

# IDENTIFICATION FICHE FOR CLASS 3 SERIES-PRODUCED ULM

## 1 – Subject

This guide is intended to assist you in compiling your application file for a “fiche d’identification” (FI) request for a class 3 series-produced ULM and thus enable an easier processing by the DSAC.

It contains a presentation on the key steps of the process and explanations of specific expectations. It also contains a checklist listing all the elements of the file to be constituted and the associated expectations.

## 2 – References

[ULM order]: order dated 23 September 1998 related to ultralight motorised aircrafts (ULM) (<https://www.legifrance.gouv.fr/loda/id/LEGITEXT000005626846>).

[ULM instruction]: instruction dated 24 June 2019 related to ultralight motorised aircrafts (<https://www.legifrance.gouv.fr/download/pdf/circ?id=44800>).

[Noise order]: order dated 24 February 2012 related to noise emitted by ULM (<https://www.legifrance.gouv.fr/loda/id/JORFTEXT000025467757>).

“ULM – Manufacturers” webpage: <https://www.ecologie.gouv.fr/en/public-policies/ulm-manufacturers>. You will find the additional forms and technical conditions mentioned in the rest of the document.

Notions of anemometry: [https://www.ecologie.gouv.fr/sites/default/files/documents/notions\\_danemometrie.pdf](https://www.ecologie.gouv.fr/sites/default/files/documents/notions_danemometrie.pdf)

Online fee payment website: <https://redevances.aviation-civile.gouv.fr/tous-les-produits/ulm/constructeurs-d-ulm-de-serie.html>

## 3 – Key steps of the process

Role of applicant and of a potential representative: refer to guide §§ 4.1 and 4.2

Before the FI request: if flight tests are required with an ULM identified in France, these flight tests must be carried out under:

- Manufacturer identification card (refer to <https://www.ecologie.gouv.fr/politiques-publiques/ulm-demarches-constructeurs-dulm-serie#carte-didentification-constructeur-4>), or
- Provisional identification card (refer to <https://www.ecologie.gouv.fr/politiques-publiques/ulm-demarches-particuliers#carte-didentification-provisoire-4>)

FI request is to be sent to [ulm@aviation-civile.gouv.fr](mailto:ulm@aviation-civile.gouv.fr)

Preparation of the application file:

- Application form for a FI request for a class 2 to 6 series-produced microlight: [R8-ULM-F102](#)
- Form description of a microlight class 2 to 4: [R8-ULM-F002](#)
- Form « ULM : reference empty weight report » : [R8-ULM-F104](#)
- Proof of payment of the 100€ fee (refer to guide § 4.3)
- Technical file:
  - Proof of compliance with the applicable technical conditions (handling qualities, structural strength, noise measurement, additional technical conditions when relevant)
  - User and maintenance manuals in French

Note: for ULM with a wing load at maximum weight greater than 30kg/m<sup>2</sup>, additional technical conditions based on a technical code proposed by the applicant must be defined (refer to guide § 4.9). It is recommended that this exchange with DSAC takes place as early as possible, and before applying for a FI, to ensure the technical file contains the relevant justification.

DSAC ensures that the application file contains the various documents required and only carries out consistency checks between these documents. DSAC also verifies that the declared characteristics of the ULM comply with the limits specified in the ULM order. Refer to guide § 4.4 and checklist in § 5.

If inconsistencies are detected, DSAC sends its comments to the applicant who must take them into account by returning an updated application file (refer to guide § 4.5).

When DSAC has no/no more comments, the FI will be issued.

## 4 – Guide

### 4.1 – Applicant (“manufacturer”)

The applicant for the FI, who will become its holder, is normally the designer and manufacturer of the ULM.

In any case, the applicant must undertake to assume, because of his position and the relationships he has, where appropriate, with the other actors involved in the design and manufacture of the ULM, all the responsibilities that the regulations assign to the holder of an FI:

- Ensure and certify, at the time of the initial application for the FI, and then at each ULM manufactured and identified as a microlight in France, that the microlight meets the applicable technical design conditions;
- Monitor the airworthiness of the ULM identified under the FI: analyse manufacturing problems or occurrences encountered in service, define the necessary corrective actions and make them available to the persons concerned.

In case of a control or accident, if a non-compliance to the regulation is detected, or a safety defect related to the design of the ULM or to the manufacturing of the aircraft, the holder of the FI may be made liable.

In this document, “manufacturer” will designate the applicant and future holder of the FI.

