

# Green Star NZ Compatibility Analysis

<b>Author</b>	<b>EnviroSpec</b> <i>Verification Services</i>
<b>Document type</b>	Green Star NZ compatibility analysis
<b>Document code</b>	<b>ES-GSNZ-09-11f</b>
<b>Validity</b>	Created on 10/09/2009– Valid only for the following Green Star NZ tools: <ul style="list-style-type: none"> <li>- Office V.1</li> <li>- Office 2009</li> <li>- Interiors 2009</li> <li>- Education 2009</li> <li>- Industrial 2009</li> </ul>
<b>Client</b>	<b>Forman Building Systems</b>
<b>Product name</b>	<b>Armstrong Fine Fissured Ceiling tiles (including High NRC)</b>



*This document represents the conclusions of a thorough analysis and review of manufacturer and product information in relation to Green Star NZ rating tools and requirements.*

## Notice

This document has been prepared for Forman Building Systems and must remain complete at all times. This document may be reproduced for distribution in full, not in part.

## List of contents

INTRODUCTION .....	3
GREEN STAR NZ.....	3
GREEN STAR NZ SUMMARY SHEET .....	4
GENERAL COMPLIANCE GUIDANCE .....	7
OFFICE DESIGN AND BUILT V.1 .....	7
OFFICE 2009 .....	8
EDUCATION 2009 .....	9
INDUSTRIAL 2009 .....	10
OFFICE INTERIORS 2009 .....	11
ANNEXE A – SUPPORTING EVIDENCE .....	13

### Disclaimer

#### Please read this carefully

*This document is only applicable to the Green Star NZ tools and related credit categories described herein. The New Zealand Green Building Council reserves the right to revoke this document if the product changes and to audit the information contributing towards this summary document at any time.*

*EnviroSpec and the NZGBC do not accept liability for any loss or damages resulting from the use of this document.*

*EnviroSpec assures that care has been taken to ensure robust product reviews have been undertaken for the purpose of this document. However, no guarantee is given that the information supplied in the present document is 100% accurate, neither does this represent a compliance document in accordance with specified standards. EnviroSpec does not accept liability, in part or in full, for negligence or any loss or damages arising out of the use, reliance or otherwise of this document.*

*EnviroSpec emphasizes that this document is provided as guidance only. Use of, or reliance upon, any information contained in this report is at the user's own risk.*

*The information presented in this report is valid for the Green Star NZ tools herein only. As and when the NZGBC brings out new Green Star NZ tools, the information may require updating. EnviroSpec will only update information in this report upon receiving written consent from the Manufacturer, supplier or upon request from the NZGBC. It is the responsibility of the reader to check for regular updates.*

## Introduction

**EnviroSpec Verification Services** responds to the needs of product manufacturers and specifiers by speeding up the decision-making process. **EnviroSpec Verification Services** provides the assessment and review of product and manufacturing data against existing standards, specifications or requirements and publishes the results in a user-friendly format.

## Green Star NZ

Green Star NZ is a rating tool for buildings operated by the New Zealand Green Building Council ([www.nzgbc.org.nz](http://www.nzgbc.org.nz)). All Green Star NZ rating tools operate under the same framework of eight Environmental Impact Categories, plus innovation.

These include:

Management	IEQ	Energy	Transport	+ Innovation
Water	Materials	Land Use & Ecology	Emissions	

Each category is divided into specific credits that aim to improve the environmental performance of the building. Points are awarded for each credit for actions that demonstrate that the project has met the overall objectives of Green Star NZ.

Products may contribute towards positive Green Star NZ outcomes in a number of ways:

Manner in which the product may contribute towards points in Green Star NZ	Associated Symbol in EnviroSpec
• Products must meet specific criteria (e.g. Paint VOC emissions, carpets, etc)	✓
• Products may help achieve points by their very nature, if they are specified and included in the design in accordance with Green Star NZ requirements (e.g. bicycle racks)	●
• Products may help achieve an outcome but they must be used in a specific manner (e.g. lighting control and zoning systems) <b>OR</b> This product can contribute towards the outcome but many other products or factor influence that same outcome (E.g. Potable Water Calculator)	○

**EnviroSpec** is the trusted source of information on product contributions towards Green Star NZ. Summary sheets for each of the relevant Green Star NZ tools are provided in this document and can be printed for use during Green Star NZ submissions.

