



**esp**

Environmental &  
Safety Professionals

**Airborne Occupational Exposure  
to Inhalable Wood Dust and Formaldehyde  
using Festool Brand Wood Working  
Equipment**

Report for

**Tooltechnic Systems (Aust) Pty Ltd**

63 – 65 Quantum Close

Dandenong South, Vic., 3175

Authorised by:

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*Occupational Hygienist*

**ESP – ENVIRONMENTAL & SAFETY PROFESSIONALS**

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## **ESP – ENVIRONMENTAL & SAFETY PROFESSIONALS**

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This document must be read in its entirety and in conjunction with the attached reports, measurements and analytical results.

## TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	4
1 INTRODUCTION.....	5
2 BACKGROUND.....	5
2.1 The Nature of the Dust Hazard .....	6
2.2 Formaldehyde .....	7
2.3 Regulatory Requirements .....	7
3 SAMPLING METHODS .....	9
4 RESULTS & DISCUSSION.....	9
4.1 Site Observations .....	9
4.2 Sampling Results .....	10
5 CONCLUSION & RECOMMENDATIONS.....	11
ATTACHMENT A – HEALTH AND SAFETY TERMINOLOGY.....	12
ATTACHMENT B – LABORATORY RESULTS .....	15
ATTACHMENT C – PRODUCT MSDS.....	16

## EXECUTIVE SUMMARY

ESP – Environmental and Safety Professionals (ESP) was contracted to assess occupational airborne exposure to wood dust and formaldehyde from Festool brand powered hand tool machining of compressed wood board. In these measurements each Festool tool set was used continuously for 1 hour to simulate usage during normal operation by a carpenter. This was considered to represent a significant usage of the tool during an 8 hour work day.

Tooltechnics Systems (Aust) Pty Ltd imports a range of power wood working hand tools for retail sale in Australia. The tools tested for this report form a selection of wood working tools of the Festool brand used for sawing, routing and planing. The tools are purchased as part of a kit that comes equipped with attachments for dust control.

Measured results for occupational exposure to Inhalable dust and formaldehyde for the Festool brand tools were all below the relevant Occupational Exposure Standard.

The Festool brand wood working power tool systems tested have a very low likelihood of causing occupational exposure to dust, provided that:

- Equipment sets are fitted as specified by the manufacturer.
- Vacuum suction and dust filters are maintained to ensure efficient operation.
- The required filters are used with the vacuum cleaners.

It is further recommended that:

- As part of best practice employment, respiratory protection should be supplied to employees and worn on a voluntary basis.
- Personal hygiene practices can be improved i.e. washing dust off before eating, drinking, smoking and leaving the work place to help reduce the length of time potential exposure to dust occurs.
- Cleaning up of any dust accumulated in the work area is conducted routinely.

## 1 INTRODUCTION

ESP – Environmental and Safety Professionals (ESP) was contracted by the Technical Manager (Brett Barker) of Tooltechnic Systems (Aust) Pty Ltd to undertake occupational exposure sampling for wood dust and formaldehyde from Festool brand powered hand tool machining of compressed wood board.

Measurements were carried out on 7<sup>th</sup> June 2011 at the Tooltechnics premises at 63 – 65 Quantum Close, Dandenong South.

## 2 BACKGROUND

Tooltechnics Systems (Aust) Pty Ltd imports a range of power wood working hand tools for retail sale in Australia. The tools tested for this report form a selection of wood working tools used for sawing, routing and planing. The tools are purchased as part of a kit that comes equipped with attachments for dust control.

The following equipment was used in each test setup:

Tool Type	Description	Part Number
<b>Festool Planer set</b>	EHL 65 E-Plus AUS One Hand Planer	574544
	CT 26 E AUS HEPA dust extractor	583492
	Cover, ABSA-TS55	491750
<b>Festool Saw set</b>	TS55 EBQ-Plus AUS Plunge cut saw	561430
	CT 26 E AUS HEPA dust extractor	583492
<b>Festool Router set</b>	Bench mounted router, TF 1400-Set AUS	570273
	CT 36 E AUS HEPA dust extractor	583495
	Dust extraction hose set, CS70 AB	488292

In these measurements each tool was used continuously for 1 hour to simulate usage during normal operation by a carpenter. This was considered to represent a significant usage of the tool during an 8 hour work day.

Occupational exposure was measured for both inhalable dust and formaldehyde, that is within the 300 mm area around a persons' nose considered to be a persons' 'breathing zone'.

## 2.1 THE NATURE OF THE DUST HAZARD

Not all dust materials have the same degree of health hazard; their harmfulness depends on the following factors:

- Dust composition
  - Chemical
  - Mineralogical
- Dust concentration
  - On a weight basis; milligrams of dust per cubic metre of air ( $\text{mg}/\text{m}^3$ )
  - On a quantity basis: million particles per cubic metre of air (mppcm)
- Particle size and shape
  - The particulate size distribution within the Respirable range (Inhalable – less than  $100\ \mu\text{m}$  and Respirable – less than  $10\ \mu\text{m}$ )
  - Fibrous ( $< 100\ \mu\text{m}$  with a length to width ratio  $> 3:1$ ) or spherical (Equivalent Aerodynamic Diameter (EAD))
  - Surface area of particle
  - Contaminants adhering to the particles (eg Diesel fumes)
- Exposure time
  - Workplace – 8 hour
  - Home 8 to 24 hour (depending on occupancy)
  - Environment – 24 hour

The hazard potential of airborne dust, solid particles or droplets is dependent on the mass concentration as well as the particle size. The particle size determines the deposition site within the respiratory tract and is a contributing factor in any subsequent health effect.