### 4.2 – Mandate

The applicant for the FI may be supported by a partner to assist him or her in the process of obtaining the FI.

This partner must be notified to DSAC, specifying the areas for which, if any, he is entitled to act on behalf of the manufacturer and to engage the manufacturer's liability.

DSAC has published a [standard template of mandate](#).

However, regardless of the prerogatives granted to the authorised representative, the forms for the FI application (R8-ULM-F102) and for the descriptive elements (R8-ULM-F002) must be signed by the manufacturer himself, because of their essential role in the FI issuance process.

In addition, since the manufacturer's liability may be engaged by the actions of its authorised representative, the manufacturer must be in copy of all exchanges with DSAC.

### 4.3 – Fee


Pursuant to the order dated 28 December 2005 on fees for services rendered by the State for the safety and security of civil aviation (<https://www.legifrance.gouv.fr/loda/id/JORFTEXT000000457102>), the issue of an FI is subject to the payment of a 100€ fee.

It is strongly recommended to make an online payment on <https://redevances.aviation-civile.gouv.fr/tous-les-produits/ulm/constructeurs-d-ulm-de-serie.html>.

Payment methods are described in the [ULM fee form](#); this form must be attached to the request for payments by bank transfer. In case of an online payment, the invoice can be downloaded on the payment website once payment has been successfully completed and must be attached to the request.

#### **4.4 – Nature of checks carried out by DSAC**

Upon receipt of the application file, DSAC ensures that it contains the various documents required and carries out simple consistency checks between those documents (refer to checklist in § 5). It also verifies that the declared characteristics of the ULM comply with the limits defined in the ULM order.

 As stated in the ULM order, the FI is only issued based on the applicant's conformity statement. The issuance of the FI does not mean in any way that DSAC has validated the content of the technical file, which remains under the sole responsibility of the applicant.

The technical file is kept for archiving purposes only and may be consulted by the DSAC or handed over to the competent authorities (e.g. BEA, judiciary authorities) in particular in the event of an accident.

#### **4.5 – Document management**

In order to facilitate the processing of the FI application, here are some rules to be observed:

- The date of signature/editing of documents (or drafts) must be updated with each evolution of these documents (or drafts);
- For documents with a version number (in particular user and maintenance manuals): if the document has not been circulated outside the exchanges between the applicant and the DSAC (i.e., it can be considered as a working document at draft stage) then it is not necessary to update this version number (the date of the document must be updated instead). In case the document has been officially released, whether publicly (e.g. publication on the manufacturer's website) or in a restricted manner (individual distribution to one or more users), the version number AND the date of the document shall be updated.

Form R8-ULM-F102 for the serial FI application shall constitute the manufacturer's formal commitment to the accuracy and validity of the dossier. Consequently, its date of signature must be posterior to the dates of signature/editing of all the other documents contained into the application dossier. To avoid the applicant having to fill in this form a significant number of times, it is possible to resend it only the file has been completed.

#### **4.6 – Weight concepts**

For weight concepts (maximum weight, maximum empty weight, reference empty weight) refer to the guide [https://www.ecologie.gouv.fr/sites/default/files/documents/ulm\\_notions\\_masse.pdf](https://www.ecologie.gouv.fr/sites/default/files/documents/ulm_notions_masse.pdf).

Notes:

- It is recommended to choose as maximum empty weight the limit value allowed by the regulation (maximum weight - standard pax weight - standard fuel weight). Otherwise, this will reduce the possibilities for the owner to add options, while having no safety reason.

Reminder: the maximum empty weight must be mentioned in the user manual, specifying whether or not a parachute is mentioned in the FI.

- It is recommended that the reference empty weight is equal to the empty weight on the weighting sheet, to help to identify the "reference configuration" (= that of the weighted ULM).
- For ULM with electric engine, the weight of the batteries is included in the empty weight.

#### **4.7 – Speed concepts**

##### **4.7.1 – IAS vs CAS**

The speed limitations must be provided to the crew (airspeed indicator marking, user manual) in indicated airspeed (IAS).

However, the knowledge of the calibrated airspeed (CAS) is essential, especially for:

- Check compliance with the maximum  $V_{S0}$  criterion, defined by the ULM order: 35 knots (65 km/h);
- The establishment of  $V_{NE}$  (refer to § 4.8.2 below).

