Type of wing or rotor(s),
- Wing surface, main rotor surface or volume of the envelope,
- List of any special activities provided for by the manufacturer,
- Reference of the maintenance manual,
- Reference of the user manual.

APPENDIX V - Descriptive elements for class 1 microlights

These elements replace those mentioned in Appendices III and IV.

The descriptive elements of a powered paraglider include the following information:

- Maximum weight,
- Minimum weight,
- The model and reference of the wing system declared by the manufacturer,
- Surface of the wing system when flat,
- Minimum strength at each anchor point,
- Any limitations of the wing system manufacturer with regard to the engine: (the power in particular).

APPENDIX VI - Typical content of a microlight user manual

A - General:

A.1. - Description of the microlight

A.2. - Engine, propeller, rotor (where appropriate)

A.3. - Three-view drawing

B - Limitations:

B.1. - Weights

B.1.1. - Maximum weight

B.1.2. 6 Maximum unladen weight. The manufacturer draws the user's attention to the fact that the unladen weight of the microlight must always be below the maximum unladen weight.

B.2. - Speeds

B.2.1. - Top speed. This top speed cannot be above 0.9 times the demonstrated top speed in flight. It must be established in motor-driven and non motor-driven flight for class 6 microlights.

B.2.2. - Vso (if applicable)

B.3. - Manoeuvring load factors.

B.4. - Weight and centre-of-gravity limits. If necessary, the manufacturer also gives details of the behaviour of the machine according to the weight and centre of gravity in the specified flight envelope. For suspended microlights, the notion of centre of gravity is to be considered in relation to the hooking points.

B.5. - Authorised manoeuvres

B.6. - Engine

B.7. - Maximum declared power

B.8. - Maximum engine speed

B.9. - Maximum speed of rotation of the propeller (if applicable)

B.10. - Type of reduction gear and reduction ratio

B.11. - Range of speed of rotation for class 4 and 6 microlights

B.12. - Noise pollution (the manufacturer specifies the minimum over-flight altitude and, for class 6 microlights, the minimum speed, apart from in the take-off and landing phases, in order to abide by the order on noise from microlights).

C- Emergency procedures

C.1. - Engine failure

C.2. - Restarting the engine in flight

C.3. - Smoke and fire

C.4. - Gliding flight or autorotation for class 4 and 6 microlights

C.5. - Emergency landing

C.6. - Other emergencies, in particular anti-torque motor failure for class 6 microlights

C.7. - Practice in the emergency procedures for class 6 microlights

D - Normal procedures

D.1. - Pre-flight checks

D.2. - Starting up

D.3. - Take-off

D.4. - Cruising

D.5. - Landing

D.6. - Post-landing and stopping the engine

E - Performances

E.1. - Take-off

E.2. - Recommended speed

E.3. - Ground roll distance (*)

E.4. - Take-off distance (passage at 15 m) (*)

E.5. - Demonstrated cross-wind limit

E.6. - Landing

E.7. - Recommended speed

E.8. - Landing distance (passage at 15 m) (*)

E.9. - Demonstrated cross-wind limit

E.10. - Maximum lift-drag ratio with the engine stopped and the corresponding speed

E.11. - Height-speed graph on take-off and the upper limits with and without ground effect for a class 6 microlight

F - Weights and centre of gravity, equipment

F.1. - Reference unladen weight

F.2. - Reference unladen centre of gravity

F.3. - The configuration of the microlight used to determine the reference unladen weight.

F.4. - List of equipment - Unladen centre of gravity and weight (the manufacturer provides all the input to allow every user to easily and precisely calculate the unladen weight and the unladen centre of gravity of their microlight. They indicate the weight of all the adaptable equipment and the corresponding centre of gravity arm.

F.5. - Weight and centre of gravity (the manufacturer provides all the input to allow every user to calculate the weight and centre of gravity of their microlight, and in particular the centre of gravity arm of the occupants and the tanks).

F.6. - Weighing method

G - Assembly and settings

G.1. - Installation and removal instructions

G.2. - List of the settings accessible to users and their consequences on the flight characteristics.

H - Other uses

H. 1. - Consequences of the installation of special equipment (in particular skis and floats) or installations for special uses, and the corresponding procedures and limitations.

(*) *For class 6 microlights, this data is adapted to inform the pilot of the transitions between stationary flight and forward flight, with and without ground effect, autorotation and leaving a vortex.*