Greenhouse and Energy Minimum Standards (GEMS) Equipment Energy Efficiency (E3) Program Check Testing Policy

PURPOSE

This GEMS Check Testing Policy (the Policy) sets out the procedure adopted by the Australian GEMS Regulator to verify through laboratory testing, whether the performance of individual product models meet GEMS requirements and the claims of manufacturers and suppliers. Check testing encourages compliance with the GEMS Act and helps to uphold the integrity of the E3 Program.

The Policy sits within the broader Australian Government law enforcement policy context and should be read in conjunction with other relevant documents.

It is targeted towards responsible parties, who are appliance and equipment manufacturers, importers, suppliers, and commercial users who have obligations under the GEMS Act.

OVERVIEW OF GEMS LEGISLATION

The GEMS Act commenced on 1 October 2012 and implements the decision of the Australian Government and the Council of Australian Governments to establish national legislation to regulate energy efficiency and labelling standards for appliances and other products.

The GEMS Act follows through on commitments made under the United Nations Framework Convention on Climate Change to adopt national policies and measures to mitigate climate change and limit Australia’s anthropogenic (man-made) emissions of greenhouse gases and to promote the development and application of technologies and practices that minimise these emissions of greenhouse gases.

The GEMS Act assists with these aims by providing a nationally consistent legislative and policy framework for the regulation of energy-using (both electricity and other fuel sources) equipment and appliances and the regulation of equipment and appliances that affect the energy used by other products.
The GEMS Act is administered by the Department of Industry through the Equipment Energy Efficiency (E3) Program. The GEMS legislation consists of the following key instruments:


**THE AUSTRALIAN GEMS REGULATOR**

The GEMS Act establishes the office of, and defines the functions and powers available to, the GEMS Regulator\(^2\). One of the key functions of the Regulator is to monitor and enforce compliance with the GEMS Act.

**CHECK TESTING PROGRAM**

The check testing program is an important part of the Regulator’s monitoring and enforcement function. It is the way the Regulator verifies the performance of individual product models in laboratory conditions to see if they meet GEMS requirements and the claims of manufacturers and suppliers. Check testing encourages compliance with the GEMS Act and helps to uphold the integrity of the E3 Program.

The check testing program follows five main steps. At the first step, the Regulator selects product models for testing according to defined criteria and risk factors. After acquiring units of the selected models for testing, the Regulator proceeds with the Stage One check test at the Regulator’s expense. If the Stage One test indicates the model complies with GEMS requirements, the person responsible for the product’s registration (registrant) is informed and no further action is taken.

If the Stage One test indicates the model does not comply with relevant requirements, the registrant must either cancel the registration or may arrange for further (Stage Two) testing. If the registrant elects to cancel the registration, the Regulator may pursue other enforcement action such as infringement notices, compensation, or fines.

If the registrant considers the results of the Stage One test do not accurately reflect the model as a whole, the registrant may arrange for State Two testing. Stage Two testing is conducted at the registrant’s expense, in line with reasonable instructions given by the Regulator. If the Stage Two test indicates the model complies with relevant requirements, no further action is taken. If the test indicates the model does not comply, the product registration must be cancelled and the Regulator may take further enforcement action.

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\(^1\) A Determination is made by the Minister under Section 23 of the GEMS Act for products in a product class that use energy or affect the use of energy by other products. A Determination may specify the energy use and labelling requirements and other GEMS requirements for products in a product class covered by the Determination.

\(^2\) Referred to in this document as the Regulator.
Step 1 – Selecting models for check testing

The Regulator selects models for check testing using a range of risk-based criteria. The broad objectives of the selection criteria are to:

1. identify models with a higher risk of non-compliance;
2. identify product categories that have the greatest potential impact on energy consumption and greenhouse gas emissions; and
3. test each type of product regulated under the E3 Program.

Factors that the Regulator may take into account when selecting models for check testing include:

Intelligence from competitors, consumer groups, individuals and overseas testing programs
Reports of possible non-compliance are important sources of information. All reports will be assessed and the Regulator may select a product model for testing based on the substantiating information provided with one complaint or on the number of complaints about a particular model or producer.

Models with a high market share
Models with high volumes of sales may be given preference when selecting models for check testing because of their greater impact on energy use, compared to models with low sales volumes.