Reminders:

- IAS = indicated airspeed = speed read on the airspeed indicator;
- CAS = calibrated airspeed = indicated airspeed corrected for errors related to the anemometric installation (instrumental errors, error related to the static port position, etc.).

Calibration tests of the anemometric chain must therefore be carried out and the test report shall be provided with the technical file. The IAS/CAS mapping curve shall be provided in the user manual.

#### 4.7.2 – $V_{S0}$

The ULM order defines la  $V_{S0}$  in CAS as the “stall speed, if it can be reached in flight, or the minimum speed in steady flight, elevator at stop, for which it’s possible to maintain control of the ULM, in the following configuration: engine on idle or shut off, throttle on minimum, propeller in normal take-off configuration, landing gear extended, flaps in landing position, worst balance, maximum weight”<sup>1</sup>.

It must be determined under these conditions, following the process defined in § 7.1.1 of the ULM instruction (or using the procedure specified by the applicable design technical conditions).

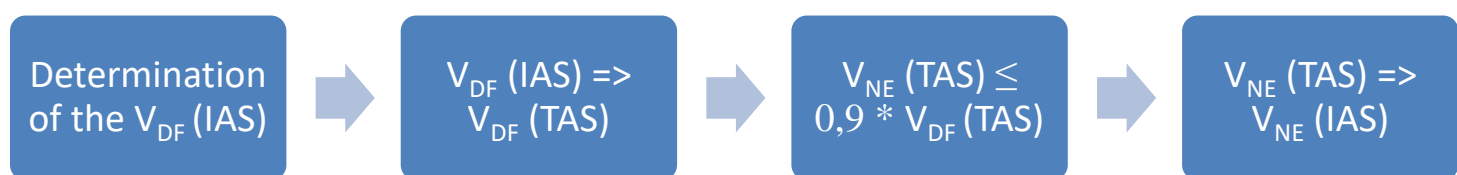
#### 4.7.3 – $V_{NE}$

The never exceed speed ( $V_{NE}$ ) shall also be tested in flight and shall be documented in IAS in the operating manual and in form R8-ULM-F002.

To determine this maximum in-flight speed, it is first necessary to define a demonstrated maximum speed (VDF). At this speed, it shall be possible to perform actions on the controls without encountering flutter.

Flutter depends on the true air speed of the aircraft (TAS), which itself depends on the CAS, altitude and temperature. The value in IAS must therefore be converted into CAS - via the calibration curve - and then into TAS.

The VNE in TAS shall be less than the VDF in TAS to which a factor 0,9 shall be applied. It is then necessary to reconvert this speed to IAS, so that the value can be exploited by the pilot. A standard atmosphere - no temperature difference - will be used and the altitude considered will be the operating ceiling of the ULM.



Reminder: if the speed obtained would be very penalising in low altitude, it is possible to define altitude ranges, with a decreasing VNE with altitude. In this case, the first tranche shall cover at least the range 0ft – 5000ft, and a label indicating the VNE according to altitude shall be affixed to the dashboard.

The test report shall include the maximum speed obtained, the altitude at which that speed was obtained and the outside temperature at that altitude, and details of all calculations.

For clarity, an example of the calculation of  $V_{NE}$  and associated placard are presented in Annex II.

<sup>1</sup> This is a courtesy translation only.

#### 4.8 – Engine power concepts

The ULM order<sup>2</sup> lays down the following requirements on maximum power:

“Maximum power: maximum engine shaft power under standard conditions at sea level that may be delivered by the engine when used within its declared operating limits.

*The power retained shall be the highest one declared by the engine manufacturer, irrespective of any operating limitations associated with the use of that power.*

*It includes the take-off regime if defined, and any possible emergency regime.*

*Operating instructions limiting the rotational speed, maximum inlet pressure or any other parameter used to control the power below the operating limits declared by the engine manufacturer cannot be accepted as an acceptable means of ‘compliance’.”*

The power shall be justified by data from the engine manufacturer (to be enclosed to the technical file if the engine is not already recorded in the DSAC database).

Maximum permitted power levels: 65 kW for a single-seater, 80 kW for a two-seater.

#### 4.9 – Applicable technical conditions

(Refer to also § 4.10 for noise requirements)

By default, the applicable technical conditions are defined in § 7 of the ULM instruction.

