	<b>Service NOTIFICATION</b>	
	<b>Flight Design GmbH</b> Sielminger Str. 65 D-70771 L.-Echterdingen Tel +49 (0)711 90287-0 Fax +49 (0)711 90287-99 E-Mail: <a href="mailto:info@flightdesign.com">info@flightdesign.com</a>	<b>SN-ASTM-CT__-06; SN-ASTM-CT2k-08;          SN-ASTM-CTSW-05; SN-ASTM-CTLS-01          Revision 0</b>
		Date of Initial Publication: <b>22-Sep-2008</b> Publication Date of this Revision: <b>22-Sep-2008</b>

# Service NOTIFICATION

## Information on Usage of Ethanol Blended Fuel

**SN-ASTM-CT\_\_-06**  
**SN-ASTM-CT2k-08**  
**SN-ASTM-CTSW-05**  
**SN-ASTM-CTLS-01**

### 1 Planning Information

#### 1.1 Affected Aircraft

Type: CT  
 Model: CT, CT2k, CTSW, CTLS  
 Serial Number: All serial numbers  
 Applicable Countries: All Countries where ASTM standards are in effect

#### 1.2 Concurrent Documents

None

#### 1.3 Reason

The availability of ethanol-blended fuel such as E10 is increasingly common and its use in Flight Design aircraft influences the way they should be maintained and operated.

#### 1.4 Subject

The use of ethanol blended fuels in Light Sport Aircraft

#### 1.5 Compliance

Not applicable – For informational purposes only

#### 1.6 Personnel Qualifications

Not applicable

#### 1.7 Approval


None required

#### 1.8 Weight and Center of Gravity

Not applicable

#### 1.9 References

Aircraft Operation Instructions (AOI):	Reference to suitable fuels
Rotax Engine Operators Manual (OM-912):	Reference to suitable fuels
Rotax Service Instruction SI-912-016-R1:	Reference to effects from alcohol in fuel

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### 1.10 Superseded Documents

None

### 1.11 Contact Details

For further information or to report any Safety of Flight or Service Difficulty issues contact your Distributor responsible for your country.

Specific contact in USA:

Flight Design USA  
 P.O. Box 325 South Woodstock, CT 06267  
 Tel: 860 963 7272 / Fax: 860 963 7152  
 Web: [www.flightdesignUSA.com](http://www.flightdesignUSA.com)  
 E-Mail: [airworthiness@flightdesignUSA.com](mailto:airworthiness@flightdesignUSA.com)

For all other countries and in cases where the local distributor is not known or available contact Flight Design GmbH directly.

## 2 Resources

### 2.1 Materials

Not applicable

### 2.2 Manpower

Not applicable

### 2.3 Cost

Not applicable


## 3 Instructions

### 3.1 Information

These days, the practice of blending ethanol with automotive fuels is commonplace. In fact, in some countries, minimum ethanol content is required by law for automotive fuels; for example: 10% in some parts of the USA, and 5% in some EU countries.

There have been reports that some CT owners may be using ethanol blends of up to 10% in their aircraft. Operators using these blends should be aware of at least the following.

Ethanol blends well with gasoline, but it also is completely miscible (mixable) with water. When water infiltrates a tank, the ethanol in the ethanol-gasoline blend will absorb the water. If enough water is present it will overwhelm the ethanol's ability to remain blended with the gasoline. Because ethanol mixes easier with water than gasoline, the ethanol will migrate from the gasoline to the water, separating at the lowest point in the system. The product in the tank is no longer a homogeneous blend of ethanol and gasoline, but two layers of product--a layer of gasoline on top and an ethanol layer on the bottom. This is known as "phase separation."

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When this happens, several things may result.

- The components in the lower part of the fuel system, such as the in-line fuel filter behind the instrument panel, may be exposed to high concentrations of ethanol (perhaps exceeding 90%). The result could be that components made from materials that are suitable for 10% ethanol (such as the filter) might start showing adverse effects.
- Due to the cleaning effect of pure ethanol, dirt and debris that normally and harmlessly accumulate within the fuel system might wash downstream and block filters, and in some cases reach the carburetor nozzles, potentially blocking them.
- The engine may be fed pure ethanol, which will directly result in ignition problems, as the engine is designed to burn aviation or auto fuel, not ethanol.
- Because ethanol attracts and absorbs moisture, in cold climates, with enough water present in the system, ice might form, leading to rough operation of the engine or even stoppage.

It is worth noting, at this time, that Rotax only allows for 5% alcohol, including ethanol content at this time.

### **3.2 Recommendations**

The following minimum precautions should be observed if ethanol blended fuel is to be used.

- Verify that the ethanol content, as listed on the fuel pump, is correct. Suitable Ethanol testers are available on the market. Do not let the same batch of fuel sit in the fuel system during extended down times; most notably in warm and humid climates. Significant amounts of water may accumulate rapidly.
- When it is expected that the aircraft will sit for long periods, fuel the aircraft with either non-ethanol blended fuel or aviation 100LL and run the engine long enough to burn off the ethanol blended fuel remaining in the bottom of the fuel system.
- If your aircraft has been sitting with blended fuel, flush the old fuel out through the gascolator, which is the lowest part of the fuel system, and replace it with fresh fuel. Inspect the in-line fuel filter behind the instrument panel and replace it if any damage is noted or suspected.
- Stay informed as more information becomes available and is reported through aviation media outlets.

## **4 Appendix**

### **4.1 Changes to Previous Revision**

Original Issue – no changes

### **4.2 Feedback Template Flight Design**

No specific feedback required