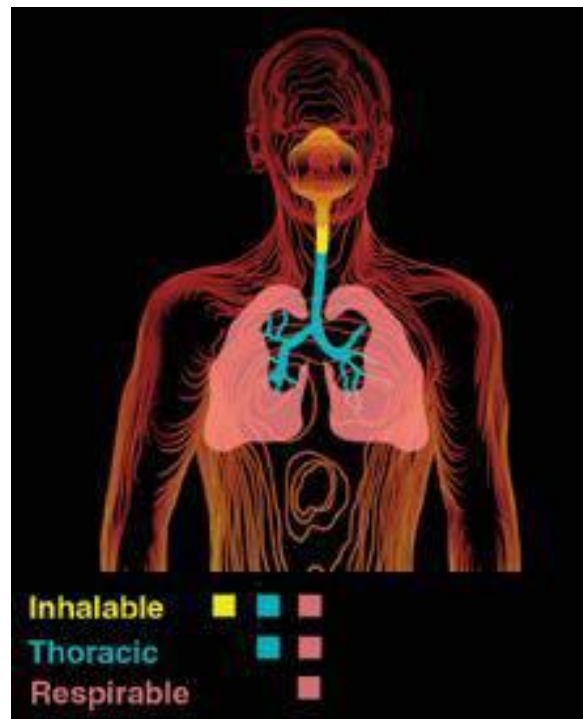


Diagram 2.1 Particle size deposit areas

Note: In Australia, only Inhalable and Respirable terminology is used.

**Inhalable Dust:** from AS3640-2004 is the dust fraction consisting of those airborne particles which are taken in through the nose or mouth during breathing and has been defined in ISO 7708 as the percentage of inhalable matter collected by a device conforming to a sampling efficiency curve. The term “dust” may include fume and non-vapour components of mists.

**Respirable Dust:** The proportion of airborne particulate matter that, when inhaled, penetrates to the un-ciliated airways (of the lungs). This fraction is further described in ISO 7708 as the percentage of inhalable matter collected by a device conforming to a sampling efficiency curve. Alternatively it can be described by a cumulative log-normal distribution with a median EAD of 4.25µm and a geometric standard deviation of 1.5.

## 2.2 FORMALDEHYDE

Formaldehyde is a Volatile Organic Compound with a pungent suffocating odour. Most people can smell formaldehyde in air between 0.05 and 1 ppm. It is common in human activity arising in both cooking activities and in building fit-out materials. Formaldehyde is commonly used in the manufacture of glues, carpets, wall partitions and other building materials. It is the most common type of glue used in custom, chip and particle boards.

Formaldehyde is classified as a Group 1 carcinogen by the International Agency for Research on Cancer (IARC), however, SafeWork Australia (SWA) classifies formaldehyde as a Category 3 carcinogen. IARC group 1 is a ‘*known human carcinogen*’ and Australian Category 3 is a chemical with ‘*suspected human carcinogenic potential*’.

It was noted from the Hazardous Substance Information System (HSIS) database of Safe Work Australia (SWA) that the 8-hour OES-TWA for formaldehyde is 1 ppm and the 15-minute Short Term Exposure Limit (STEL) is 2 ppm. Formaldehyde is also classified by SWA as a skin sensitiser.

## 2.3 REGULATORY REQUIREMENTS

Safe Work Australia (SWA) mandates Occupational Exposure Standards (OES) that are applied by Australian State and Territory Governments within each jurisdiction as Health and Safety Regulations. An Occupational Exposure Standard – Time Weighted Average (OES-TWA) is the average airborne concentration of a particular substance when calculated over a normal eight-hour working day, for a five-day working week - that is, the long term average exposure. It was noted from the Safe Work Australia Hazardous Substance Information System (HSIS) system that the OES-TWA has been stated to be 5 mg/m<sup>3</sup> for inhalable soft wood dust.

Occupational Exposure Standard - Short Term Exposure Limit (STEL) means a 15 minute TWA exposure that should not be exceeded at any time during a working day even if the eight-hour TWA average is within the TWA exposure standard. Exposures at the STEL should not be longer than 15 minutes and

should not be repeated more than four times per day. There should be at least 60 minutes between successive exposures at the STEL.

Soft wood has a Safe Work Australia Short Term Exposure Limit (STEL) of 10 mg/m<sup>3</sup> for a 15 minute interval no more than 4 times in any 8 hours.

It is a requirement of Regulations 4.1.26 and 4.1.27 of the Victorian *Occupational Health and Safety Regulations 2007* (the Regulations) to maintain an employee's exposure below the relevant OES-TWA.



## 3 SAMPLING METHODS

A Material Safety Data Sheet (MSDS) provides data on the likely chemicals that may arise during work situation. In the case of manufactured wood products this is most likely to be soft wood and formaldehyde based resin. The MSDS used in this measurement is shown in Attachment C.

Occupational sampling was conducted in the breathing zone of each workman while using the Festool wood working equipment.

Sampling for wood dust was conducted using IOM Inhalable dust samplers and constant flow volumetric pumps taken in accordance with the applicable Australian Standard AS 3640-2009, *Workplace atmospheres – Method for sampling and gravimetric determination of inhalable dust*. Sampling using the 'IOM' method is required to be conducted for a minimum period of 4 and up to 8 hours.

Formaldehyde was measured in accordance with *US OSHA Method 1007 Formaldehyde (Passive Samplers), May 2005*. Sampling using the 'Formaldehyde' method is required to be conducted for a minimum period of 15 minutes and up to 24 hours. Following sampling, the formaldehyde samplers were placed inside their heat shielded delivery containers (laminated aluminium and plastic resealable pouches) placed in a thermal control container with "ice" blocks and immediately shipped to a NATA accredited laboratory for analysis.

Separate Chain of Custody (CoC) records were made for each type of sample taken.

## 4 RESULTS & DISCUSSION

### 4.1 SITE OBSERVATIONS

Separate areas were set up with the required equipment for dust testing. Each operator ran their respective equipment for 1 hour.

It was noted that the planer produced some large visible particles of dust on the bench after use.