Product types with the highest greenhouse gas emissions
Some products consume more energy and have higher greenhouse gas emissions than other products (e.g. commercial refrigerators vs. bar fridges). The impact of non-compliant models with high energy consumption will be greater than models with lower consumption, so check testing may prioritise product types with higher energy consumption.

Brands with a history of non-compliance or with no check test history
Brands with a demonstrated record of non-compliance are generally subject to greater scrutiny in the check testing program than brands with a demonstrated history of compliance. Brands with no check test history also may be targeted for testing, until such time as the Regulator generates a demonstrated history of compliance.

Product types with comparatively higher levels of non-compliance
Some product types have a demonstrated history of non-compliance, so may be subject to greater check testing than other product types regardless of the brand or producer.
Models supported by test laboratories with a poor test history (or without a test history)

When products are registered under the E3 Program, the application is generally supported by a test report confirming the energy efficiency level (and other technical details). If check testing results indicate that products tested by a particular laboratory consistently fail to meet relevant requirements, product models tested by that lab will tend to attract a higher degree of scrutiny. Product models tested by labs with no previous involvement in the check testing program may also be prioritised in check testing, until such time as the Regulator generates a pattern of accurate testing.

*New product categories*

The check testing program will prioritise models in product types that are newly regulated and have no history of check testing. Testing models in newly regulated product types will encourage compliance with new energy efficiency requirements.

*Coverage of all product groups*

Over the long term, the Regulator aims to ensure that all regulated product types are included in the check testing program. Product types that have not been tested for several years may be prioritised over more recently tested product types.

*High efficiency claims*

Models with the highest claims for energy efficiency (i.e. high star ratings) may be given preference when considering models for check testing to ensure that consumers’ expectations of higher performance are met, and to protect the integrity of the energy rating program. The Regulator’s compliance officers will consider a matrix of these factors when selecting product models for check testing, prioritising those product models with more risk factors.

**Step 2 – Acquiring models for check testing**

Units of models selected for check testing will, where possible, be purchased anonymously from the market for example from a retail outlet. In limited circumstances, section 57 of the GEMS Act permits the Regulator to compulsorily acquire units of a product model from a registrant. A product can only be acquired for testing under section 57 where the Regulator has evidence that it would not be practical to purchase the product (e.g. because purchase has been refused, or because no units can be found on the market). The Regulator must provide adequate compensation for units acquired under section 57 (e.g. market sale price).

**Step 3 – The Stage One check test**

After acquiring units for check testing, the Regulator contracts a test laboratory to conduct the Stage One check test. The Stage One test is normally performed on one unit of the selected model, although for some product types more than one sample must be tested. The test is conducted according to the requirements set out in the relevant test standard.

Wherever possible, the Regulator uses only those laboratories accredited by the National Association of Testing Authorities (NATA), Australia or an accreditation body having mutual recognition with the NATA, Australia.
The laboratory contracted to conduct a Stage One check test is required to store the unit securely with no access by any third parties while it is in their possession. The laboratory must also maintain strict confidentiality with regard to the product types, brands and models it has been contracted to test.

Before proceeding with the Stage One test, the laboratory will inspect the model for any damage or defects. Testing will only proceed where no damage or defect is detected. If the registrant subsequently wishes to dispute a test result on the grounds that the unit tested was damaged or defective, the registrant will need to provide evidence to the Regulator that the particular unit tested was damaged or defective.

If the Stage One test indicates the model meets relevant product standards, the Regulator will notify the registrant of the test and the pass result and take no further action.

If the Stage One test indicates the model fails to meet performance and/or labelling requirements, the Regulator will issue a Notice of Non-compliance with GEMS Determination – Stage One Checktest, to inform the registrant of the failed test\(^3\). The purpose of the Notice is to advise the Registrant that they may be issued with a formal Notice under s61 of the GEMS Act 2012 and provides the registrant an opportunity to respond to the results of the Stage One check test, for example, to provide any additional information in relation to the accuracy of the test results that may affect the Regulator’s decision to issue a s61 Notice. The registrant has 14 days from the date of the Notice to respond.

If the registrant provides evidence that the Regulator agrees is sufficient to demonstrate that the Stage One unit was defective or damaged or that there was an error in the conduct of the Stage One check test, the Stage One check test result will be voided and the test must be repeated – either on the same unit after repairs or on a second unit chosen randomly by the Regulator. Costs associated with inspection and repair of the original unit or provision of a replacement unit must be met by the registrant. If the unit passes the repeat Stage One check test the model is deemed to meet the relevant requirements and no further action is taken.

