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CHAN CHUAN CHANG METAL WORKS

BLOCK 5055, ANG MO KIO INDUSTRIAL PARK 2, #01-1141,
SINGAPORE 569558 TEL : 64817736 FAX : 64813517
Email: sales@ccc.com.sg Website: http://www.ccc.com.sg
Reg. No. 204949/00M



ANTI-CONDENSATION COATING



Brand : CCC

**AIR DIFFUSION EQUIPMENT
ANTI-CONDENSATION COATING
Series : CCC-ACC**



CHAN CHUAN CHANG METAL WORKS



VISION

“To produce high quality products, high standard of creativity in design and excellent credibility in reputation”

MISSION

“Serve customer with satisfactory and reliable works and products”

Chan Chuan Chang Metal Works was established in 1975, committed to the vision to manufacture good quality Air Diffusion Equipment. After building up its reputation in the industry as a top manufacturer, the company registered the logo with the Registry of Trade and Patents (Singapore). From then onwards, all equipment which has the trade mark symbolise our commitment to serve our customer with satisfactory and reliable works and products.

Our products have been tested by VIPAC, testing laboratory at Victorian technology Centre, Port Melbourne, Victoria. Furthermore, the results are NATA Certified (National Association of Testing Authorities, Australia) to ADC 10623 R3 (Air Diffusion Council, USA) and are officially endorsed in countries which are signatories to the I.L.A.C agreement-namely, Australia, New Zealand, Britain, USA and Malaysia.

We were proud to introduce the **Heavy Duty Aluminium Computer Floor Grille**, Series : CR to the industry in 1991. This has been a breakthrough as the grille are able to provide adequate air flow whilst maintaining the weight of any person or equipment. This is verified by the Comprehensive Loading Test performed by Singapore Institute of Standard & Industrial Research (SISR), currently known as Spring Singapore. Series : CR has since then been installed in many computer rooms, wafer manufacturing plant and places which require the product.








COMPANY MILESTONE

1975 Established with the vision to manufacture high quality Air Diffusion Equipment to meet future needs and demands. Together with a team of experienced Engineers & Craftsman dedicated to Chan Chuan Chang's Motto – Commitment, Creativity & Credibility, we produced good quality products with high standard of creativity in design and maintained excellent credibility in reputation.

1982 Registered with the Registry of Trade and Patents (Singapore), CCC Trade Mark  has since become a household name in its industry.

1986 Chan Chuan Chang (CCC) products are tested by VIPAC, a testing laboratory at Victorian Technology Centre, Port Melbourne, Victoria. These results are NATA Certified (National Association of Testing Authorities, Australia) to ADC 10623 R3 (Air Diffusion Council, USA) and are officially endorsed in countries which are signatories to the I.L.A.C agreement – namely, Australia, New Zealand, Britain, USA and Malaysia.

1991 CCC Aluminium Computer Floor Air Grille was sent for Comprehensive Loading Test conducted by Singapore Institute of Standard & Industrial Research (SISIR) and achieved excellent results.

1997 CCC was awarded ISO 9002 Certification. Our impressive list of satisfied clients is testimony to CCC's motto – Commitment, Creativity and Credibility.

2005 CCC has improved its quality management system with respect to the ISO 9001:2000 standard due to our commitment towards quality improvement in our products and customer satisfaction. We thank you for your faith and support in our products. We will continue to strive harder to exceed your demand & satisfaction.

2012 CCC was awarded ISO 9001:2008 Certification by BVQI Accreditation. CCC also became a certified member of Air Movement and Control Association International (AMCA). Our Low Leakage dampers were tested according to AMCA standards and received certifications.



OUR CCC ANTI-CONDENSATION COATING AND CHEMICAL TREATMENT. GUARANTEE 10 TO 20 YEARS EXCLUDING SCRATCHES, DAMAGED OR DIRTIED.