## 4.2 SAMPLING RESULTS

Sample No.	Employee	Job or Task	Exposure Grouping	Sample Time (minutes)	Blank corrected total mass collected (mg)	Concentration (mg/m <sup>3</sup> )	Concentration (ppm)	8hr exposure standard (OES) (mg/m <sup>3</sup> or ppm)	Percentage of 8hr exposure standard (mg/m <sup>3</sup> )	STEL (mg/m <sup>3</sup> or ppm)
1	Christian (IOM)	Festool Planer	1	240	0.00	ND <sup>1</sup>	N/A	5	N/A	10
AO26234	Christian (Formaldehyde)	Festool Planer		60	< 0.00050 <sup>2</sup>	N/A	ND <sup>3</sup>	1	N/A	2
2	Bruce(IOM)	Festool Router	2	240	0.07	0.14	N/A	5	2.8	10
AO26226	Bruce (Formaldehyde)	Festool Router		60	< 0.00050 <sup>2</sup>	N/A	ND <sup>3</sup>	1	N/A	2
3	Brett (IOM)	Festool Saw	3	240	0.36	0.78	N/A	5	15.6	10
AO26207	Brett (Formaldehyde)	Festool Saw		60	< 0.00050 <sup>2</sup>	N/A	ND <sup>3</sup>	1	N/A	2
4	Blank (IOM)	N/A	N/A	N/A	0.00	N/A	N/A	N/A	N/A	N/A
AO26206	Blank (Formaldehyde)	N/A	N/A	N/A	< 0.00050 <sup>2</sup>	N/A	N/A	N/A	N/A	N/A

### Notes:

1. ND is less than 0.01 mg/ m<sup>3</sup>.
2. No break through reported between front and rear sampling sections. Both sections of formaldehyde samplers are reported by the analyst as ND<sup>3</sup>.
3. ND is less than 0.23 ppm
4. N/A = Not Applicable.

## 5 CONCLUSION & RECOMMENDATIONS

Measured results from using Festool brand wood working equipment tested for this report for Inhalable dust and formaldehyde are below the relevant Occupational Exposure Standard.

The Festool brand wood working power tool systems tested have a very low likelihood of causing occupational exposure to dust, provided that:

- Equipment sets are fitted as specified by the manufacturer.
- Vacuum suction and dust filters are maintained to ensure efficient operation.
- The required filters are used with the vacuum cleaners.

It is further recommended that:

- As part of best practice employment, respiratory protection should be supplied to employees and worn on a voluntary basis.
- Personal hygiene practices can be improved i.e. washing dust off before eating, drinking, smoking and leaving the work place to help reduce the length of time potential exposure to dust occurs.
- Cleaning up of any dust accumulated in the work area is conducted routinely.

## ATTACHMENT A – HEALTH AND SAFETY TERMINOLOGY

### Abbreviations/Acronyms used in Health and Safety:

<b>AS/NZS</b>	Australian Standard/ New Zealand Standard
<b>ASHRAE</b>	American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc.
<b>EPA</b>	Environmental Protection Authority
<b>HEPA</b>	High Efficiency Particulate Air (filter)
<b>LEL</b>	Lower explosive limit
<b>NH&amp;MRC</b>	National Health & Medical Research Council
<b>NIOSH</b>	National Institute of Occupational Safety and Health
<b>NOHSC</b>	National Occupational Health & Safety Commission
<b>OES-TWA</b>	Occupational Exposure Standard - Time Weighted Average
<b>STEL</b>	Short Term Exposure Limit
<b>SWA</b>	Safe Work Australia [formerly Australian Safety & Compensation Council]
<b>USEPA</b>	United States Environmental Protection Agency
<b>WHO</b>	World Health Organisation

### Unit Abbreviations used in Health and Safety:

<b>g/m<sup>3</sup></b>	grams per cubic metre
<b>°C</b>	degrees Celsius
<b>Ha</b>	Hectopascals
<b>µg/m<sup>3</sup></b>	micro grams per cubic metre
<b>mg/m<sup>3</sup></b>	milligrams per cubic metre
<b>ppm</b>	parts per million
<b>kPa</b>	Kilopascal

### Terminology:

**'Air-handling system'** means a system for the purpose of directing air in a controlled manner to or from specific enclosures by means of air-handling plant, ducts, plenums, air distribution devices, ventilation devices and automatic controls.

**'Atmospheric contaminants'** are determined in accordance with the *"Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC: 1003 (1975)]* and the *'Guidance Note on the Interpretation of Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC: 3008 (1995)]'*.

**'Breathing Zone'** means the volume of air within 300 mm of a persons' nose.

**'Ceramic Fibres'** are amorphous, glassy, predominantly alumino-silicate materials which are created from molten masses of either alumina and silica or naturally occurring kaolin clays. Australian materials are generally only made from alumina and silica melts.

**'Competent person'** means a person who has acquired a level of knowledge about the industry through training, qualifications and/or experience or a combination of knowledge and skills to carry out the assigned tasks competently.

**'Consequence'** means outcome or impact of an occurrence.

**'Consultation'** means the sharing of information and exchange of views between employers, employees and/or employee representative(s) on health and safety issues. It includes the opportunity to contribute to decision making in a timely fashion to minimise the risk(s) of workplace hazards.

**Employee** means an individual who works under a contract of employment, apprenticeship or traineeship.

**Employee representative(s)** includes an employee member of a health and safety committee where established in the workplace, or a person elected to represent a group of employees on health and safety matters.

**Employer** means a corporation or an individual who employs persons under contract of employment, apprenticeship or traineeship.

Note: The definition of employer includes the self-employed, which means a person who works for gain, other than under a contract of employment, apprenticeship or traineeship, whether or not that person employs others.

**'Exposure'** occurs when a person is exposed to a hazard.

**'Exposure standard'** means the maximum level for noise exposure in the workplace as required in the applicable Regulation.

**'Fibre'** is a particle with a length to width ratio of at least 3:1.

**'Generic risk assessment'** means a risk assessment, which may be used across areas and job sites because the hazards and risks have been deemed similar.