If a registrant does not respond to the Interim Notice within 14 days, or is unable to show cause for the Stage One test to be voided, or the Stage One re-test results in a fail result, the Regulator will issue a formal Notice under s61 of the GEMS Act 2012 (s61 Notice). The s61 Notice will require the registrant to either:

(a) cancel the product registration under s54(2) of the Act; or
(b) apply for further testing (Stage Two Checktest (s61(2)(b)(i) and (ii) of the Act).

If the registrant elects to cancel the product registration, they will be required to complete the prescribed form to ‘Elect to cancel registration’, provided with the s61 Notice. Following cancellation of the registration, the Regulator will consider the appropriate enforcement response (see Step 5 – Enforcement Action).

\(^3\) A model that has failed a Stage One check test will be retained by the test laboratory until the check test process has been finalised, after at the end of Stage One or Stage Two testing.
Step 4 – The Stage Two check test

Under section 61 of the GEMS Act, if a registrant does not elect to cancel a product model’s registration following receipt of the s61 Notice, the registrant must arrange and pay for Stage Two testing.

Stage Two testing must be carried out in accordance with any reasonable instructions issued by the Regulator included in the notice issued under section 61 of the GEMS Act. In general, these instructions will include:

- the timeframe in which Stage Two testing must be completed; and
- a requirement for the registrant to provide a list of serial numbers of all products held in stock, from which the Regulator will select the units for testing.

The registrant must respond to the section 61 Notice and provide the necessary information, before going ahead with the test process.

Number of Stage Two units

Where the Stage One failure relates to a performance requirement, e.g. a minimum energy performance requirement, the registrant must test a minimum of two units from the list of serial numbers nominated by the Regulator (Stage Two [a] testing). If both units pass the test, the Regulator will conclude that the model meets relevant performance requirements. If both units fail, the Regulator will conclude that the model does not meet relevant performance requirements. If one unit passes and one unit fails, one additional unit from the list of units selected by the Regulator must be tested (Stage Two [b] testing) and must pass the test for the model to meet relevant performance requirements. For some product types, such as lighting products, more than two units must be tested at Stage Two. Details of the requirements for different product types will be provided by the Regulator in the Section 61 Notice.

Where the Stage One failure relates to a performance claim by the registrant, e.g. the energy efficiency claimed on a label, the registrant must test a minimum of three units from the list of serial numbers nominated by the Regulator. A majority of the units tested must pass the test for the Regulator to conclude the model meets relevant performance claims. Requirements will be provided by the Regulator in the Section 61 Notice.

For Stage Two check testing the Regulator will only allow laboratories accredited by NATA or with a mutual recognition agreement with NATA, that are independent of the registrant for the model being tested. By arrangement, the Regulator will only accept the results of Stage Two testing from the registrant’s own accredited facility where there is no reasonable alternative. Under these circumstances, the registrant must, by agreement with the Regulator, engage an independent witness to monitor and verify the testing procedure. The Regulator may advise any necessary qualifications for the witness. The witness must provide a written statement to the Regulator following completion of Stage Two check testing confirming that the check testing was conducted
According to the relevant test standard and in accord with NATA requirements. The registrant must cover the costs associated with the witness.

**Step 5 – Enforcement response to non-compliance**

When check testing demonstrates a model does not comply with relevant requirements, whether at Stage One or Stage Two testing, a registrant may be liable for fines or other enforcement action.


The first response is that the model’s registration must be cancelled (see sections 49 and 54 of the GEMS Act). The registration of any products that are registered using the same test report, and are therefore equivalent in terms of performance, will also be cancelled (whether registered as a family or registered separately).

If the product model failed testing on the grounds that measured performance did not meet performance claims, but did meet the relevant performance requirements, the model may be re-registered if accompanied by an accurate test report. If the model does not meet one or more of the relevant performance requirements, or is not registered, then the product must not be sold or used in Australia.

In addition to de-registration, the Regulator may issue infringement notices or fines, or pursue an ‘enforceable undertaking’ where the registrant agrees to compensate consumers or the environment.

**VERIFICATION CRITERIA**

The GEMS Act allows the GEMS Regulator to set, via legislative instrument, requirements (or thresholds) for determining whether a product complies with a GEMS determination. This instrument will be made publicly available when complete. In the interim the thresholds are identical to those that were set out in the E3 Program’s Administrative Guidelines and are provided in Appendix A to this document.