### Green Star NZ submissions

For purposes of a Green Star NZ submission, please print off the *Green Star NZ summary sheet supplied separately*

## Green Star NZ Summary Sheet

*Note:* A two-page printable "summary sheet" is provided separately. Please refer to [www.envirospec.co.nz](http://www.envirospec.co.nz)

Green Star NZ tool	Credit category	Points available <sup>1</sup>	Contribution symbol	Contribution Potential (points) <sup>1</sup>	Detail
Office V.1	IEQ - 5	3	○	Contributing factor	This credit rewards buildings that maximize daylight. Armstrong Fine Fissured Ceiling tiles have a Light Reflectance Value of 85% (average) which may help improve the floor area with a daylight factor above 2.5%.
	IEQ - 12	2	○	Contributing factor	This credit rewards buildings that maintain adequate noise levels. Armstrong Fine Fissured Ceiling tiles have a CAC of 30 and NRC of 0.55 (40 and 0.70 respectively for the high NRC version) which may assist in maintaining suitable noise levels.
	ENE- 5	3	○	Contributing factor	This credit rewards design options that lessen lighting energy consumption while maintaining adequate lighting levels. Armstrong Fine Fissured Ceiling tiles have a Light Reflectance Value of 85% (average) which may assist in reducing the lighting output required to obtain a given lighting level in a space.
Office Design and Built 2009	IEQ - 3	5	✓	2	Certain items within this credit reward 1 point for the use of low VOC ceiling tiles and 1 point for the use of low formaldehyde ceiling tiles and composite timber boards. Armstrong Fine Fissured Ceiling tiles are low VOC and low Formaldehyde in accordance with Greenguard, thus satisfying both requirements applicable to this product.
	IEQ - 8	3	○	Contributing factor	This credit rewards buildings that maximize daylight. Armstrong Fine Fissured Ceiling tiles have a Light Reflectance Value of 85% (average) which may help improve the floor area with a daylight factor above 2.5%.
	IEQ - 11	3	✓○	2 (Contributing factor)	This credits rewards for good visual comfort and lighting design. To achieve 2 point or more, the light reflectance of Ceilings must be minimum 75%. Armstrong Fine Fissured Ceiling tiles have a Light Reflectance Value of 85% (average), thus satisfying this requirement. The remaining items in this credit are based on lighting design and are not product-dependent.
	IEQ - 13	2	○	Contributing factor	This credit rewards buildings that maintain adequate noise levels. Armstrong Fine Fissured Ceiling tiles have a CAC of 30 and NRC of 0.55 (40 and 0.70 respectively for the high NRC version) which may assist in maintaining suitable noise levels.
	ENE- 4	3	○	Contributing factor	This credit rewards design options that lessen lighting energy consumption while maintaining adequate lighting levels. Armstrong Fine Fissured Ceiling tiles have a Light Reflectance Value of 85% (average) which may assist in reducing the lighting output required to obtain a given lighting level in a space.
Education 2009	IEQ - 3	5	✓	2	Certain items within this credit reward 1 point for the use of low VOC ceiling tiles and 1 point for the use of low formaldehyde ceiling tiles and composite timber boards. Armstrong Fine Fissured Ceiling tiles are low VOC and low Formaldehyde in accordance with Greenguard, thus satisfying both requirements applicable to this product.
	IEQ - 8	4	○	Contributing factor	This credit rewards buildings that maximize daylight. Armstrong Fine Fissured Ceiling tiles have a Light Reflectance Value of 85% (average) which may help improve the floor area with a daylight factor above 2.5%.
	IEQ - 11	3	✓○	2 (Contributing factor)	This credits rewards for good visual comfort and lighting design. To achieve 2 point or more, the light reflectance of Ceilings must be minimum 75%. Armstrong Fine Fissured Ceiling tiles have a Light Reflectance Value of 85% (average), thus satisfying this requirement. The remaining items in this credit are based on lighting design and are not product-dependent.
	IEQ - 13	2	○	Contributing factor	This credit rewards buildings that maintain adequate noise levels. Armstrong Fine Fissured Ceiling tiles have a CAC of 30 and NRC of 0.55 (40 and 0.70 respectively for the high NRC version) which may assist in maintaining suitable noise levels.
	ENE- 4	N/A	N/A	N/A	N/A