**'Glasswool'** is a fibrous product formed by either blowing or spinning a molten mass of glass. The resultant fibres are subsequently collected as an entangled matt of fibrous product.

**'Harm'** is death, injury, illness (including psychological illness) or disease that may be suffered by a person because of a hazard or risk.

**'Hazard'** means something that can or has the potential to cause injury or illness.

**'Hazardous area'** means an area where an explosive atmosphere may occur continuously or intermittently, presenting a risk to safety. Hazardous areas include all storage and handling areas for dangerous goods with Class or Subsidiary Risk of 2.1; 3; 4 or 5 and dangerous goods that may generate combustible dusts.

**'Health surveillance'** means the monitoring of an employee, including the use of biological monitoring, to identify changes (if any) in the employee's health due to exposure to a hazardous substance, but does not include the monitoring of atmospheric contaminants.

**'Inspirable'** is that fraction of dust which enters the respiratory tract as defined in *Australian Standard AS 3640:2004 – Workplace atmospheres – method for sampling and gravimetric determination of inhalable dusts*.

**'Legionnaire's disease'** Legionella Pneumophila is a bacterium, which invades the respiratory system presenting initially like Influenza. However, in some individuals the condition escalates into a multi organ infection, which, in those most vulnerable, can be fatal.

**'Likelihood'** describes the probability or frequency of an injury or illness occurring.

**'MSDS'** means Material Safety Data Sheet.

**'Monitor'** means to check, supervise, observe critically or measure the progress of an activity, action or system on a regular basis in order to identify change from the performance level required or expected.

**'National Exposure Standard'** WorkSafe Australia (formerly ASCC) issues a list of National Occupational Exposure Standards, which determine safe exposure levels. Exposure to hazardous substances should be kept to as low as reasonably practicable and below the National Occupational Exposure Standard (NES).

**'No effect'** means the greatest concentration or amount found by experiment or observation which causes no detectable adverse alteration of morphology, functional capacity, growth, development, or life span of the target organism under defined conditions.

**'Noise'** means any unwanted or damaging sound.

**'Noise control policy'** means a written policy, developed by the employer, in consultation with employees and/or employee representative(s) that should aim to minimize the generation and emission of noise from plant and/or processes and set goals for exposure to peak and daily noise exposure levels at work and strategies to achieve them.

**'Occupational Exposure Standard'** means an airborne concentration of a particular substance in the worker's breathing zone, exposure to which, according to current knowledge, should not cause adverse health effects nor cause undue discomfort to nearly all workers. The exposure standard can be of three forms; time-weighted average (TWA), peak limitation, or short term exposure limit (STEL).

**'Occupational Exposure Standard - Peak'** means a maximum or peak airborne concentration of a particular substance determined over the shortest analytically practicable period of time which does not exceed 15 minutes.

**'Occupational Exposure Standard - Short Term Exposure Limit (STEL)'** means a 15 minute TWA exposure which should not be exceeded at any time during a working day even if the eight-hour TWA average is within the TWA exposure standard. Exposures at the STEL should not be longer than 15 minutes and should not be repeated more than four times per day. There should be at least 60 minutes between successive exposures at the STEL.

**'Occupational Exposure Standard - Time-Weighted Average (TWA)'** means the average airborne concentration of a particular substance when calculated over a normal eight-hour working day, for a five-day working week.

**'Plant'** means any machinery, equipment, appliance, implement or tool, and anything fitted or connected to them.

**'Practicable'** means 'practicable' in Victoria, Queensland, Western Australia and the Northern Territory, 'reasonably practicable' in New South Wales, South Australia, the Australian Capital Territory and Commonwealth jurisdiction, and a 'reasonable precaution' in Tasmania.

**'Probability'** a measure of the chance of occurrence expressed as a number.

**'Residual risk'** means the remaining risk after implementation of the risk control measures.

**'Respirable fibre'** is a particle with a diameter less than 3 micrometres and a length greater than 5 micrometres and with a length to width ratio of greater than 3:1. These fibres can reach the deepest part of the lung.

**'Risk'** means the probability or likelihood and consequences of a hazard causing injury or illness.

**‘Risk analysis’** mean the analysis of risk by use of a table or other process which may be qualitative, quantitative or a combination of these methods to assist in the evaluation of a hazard according to the probability or likelihood and consequence of injury or illness.

**‘Risk assessment’** means the overall process of risk analysis and risk evaluation (AS/NZS 3931). It is the process of evaluating the probability and consequences of injury or illness arising from exposure to an identified hazard or hazards.

**‘Risk control’** means the process of managing the elimination or minimisation of a risk. This may be an object, work process or system of work.

**‘Risk evaluation’** is the decision making process of the assessed risks to determine which risks require control and control priorities in an organisational context.

**‘Risk management’** means the culture, processes and structures that are directed towards promoting health and safety by the management of hazards and risks within an organisation.

**‘Risk management framework’** means a set of elements in a system which may include strategic planning, decision making, processes, policies and procedures for dealing with the risks.

**‘Risk retention’** means the loss or benefit remaining from a particular risk.

**‘Rock wool’** is a fibrous product formed by either blowing or spinning from a molten mass of rock. In Australia, this is usually basalt. The resultant fibres are subsequently collected as an entangled matt of fibrous product.

**‘Scheduled carcinogenic substance’** means a substance listed in NOHSC: 2014 (1995).

**‘SMF or MMMFS’** means synthetic Mineral Fibres or Man Made Mineral Fibres. It is a generic term to describe a number of amorphous (non-crystalline) fibrous materials including glass fibre, mineral wool and ceramic fibre.

**‘Substance’** includes a chemical entity, composite material, mixture or formulation, and other than in relation to an article that contains asbestos, does not include an article.

**‘The Australian Dangerous Goods Code (ADG Code)’** The ADG Code provides information on the classification of dangerous goods, identification of packaging groups, and correctly labelling dangerous goods.

