



# **ECL First Impressions Testing<sup>®</sup>: Issues and Answers for the Embedded Industry**

An ECL White Paper

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## Hardware: Only Half the Battle for Customers

We all know about the incredible advances in microprocessor, microcontroller, and DSP architectures that have occurred in the last decade. Amazing new RISC, VLIW, and hybrid processors are announced each week, and there certainly is no shortage of good 16-bit and 32-bit workhorse microprocessors. The embedded processor market sees new instruction set extensions and peripheral support being added at a rapid pace, providing system designers more performance, more flexibility, lower costs, and improved power consumption.

But the next time you or your customers consider that latest hot-rod architecture, or even consider moving from one architecture to another, ask yourself this: "can mere human beings program it?"

Software for programming processors includes compilers, debuggers, linkers, emulators, simulators, profilers, and other tools. When you or your customers are considering a processor, do you consider how easy - or how difficult - it is to use those tools?

*You should - software people are going to be spending a lot of time with them.*

The modern processor revolution starts with the notion that "architecture" means both hardware (in this case, processor and board) and software (compilers and other tools to create firmware, operating systems, and applications). That was part of the RISC revolution, and it's even more pronounced with VLIW processors that have shifted much of the hardware decoding and scheduling complexity to the compiler.

Tools that promise the ability to program in C, C++, and Java high-level languages are the key to exploiting modern RISC, DSP, and VLIW architectures, and good compilers can often extend the useful life of standard 32-bit, 16-bit, and even 8-bit microcontrollers.

## A Revolution Breeds a Revelation

Software tools are at least as important as the underlying hardware. When ECL spoke with embedded customers such as Delphi Automotive, Visteon, Lexmark, and many others, one of the messages was this: when selecting a processor, tools availability, quality, and reliability, software tools are as important as processor performance - and selection of software tools can be a disappointing experience if you pick the wrong vendor.

Moreover, the learning curve associated with tools across an entire organization can be substantial. Changing tools can be painful, which can translate into missed schedules, disheartened employees (with some attrition possible), and potential for reduced quality.

*Software tools are often the key differentiator for savvy customers.*

## ECL's Background

ECL, the EEMBC Certification Laboratories, was formed to provide fair, impartial, unbiased benchmark score certification for EEMBC, the Embedded Microprocessor Benchmark Consortium. This includes both "out of the box" benchmarks that cannot be modified, and optimized benchmarks that can be altered according to EEMBC's optimization rules (which ECL helps enforce).

Because ECL was chartered by EEMBC, we feel we have an obligation to perform this work according to a standardized, rigorous methodology, and to charge prices that are directly related to costs. Thus, we view ourselves as an "industry facility", much like Underwriter's Laboratories (U.L.) is an industry facility for the insurance industry. Just as U.L. benefits the ultimate consumer, ECL does as well, by providing assurances that the benchmark scores are honest and repeatable.

As a result of our work benchmarking and certifying those scores, ECL sees more embed

ded tools than any company on Earth. But remember – our prices are fixed for this type of work. Every hour we spend trying to get cranky tools to work properly is a cost that we cannot recover. And in our experience, we see many tools that really need professional help. We also obtain an incredible depth of experience in tools for all kinds of architectures.

## Turning Lemons Into Lemonade

ECL prides itself on staying very close to embedded customers and their needs, and in working with processor and compiler companies, we noticed a genuine lack of comparative data regarding software tools. Moreover, we felt a need to help companies improve their tools – *and to save us from absorbing too many costs associated with poor tools!*

## ECL First Impressions and Deep Impressions Solutions

With an extensive background in Software Testing and Quality Assurance, as well as embedded development, our company created **First Impressions Testing** and **Deep Impressions Testing**.

Companies that submit their software tools to ECL, once they pass a rigorous set of tests and analysis, are eligible for the ECL Tested! and ECL Certified! Seals of Approval.



analysis, with an eye on both Feature Content and Quality **ECL First Impressions** delivers both quantitative and qualitative feedback on the tools. Our 50-60 page, customized report explores all aspects of the tools - from documentation and packaging to compiler code quality and debugger usability, from Web and phone support to simulator accuracy and capabilities. The deliverable is ECL's unique "**First Impressions Testing Report**," the new industry-standard in SDK (Software and Hardware Development Kit) ratings.

**ECL First Impressions Testing** provides clients with an in-depth analysis of a tool's "out-of-the-box experience." Focusing on product analysis and competitive

ECL's customers who have publicly declared their support for **ECL First Impressions Testing** include:

- ❖ BOPS
- ❖ Improv Systems
- ❖ Texas Instruments
- ❖ TriMedia
- ❖ WindRiver



**ECL Deep Impressions Testing** takes **ECL First Impressions Testing** much further. With comprehensive embedded tools software testing and quality

assurance, **Deep Impressions** dives deep into the very heart of a product or group of products. Customized for each vendor, but using the same rigorous coverage backed by excellent technical capabilities, **ECL Deep Impressions Testing** can include

- ❖ Nullstone<sup>™</sup> Test Suite Porting, Execution, and Analysis for Compilers
- ❖ Automated Software Test Design and Automated Test Execution
- ❖ Hardware-Software Integration Testing
- ❖ Complete Functional and System Testing
- ❖ All of the First Impressions Competitive and Product Analysis.

A company that engages with ECL for **ECL Deep Impressions Testing** is a company totally committed to *Continuous Quality Improvement* and clearly has the customer's interests firmly in mind.

## ECL SDK Rating Service - Your Mark of Quality

**If you are a tools company**—whether you define yourself as a compiler company, a simulator or emulator company, an RTOS company, or a comprehensive embedded tools company, you will find that ECL's level of expertise, caring, and attention to detail, will yield incredible results in a very short amount of time.

Your selection of **ECL Impressions Testing**

and your willingness to submit your products to independent, unbiased, fair testing and assessment, tells your customers all the right messages, and we can help you **earn** that quality image you desire - and your customers demand.

**If you are a customer who buys embedded tools**, you may have experienced the frustration downloading free trial versions of tools, only to find that it takes days – or even weeks – to figure them out and make them work. Insisting on **First Impressions Testing** from your current – and prospective – tools vendors will save you time and wasted energy.

ECL can perform custom **First Impressions Testing** studies on the tools of your choice - privately, or with the vendor's assistance. It is essential to have assurances that the tools vendor you select can stand up to real-world, production-level quality. You can ask your tools vendor for their **ECL SDK Ratings<sup>™</sup>** or contact ECL directly for a quote on an extremely cost-effective **ECL First Impressions Testing** study.

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## ECL's Other Services

### ❖ Benchmark and Certification

EEMBC Certification is our at our core, but we also have extensive experience with SPEC, BAPCo, and dozens of other benchmarks. *We can customize a benchmark study to fit your exact needs.*

### ❖ Compliance Certification

If you have a consortium or organization that requires compliance testing and certification, ECL has extensive experience with Java, Unix/Linux, networking, and wireless technologies. We're independent and cost-effective.

### ❖ Embedded Development

Whether it's board layout, firmware, documentation, applications, or operating system porting, ECL can get the job done on schedule, under budget, with great quality.

### ❖ ECL First Customer

A major new initiative (see our White Paper for more details!)

### ❖ Strategic Consulting and Investment Due Diligence

Venture Capitalists, such as NW Brown Group/Cambridge Gateway Fund have used ECL for investment due diligence. Our comprehensive knowledge of the processor and software industries, with more than 30 years of cumulative experience, will help guarantee that you are making the right investment.