However, if the ULM has specific design or operating characteristics, additional technical conditions (CTC) may apply:

- Generic CTC (variable pitch propeller, safety parachute, retractable landing gear, glider towing): refer to <https://www.ecologie.gouv.fr/en/public-policies/ulm-manufacturers#references-reglementaires-8> under section “Documents techniques”.
- Electric powered ULM: currently, no CTC have been defined. However, Annex I of the present document identifies generic risks (non-exhaustive list) that the manufacturer must take into account when designing its ULM and preparing its technical documentation.
- In the case of ULMs with a wing load at maximum mass greater than 30 kg/m<sup>2</sup>: the requirements of Subparts B (flight) and C (structure) of a technical code such as CS-VLA, or of another technical code acceptable to DSAC, shall apply.

The applicant must propose the envisaged technical code and obtain the agreement of DSAC. It is recommended that this exchange takes place as early as possible, prior to FI application, in order to ensure that the technical file contains all the necessary supporting documents.

The technical code used (e.g. ‘CS-VLA adt1, Subparts B and C’) must be indicated in the CTC table of R8-ULM-F102 form:

	Particular conditions	Additional technical conditions
<input checked="" type="checkbox"/>	Other <sup>2</sup> : wing load > 30 kg/m <sup>2</sup>	CS-VLA adt1, Subparts B and C

- Specific CTC: specific CTC may be defined for a specific aircraft as necessary.

<sup>2</sup> The below are courtesy translations.

#### **4.10 – Noise**

Noise measurements tests must be carried out in accordance with the procedure described in the annex to the noise order. A detailed flight test report has to detail the conditions under which the tests were carried out, the values obtained and the use of these values to determine the minimum flight height. This height shall be such that, apart from take-off and landing manoeuvres and authorised low flights, the sound level measured on the ground is not more than 65 dB(A).

Minimum flight height as described above shall be documented in the flight manual.

All the configurations likely to affect noise pollution (especially each engine/propeller combination) request specific flight tests.

## 5 – Checklist

Form / document	Key point	Status	Comment															
R8-ULM-F102 FI request form	Is the applicant the designer and manufacturer of the aircraft?	<input type="checkbox"/> Yes / <input type="checkbox"/> No	Refer to guide § 4.1 If not, the applicant must give explanations on his/her links with the designer and/or manufacturer, enabling him/her to fulfil his responsibilities as holder of an ULM FI.															
	Is the signatory an employee of the applicant and not a representative?	<input type="checkbox"/> Yes / <input type="checkbox"/> No	Refer to guide § 4.2															
	Is the date of signature clearly specified and posterior or equal to all dates specified in the attached technical documents?	<input type="checkbox"/> Yes / <input type="checkbox"/> No	Refer to guide § 4.5															
	Have all the additional technical conditions (CTC) been identified?	<input type="checkbox"/> Yes / <input type="checkbox"/> No	Refer to guide § 4.9															
R8-ULM-F002 description of a microlight form	Is the signatory an employee of the applicant and not a representative?	<input type="checkbox"/> Yes / <input type="checkbox"/> No	Refer to guide § 4.2															
	Does the maximum weight comply with the limits of the ULM order?	<input type="checkbox"/> Yes / <input type="checkbox"/> No	Reminder of the maximum weight limits of the ULM order: <table><tr><td></td><td>Single seater</td><td>Two-seater</td></tr><tr><td>Without parachutes or floats</td><td>330kg</td><td>500kg</td></tr><tr><td>With parachute</td><td>345kg</td><td>525kg</td></tr><tr><td>With floats</td><td>360kg</td><td>545kg</td></tr><tr><td>With parachute and floats</td><td>375kg</td><td>570kg</td></tr></table>		Single seater	Two-seater	Without parachutes or floats	330kg	500kg	With parachute	345kg	525kg	With floats	360kg	545kg	With parachute and floats	375kg	570kg
		Single seater	Two-seater															
	Without parachutes or floats	330kg	500kg															
	With parachute	345kg	525kg															
	With floats	360kg	545kg															
	With parachute and floats	375kg	570kg															
	Does maximum empty weight ensure a regulatory minimum payload?	<input type="checkbox"/> Yes / <input type="checkbox"/> No	Refer to guide § 4.6															
Are the special equipment on the ULM ticked?	<input type="checkbox"/> Yes / <input type="checkbox"/> No / <input type="checkbox"/> Not applicable																	
Is the V <sub>so</sub> filled in calibrated airspeed (CAS)?	<input type="checkbox"/> Yes / <input type="checkbox"/> No	Refer to guide § 4.7.2																
Are the engine and propeller data the ones reported by the engine and propeller manufacturer(s)?	<input type="checkbox"/> Yes / <input type="checkbox"/> No	Do not indicate specific values according to the ULM installation																
If there is a single manual for both user manual and maintenance manual, is its (single) reference identified in both fields?	<input type="checkbox"/> Yes / <input type="checkbox"/> No / <input type="checkbox"/> Not applicable																	
Proof of payment of the fee	Is the appropriate document provided?	<input type="checkbox"/> Yes / <input type="checkbox"/> No	Refer to guide § 4.3															
Proofs of structure	Is the tested aircraft model exactly the same as the requested aircraft model?	<input type="checkbox"/> Yes / <input type="checkbox"/> No	If not, provide a justification explaining how the test(s) carried out is/are relevant to the model requested.															
	Were the structural tests carried out in accordance with the ULM instruction, or with a technical code accepted by DSAC?	<input type="checkbox"/> Yes / <input type="checkbox"/> No	A technical code is mandatory when the wing load is greater than 30kg/m² Refer to guide § 4.9															