**‘Water cooling systems’** means the cooling systems to regulate thermal comfort.

**‘Workplace’** means any place, whether or not in an aircraft, ship, vehicle, building or other structure, where employees or self-employed persons work, or are likely to be in the course of their work.

## ATTACHMENT B – LABORATORY RESULTS

# Groundswell laboratories

" A New Force in Analytical Testing"

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## CERTIFICATE OF ANALYSIS

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<b>Client Name :</b>	Environmental & Safety Professionals	<b>Groundswell Batch # :</b>	GS11153
<b>Client Address :</b>	Unit 2 / 2B Parker Street, Footscray, Victoria, 3011	<b>Project Name :</b>	TT Systems
<b>Client Phone # :</b>	03 9688 8000	<b>Project # :</b>	16459H
<b>Client Fax # :</b>	03 9689 6470	<b>Date Samples Received :</b>	7/06/2011
<b>Project Manager :</b>	David Moulton	<b>Sample Matrix :</b>	Air Filters
<b>E-mail :</b>	<a href="mailto:dmoulton@esplabs.com.au">dmoulton@esplabs.com.au</a>	<b>Sample # Submitted :</b>	4
<b>Project Sample Manager :</b>	As above	<b>Groundswell Quote # :</b>	Not Applicable
<b>E-mail :</b>	As above	<b>Date CofA Issued :</b>	9/06/2011

---



Paul Woodward  
Managing Director

[paul@groundswelllabs.com.au](mailto:paul@groundswelllabs.com.au)



NATA Accredited Laboratory 17067

This Document is issued in accordance with  
NATA accreditation requirements

Accredited for compliance with ISO/IEC  
17025



Chris De Luca  
Senior Chemist

[chris@groundswelllabs.com.au](mailto:chris@groundswelllabs.com.au)

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Reference AF57.Rev3 Date Issued : 3/11/2010



## Filter Results

Client Sample ID				231	232	233		234				
Laboratory Sample Number				GS11153-1	GS11153-2	GS11153-3		GS11153-4				
Date Sampled				7/06/2011	7/06/2011	7/06/2011		7/06/2011				
Metal	Literature Reference	Units	LOR									
Pre Weight	In House	g	0.00001	0.00658	0.00665	0.00624		0.00630				
Post Weight	In House	g	0.00001	0.00658	0.00672	0.00660		0.00630				
Weight Difference	In House	g	0.00001	0.00000	0.00007	0.00036		0.00000				

Reference AF57.Rev3 Date Issued : 3/11/2010

**Comments :**

1. Groundswell Laboratories is not NATA accredited for weighing analysis.

# Groundswell laboratories

116 Moray Street, South Melbourne, Victoria, 3205.  
Ph (03) 8669 1450 Fax (03) 8669 1451 (M) 0416 203 845 e-mail : admin@groundswelllabs.com.au

## Sample Receipt Notice

Client Name ESP  
Client Project Manager David Moulton  
Client e-mail [dmoulton@esplabs.com.au](mailto:dmoulton@esplabs.com.au)  
Client Address Unit 2/2b, Parker Street, Footscray  
Client Phone 03 9688 8000

Project Name TT Systems  
Project Number 16459H  
CofC Serial Number Not Applicable  
Purchase Order Number Not Applicable

Date Sampled / Sampling Period 7/06/2011  
Date Samples Received 7/06/2011  
Date Sample Receipt Notice Issued 8/06/2011  
Date Analytical Report Due 9/06/2011

Groundswell Batch Number GS11153  
Groundswell Quote Number Not Applicable  
Groundswell Sample Receipt Contact Chris De Luca  
E-mail [chris@groundswelllabs.com.au](mailto:chris@groundswelllabs.com.au)  
Groundswell Reporting Contact Paul Woodward  
E-mail [paul@groundswelllabs.com.au](mailto:paul@groundswelllabs.com.au)

Reporting Requirements pdf, .xlsx

Sample Condition Samples were received in good condition  
COC received with samples & samples detailed on the COC match those received  
Analytical request on the CofC clear  
Samples were received in appropriate containers, and appropriately preserved  
Samples were received within the THT's adopted by Groundswell

Comments None

Subcontracted Analysis Not Applicable

Secondary Laboratory Analysis Not Applicable

*Thanks for choosing Groundswell Laboratories*



# Certificate Of Analysis

26298

Date Received: 7/06/2011

Client Name: ESP Environmental

Page number: 1 of 1

Client Details: 2B/2 Parker Street

Date Reported: 10/06/2011

Footscray, Victoria 3011

Description: UMEX 100 monitors

Attention: David Moulton

for formaldehyde analysis

Method: Adapted from NIOSH 2016

Results expressed in micrograms (ug), total weight present on monitors

Sample(s) analysed as received.

Laboratory No:	M0412	M0412	M0413	M0413	M0414	M0414	M0415	M0415
	Front	Blank	Front	Blank	Front	Blank	Front	Blank
Client ID:	A026234		A026226		A026207		A026206	

Volatile Organic Compound	*LOR*	Not tested							
Benzene	1.0								
Toluene	1.0								
Xylenes	1.0								
n-Hexane	1.0								
		Not tested							
n-Pentane	5.0								
2 Methylpentane	5.0								
3 Methylpentane	5.0								
Methylcyclopentane	5.0								
Cyclohexane	5.0								
Methylcyclohexane	5.0								
Acetone	5.0								
Ethanol#	5.0								
Isopropanol#	5.0								
Butanol#	5.0								
Chlorobenzene	5.0								
Other's^^	10								
Other Analytes#	*LOR*								
Formaldehyde	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

^^ All VOC's, except those listed separately. 'Others' are calculated using the n-Hexane standard

# not covered by NATA accreditation

\*LOR\* Limit of Reporting



J.M.L. Martens (M.Sc.)