CCC-ACC

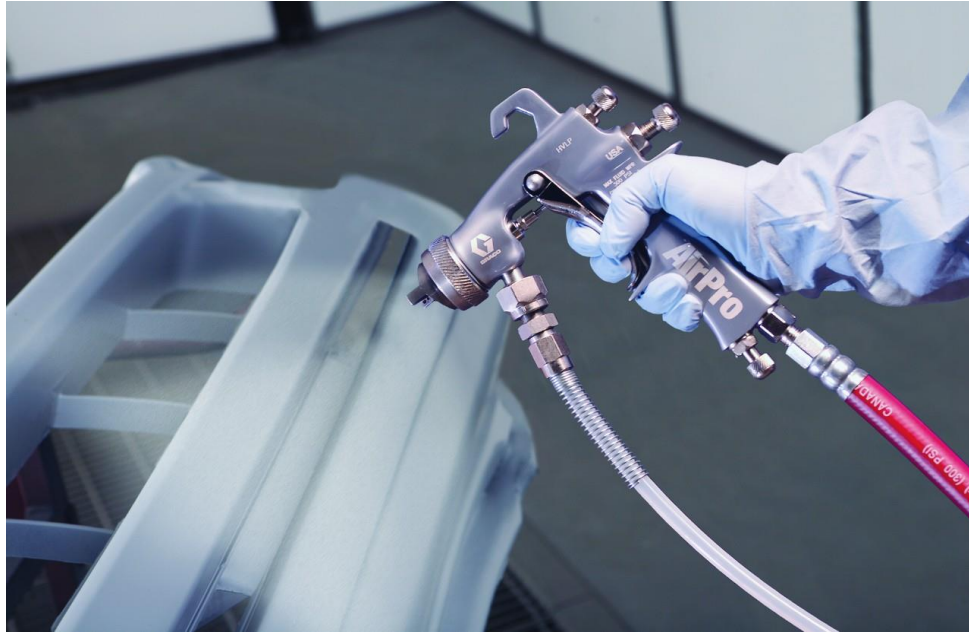
APPLICATIONS

- CCC's anti-condensation coating can be used on pipes, including the tees and elbows, air conditioning ducts, spiral bound, concrete walls and ceilings, aluminium foil, canvas, wood, glass, copper and PVC.
- Our anti-condensation coating do not require any primer to be added into it.

FEATURES & DETAILS

Our Anti-Condensation Coating is as follows:

- Fire Resistant.
ASTME E84 flame spread = 0
Smoke developed = 10
- Non-Toxic. Green Label Approved
- Can withstand sweating 24hours daily.
- Good Exterior Durability (10 to 20 years).
- Cost Effective.
- Requires No Primer, eliminating the need and subsequent cost of an additional applications.



CCC ONLY USES HIGH QUALITY ANTI-CONDENSATION COATING THAT WORKS! WE SPENT TIME RESEARCHING, TESTING AND GETTING FEEDBACKS.

Condensation (sweating) can cause serious, even hazardous conditions to both the surface and surrounding areas where it occurs. Condensation can result in costly repairs; dripping moisture can cause hazardous conditions in hallways, floors, stairways and office areas. Contamination of foodstuffs, such as meat, poultry and dairy products can also be very costly.

The answer to these and many other problems where condensation occurs is
ANTI-CONDENSATION TREATMENT!

Our Anti-Condensation Coating is a permanent, water based coating which when applied to a thickness of 1/32", will prevent condensation by absorption and desorption. This action widely disperses water vapour and releases it back into the atmosphere before dripping occurs. Thus the coated surface remains dry to touch.



*ANTI-CONDENSATION COATING IS THE ONLY SOLUTION TO
YOUR AIR DIFFUSION EQUIPMENT TO PREVENT SWEATING!*

Product Name : CCC Anti-Condensation Coating

Model : CCC-AAC

Features :

Our CCC Anti-Condensation Coating is fire resistant, non-toxic, has exterior durability and cost effective. Applications can be on pipes, air conditioning ducts, concrete walls and ceiling. We only have white and dark brown finishing for these special coatings.

The standard procedure for our Anti-Condensation treatment is around 8 to 12 layers of coating to your grilles and diffusers to build up around 700 to 1000microns. However, if you requires specifications with more coating in order to work more efficiently, do not hesitate to contact us to discuss more on your requirements.

It will be effective to have anti-condensation treatment for your air diffusion equipment if that area have changes in temperature often.

We offers one of the most affordable ant-condensation treatment you can find locally in Singapore.

We do not carry warranty for these coatings, but please feel free to get back to us for any after services and we will assist you in whatever ways we could. Please be careful when installing finished products as these coatings are prone to scratches easily.