<b>Industrial 2009</b>	IEQ - 3	5	✓	2	Certain items within this credit reward 1 point for the use of low VOC ceiling tiles and 1 point for the use of low formaldehyde ceiling tiles and composite timber boards. Armstrong Fine Fissured Ceiling tiles are low VOC and low Formaldehyde in accordance with Greenguard, thus satisfying both requirements applicable to this product.
	IEQ - 8	4	○	Contributing factor	This credit rewards buildings that maximize daylight. Armstrong Fine Fissured Ceiling tiles have a Light Reflectance Value of 85% (average) which may help improve the floor area with a daylight factor above 2.5%.
	IEQ - 11	3	✓○	1 (Contributing factor)	This credits rewards for good visual comfort and lighting design. To achieve the first point, the light reflectance of Ceilings must be minimum 65%. Armstrong Fine Fissured Ceiling tiles have a Light Reflectance Value of 85% (average), thus satisfying this requirement. The remaining items in this credit are based on lighting design and are not product-dependent.
	IEQ - 13	2	○	Contributing factor	This credit rewards buildings that maintain adequate noise levels. Armstrong Fine Fissured Ceiling tiles have a CAC of 30 and NRC of 0.55 (40 and 0.70 respectively for the high NRC version) which may assist in maintaining suitable noise levels.
	ENE - 4	N/A	N/A	N/A	N/A
<b>Office Interiors 2009</b>	IEQ - 3	5	✓	1	Certain items within this credit reward 1 point for the use of low VOC and low Formaldehyde ceiling tiles. Armstrong Fine Fissured Ceiling tiles are low VOC and low Formaldehyde in accordance with Greenguard, thus satisfying the requirements for this product.
	IEQ - 8	3	○	Contributing factor	This credit rewards projects that maximize daylight. Armstrong Fine Fissured Ceiling tiles have a Light Reflectance Value of 85% (average) which may help improve the floor area with a daylight factor above 2.5%.
	IEQ - 11	3	✓○	2 (Contributing factor)	This credits rewards for good visual comfort and lighting design. To achieve 2 point or more, the light reflectance of Ceilings must be minimum 75%. Armstrong Fine Fissured Ceiling tiles have a Light Reflectance Value of 85% (average), thus satisfying this requirement. The remaining items in this credit are based on lighting design and are not product-dependent.
	IEQ - 13	2	○	Contributing factor	This credit rewards projects that maintain adequate noise levels. Armstrong Fine Fissured Ceiling tiles have a CAC of 30 and NRC of 0.55 (40 and 0.70 respectively for the high NRC version) which may assist in maintaining suitable noise levels.
	ENE - 4	3	○	Contributing factor	This credit rewards design options that lessen lighting energy consumption while maintaining adequate lighting levels. Armstrong Fine Fissured Ceiling tiles have a Light Reflectance Value of 85% (average) which may assist in reducing the lighting output required to obtain a given lighting level in a space.

<sup>1</sup> Points available and points achieved are considered pre-weighting. Final Green Star NZ category weightings for each tool still apply.

## General compliance guidance

The following is provided as general guidance to assist sales representatives and Design Teams understand each other's roles in ensuring a smooth process for compliance. The documentation dives deeper into each tool and identifies not only the manner in which the product contributes towards the credit, but also highlights the additional documentation that must be provided by the Design Team to the NZGBC during a submission. It is essential that suppliers fully understand these requirements in order to best respond to the needs of their market.

### Office Design and Built V.1

Impact Category	Credit Title	Credit No	Points Achieved	Product Contribution	Related Supporting Evidence
Indoor Environmental Quality	Daylight	IEQ - 5	Contribution potential towards compliance	This credit rewards buildings that maximize daylight. Armstrong Fine Fissured Ceiling tiles have a Light Reflectance Value of 85% (average) which may help improve the floor area with a daylight factor above 2.5%.	<ul style="list-style-type: none"> <li>Daylight modeling report describing compliance with Green Star NZ requirements.</li> <li>Architectural façade and roof drawings and elevations</li> <li>Summary sheet or glazing schedule with the quantity and type of all glazing installed.</li> <li>Manufacturer's data sheets for all glazing types showing VLT.</li> <li>Site plan in the context showing heights and location of surrounding buildings and average reflectance for those buildings.</li> </ul>
	Internal noise levels	IEQ - 12	Contribution potential towards compliance	This credit rewards buildings that maintain adequate noise levels. Armstrong Fine Fissured Ceiling tiles have a CAC of 30 and NRC of 0.55 (40 and 0.70 respectively for the high NRC version) which may assist in maintaining suitable noise levels. A general rule being the thinner the floor, the higher the CAC should be.	<ul style="list-style-type: none"> <li>Copy of the noise design report, prepared by a qualified acoustics consultant, describing all relevant internal and external noise sources and the design features required to demonstrate the Credit Criteria has been achieved.</li> <li>Copy of architectural plans, sections and details to demonstrate noise control design features which are included in the design, OR, Extracts from the commissioning report showing noise testing as compliant.</li> </ul>
Energy	Office lighting power density	ENE - 5	Contribution potential towards compliance	This credit rewards design options that lessen lighting energy consumption while maintaining adequate lighting levels. Armstrong Fine Fissured Ceiling tiles have a Light Reflectance Value of 85% (average) which may assist in reducing the lighting output required to obtain a given lighting level in a space.	<ul style="list-style-type: none"> <li>Extracts from the specification showing the design lighting levels which will be provided.</li> <li>Reflected ceiling plans clearly showing each typical lighting layout and the types of lamps used for each fitting.</li> <li>Short report showing each typical lighting layout, the proportion of the NLA served by that layout, and the calculations showing the lighting power density for that layout.</li> </ul>

