

# Industry Model Testing

Reduce the risk and cost of upgrading to the latest MathWorks software release

Industry Model Testing (IMT) is part of a strategic quality initiative at MathWorks. The IMT system is designed to identify, isolate, and prevent customer facing regressions in MathWorks software. As part of this system, MathWorks tests real customer models and code in a secure environment. This environment is integrated with the MathWorks software build, test, and release processes. Including your model and code in the IMT process dramatically reduces the chance of release incompatibilities.

## What does MathWorks do with my models and codes?

An automated testing system exercises customer models and code using internal builds of MathWorks software. The tests generate artifacts that reflect various measurements of compatibility and performance. When compatibility failures or performance regressions occur, developers immediately work to resolve them. If the incompatibility requires a change to a customer model or a manual code, MathWorks communicates what needs to be changed and explains why the incompatibility cannot be addressed another way. This process facilitates customers' migration to the latest release of MathWorks software. Customers who participate in Industry Model and Code Testing report far fewer incompatibilities when upgrading to new releases.

The test artifacts are also used to improve MathWorks development processes to ensure high-quality software. IMT is one of the final quality checks MathWorks performs.

## What exactly does IMT test?

The IMT system can test every semantic available in Simulink, Stateflow, Simulink Coder, Embedded Coder, MATLAB Coder and HDL Coder as well as Polyspace verifications on Embedded Coder generated code and customers handwritten code. IMT duplicates the customer environment as closely as possible. Not all target-specific compilers supported by Simulink Coder, Embedded Coder and MATLAB Coder can be tested in IMT. Testing includes software aspects such as desktop performance, numerical accuracy, simulation performance, model coverage, MISRA violations, absence of Run Time Errors, code generation, complexity of generated code, generated code coverage, model and library dependencies, and numerous other metrics. The table below details the specific tests that are available.

## KEY BENEFITS

### Increased productivity

A stable development tool with a smooth upgrade capability promotes company-wide tool adoption and increased efficiency.

### Advance warning

Specific information on how upcoming incompatibilities will impact your models reduces surprises.

### Performance

Models and Codes in IMT serve as a release criterion by which MathWorks evaluates product performance.

		Release Compatibility	Desktop Performance	Numerical Baseline Equivalence	Code Efficiency Execution Time, RAM/ROM	Code Compliance Checks	Runtime Error Checks
MATLAB®	Function Execution	●	●	●			
	Mex Generation	●	●				
	Mex Execution	●	●	●			
Simulink® and Stateflow®	Load	●	●				
	Update Diagram	●	●				
	Simulation Normal, Accelerator, and Rapid Accelerator Modes	●	●	●			
Simulink Coder™, MATLAB Coder™ & Embedded Coder®	Code Generation	●	●		●	MISRA	
	Generated Code	●	●				
	Compilation	●	●				
HDL Coder™	Generated Code Execution	●	●	●	●		
	Code Generation	●	●	●	●	HDL Industry	●
Polyspace®	Manual Code	●	●			MISRA	●
	Generated Code	●	●			MISRA	●

## How are my models and codes kept secure?

MathWorks has taken comprehensive measures to protect customer data and intellectual property. Customer files are stored on a secure server on a private network within MathWorks. Additionally, the machines making up this secure network are stored in a locked room. Only authorized staff members of MathWorks have access to this data. The IMT system handles International Traffic in Arms Regulations (ITAR) data.

## How many models or codes should I send?

The MathWorks recommends that you provide a representative model or code and/or a set of at least three but no more than 10 models or codes; these codes and models should contain all or most design and code constructs that you use. The submitted data should also contain examples of all semantics usage, custom functions, and typical usage patterns in the full set of models and codes at your site. In this way, all typical constructs will be tested within IMT and the results and reports will provide sufficient information that relates to the majority of the models and code you use.

## How do I get started?



Getting started with IMT is a simple four-step process.

### 1. Establish a non-disclosure agreement (NDA)

The NDA should meet your requirements and protect your intellectual property (IP). Standard template NDAs are available for review. If you do not require specific IP protection, you may skip this step.

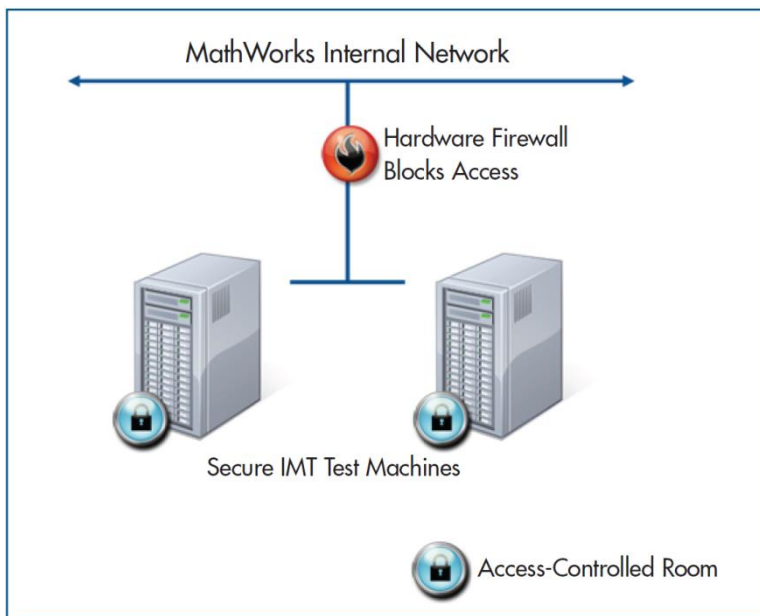
### 2. Package your models and codes

MathWorks provides a packaging tool that allows you to easily specify how you want your model and code to be tested. The tool then helps you package your model and code into a compressed .zip file for easy relocation. Contact the IMT team directly at [dev-imt@mathworks.com](mailto:dev-imt@mathworks.com) or work with your local office to obtain the packaging tool.

3. Send models and code to MathWorks  
You can transmit your models and code to MathWorks via e-mail, package delivery services, or the postal service.

### 4. Review and act on results

MathWorks tests your models and code in the secure IMT environment against internal builds of MathWorks products and confirms whether they run correctly. If compatibility and performance issues occur that require your attention, the IMT team identifies and communicates to you what needs to change and why.



## Contact Us

### E-mail

Send models as an e-mail attachment to:

[dev-imt@mathworks.com](mailto:dev-imt@mathworks.com)

(PGP encryption supported)

### Mail

Save models to a CD/DVD and send them to:

**Murali Gopinathan**

**The MathWorks**

**3 Apple Hill Drive**

**Natick, MA 01760**