



## STS Directory

Accreditation number: STS 0059

International standard: ISO/IEC 17025:2017  
Swiss standard: SN EN ISO/IEC 17025:2018

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Internet: [www.empa.ch](http://www.empa.ch)  
Initial accreditation: 22.04.1994  
Current accreditation: 01.12.2019 to 30.11.2024  
Scope of accreditation see: [www.sas.admin.ch](http://www.sas.admin.ch)  
(Accredited bodies)

### Scope of accreditation as of 17.10.2023

Testing laboratory for physical qualification, reliability and non-destructive testing as well as analysis of materials, components and systems

Group of products or materials, field of activity	Principle of measurement <sup>3)</sup> (characteristics, measuring ranges, type of test)	Test methods, remarks (national, international standards, in-house test methods)
Temperature of solid, liquid and gaseous media, on devices and equipment	<b>Thermocouple and Resistance Thermometry</b>  Measuring range: -200°C to +660°C  Smallest measurement uncertainty: ±0.05 °C (k =2)	SOP 2560
	<b>Thermography</b>  Measuring range: -10°C to +1200°C  Smallest measurement uncertainty: ±2 °C or 2% (k =2)	SOP 4125 Based on VDI/VDE 3511



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Qualification (reliability, failure, availability) of components, devices and systems	<b>Environmental and reliability testing, individually or combined</b>	Based on IEC 60'068
	Constant thermal load	SOP 5151
	Thermal cycling	SOP 5152
	Climatic test, steady state	SOP 5153
	Climatic test, cyclic	SOP 5154
	Mechanical load (static, dynamic)	SOP 3980
	Vibration, mechanical shock	SOP 3983
Qualification (reliability, failure, availability) of components, devices and systems	<b>Failure Analysis</b>	SOP 3976
	Detection of failure	
	Non-destructive analysis	
	Semi-destructive analysis	
	Destructive analysis	
	Investigation of failure mechanisms	
Qualification (reliability, failure, availability) of components, devices and systems	<b>Reliability and availability analyses</b>	Based on
		IEC 60'300
		IEC 60'605
		IEC 60'812
		IEC 60'863
		IEC 61'025
		IEC 61'078
		IEC 61'709
	1. Failure rate analysis	
	- Evaluation of the predicted failure rate	SOP 3984
	- Evaluation of predicted reliability	SOP 3985
	- Statistical quality control, reliability tests and goodness-of-fit tests	SOP 3986
	2. Risk analyses of technical systems: FMEA / FMECA, FTA, ETA	SOP 3987

1) Scope of accreditation type A (fix)

2) Scope of accreditation type B (flexible)

3) Scope of accreditation type C (flexible)

Definition of flexibility see SAS Document 741



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Electrical components, devices and systems	<b>Conductivity and resistance measurement</b> Measuring range 40 $\mu\Omega$ to 10 $P\Omega$ ( $4 \cdot 10^{-5}$ - $10^{16}$ $\Omega$ )	SOP 2853
Electrical components, devices and systems	<b>Measurement of</b> R-, C-, L-, f-characteristics (tracking generator)	SOP 2854
Electrical components, devices and systems	U, I, Q, P (S, $\cos \varphi$ ), U-I-characteristics	SOP 2855
Electrical components, devices and systems	<b>Testing of electrical energy storage</b>	SOP 5081
Electrical energy storage systems	<b>Batteries</b> - Failure analysis - Electrical characterisation - Altitude simulation - Temperature - Vibration - Shock - External short circuit - Impact / Crushing - Overcharging - Forced discharge - Overdischarging - Drop test - Immersion in water - Fire exposure - Failure of temperature control - Internal short circuit - Propagation	Empa-SOP 5081 and other Empa-SOPs used therein  UN 38.3; ECE R100; ISO 12405-1,2,3; DIN EN 15194; DIN EN 50604-1; DIN EN 61960; IEC/DIN EN 62133-2; IEC/DIN EN 62281; IEC/DIN EN 62619; IEC/DIN EN 62660-1,2,3

The testing laboratory maintains a list with detailed information on the activities within the scope of accreditation. It is available upon request at the laboratory.

In case of contradictions in the language versions of the directories, the German version shall apply.

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