Optional Accessories (chargeable) :

- More coatings to enable better performances.
- Other any special equipment that requires the treatment please feel free to contact us.



WB-AC/AC-801

CCC Anti-Condensation Coatings

Technical Data Sheet

03012011 GB

CCC Anti-Condensation Coating is a permanent, water based coating, applied to a thickness of 1.1mm, prevents condensation by absorption and desorption. This action widely disperses water vapor and releases it back into the atmosphere before dripping occurs. Thus the coated surface remains dry to touch.

CCC Anti-Condensation Coating is

- fire resistant
- non-toxic
- permanent
- exterior durability
- apply by brush, roller or spray

Features: No primer required. Excellent adhesion to galvanized steel, mild steel, bonderite steel, PVC, Masonite, concrete and wood. Good adhesion to aluminium and polyethylene. **CCC Anti-Condensation Coating** sticks to polypropylene but does not pass adhesion test.

Chemical and solvent resistance: **CCC Anti-Condensation Coating** is resistant to mild acids, alkalis, detergents, mineral spirits, acetone, esters, and ammonium nitrate. **CCC Anti-Condensation Coating** is resistant to the alkali in concrete and other masonry products. **CCC Anti-Condensation Coating** can be used on concrete without primer and can be used as a block filler. When using on new plaster, allow the plaster to cure for 180 days before applying.

CCC Anti-Condensation Coating will soften and swell in aromatic solvents i.e. toluene, xylene and unleaded gasoline.

Fire retardant: ASTM E48, Flame spread = 0 Smoke developed classification = 10

Surface preparation: All surfaces should be clean, free of dust, grease and wax. Heavily rusted surfaces should be wire brushed and/or sanded. Molded and mildewed surfaces should be washed with a mildew remover and allowed to dry before applying.

Coverage: Apply CCC Anti-Condensation Coating at a thickness of 1.1 mm for most applications. The coverage is 4.5 square metres per 3.785 litres tins.

Drying time: The rate of drying is dependent upon thickness, temperature and humidity. In general, one coat having a thickness of 0.5 mm will dry in two to four hours at an average temperature of 25° Celsius. Do not apply when the surface and/or air temperature is below 10° Celsius. Excess drying timing can be caused by low temperature, high humidity or poor ventilation.

Application: Apply by brush, roller or spray. If applying by spray, use a large diameter airless spray tip.

Clean-up: Thin films of CCC Anti-Condensation Coating cure at an extremely fast rate. Brushes, rollers and spray tips should be cleaned immediately with water. If cleaning is delayed, it will be necessary to use an aromatic solvent such as toluene, xylene or Exxon solvent 150 for clean-up.

The Solution to your Condensation



One of our sample (2 Slot Linear Diffuser with Anti-Condensation Coating) installed on the right. Noticed that the diffuser on the left does not have any treatment done and it is condensing badly. Doing anti-condensation treatment will bring down the condensation rate by almost 85%! It is totally non-flammable and toxic free, hence very safe for use under any environment.



We always does Quality Check before packing the products. We will make sure the anti-condensation coating reaches a limit of 700 to 1000 microns for it to work effectively. Some severe areas may requires more microns of coatings in order to treat it effectively.

Our treatment is full coating treatment with hard and matt surfaces only.

The colour available are White, Dark Brown and Black etc. Please send us your colour enquires!





Anti-Condensation Test Report

Test Report No. 7191178814-EEC18/01-CSL
 dated 08 Feb 2018

Note: This report is issued subject to the Testing and Certification Regulations of the TÜV SÜD Group and the General Terms and Conditions of Business of TÜV SÜD PSB Pte Ltd. In addition, this report is governed by the terms set out within this report.



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SUBJECT:

Anti-condensation test of coatings submitted by Chan Chuan Chang Metal Works on 25 Jan 2018.

TESTED FOR:

Chan Chuan Chang Metal Works
 Blk 5055 #01-1141,
 Ang Mo Kio Industrial Park 2,
 Singapore 569558.