This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025 NATA #2431

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## ATTACHMENT C – PRODUCT MSDS

# MATERIAL SAFETY DATA SHEET

## Section 1: Identification of Material and Supplier

**Product Name:** Customwood® MDF Panels Customwood® E1 MDF Panels, Customwood® EO MDF Panels Customwood® ULTRAprime™ Mouldings Customwood® MDF Readi-cote® MDF door panels

**Other Names:** Customwood® MR

**Manufacturer's Product Code:** Not Applicable

**Recommended Use:** Construction of furniture, cabinets and doors. General purpose building boards.

**Supplier name:** Carter Holt Harvey Wood Products Pty Ltd  
ACN 002 993 106

**Address:** Tower A, Level 6, 821 Pacific Highway  
Chatswood NSW 2067  
Locked Bag 4025  
Chatswood NSW 2067  
Australia

**Telephone** + 1300 658 828

**Facsimile:** + 1800 891 881

## Section 2: Hazards Identification

### Overall Statement of Hazardous Nature:

In its intact state, this product is classified as not hazardous according to the criteria of Worksafe Australia. Dust from the product is hazardous according to the criteria of Worksafe Australia.

### Health Hazard Information:

In its intact state this product is not classified as a hazardous substance by Worksafe Australia. Formaldehyde gas may be released under some conditions, particularly when product is heated. However, in well ventilated storage areas and workplaces, the concentration of formaldehyde is unlikely to exceed the World Health Organisation standard of 0.1 ppm for the general environment and it will be well below the National Occupational Health and Safety Commission (NOHSC) Occupational Exposure Standard of 1.0ppm.

Wood dust may be produced from machining the product, and gas and vapour may

be produced from heat process. Exposures to wood dust produced from machining the products and gas and vapours from heat processing with inadequate ventilation may result in the following health effects:

- Abdominal discomfort if dust is swallowed
- Eye irritation causing discomfort and redness.
- Skin irritation resulting in itching and occasional red rash.
- Nose, throat and lung irritation, especially in people with upper respiratory tract or chest complaints such as asthma.

Repeated exposure over many years to uncontrolled wood dust increases the risk of nasal cavity cancer. Inhalation of wood dust may also increase the risk of lung fibrosis (scarring). There are also increased risks of respiratory and skin sensitisation from wood dust and formaldehyde resulting in asthma and dermatitis respectively. Wood dust has been evaluated by the International Agency for Research on Cancer (IARC) as group 1, carcinogenic to humans. Formaldehyde has been evaluated by the International Agency for Research on Cancer (IARC) as group 1, carcinogenic to humans and by the European Union (EU) as a Category 3 carcinogen (possibly carcinogenic).

**Explosion Hazard:**

Dry wood dust in high concentrations-in-air and at the temperatures greater then 204°C / 400°F (> 40 grams of dust per m<sup>3</sup> of air) may spontaneously explode.

**Dangerous goods class & Subsidiary Risks:** None Allocated.

**Poisons schedule Number:** None Scheduled.

<b>Section 3: Composition / Information on Ingredients</b>
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**Substances**

Chemical name	CAS Number	Proportion
Wood from plantation softwood and eucalyptus	---	> 78%
Urea Formaldehyde (UF) resin	9011-05-6	< 20%
Melamine Urea Formaldehyde resin (MUF)	25036-13-9	< 20%
Paraffin Wax	8002-74-2	< 2%

**Notes**

- 1) The ingredients are bound together under heat and pressure. The process cures the resin but small amounts of formaldehyde from the resin may be released from the finished product. The finished product contains less than 1.0 mg/lit of formaldehyde when tested to AS/NZS 4266.16 (Desiccator test).

- 2) The proportion of paint on coated products is less than 1% of the board mass.
- 3) A proportion of less than 1% of dyes and/or pigments may be used to colour wood fibres in certain products.

<b>Section 4: First Aid Measures</b>
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**Swallowed:** Give water to drink. If abdominal discomfort occurs seek medical attention.

**Eyes:** Flush with flowing water for at least 15 minutes. If symptoms persist seek medical attention.

**Skin:** Wash with mild soap and running water. Remove clothes contaminated with dust. Do not scratch or rub skin if it becomes irritated.

**Inhalation:** Leave dusty area.

**First Aid Facilities:** Provide eye-wash facility

**Advice to Doctor:** Treat symptomatically

<b>Section 5: Fire Fighting Measures</b>
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**Extinguishing media:** Water, Carbon dioxide, Foam or dry chemicals fire extinguishers.

**Hazards from combustion products:** Burning or smouldering boards or dust can generate carbon dioxide, carbon monoxide, oxides of nitrogen, hydrogen cyanide and other pyrolysis products which are irritating to respiratory tract.

**Protective precautions for fire fighters:** Fire fighters to wear breathing apparatus.

**Hazchem code:** None Allocated

<b>Section 6: Accidental Release Measure</b>
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**Emergency procedures:** Not Applicable

**Methods and materials for containment and clean up:** Not applicable



## Section 7: Handling and Storage

**Handling information:** See Personal Protection.  
**Storage information:** The boards should be stored in well ventilated areas away from sources of heat, flame or sparks. Avoid smoking in storage or working areas.

## Section 8: Exposure controls / Personal Protection

National Exposure Standards:	<i>NOHSC[1003 (1005)] Australia / OSH New Zealand (May 1995)</i>
<b>Wood dust (softwoods)</b>	5 mg/m <sup>3</sup> TWA 10 mg/m <sup>3</sup> STEL Listed as a Sensitiser
<b>Wood dust (hardwoods)</b>	1 mg/m <sup>3</sup> TWA Listed as a Sensitiser
<b>Formaldehyde</b>	1.0 ppm (1.2 mg/m <sup>3</sup> ) TWA 2.0 ppm (2.5 mg/m <sup>3</sup> ) STEL (short term exposure limit of 15 minutes). Listed as a Sensitiser and Category 2 carcinogen (probable human carcinogen)
<b>Paraffin wax fumes</b>	2 mg/m <sup>3</sup> TWA

**Biological limit values:** Not applicable

### Engineering controls:

All work with these boards should be carried out in such a way as to minimise the generation of, and exposure to dust. Under factory conditions, sawing, drilling, sanding etc. should be done with equipment fitted with exhaust devices capable of removing wood dust, at source. Hand power tools should be fitted with dust bags and used in well ventilated areas. Work areas should be well ventilated. They should be cleaned at least daily, and dust removed by vacuum cleaning or wet sweeping method.