Form / document	Key point	Status	Comment
Flight tests	Were the flight tests carried out in accordance with the ULM instruction, or with a technical code accepted by DSAC?	<input type="checkbox"/> Yes / <input type="checkbox"/> No	A technical code is mandatory when the wing load is greater than 30kg/m <sup>2</sup> Refer to guide § 4.9
	Do flight tests determine weight and performance limits of the ULM?	<input type="checkbox"/> Yes / <input type="checkbox"/> No	
	Are manoeuvrability and stability demonstrated for all phases of flight and all configuration of weight and balance?	<input type="checkbox"/> Yes / <input type="checkbox"/> No	
	Do flight tests include IAS/CAS calibration report?	<input type="checkbox"/> Yes / <input type="checkbox"/> No	
	Was the V <sub>NE</sub> determined in accordance with instructions of § 4.7.3?	<input type="checkbox"/> Yes / <input type="checkbox"/> No	
	Are noise test reports enough detailed, and are measurement made in accordance with the noise order?	<input type="checkbox"/> Yes / <input type="checkbox"/> No	Refer to guide § 4.10
User manual	Does the manual include all relevant information specified in the Annex VI of the ULM instruction?	<input type="checkbox"/> Yes / <input type="checkbox"/> No	
Maintenance manual	Are the periodic maintenance operations specified, as well as their deadlines (flight hours and/or time period since the last check)?	<input type="checkbox"/> Yes / <input type="checkbox"/> No	



## 6 – Annexes

### I. Electric engine

The following list (non-exhaustive), identifies risks specific to electric engine:

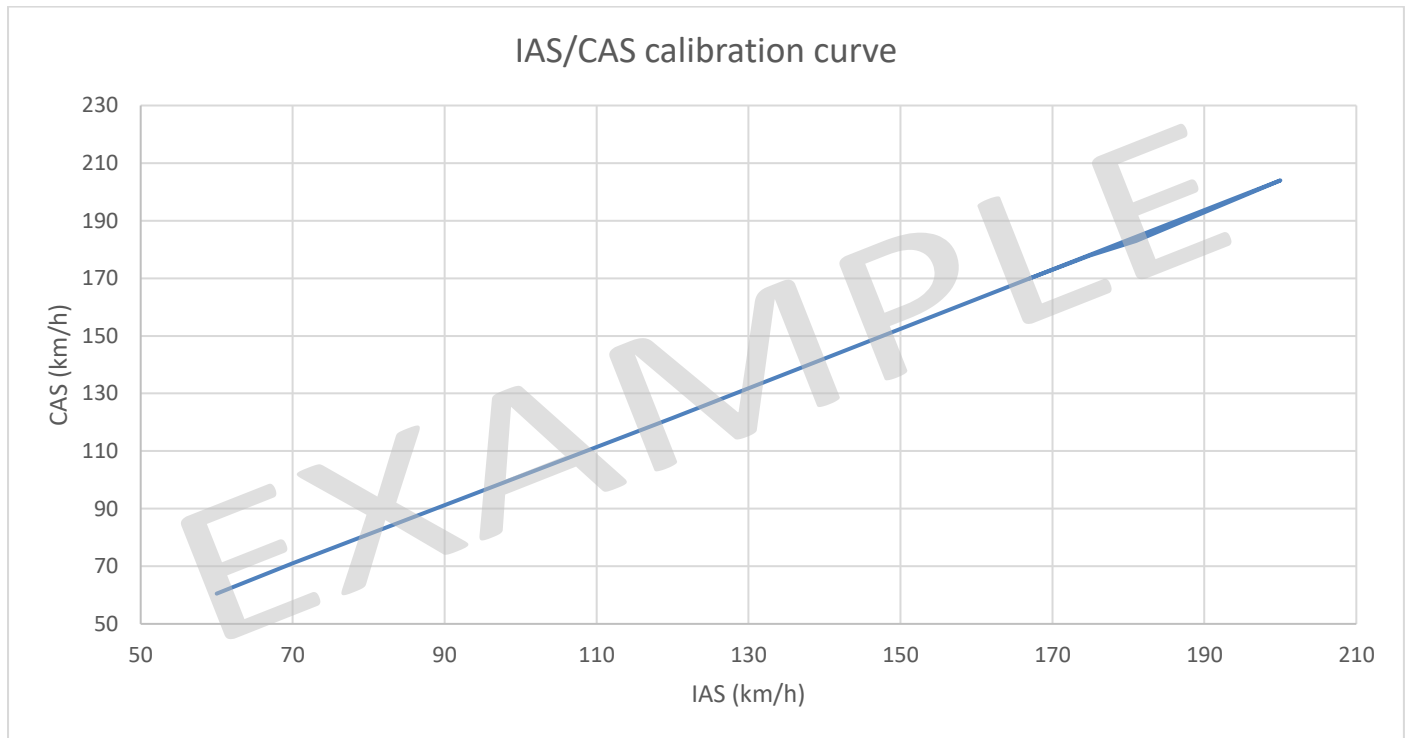
- a. Does the pilot have a means of assessing the flight time remaining before the residual charge of the batteries is too low to continue the flight?
- b. How can the pilot detect a fire or an abnormal rise in battery temperature in flight?
- c. Do the user and maintenance manuals include all the information needed to use, recharge, replace, maintain and handle the batteries?
- d. In the event of recharging on the ground or, if applicable, in flight (regeneration), are the batteries protected against overcharging or an excessive rise in temperature?
- e. In the event of battery failure (flames, emission of liquids or gases, pressure rise), how have the risks to the occupants and the primary structure of the ULM been considered?
- f. Is there a possibility of an unexpected engine start when the system is switched on if the thrust lever (or the thrust knob) is not on neutral position?
- g. In case of an accident, are the first responders informed through labelling of the high voltage equipment location, in order to protect them from electrocution?

The manufacturer is invited to ensure that those risks have been properly taken into account in the design and documentation of the ULM.

Note: if lithium batteries are used for propulsion, it is useful to be aware of the recommendations for the design, tests and installation of these batteries proposed in the RTCA DO-311A “Minimum Operational Performance Standards for Rechargeable Lithium Batteries and Battery Systems” (linked in particular with points b, d and e of the list above).

## II. Example of $V_{NE}$ calculation

$V_{DF}$  of 200 km/h (IAS), obtained at an altitude of 5000ft and a temperature of 7°C. Calibration curve indicates that 200 km/h (IAS) is equivalent to 204 km/h (CAS). ULM ceiling is 10 000ft.



At 5000ft in ISA, the temperature is  $15^{\circ}\text{C} - \frac{2^{\circ}\text{C}}{1000\text{ft}} \times 5000\text{ft} = 5^{\circ}\text{C}$ . So, there is a +2°C gap to the standard temperature.

With this information, we can get a  $V_{DF}$  (TAS) of 220 km/h, so the  $V_{NE}$  (TAS) is  $220 \times 0.9 = 198$  km/h.

At 10 000ft in ISA, 198 km/h (TAS) is the same as à 170 km/h (CAS). With the calibration curve, we get that is equal to 167 km/h (IAS). So,  $V_{NE}$  (IAS) = 167 km/h for the whole flight envelope.

$V_{NE}$  according to the altitude: with the same values, if we want to have different  $V_{NE}$  values according to the altitude, we find at 5000ft 183 km/h (CAS), and 178km/h (CAS) at 7000ft (181 km/h et 175 km/h (IAS) according to the calibration curve).

The following label shall be added on the instrument panel (in French):

<u><math>V_{NE}</math> selon l'altitude (IAS)</u>	
0 – 5000 ft	181 km/h
5000 – 7000 ft	175 km/h
5000 – 10000 ft	167 km/h