

RapiTest tool qualification for ISO 26262 projects



Introduction

Tool qualification is essential in the production of software designed for safety-related embedded systems. In the tool qualification process, the tool developer provides evidence that the tool meets its functional and safety requirements. Typically, this qualification is only valid within certain conditions (*Conditions of Use*), which the tool developer must also document.

When you use Rapi**Test** for an ISO 26262 project, we can provide tool qualification evidence. We can also provide engineering effort, tests and further documentation to help you validate the *Conditions of Use*.

Tool qualification evidence

The objective of ISO 26262 tool qualification is to provide evidence that software tools are suitable for use in developing safety-related software. We perform software tool criteria evaluation and tool qualification to produce test evidence, resulting in the work products described in Table 1:

Table 1. Tool qualification work products for ISO 26262 projects

Document	ISO 26262 reference	Description
Software Tool Criteria Evaluation Report	8-11.4.5	Assesses the detectability and consequences of tool failure. Determines tool confidence level and the tool qualification process.
Software Tool Qualification Report	8-11.4.6 to 10	Describes tool functional and robustness behaviour. Describes requirements development and testing of the tool. Presents test results, tool deviations and limitations.

RapiTest tool qualification

Internally, our requirements-based testing process follows the aerospace standard DO-330, and we derive the *Conditions of Use* from software tool-chain analysis within that process.

Rapi**Test** may be used with off-the-shelf or custom target integrations, so the *Conditions of Use* include validation of the correctness of the target integration.

When you purchase a license for Rapi**Test** (RPF), we can provide documents and tests that you need to validate the *Conditions of Use*. These are part of a fully qualified installation of Rapi**Test**, which includes the following:

- RPF: the Rapi**Test** tool.
- TIK (Target Integration Kit): integration of RPF into your build and target environments (see our *Target Integration Service* product brief for more details).
- QK-RPF (Rapi**Test** Qualification Kit): documents describing qualification for the version of Rapi**Test** you use in your project.
- QTIK (Qualified Target Integration Kit): documents describing qualification for the integration of Rapi**Test** into your build and target environments including tests of that Rapi**Test** integration.

Tool Qualification Kit

The tool qualification kit contains documents that describe the version of RapiTest you are using. This forms part of the evidence you need to qualify the tool, and contains the following documents:

- STCER (Software Tool Criteria Evaluation Report)
- STQR (Software Tool Qualification Report)
- Safety Manual
- Template IQR (Integration Qualification Report)

The documents in this kit must be supported with documents describing the integration of RapiTest into your development environment, and tests of the integration.

Qualified Target Integration Kit

To complete your RapiTest qualification, you must provide evidence describing the integration of RapiTest into your build and target environments, and validation of the *Conditions of Use*. We consider three types of condition:

- Conditions discharged by review of the integration code. For example, the correct use of macros and appropriate memory initialization.
- Conditions discharged by tests of the integration. For example, checking that data is streaming correctly from the target.
- Conditions discharged by the process of using RapiTest. For example, validating the tool coverage settings.

When you order a qualified target integration kit (QTIK), we provide the following documentation and tests:

- Full IQR (Integration Qualification Report) describing validation of the *Conditions of Use* pertaining to integration code review.
- On-site tests validating the *Conditions of Use* pertaining to tests of the integration code.
- A list of expected results.

This reduces your effort to validation of a small number of process conditions.

Qualification options and licensing

You have a number of options when you purchase RapiTest, as shown in Table 2.

Each *use* of a qualification kit in a project requires a separate license of the qualification kit. A *use* is defined as a tool installation specific to one target and test environment and typically represents a single submission or application for certification.

We offer multiple license discounts if you want to *use* our tools multiple times on the same system or project.

Table 2. RapiTest qualification options

		Tool		Qualification	
		RapiTest tool (RPF)	Target Integration Kit (TIK)	RapiTest Qualification Kit (QK-RPF)	Qualified Target Integration Kit (QTIK)
Option 1	Provided by:	Rapita	Customer	Customer	Customer
Option 2		Rapita	Rapita	Customer	Customer
Option 3		Rapita	Customer	Rapita	Customer
Option 4		Rapita	Rapita	Rapita	Customer
Option 5		Rapita	Rapita	Rapita	Rapita



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