Inhalation of airborne particles from other sources in the work environment, including those from cigarette smoke, may increase the risk of contracting lung diseases associated with exposure to dust from this product. Carter Holt Harvey Wood Products Pty Ltd recommends that all work and storage areas be smoke free and other airborne contaminants be kept to a minimum.

For fire prevention avoid build-up of dust and keep working areas well ventilated. Avoid sources of heat and ignition including those associated with electrical equipment included the ones associated with dust extraction equipment.

**Ventilation:**

Local exhaust ventilation should be provided at areas of cutting to remove airborne dust. General dilution ventilation should be provided as necessary to keep airborne dust below the applicable exposure limits and guidelines. The need for ventilation systems should be evaluated by a professional industrial hygienist, while the design of specific ventilation systems should be conducted by a professional engineer.

**Personal Protective Equipment:**

**Skin protection:** Wear loose, comfortable clothing. Long sleeved shirts and trousers are recommended to prevent skin irritation. Wash work clothes regularly and separately from other clothes. Wear comfortable work gloves (AS2161 or NZS5812) to avoid hand cuts when handling panels.

**Eye protection:** Wear industrial safety glasses or non fogging goggles (AS/NZS 1336) when machining products.

**Respiratory protection:** Avoid breathing dust. Wear a class P1 or P2 replaceable filter or disposable half face-piece respirator when machining products. Respirators should comply with AS/NZS 1716 and be selected, used and maintained in accordance with AS/NZS 1715.

<b>Section 9: Physical and Chemical Properties</b>
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**Appearance:** The products are manufactured as pressed medium density fibreboards. These are made primarily from wood fibres bonded with resins and may contain other additives. Panels are made of a variety of sizes and thicknesses. Mouldings may be totally or partially paint coated.

<b>Odour:</b>	Newly manufactured boards and freshly cut surfaces
<b>pH:</b>	Not determined
<b>Vapour pressure:</b>	Not determined
<b>Vapour density:</b>	Not determined
<b>Boiling point:</b>	Not applicable
<b>Melting point:</b>	Not applicable
<b>Solubility in water:</b>	Negligible
<b>Specific gravity:</b>	0.45 to 1.1
<b>Flammability:</b>	These products are flammable but difficult to ignite.
<b>Flash point:</b>	Not applicable
<b>Flammable limits in air:</b>	Not applicable
<b>Ignition temperature:</b>	> 200 °

**Early fire hazard properties when tested to AS/NZS 1530 Part 3:**

**Ignitability index:** 14 – 16

**Spread of flame index:** 8  
**Heat evolved index:** 7 – 9  
**Smoke developed index:** 3 – 5  
**Potential for dust explosion:** Yes

**Additional information:**

<b>Specific heat value:</b>	Not Applicable
<b>Particle size:</b>	Not Applicable
<b>Volatile Organic Compounds content:</b>	Not Applicable
<b>Evaporation rate:</b>	Not Applicable
<b>Viscosity:</b>	Not Applicable
<b>Percent volatile:</b>	Not Applicable
<b>Octanol / water partition coefficient:</b>	Not Applicable
<b>Saturated vapour concentration:</b>	Not Applicable
<b>Decomposition temperature:</b>	Not Applicable

<b>Section 10: Stability and Reactivity</b>
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<b>Chemical stability:</b>	The product is chemically stable under normal conditions.
<b>Conditions to avoid:</b>	Avoid open flames and environments with high moisture and temperatures.
<b>Incompatible material:</b>	Avoid contact with oxidizing agents and strong acids.
<b>Hazardous decomposition products:</b>	Thermal and /or thermal oxidative decomposition or burning or smouldering boards or dust can generate carbon dioxide, carbon monoxide, oxides of nitrogen, hydrogen cyanide and other pyrolysis products.

**Hazardous reactions:** Not applicable.

<b>Section 11: Toxicological Information</b>
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Any health hazards associated with these products have been evaluated on the basis of the individual ingredients, and these hazards should be assumed to be additive. The hazards described in this document have been evaluated based on a threshold of 1.0% for all hazardous ingredients and 0.1% for all carcinogens.

**Acute effects:**

The dust, which may be generated during manual or mechanical cutting, drilling, sanding or other abrading processes, and the smoke generated by heating or laser cutting, may cause temporary irritation of the eyes and upper respiratory system.

The symptoms are expected to subside after exposure has stopped and are not expected to cause any long term effects. Allergic skin and lung reactions have been reported with exposure to various wood panels dusts due to the chemicals presented in wood and cured resin. These rashes resemble other allergic skin reactions caused by plants, and usually heal rapidly.

**Chronic effects:**

The risk of nasal cancer has been associated with wood dust exposure. In the 1960s, studies linking wood dust exposure in the furniture industry with nasal cancer were first reported in England. The link was confirmed in several other European countries and furniture industries. The studies showing a link to nasal cancer have been primarily conducted in industries using hardwood.

The International Agency for Research on Cancer (IARC) evaluated dusts from both hardwood and softwood in 1995 and concluded that: "there is sufficient evidence in humans for the carcinogenicity of wood dust. There is inadequate evidence in experimental animals for the carcinogenicity of wood dust. Wood dust is carcinogenic to humans (Group 1)".