# Office 2009

Impact Category	Credit Title	Credit No	Points Achieved	Product Contribution	Related Supporting Evidence
Indoor Environmental Quality	Indoor Air Quality	IEQ - 3	2 points <small>(i.e. maximum points available for this product)</small>	Certain items within this credit reward 1 point for the use of low VOC ceiling tiles and 1 point for the use of low formaldehyde ceiling tiles and composite timber boards. Armstrong Fine Fissured Ceiling tiles are low VOC and low Formaldehyde in accordance with Greenguard, thus satisfying both requirements applicable to this product.	<ul style="list-style-type: none"> <li>Specification extract nominating low VOC and Formaldehyde requirements and all other items required by the Technical Manual, and clearly Stating the nominated Armstrong ceiling tile in the schedule of finishes Design rating), OR, Confirmation from the Contractor that the correct ceiling tiles were installed (built rating).</li> <li>Short Summary listing and referencing all the products and demonstrating that the 90% compliance is achieved.</li> <li>Relevant product data and information roving compliance.</li> </ul>
	Daylight	IEQ - 8	Contribution potential towards compliance	This credit rewards buildings that maximize daylight. Armstrong Fine Fissured Ceiling tiles have a Light Reflectance Value of 85% (average) which may help improve the floor area with a daylight factor above 2.5%.	<ul style="list-style-type: none"> <li>Daylight modeling report describing compliance with Green Star NZ requirements.</li> <li>Site plan in the context showing heights and location of surrounding buildings and average reflectance for those buildings.</li> <li>Specification extract demonstrating glazing requirements and minimum VLTs (design rating.)</li> <li>Glazing schedule with quantity and types of glazing installed (built rating).</li> <li>Manufacturer's data sheets for all glazing types showing VLT (built rating).</li> </ul>
	Electric lighting levels	IEQ-11	2 points <small>(Contributing factor when included in calculations)</small>	This credits rewards for good visual comfort and lighting design. To achieve 2 point or more, the light reflectance of Ceilings must be minimum 75%. Armstrong Fine Fissured Ceiling tiles have a Light Reflectance Value of 85% (average), thus satisfying this requirement. The remaining items in this credit are based on lighting design and are not product-dependent.	<ul style="list-style-type: none"> <li>Extract(s) from the specification(s) stipulating the average maintained illuminance lighting levels and the reflectance values required (design rating).</li> <li>Short report describing how the Credit Criteria have been met in accordance with Green Star NZ requirements and referencing attached documents as appropriate.</li> <li>Relevant Ceiling plan drawings marked up to demonstrate compliance in accordance with the requirements set out in the Technical Manual.</li> <li>Isolux drawings complete with stated uniformities, surface reflectances, maintenance factors and task heights.</li> </ul>
	Internal noise levels	IEQ - 13	Contribution potential towards compliance	This credit rewards buildings that maintain adequate noise levels. Armstrong Fine Fissured Ceiling tiles have a CAC of 30 and NRC of 0.55 (40 and 0.70 respectively for the high NRC version) which may assist in maintaining suitable noise levels. A general rule being the thinner the floor, the higher the CAC should be.	<ul style="list-style-type: none"> <li>Copy of the noise design report, prepared by a qualified acoustics consultant, in accordance with the requirements of the Technical Manual</li> <li>Specification extract or design drawings (design rating)</li> <li>Extracts from the commissioning report in accordance with Technical Manual requirements (built rating), OR, As-built plans, sections and details to demonstrate noise control design features which are included in the design (when building cannot practically be measured as open plan).</li> </ul>
Energy	Lighting	ENE- 4	Contribution potential towards compliance	This credit rewards design options that lessen lighting energy consumption while maintaining adequate lighting levels. Armstrong Fine Fissured Ceiling tiles have a Light Reflectance Value of 85% (average) which may assist in reducing the lighting output required to obtain a given lighting level in a space.	<ul style="list-style-type: none"> <li>Short report in accordance with the Technical Manual requirements.</li> <li>Computer Modeling sheets</li> <li>Relevant Reflected Ceiling Plans</li> <li>Specification extract nominating lighting levels (design rating), OR, Commissioning report confirming compliance (built rating).</li> <li>Design single line diagram showing the intended lighting control system schematic. Commissioning report extract demonstrating compliance with 3<sup>rd</sup> point (if applicable).</li> </ul>