TEST DATE:

05 Feb 2018 to 08 Feb 2018

DESCRIPTION OF SAMPLES:

S/N	Product Description	Colour	Coating thickness (µm)	Sample received (coated container)
1	CCC Anti-Condensation Coating	Cream	1000	1
2			2000	1



Test Report No. 7191178814-EEC18/01-CSL
 dated 08 Feb 2018



METHOD OF TEST:

The test was conducted in accordance with the method below as agreed by client:

1. Condition the coated container in a controlled environment of (23±2)°C and (50±5)% relative humidity for at least 24h. The entire test is conducted in the same controlled environment.
2. Determine the weights of the conditioned container. The weight of the container coated with dry paint is reported as WCdp.
3. Suspend the coated container from the rack. Fill the container with ice and then cold water to a height of 10 mm below the top of the container. Leave the container for condensation of water from the surrounding air and absorption of the condensate.
4. Empty the container after 4-5h and refill with new ice and water. Leave again for further condensation. Observe if any water drips from the tip of the cone or any condensation on the surface.
5. After 24h, measure the total amount of collected water and report as Ww.
6. The container is emptied of water and dried on the inside by wiping with a dry towel. Determine the container weight without touching the outside. Repeat wiping the inside with the towel and weigh again. Two consecutive determinations should not differ by more than 0.2g. This is reported as WCsa, the weight of the container with water saturated paint.
7. The coating is removed and the uncoated container is conditioned as per step 1. Determine the weight of the conditioned uncoated container. The weight of the uncoated container is reported as WCo.
8. Calculate and report the following results:

a. Water absorption per surface area = $\frac{Ww}{A} \times 100$ (%)

b. Water absorption capacity (dry paint), EW PAC = $\frac{WCsa - WCo}{WCdp - WCo} \times 100$ (%)

RESULTS:

Product Description	Coating thickness (µm)	Observation after filling with ice and water for 4-5h	Weight of collected water after 24h, Ww (g)	Water absorption per surface area (g/m ²)	Water absorption capacity (dry paint), EW PAC (%)
CCC Anti-Condensation Coating	1000	No water dripping, no condensation on surface	0.3	146.3	10.7
	2000	No water dripping, no condensation on surface	0	279.6	8.6

REMARKS:

1. Containers made of aluminium are provided by the client.
2. Coating application conducted by client before sample submission.
3. Surface area per container is 0.097 m².


 Shareen Chan
 Engineer


 Wong Bee Hui
 Product Manager
 Consumer Products



Test Report No. 7191178814-EEC18/01-CSL
dated 08 Feb 2018



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APPENDIX:



Photo 1: CCC Anti-Condensation Coating - 1000 µm thickness



Photo 2: CCC Anti-Condensation Coating - 2000 µm thickness



Test Report No. 7191178814-EEC18/01-CSL
dated 08 Feb 2018



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APPENDIX (cont'd):

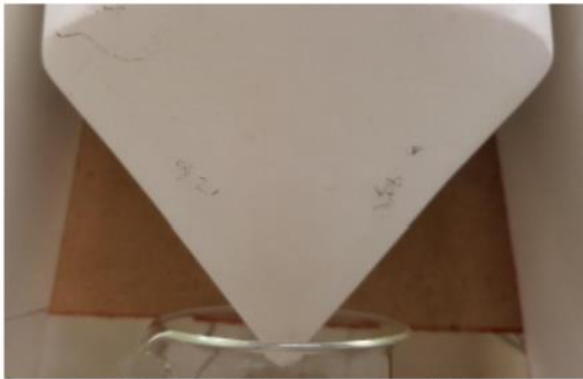


Photo 3: 1000 µm – after 4-5h



Photo 4: 1000 µm – after 24h



Photo 5: 2000 µm – after 4-5h



Photo 6: 2000 µm – after 24h



Test Report No. 7191178814-EEC18/01-CSL
dated 08 Feb 2018



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Please note that this Report is issued under the following terms :

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2. The sample/s mentioned in this report is/are submitted/supplied/manufactured by the Client. TÜV SÜD PSB therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture, consignment or any information supplied.
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July 2011





Green Label Testing Report

TEST REPORT: 7191178814-CHM18/02-CSY

Date: 12 Feb 2018 Tel: +65 68851312 Fax: +65 67784301
 Client's Ref: Email: zhou.xiao@tuv-sud-psb.sg

Note: This report is issued subject to the Testing and Certification Regulations of the TÜV SÜD Group and the General Terms and Conditions of Business of TÜV SÜD PSB Pte Ltd. In addition, this report is governed by the terms set out within this report.