The IARC also evaluated formaldehyde in 1995<sup>1</sup> and concluded that: " *There is limited evidence in humans for the carcinogenicity of formaldehyde; and that overall, formaldehyde is probably carcinogenic to humans (group 2A)*". The IARC again evaluated formaldehyde in June 2004 <sup>2</sup> and concluded that: " *There are adequate data available from humans for an increased risk of nasopharyngeal cancer*" and that formaldehyde should now be classified as Group 1, carcinogenic to humans. Whilst this wood panel product contains less than 0.01% free formaldehyde, people using the product may be exposed to low concentration of formaldehyde if the boards are heated (as in laminating), are cut by laser cutting machines, and/or if dust particles come in contact with the moist mucous membranes lining the upper respiratory track.

Extensive literature searches and research carried out by independent occupational and environmental health specialists has not indicated any risks over and above those associated with wood dust without binder. This research includes the 1999 formaldehyde risk assessment carried out by US scientists in collaboration with the US EPA and Health Canada.

The risk assessment concludes that if a non-smoking worker were exposed to 0.004 ppm of formaldehyde continuously for 80 years, and also to 0.1 ppm for 40 years at work, then the predicted additional risk of respiratory tract cancer would be 4.1 per 1,000,000,000. The controls needed for minimising the potential for formaldehyde exposure from this product will be the same as those for control of dust exposures. These risk assessments and conclusions are in no way altered by the reclassification of formaldehyde to Group 1 by the IARC.

**Reference:**

1. IARC *Monographs on the Evaluation of Carcinogenic Risks to Humans*. Volume 62: Wood dust and formaldehyde. IARC, Lyon, France. 1995.
2. IARC Press Release No 153, 15 June 2004. IARC, Lyon, France.

### Section 12: Ecological Information

<b>Ecotoxicity:</b>	These products should be used only for its designated purposes.
<b>Persistence and degradability:</b>	Not determined
<b>Mobility:</b>	Not determined
<b>Environmental fate:</b>	Not determined
<b>Bio accumulative potential:</b>	Not determined

### Section 13: Disposal considerations

<b>Disposal method and containers:</b>	These products are not regulated as a hazardous waste by Australian environmental authorities. Off-cuts and general waste material should be placed in containers and disposed of at approved landfill sites or burnt in an approved furnace or incinerator in accordance with disposal authority guidelines.
<b>Special precautions for landfill or incineration:</b>	Do not burn in barbecues, combustion stoves or open fires in the home as irritating gases are emitted.

### Section 14: Transport Information

<b>UN Number:</b>	None Allocated
<b>UN Proper shipping name:</b>	None Allocated
<b>Class and subsidiary risk:</b>	None Allocated
<b>Packing group:</b>	None Allocated
<b>Special precautions for user:</b>	None Allocated
<b>Hazchem Code:</b>	None Allocated

These products are not regulated as dangerous goods. No special transport requirements are necessary.

### Section 15: Regulatory Information

Carter Holt Harvey has assessed this product in accordance with the criteria of the National Occupational Health and Safety Commission: NOHSC:1008(1999) and NOHSC:10005(1999), and the assessment is that occupational exposure to dust , smoke or fume from this product is hazardous according to the criteria of the NOHSC.

No special State or Commonwealth regulations apply. The product is not listed in the

Standard for the Uniform Scheduling of Drugs and Poisons. *Wood dust - (certain hardwoods such as beech and oak)*, and *Wood dust - softwood* are listed in the 1999 NOHSC list of Designated Hazardous Substances: NOHSC: 10005(1999). *Formaldehyde* - is listed in the 1999 NOHSC list of Designated Hazardous Substances: NOHSC: 10005(1999) if present in concentrations of 0.2% or more (this wood panel product contains <0.01% formaldehyde).

## Section 16: Health & Safety Information to Users

### Cater Holt Harvey Health and Safety Warning Wood panels product

- Ingredients:** Wood fibre or particles and heat cured resin.
- Risk:** Dust and smoke from this product are irritating to eyes, skin and respiratory system. May cause sensitisation by inhalation (asthma) and skin contact (dermatitis).  
Repeated inhalation of the dust increases the risk of nasal cavity cancer and may increase the risk of lung fibrosis (scarring).
- Safety:** Avoid repeated or prolonged contact with skin.  
Avoid contact with eyes.  
Avoid breathing dust and smoke.  
Wear suitable clothing, standard duty gloves (AS 2161), and dust resistant eye protection (AS/NZS 1336). If machining without adequate dust or smoke extraction or if dusty or smoke, respiratory protection (particulate dust mask) must be worn (AS/NZS 1715 and 1716). Keep work areas clean by wet sweeping and/or vacuuming.  
Wash work clothes regularly and separately from other clothes.
- First-aid:** Irrigate eyes with plenty of water.  
Wash skin with soap and water.
- Disposal:** Follow above safety instructions, and:  
Collect in containers for disposal as trade waste in accordance with local authority guidelines.
- The intact product and dust must not be burnt in barbecues, combustion stoves, or open fires in the home, as irritating gases are emitted.**

## Section 17: Other Information

Whilst the information contained in this document is based on data which, to the best

of our knowledge, was accurate and reliable at the time of preparation, no responsibility can be accepted by us for errors and omissions. The provision of this information should not be construed as a recommendation to use any of our products in violation of any patent rights or in breach of any statute or regulation. Users are advised to make their own determination as to the suitability of this information in relation to their particular purposes and specific circumstances. Since the information contained in this document may be applied under conditions beyond our control, no responsibility can be accepted by us for any loss or damage caused by any person acting or refraining from action as a result of this information.

**Date of preparation or last revision of the MSDS:** **01/05/2006**

**Sources of data:** *IARC Monographs on the evaluation of Carcinogenic Risks to Humans. Vol:62 Wood dust and Formaldehyde. IARC, Lyon France 1995.*  
*IARC Press Release Vol:153 Formaldehyde. IARC, Lyon France 1995.*