## Education 2009

Impact Category	Credit Title	Credit No	Points Achieved	Product Contribution	Related Supporting Evidence
Indoor Environmental Quality	Indoor Air Quality	IEQ - 3	2 points <small>(i.e. maximum points available for this product)</small>	Certain items within this credit reward 1 point for the use of low VOC ceiling tiles and 1 point for the use of low formaldehyde ceiling tiles and composite timber boards. Armstrong Fine Fissured Ceiling tiles are low VOC and low Formaldehyde in accordance with Greenguard, thus satisfying both requirements applicable to this product.	<ul style="list-style-type: none"> <li>• Short Summary listing and referencing all the products and demonstrating that the 90% compliance is achieved.</li> <li>• Relevant product data and information proving compliance.</li> <li>• Specification extract nominating low VOC and Formaldehyde requirements and all other items required by the Technical Manual, and clearly Stating the nominated Armstrong ceiling tile in the schedule of finishes (design rating), OR, confirmation from the contractor and quantity surveyor.</li> </ul>
	Daylight	IEQ - 8	Contribution potential towards compliance	This credit rewards buildings that maximize daylight. Armstrong Fine Fissured Ceiling tiles have a Light Reflectance Value of 85% (average) which may help improve the floor area with a daylight factor above 2.5%.	<ul style="list-style-type: none"> <li>• Daylight modeling report OR manual calculations describing compliance with Green Star NZ requirements.</li> <li>• Drawings showing workstation location in relation to light penetration line.</li> <li>• Summary sheet or glazing schedule with the quantity and type of all glazing installed (if modeling used).</li> <li>• Manufacturer's data sheets for all glazing types showing VLT. (if modeling used).</li> <li>• Site plan in the context showing heights and location of surrounding buildings and average reflectance for those buildings.</li> </ul>
	Electric lighting levels	IEQ-11	2 points <small>(Contributing factor when included in calculations)</small>	This credits rewards for good visual comfort and lighting design. To achieve 2 point or more, the light reflectance of Ceilings must be minimum 75%. Armstrong Fine Fissured Ceiling tiles have a Light Reflectance Value of 85% (average), thus satisfying this requirement. The remaining items in this credit are based on lighting design and are not product-dependent.	<p><u>For first 2 points:</u></p> <ul style="list-style-type: none"> <li>• Specification (design phase), OR, Summary table (Built phase) detailing luminances and reflectance values.</li> <li>• Calculations verifying the surface illuminations</li> <li>• Manufacturer LRV datasheets or estimation according to Technical Manual (built rating).</li> </ul> <p><u>If 3<sup>rd</sup> point is being claimed:</u></p> <ul style="list-style-type: none"> <li>• Short report in accordance with Technical Manual requirements describing how credit has been met.</li> <li>• Relevant Reflected Ceiling Plan drawings.</li> <li>• Relevant Isolux drawings complete with stated uniformities, surface reflectances, maintenance factors and task heights.</li> </ul>
	Internal noise levels	IEQ - 13	Contribution potential towards compliance	This credit rewards buildings that maintain adequate noise levels. Armstrong Fine Fissured Ceiling tiles have a CAC of 30 and NRC of 0.55 (40 and 0.70 respectively for the high NRC version) which may assist in maintaining suitable noise levels. A general rule being the thinner the floor, the higher the CAC should be.	<ul style="list-style-type: none"> <li>• Copy of the noise design report, prepared by a qualified acoustics consultant, in accordance with the requirements of the Technical Manual</li> <li>• Specification extract or design drawings (design rating)</li> <li>• Extracts from the commissioning report in accordance with Technical Manual requirements (built rating), OR, As-built plans, sections and details to demonstrate noise control design features which are included in the design (when building cannot practically be measured as open plan).</li> </ul>
Energy	Lighting	ENE- 4	N/A	N/A	N/A