**REVIEW OF THIS POLICY**

The Australian GEMS Regulator is committed to administering the GEMS Act in a transparent and accountable manner. As such, the Australian GEMS Regulator will regularly review the Policy and its implementation, ensuring that operational experiences and amendments to legislation are incorporated. In the event that amendments to the Policy are required as a result of review findings, the Policy will be updated on the Energy Rating website.

**FURTHER INFORMATION**

Further information about the GEMS Act and the E3 Program is available from the E3 Program website at www.energyrating.gov.au.
Appendix A

VERIFICATION CRITERIA

During 1999, a statistical consultancy was commissioned by the E3 Program to prepare a methodology to determine an approach for verification or rejection of a supplier’s claim, based on the testing of up to three units via check tests. The following process is drawn from the recommendations of this report.

These criteria relate only to the verification of the claim associated with energy labelling or MEPS. They must not be interpreted as an allowed tolerance on the original test measurements used to support an application for registration.

Supplier Declarations

A supplier declaration is a declaration of energy or performance made wither within an energy labelling application or through manufacture information supplied with the product (accompanying literature, user manuals, information affixed to the product such as a rating plate) or at the point of sale (advertising). Supplier declarations include:

- Declared energy consumption for all products (eg energy label)
- Air conditioner heating and cooling capacity
- Air conditioner efficiency (AEER or ACOP)
- Clothes washer spin performance.

The general rule for verification of a supplier’s declaration is:

- A single stage one check test must not be more than 10% worse than the declaration (Stage One);
- If this is found to be the case, a further three units (randomly selected by the regulator) are to be check tested at the supplier’s expense (Stage Two);
- If the mean of the three additional units check tested for Stage Two are found to be more than 10% worse than the declaration, the product fails.

The consultancy found that for typical measurement errors and variability, the current rule of allowing a 10% variation as the trigger for additional check tests and as the basis of verification of a further three units is sound. The consultancy also found that the probability of de-registration of a model under this rule is extremely small if the supplier’s original declaration is in fact accurate.

The following supplier’s declarations are used to verify other performance characteristics of appliances so are only subject to indirect verification:

- Clothes dryer capacity (0.5 kg steps)
- Clothes washer capacity (0.5k kg steps)
- Dishwasher capacity (whole number of place settings).
It is important to note that verification tolerances are not applied to checks of supplier declarations – the assumed limit of 10% (or other relevant limit for other variables) includes allowances for elements such as production variability, measurement accuracy and uncertainties.

A special case is the volume declaration for refrigerators and freezers, where the Standard specifies an allowable tolerance of 3% on the measurement (note that the precise rule depends on the compartment volume). Given that this measurement of gross volume by third parties is difficult in some cases (and therefore subject to some uncertainties), the check testing tolerance for refrigerator volume is set at 5% less than the declared value before regulatory action is to be taken (ie an allowance of 2% above the tolerance value specified in the standard).

A second special case is the verification of the rated hot water delivery volume for an electric storage water heater. The standard does not specify any tolerance on the measurement of hot water delivery during a verification test. Given that the volume of water and its temperature can be measured with some degree of certainty, a tolerance limit of 3% has been set for this variable.

**Performance Limits**

A performance limit is the minimum required level of a performance measure specified in the relevant Australian/ New Zealand. Generally, performance limits are determined by the relevant standards committee and are set at a level that provides a level of energy service that could reasonably be expected by a consumer.

Performance limits are set primarily for consumer protection. Minimum Energy Performance Standards (MEPS) are a performance limit that relates specifically to the energy efficiency of an appliance (eg maximum allowable energy consumption for a specified size and/or features) – these are usually set by governments (but not in all cases). From 1 October 1999, refrigerators, freezers, and electric storage water heaters have been regulated by Governments for MEPS. A range of other products have subsequently had MEPS requirements introduced.

In Australian and New Zealand Standards, a wide range of mandatory performance limits are specified and required for regulatory purposes. These are set out in Table 2: Verification Limits – Minimum Performance Requirements below.

