

SuperTest™ Rembrandt Release

Quality, Creativity and Knowledge



SuperTest Rembrandt Release

In the seventeenth century, the Golden Age in The Netherlands, Rembrandt was considered a revolutionary artist. Nevertheless, his ideas were by no means immediately accepted by his contemporaries. Today he is known for his creativity, quality and eye for detail. His work shows an incredible understanding of lighting and he used this knowledge to exactly point out the important details that made his work look realistic. ACE keeps these values close to its heart and builds on this Dutch tradition of craftsmanship, quality and finesse.



ACE - Knowledge of Compiler Testing

With over 37 years of experience in testing and developing compilers, knowledge is what makes SuperTest stand out as the undisputed testing product. ACE has built up a solid amount of knowledge on programming languages, compiler optimizations and code generation that is reflected in SuperTest, where each of the tests is characterized by the experience that was used to construct it.

SuperTest Expansion

The core of the SuperTest suite **has expanded with 1400+ high quality tests** since the last Release. It includes new tests for language constraints, C99 library functions and complex types, as well as test cases that follow from developing compiler optimizations at ACE.

For the purpose of testing dependence-analysis and loop-optimizations in particular, the suite has been extended with a number of templates to generate a vast number of complicated loop-constructs that varies different types of data- and control-flow and iteration behaviour. These loop templates result in improved compiler coverage for a range of algorithms with a focus on loops and data dependence analysis. As a new aspect in SuperTest, several tests were added that perform *stress testing* of compiler optimizations, where the algorithmic complexity is tested for reasonable compilation time and terminating behaviour.

C++ Library Testing

New in the SuperTest Rembrandt Release is testing of the C++ Standard Library (Chapters 16-25) that verifies both conformance to the standard and correctness of the implementation. The tested sections include the language support library, diagnostics and error-handling library, general utilities library, string utilities library, container classes and their corresponding iterator- and algorithm libraries. This new section in SuperTest comprises around **550 handcrafted and elaborate C++ tests**.

Integration Testing through Binary Interfaces

SuperTest now features an ABI Tester to expose typical errors as found in calling conventions and binary interfaces between software libraries. This enables integration testing of software components for environments where different compilers or optimization levels are used.

The new ABI Test Generator creates and tests a nearly endless number of tests, which is comprised of caller definitions to setup data structures for all data types and combinations of (nested) data structures and unions, invoke function calls and verify return values. Each test also comprises its corresponding callee definition with functionality to verify its passed parameters. The generator is packaged with a framework to compile, run and cross-reference the results and allows for easy integration into your custom QA/QC framework.

Extended Depth Testing

ACE delivers predefined test suites (Depth Suite) as a separate service to its SuperTest customers. The Depth Suite is customized and generated for different architecture variants based on their target descriptions. For the SuperTest Rembrandt Release, ACE has made extensions to the Depth Suite to support testing the correct implementation of operator precedence rules. In addition to the regular Depth Suites, ACE has added smaller versions of each Depth Suite, which allows for faster verification that comes in useful for day-to-day compiler testing and development.

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