## Industrial 2009

Impact Category	Credit Title	Credit No	Points Achieved	Product Contribution	Related Supporting Evidence
Indoor Environmental Quality	Indoor Air Quality	IEQ - 3	2 points <small>(i.e. maximum points available for this product)</small>	Certain items within this credit reward 1 point for the use of low VOC and low Formaldehyde ceiling tiles. Armstrong Fine Fissured Ceiling tiles are low VOC and low Formaldehyde in accordance with Greenguard, thus satisfying the requirements for this product.	<ul style="list-style-type: none"> <li>Specification extract nominating low VOC and Formaldehyde requirements and all other items required by the Technical Manual, and clearly Stating the nominated Armstrong ceiling tile in the schedule of finishes.</li> <li>Short Summary listing and referencing all the products and demonstrating that the 90% compliance is achieved.</li> <li>Relevant product data and information proving compliance.</li> </ul>
	Daylight	IEQ - 8	Contribution potential towards compliance	This credit rewards buildings that maximize daylight. Armstrong Fine Fissured Ceiling tiles have a Light Reflectance Value of 85% (average) which may help improve the floor area with a daylight factor above 2.5%.	<ul style="list-style-type: none"> <li>Daylight modeling report OR manual calculations describing compliance with Green Star NZ requirements.</li> <li>Relevant Drawings showing the GFA within the light penetration line.</li> <li>Site plan in the context showing heights and location of surrounding buildings and average reflectance for those buildings.</li> <li>If the modeling approach is used then also provide specification or glazing schedule showing glazing type installed, quantity and VLT.</li> <li>Manufacturer's data sheets for all glazing types showing VLT (Built rating with modeling approach).</li> </ul>
	Electric lighting levels	IEQ-11	1 point <small>(Contributing factor when included in calculations)</small>	This credit rewards for good visual comfort and lighting design. To achieve the first point, the light reflectance of Ceilings must be minimum 65%. Armstrong Fine Fissured Ceiling tiles have a Light Reflectance Value of 85% (average), thus satisfying this requirement. The remaining items in this credit are based on lighting design and are not product-dependent.	<p><u>For first 1st point:</u></p> <ul style="list-style-type: none"> <li>Specification (design phase), OR, Summary table (Built phase) detailing luminances and reflectance values.</li> <li>Calculations verifying the surface illuminations</li> <li>Manufacturer LRV datasheets or estimation according to Technical Manual (built rating).</li> </ul> <p><u>If 2<sup>nd</sup> and 3<sup>rd</sup> points are being claimed:</u></p> <ul style="list-style-type: none"> <li>Short report in accordance with Technical Manual requirements describing how credit has been met.</li> <li>Relevant Reflected Ceiling Plan drawings.</li> <li>Relevant Isolux drawings complete with stated uniformities, surface reflectances, maintenance factors and task heights.</li> </ul>
	Internal noise levels	IEQ - 13	Contribution potential towards compliance	This credit rewards buildings that maintain adequate noise levels. Armstrong Fine Fissured Ceiling tiles have a CAC of 30 and NRC of 0.55 (40 and 0.70 respectively for the high NRC version) which may assist in maintaining suitable noise levels. A general rule being the thinner the floor, the higher the CAC should be.	<ul style="list-style-type: none"> <li>Copy of the noise design report, prepared by a qualified acoustics consultant, describing all relevant internal and external noise sources and the design features required to demonstrate the Credit Criteria has been achieved, OR, Extracts from the commissioning report in accordance with Technical Manual requirements.</li> <li>Copy of architectural plans, sections and details to demonstrate noise control design features which are included in the design.</li> </ul>
Energy	Lighting	ENE- 4	N/A	N/A	N/A

## Office Interiors 2009

Impact Category	Credit Title	Credit No	Points Achieved	Product Contribution	Related Supporting Evidence
Indoor Environmental Quality	Indoor Air Quality	IEQ - 3	1 point <small>(i.e. maximum points available for this product)</small>	Certain items within this credit reward 1 point for the use of low VOC ceiling tiles and 1 point for the use of low formaldehyde ceiling tiles and composite timber boards. Armstrong Fine Fissured Ceiling tiles are low VOC and low Formaldehyde in accordance with Greenguard, thus satisfying both requirements applicable to this product.	<ul style="list-style-type: none"> <li>Specification extract nominating low VOC and Formaldehyde requirements and all other items required by the Technical Manual, and clearly Stating the nominated Armstrong ceiling tile in the schedule of finishes.</li> <li>Short Summary listing and referencing all the products and demonstrating that the 90% compliance is achieved.</li> <li>Relevant product data and information proving compliance.</li> </ul>
	Daylight	IEQ - 8	Contribution potential towards compliance	This credit rewards projects that maximize daylight. Armstrong Fine Fissured Ceiling tiles have a Light Reflectance Value of 85% (average) which may help improve the floor area with a daylight factor above 2.5%.	<ul style="list-style-type: none"> <li>Short report describing compliant with Green Star NZ requirements.</li> <li>Daylight modeling report OR manual calculations.</li> <li>Drawings showing workstation location in relation to light penetration line.</li> <li>Summary sheet or glazing schedule with the quantity and type of all glazing installed (if modeling used).</li> <li>Manufacturer's data sheets for all glazing types showing VLT. (if modeling used).</li> <li>Site plan in the context showing heights and location of surrounding buildings and average reflectance for those buildings.</li> </ul>
	Electric lighting levels	IEQ-11	2 points <small>(Contributing factor when included in calculations)</small>	This credit rewards for good visual comfort and lighting design. To achieve 2 point or more, the light reflectance of Ceilings must be minimum 75%. Armstrong Fine Fissured Ceiling tiles have a Light Reflectance Value of 85% (average), thus satisfying this requirement. The remaining items in this credit are based on lighting design and are not product-dependent.	<p><u>Minimum requirements</u></p> <ul style="list-style-type: none"> <li>Summary table detailing luminances and reflectance values.</li> <li>Calculations verifying the surface illuminations</li> <li>Manufacturer LRV datasheets or estimation according to Technical Manual.</li> <li>Short report describing how credit has been met and RCP drawings (if claiming for 3<sup>rd</sup> point)</li> </ul> <p><i>Then</i></p> <p><u>If modeling is being used:</u></p> <ul style="list-style-type: none"> <li>Calculations verifying illuminances</li> <li>Isolux drawings complete with stated uniformities, surface reflectances, maintenance factors and task heights (if claiming for 3<sup>rd</sup> point).</li> </ul> <p><u>If measurements are being used:</u></p> <ul style="list-style-type: none"> <li>Drawings showing room elevations and measured illuminance</li> <li>Calibration certificate</li> <li>Lux level measurements</li> </ul>
	Internal noise levels	IEQ - 13	Contribution potential towards compliance	This credit rewards buildings that maintain adequate noise levels. Armstrong Fine Fissured Ceiling tiles have a CAC of 30 and NRC of 0.55 (40 and 0.70 respectively for the high NRC version) which may assist in maintaining suitable noise levels. A general rule being the thinner the floor, the higher the CAC should be.	<ul style="list-style-type: none"> <li>Copy of the noise design report, prepared by a qualified acoustics consultant, describing all relevant internal and external noise sources and the design features required to demonstrate the Credit Criteria has been achieved</li> <li>Extracts from the commissioning report in accordance with Technical Manual requirements.</li> </ul>
Energy	Lighting	ENE- 4	Contribution potential towards compliance	This credit rewards design options that lessen lighting energy consumption while maintaining adequate lighting levels. Armstrong Fine Fissured Ceiling tiles have a Light	<p><u>Minimum requirements</u></p> <ul style="list-style-type: none"> <li>Short report demonstrating compliance in accordance with Technical Manual requirements.</li> <li>Reflected ceiling plans.</li> </ul> <p><i>Then</i></p> <p><u>If modeling is being used:</u></p>