For the verification of minimum performance limits, it is assumed that the actual performance across individual units of the same model is normally distributed. The standard generally specifies that each unit shall meet the required performance limit, where these are set. Under a normal distribution, it is not possible to be assured that all units will be able to pass the standard minimum requirements so an alternative approach is used. For the verification of minimum performance limits, a practical requirement is to allow the worst 10% of units of a particular model to fail the limit stated in the standard (meaning that 90% are required to pass the limit). Given that the measurement error is typically of equal magnitude to the variability of the test measurement, this limit has been doubled to 18% of units.

The practical general application of this rule is:

- A single initial Stage 1 check test is conducted and the unit must not fail the performance requirements specified in the standard (Stage One);
• If it does fail, a further two units (randomly selected by the Regulator) are to be tested at the supplier’s expense (Stage Two a);
• If both of the additional units tested for Stage Two (a) are found to fail the performance requirements specified in the standard, the product shall fail.
• If both of the additional units tested for Stage Two (a) are found to pass the performance requirements specified in the standard, the product shall be deemed to pass.
• If one of the additional units tested for Stage Two (a) is found to fail the performance requirement specified in the standard while one passes, one additional unit is tested (Stage Two b).
• If two of the additional three units tested in Stages Two (a) and Two (b) are found to fail the performance requirements specified in the standard, the product shall fail.
• If two of the additional three units tested for Stages Two (a) and Two (b) are found to pass the performance requirements specified in the standard, the product shall be deemed to pass.

If three units are initially tested in Stage Two, then Stages Two (a) and Two (b) are not required. However, two of the three units tested in Stage Two must pass the requirements. For some products, a larger sample may be requested to verify the Stage Two check test requirements (e.g., lighting products where product variability may be a factor). For some larger products such as certain models of distribution transformers, a sample of three units may not be possible.

Unlike other MEPS products in Australia, domestic refrigerators and freezers allow an approach where the MEPS level applies to the average of production rather than defining an absolute maximum allowable for every individual product. To verify compliance with MEPS for the product, regulators have to establish the likely average energy for the product and whether this exceeds the MEPS level or not so this product is subject to a different verification procedure.

Where there is a known margin of error or uncertainty in the measurement procedure for a particular test, then this value will be used as a verification tolerance by the regulatory agencies on the performance level specified in the standard. Generally, this measurement error is set at a maximum of 2% of the performance level specified, except in the cases that are documented to have different measurement errors on the basis of a series of round robin tests conducted for regulatory agencies or on error analysis. Regulatory agencies will also take into account other factors where these are known to impact on the performance measure, such as the calibration swatches used to assess washing performance of clothes washers. Verification tolerances are only applied to results for performance limit parameter from units tested in Stage Two check tests.

**Complex Performance Requirements**

In Australian Standards, the following mandatory performance limits are specified and are required for regulatory purposes and are defined as “complex” for verification purposes:

• Refrigerator temperature operation test
• Clothes dryer dry clothes in a single operation
• Clothes dryer maximum allowable drum temperature
• Air conditioner maximum cooling test.
For complex tests with multiple pass/fail criteria, it is not possible to define simple validity criteria. Explanations are provided below:

- **Refrigerator temperature operation test** – the unit is tested with one to several control setting combinations to establish that the unit has at least one combination of control settings where all internal compartment temperature requirements can be met simultaneously under the specific ambient temperature (tests at 10°C, 32°C and 43°C are required for most product groups).

- **Dry clothes in a single operation** – clothes dryers are required to reach the specified final moisture content (6% of bone dry mass) within a single control setting (either via a timer or with an automatic sensor) before cool-down commences. There is no continuous measure for this test form for which a tolerance can be defined (the dryer either passes or fails).

- **Clothes dryer maximum allowable drum temperature** – theoretically the temperature measurement for this test is on a continuous scale so a tolerance could be defined. However, in practice, the temperature recording strips used record temperatures at about 5°C intervals and strips are selected to record temperatures just below the allowable maximum temperature (typically 128°C to 130°C) with the next step well above the allowable temperature. In effect, the tolerance for this test is built into the type of equipment used.

- **Air conditioner maximum cooling test** – this involves running the air conditioner under extreme conditions then shutting the power off. The air conditioner must meet various requirements after the restoration of power including no motor or wiring damage, as well as commence operation again within a specified period after the restoration of power without motor overload trips and to operate continuously for one hour.

The above complex performance measures and limits are verified or applied as defined in the relevant standards without any tolerance values. The same general rule applies to the verification of both simple and complex performance criteria (ie 2 + 1 rule set out for Stage Two check test).

