

## Environmental Conditions for OEM Mainboards - Rev. 05 -

### Operating

The specified operating temperature is the ambient temperature of the mainboard (= inside the chassis / system). In general, the acceptable ambient temperature outside the chassis is lower than the specified maximum mainboard ambient temperature.

The system integrator is responsible to ensure that the specified maximum component temperatures (see related TechNotes documents for reference) are never exceeded under any operating conditions.

High concentration of halogen, sulphur or halogen-/sulphur -compound gas environment must be avoided.

	<b>Classic Desktop Mainboards</b>	<b>Extended Lifecycle Mainboards</b>	<b>Industrial Mainboards</b>
Operating temperature T (forced cooling required)	10°C – 45°C	10°C – 50°C	0°C – 60°C non condensing
Maximum temperature gradient	20°C / hour		
Relative humidity (adapted according 3K2)	5% - 85%	5% - 85%	5% - 85% (5% - 75% for T > 50°C) non condensing
Altitude <sup>1</sup>	up to 5.000m (16.400ft)		
Expected system test standard	adapted according 3K2	adapted according 3K2	FTS OEM specification

<sup>1</sup> Note: The operating altitude has no effective influence on the electronic components of the mainboard. But: Due to decreasing air pressure, the effectiveness of the system cooling implementation has to be considered!

Furthermore, the system PSU must comply to the appropriate requirements regarding clearance and creepage distances which depends on the operating altitude.



## Transportation

High concentration of halogen, sulphur or halogen-/sulphur -compound gas environment must be avoided.

	<b>Classic Desktop Mainboards</b>	<b>Extended Lifecycle Mainboards</b>	<b>Industrial Mainboards</b>
Transportation temperature	-25°C – 70°C	-25°C – 70°C	-25°C – 70°C
Maximum temperature gradient	20°C / hour		
Relative humidity (non-condensing)	5% - 98%	5% - 98%	5% - 98%
Expected system test standard	adapted 2K2	adapted 2K2	FTS OEM Specification

## Storage

High concentration of halogen, sulphur or halogen-/sulphur -compound gas environment must be avoided

	Mainboards with Al Capacitors and Polymer capacitors	Mainboards with Polymer Capacitors only
		
Temperature	-25°C up to 60°C <sup>1</sup>	
Maximum temperature gradient	20°C / hour	
Relative Humidity (non condensing)	5% up to 85%	
Special measurements depending on storage time <sup>2</sup>	< 2 years	no actions required!
	> 2 years (5 years max.)	Every 18 months power on for 15 - 30 minutes strictly required! <sup>3</sup>
	no actions required!	

<sup>1</sup> Extended temperature ranges such as – 25°C up to 60°C are possible for “Storage”. Such extreme temperature ranges require specific careful handling of the mainboards such as:

- Before usage the mainboard has to be tempered up to min. 0°C under non-condensing conditions.
- Condensation has to be avoided best in case during the whole storage period, but at least before power on.
- Plastic parts have to be handled with care at low temperatures. Usage within specified operation temperatures is highly recommended!
- In order to avoid damages caused by freezing (humidity between components), the ambient humidity should be less than 75% while reaching freezing point.

<sup>2</sup> Note: Storage time starts from date of production!  
The system test standard is adapted to 1K2!

<sup>3</sup> Mainboard refreshment:  
Visual check of the capacitors → Blown caps must be replaced in advance!  
Then switch on the mainboard (processor / memory must be installed first) and boot it.