				<p>Reflectance Value of 85% (average) which may assist in reducing the lighting output required to obtain a given lighting level in a space.</p>	<ul style="list-style-type: none"> <li>• Computer modeling sheets</li> <li>• As-built furniture drawings</li> <li>• Extracts from the commissioning report</li> </ul> <p><u>If measurements are being used:</u></p> <ul style="list-style-type: none"> <li>• As built drawings showing furniture and Lux levels.</li> <li>• Calibration certificate</li> </ul>
--	--	--	--	--	--

## Annexe A – Supporting evidence



### Sustainable Performance

- **GECA Certified** Fine Fissured ceiling products will automatically achieve a 'product score' of 100% in the **Green Star** calculators.
- Independent **ESD Certification** by Good Environmental Choice Australia and Ecospecifier.
- Additional **Green Star** points may also be achieved using Armstrong ceilings (contact your Armstrong office for details).
- Recycled Content 34–52%

### Key Selection Attributes

- Cost effective ceiling solution
- Nondirectional visual reduces installation time
- High Light Reflectance
- High Acoustic performance options
- Reliable, proven performance
- **HumiGuard Plus** performance – Sag-resistant formulation to withstand temperatures between 0°C–49°C and relative humidity up to 99%

- **BioBlock™ Plus** paint on face and back of HumiGuard panels to inhibit or retard growth of mold/mildew and bacteria on painted surface
- Warranty: 30 years for **Fine Fissured HumiGuard Plus** with Armstrong grid systems

























### Typical Applications

- Office area
- Retail
- Healthcare spaces
- Public areas
- Education

**30-Year System Performance Guarantee**  
Against Visible Sag  
**HumiGuard® Plus**  
Against Mold/Mildew & Bacterial Growth  
**BioBlock™ Plus**

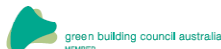
### Visual Selection

### Performance Selection

Grid Face	Edge Profile	Item Number	Dimensions (Nom)		Acoustics NRC/ALPHA W	CAC/DNCW	Anti-Mold/ Mildew	Sag Resist	Light Reflect	Installed Cost
<b>Fine Fissured</b>										
15mm	Beveled Tegular	1734M	600 x 600 x 16mm		0.55/0.50	32/32			0.85	\$
24mm	Angled Tegular	3572	600 x 600 x 16mm		0.55/0.50	32/32			0.85	\$
		3574	600 x 1200 x 16mm		0.55/0.50	32/32			0.85	\$
24mm	Square Lay-in	3510	600 x 600 x 16mm		0.55/0.55	32/30			0.85	\$
		1730	24 x 48 x 5/8"		0.55/0.55	32/30			0.85	\$
		3570	600 x 1200 x 16mm		0.55/0.55	32/30			0.85	\$
32mm	Top Hat Grid	K2C2 Edge with Concealed Spline*	400 x 1200mm 450 x 1350mm 500 x 1500mm Other		0.55/0.55	40/40*			0.85	\$\$
<b>Fine Fissured – High Acoustic</b>										
24mm	Square Lay-in	1714MEX	600 x 1200 x 19mm		0.70/0.60MH	40/40			0.85	\$\$



Licence No. ARM2007  
Standard: GECA 28-2005 – Furniture and Fittings



- \* CAD estimate – based on Dncw test data for Prima Fine Fissured
- Additional information on Fine Fissured and other Armstrong products can be found on our web site: [www.armstrongceilings.com.au](http://www.armstrongceilings.com.au)
- Other sizes available upon request.