**Related Situations**

Occasionally, information on the performance of appliances or equipment from sources other than energy labels (eg compliance plates, rating plates or product literature) conflicts with information on the energy label or contained in the application submitted form energy labelling and MEPS registration. Suppliers should be aware that such cases may be subject to action under energy efficiency labelling legislation and regulations or may be referred to the Australian Competition and Consumer Commission for investigation.
Table 1: Verification Limits – Supplier Declarations

<table>
<thead>
<tr>
<th>Supplier Declarations</th>
<th>Verification Limit Stage I</th>
<th>Stage II Check testing Number of units tested</th>
<th>Criteria for Passing Stage II Check testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy declarations (input: all applicable products *)</td>
<td>1.1 × claim</td>
<td>3</td>
<td>Average &lt; 1.1 × claim</td>
</tr>
<tr>
<td>Air conditioner cooling capacity</td>
<td>0.9 × claim</td>
<td>3</td>
<td>Average &gt; 0.9 × claim</td>
</tr>
<tr>
<td>Air conditioner heating capacity</td>
<td>0.9 × claim</td>
<td>3</td>
<td>Average &gt; 0.9 × claim</td>
</tr>
<tr>
<td>Air conditioner efficiency (EER &amp; COP)</td>
<td>0.9 × claim</td>
<td>3</td>
<td>Average &gt; 0.9 × claim</td>
</tr>
<tr>
<td>Clothes washer water extraction index</td>
<td>1.1 × claim</td>
<td>3</td>
<td>Average &lt; 1.1 × claim</td>
</tr>
<tr>
<td>Refrigerator compartment volume</td>
<td>0.95 × claim</td>
<td>3</td>
<td>Average &gt; 0.95 × claim</td>
</tr>
<tr>
<td>Rated hot water delivery capacity</td>
<td>0.97 × claim</td>
<td>3</td>
<td>Average &gt; 0.97 × claim</td>
</tr>
<tr>
<td>Water consumption</td>
<td>1.1 × claim</td>
<td>3</td>
<td>Average &lt; 1.1 × claim</td>
</tr>
</tbody>
</table>

Note *: For some products this limit is not applicable, e.g. ballasts, where the declaration is the Energy Efficiency Index (EEl) which is based on a total circuit power.

The following supplier declarations are not verified directly (declared values defines test conditions):

- Clothes dryer capacity (0.5 kg steps)
- Clothes washer capacity (0.5kg steps)
- Dishwasher capacity (whole number of place settings)
- Electric motor output (kW).
Table 2: Verification Limits – Minimum Performance Requirements

<table>
<thead>
<tr>
<th>Performance limits</th>
<th>Verification Limit Stage I</th>
<th>Stage II Check testing Number of units tested</th>
<th>Criteria for Passing Stage II Check testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refrigerator pull down test</td>
<td>&lt; 6 hours</td>
<td>2 + 1</td>
<td>2 of the 3 units passes the verification limit</td>
</tr>
<tr>
<td>Refrigerator MEPS (maximum annual energy)</td>
<td>Defined by group in AS/NZS4474.2</td>
<td>3 + +</td>
<td>90% confidence that the mean does not exceed the MEPS level and mean energy with verification tolerance &lt;1.03 MEPS</td>
</tr>
<tr>
<td>Clothes washer soil removal</td>
<td>&gt; 0.80</td>
<td>2 + 1</td>
<td>2 of the 3 units passes the verification limit</td>
</tr>
<tr>
<td>Clothes washer soil removal less 2 × SD</td>
<td>&gt; 0.72</td>
<td>2 + 1</td>
<td>2 of the 3 units passes the verification limit</td>
</tr>
<tr>
<td>Clothes washer water extraction index</td>
<td>&lt; 1.10</td>
<td>2 + 1</td>
<td>2 of the 3 units passes the verification limit</td>
</tr>
<tr>
<td>Clothes dryer tested energy performance</td>
<td>&lt; 1.36</td>
<td>2 + 1</td>
<td>2 of the 3 units passes the verification limit</td>
</tr>
<tr>
<td>Dishwasher washing index</td>
<td>&gt; 0.90</td>
<td>2 + 1</td>
<td>2 of the 3 units passes the verification limit</td>
</tr>
<tr>
<td>Dishwasher drying performance</td>
<td>&gt; 0.50</td>
<td>2 + 1</td>
<td>2 of the 3 units passes the verification limit</td>
</tr>
<tr>
<td>Electric storage water heater MEPS (maximum daily heat loss) *</td>
<td>Defined in AS1056.1 by hot water delivery and type</td>
<td>2 + 1</td>
<td>2 of the 3 units passes the verification limit</td>
</tr>
<tr>
<td>Air conditioner MEPS (minimum EER) *</td>
<td>Defined in AS/NZS3823.2 by output and type</td>
<td>2 + 1</td>
<td>2 of the 3 units passes the verification limit</td>
</tr>
<tr>
<td>Three phase electric motors MEPS (minimum efficiency) *</td>
<td>Defined in AS/NZS1359.5 by output and pole</td>
<td>2 + 1</td>
<td>2 of the 3 units passes the verification limit</td>
</tr>
</tbody>
</table>

Note *: The same procedure for MEPS verification limits applies to claims of high efficiency for the same product types where these are defined in the relevant standard.

** Additional units may need to be tested to establish the criteria in some circumstances. The procedure to determine MEPS validity for refrigerators and freezers is complex and was released for discussion in June 2005.

The following complex performance limits are verified or applied as defined in the relevant standards without any tolerance values.

- Refrigerator temperature operation test
- Clothes dryer dry clothes in a single operation
- Clothes dryer maximum allowable drum temperature
- Air conditioner maximum cooling test.

For these performance limits, during Stage Two check testing, at least two units of the three additional units tested must satisfy the requirements for the model to pass check testing. No tolerance is allowed for these performance limits.
**Verification Tolerances**

A general verification tolerance of 2% of the product specific minimum performance requirement (representing a typical uncertainty of measurement in an accredited laboratory) is allowed during Stage Two verification tests, except in the cases shown below where specific testing has indicated that a different verification tolerance is applicable. These tolerances relate only to the verification of the claim associated with energy labelling or MEPS – they must not be interpreted as an allowed tolerance on the original test measurements for results which are submitted for registration.

Table 3: Verification Tolerance Limits for Specified Products

<table>
<thead>
<tr>
<th>Product</th>
<th>Performance Parameter</th>
<th>Verification Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clothes Washer</td>
<td>Soil Removal (and SR less 2 x SD)</td>
<td>0.03</td>
</tr>
<tr>
<td>Dishwasher</td>
<td>Wash performance</td>
<td>0.03</td>
</tr>
<tr>
<td>Dishwasher</td>
<td>Drying performance</td>
<td>0.03</td>
</tr>
<tr>
<td>Electric Water Heaters</td>
<td>MEPS (maximum daily heat loss)</td>
<td>3% of limit</td>
</tr>
<tr>
<td>Air Conditioner</td>
<td>MEPS (EER)</td>
<td>3% of limit</td>
</tr>
<tr>
<td>Three phase electric motors</td>
<td>MEPS (minimum efficiency)</td>
<td>Specified AS/NZS1359.5 Table 1.1 *</td>
</tr>
</tbody>
</table>

Note *: Limits in AS/NZS1359.5 for verification limits are:
- Motors to 50kW – summation of losses: verification tolerance -15% of (1 - η)
- Motors above 50kW – summation of losses: verification tolerance -10% of (1 - η)
Appendix B

DEFINITIONS

GEMS Act  

GEMS determination  
A legal instrument issued by the Australian Government, under the GEMS Act, that makes GEMS requirements mandatory for all businesses supplying or using regulated products.

GEMS determinations commonly refer to Australian Standards or International Standards, effectively giving these documents the force of law.

GEMS requirement  
A legal obligation set by the GEMS Act.

These requirements may include obligations to label products at the point of supply, obligations to test products, or obligations to ensure products meet certain performance requirements.

Performance requirement  
A technical aspect of a product model for which a GEMS determination specifies a mandatory minimum or maximum level.

Performance requirements might include things like a minimum energy efficiency levels, a maximum amount of greenhouse gas production, a minimum amount of work required by the product (e.g. dirt removed from a load of washing) or health and safety requirements (e.g. permitted amount of mercury vapour in fluorescent lighting).

Performance claim  
A technical aspect of a product for a manufacturer or supplier declares a value.

Performance claims might include things like declared energy efficiency levels, declared operational lifespan of a product, or declared greenhouse gas production. Performance claims may meet or exceed performance requirements set by a GEMS determination.