### Physical Data

#### Material

Wet-formed mineral fiber

#### Surface Finish

Factory-applied vinyl latex paint with BioBlock™ mold/mildew inhibitor

#### Flame Spread/Fire Resistance

Conforms to BCA Spec. C1.10 and tested to AS/NZS 3837: 1998 – "Group 1", AS/NZS 1530.3

#### Insulation Value

R Factor – 0.26 (Watts units)

#### Backloading Recommendation

Contact your local Armstrong representative

#### Anti Mold / Mildew & Bacteria

"BioBlock™ Plus" contains an antimicrobial treatment, providing guaranteed resistance against growth of mold/mildew and Gram-positive and Gram-negative odour/stain causing bacteria for 30 years.

#### Weight

1730, 3570, 3510 – 3.1 kgs/m²  
3572, 3574, 1734M – 3.53 kgs/m²  
1811M, 1820M – 6.13 kgs/m²

#### Warranty

10-year limited warranty;  
30-year with **HumiGuard Plus** products and Armstrong grid systems

#### Recommended Suspension System

Items	Suspension System
3572, 3574, 3510, 1730	24mm PeakForm Exposed Tee
3570, 1811M, 1820M	15mm Silhouette Grid
1734M	15mm SupraTee Exposed Tee

Other Armstrong suspension systems, including, "Blue Tongue" Aluminium, available upon request.

#### AUSTRALIA

**Brisbane (QLD/NT)**  
Telephone: (617) 3272 0533  
Facsimile: (617) 3272 0690

**Melbourne (VIC/TAS)**  
Telephone: (613) 9560 9633  
Facsimile: (613) 9560 9139

**Sydney (NSW)**  
Telephone: (612) 9748 1588  
Facsimile: (612) 0748 8440

#### P R CHINA

**Beijing**  
Telephone: (8610) 6510 2818  
Facsimile: (8610) 6510 2821

**Guangzhou**  
Telephone: (8620) 8375 3802  
Facsimile: (8620) 8375 3801

**Hong Kong**  
Telephone: (852) 2585 7800  
Facsimile: (852) 2585 7113

#### Shanghai

Telephone: (8621) 6391 3366  
Facsimile: (8621) 6391 3399

#### INDONESIA / PHILIPPINES

Telephone: (65) 6358 1083  
Facsimile: (65) 6358 1084

#### MALAYSIA

Telephone: (603) 9131 8335  
Facsimile: (603) 9131 8335

#### SINGAPORE

Telephone: (65) 6358 1082  
Facsimile: (65) 6358 1084

#### TAIWAN

Telephone: (8862) 2786 7258  
Facsimile: (8862) 2786 7259

#### THAILAND

Telephone: (662) 556 0585  
Facsimile: (662) 556 0585



# Emission Test Certificate

Wednesday December 12<sup>th</sup>, 2007

Supplier: Armstrong World Industries Pty Ltd (99 Derby Street, Silver Water NSW 2128)

Sample Description: Armstrong RH99 Fine Fissured Square Edge Ceiling Panel

Date Tested: November 2007

Test Method: GREENGUARD Certification Program for Low Emitting Products incorporating ASTM D5116 "Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Material/Products".

Emission Data:

GREENGUARD Certification Program Emission Criteria for Ceiling Systems	Armstrong RH99 Fine Fissured
Formaldehyde $\leq 0.06 \text{ mg/m}^3$	0.03 $\text{mg/m}^3$
Total Volatile Organic Compounds $\leq 0.5 \text{ mg/m}^3$	0.05 $\text{mg/m}^3$
	Individual VOCs were all less than one tenth of their Threshold Limit Value. Carcinogens and reproductive toxins were not identified as part of the VOCs.



Dr. Vyt Garnys  
PhD, BSc(Hons) AIMM, ARACI, ISIAQ  
ACA, AIRAH, FMA  
Managing Director and Principal Consultant

Project CV071105



# Emission Test Certificate

Thursday February 28<sup>th</sup>, 2008

Supplier: Armstrong World Industries Pty Ltd (99 Derby Street, Silver Water NSW 2128)

Sample Description: Armstrong RH99 High (Acoustic) NRC Ceiling Panel

Date Tested: February 2008

Test Method: GREENGUARD Certification Program for Low Emitting Products incorporating ASTM D5116 "Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Material/Products".

Emission Data:

GREENGUARD Certification Program Emission Criteria for Ceiling Systems	Armstrong RH99 High NRC
Formaldehyde $\leq 0.06 \text{ mg/m}^3$	$<0.01 \text{ mg/m}^3$
Total Volatile Organic Compounds $\leq 0.5 \text{ mg/m}^3$	$<0.05 \text{ mg/m}^3$
	Individual VOCs were all less than one tenth of their Threshold Limit Value. Carcinogens and reproductive toxins were not identified as part of the VOCs.



Dr. Vyt Garnys  
PhD, BSc(Hons) AIMM, ARACI, ISIAQ  
ACA, AIRAH, FMA  
Managing Director and Principal Consultant

Project CV080105