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SUBJECT

Evaluation of "CCC Anti-Condensation Coating" comply with Singapore Green Labelling Scheme (SGLS), Category 032.

CLIENT

Chan Chuan Chang Metal Works
 Blk 5055 #01-1141
 Ang Mo Kio Industrial Park 2
 Singapore 569558

DESCRIPTION OF SAMPLE

One can of sample labelled as follows were received on 25 Jan 2018.

Product name	Quantity
CCC Anti-Condensation Coating	1 x 1L

DATE OF TEST

26 Jan 2018 – 12 Feb 2018





TEST REPORT: 7191178814-CHM18/02-CSY
 12 FEB 2018



PSB Singapore

METHOD OF TEST

The sample was tested in the "as-received" condition.

- | | | |
|----|--|---|
| 1) | Formaldehyde | The sample was analysed by UV-Vis Spectrophotometer using Acetylacetone as reagent. |
| 2) | Mercury, Lead, Cadmium and Chromium | The sample was digested in inorganic acid, followed by analysis using Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES). |
| 3) | Flash point @ 61°C | By Seta Flash. |
| 4) | Volatile organic compound content | By BS EN ISO 11890-2:2006, Paints and varnishes – Determination of volatile organic compound (VOC) content – Part 2 : Gas-chromatographic method. |
| 5) | Halogenated solvents
Aromatic solvents
Epichlorohydrin | By Gas Chromatograph –Mass Spectrometry (GC-MS). |
| 6) | N-methyl pyrrolidone | By Gas Chromatography with Flame Ionization Detector (GC-FID) |
| 7) | Alkyl Phenol Ethoxylates | BS3762 : 1990 Analysis of formulated Detergent |

SUMMARY OF TEST RESULTS

The summary of test results for "CCC Anti-Condensation Coating".

Item No.	Test	Result	Method Detection Limit	GLS032 Criteria	Inferred Remark
1	Formaldehyde Content	Not Detected	0.01%	Not Detected	Pass
2	Heavy Metals: Mercury, Lead, Cadmium, Chromium	Not Detected	0.01%	Not Detected	Pass
3	Flash point @ 61°C	No Flash	-	> 61°C	Pass
4	VOC Content	6.0 g/L	2 g/L	< 50 g/L*	Pass
5	Halogenated solvents	Not Detected	0.01%	Not Detected	Pass
6	Epichlorohydrin	Not Detected	0.01%	Not Detected	Pass
7	Aromatic solvents	Not Detected	0.01%	Not Detected	Pass
8	N-methyl pyrrolidone	Not Detected	0.01%	Not Detected	Pass
9	Alkyl Phenol Ethoxylates	Not Detected	0.01%	Not Detected	Pass

* For Water Based Coatings / Paints (Interior: Matt ☐ 25 g/L; Low Sheen ☐ 30 g/L; Semi Gloss ☐ 40 g/L; Gloss ☐ 70 g/L. Exterior: Matt and Low Sheen ☐ 50 g/L; Semi Gloss ☐ 65 g/L; Gloss ☐ 70 g/L)

For Water Based Varnishes ☐ 50 g/L

For Solvent Based Coatings / Paints (Solvent Paints and stains ☐ 200 g/L; Solvent Varnishes ☐ 250 g/L)



TEST REPORT: 7191178814-CHM18/02-CSY
 12 FEB 2018



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RESULTS (Cont'd)

Table 1 : The Formaldehyde results for "CCC Anti-Condensation Coating".

Test	Result	Method Detection Limit
Formaldehyde Content	Not Detected	0.01%

Table 2 : The Elemental results for "CCC Anti-Condensation Coating".

Test	Result	Method Detection Limit
Mercury	Not Detected	0.01%
Lead	Not Detected	0.01%
Cadmium	Not Detected	0.01%
Chromium	Not Detected	0.01%

Table 3 : The Flash Point results for "CCC Anti-Condensation Coating".

Test	Result
Flash point @ 61°C	No Flash

Table 4 : The Volatile Organic Compound (VOC) content for "CCC Anti-Condensation Coating".

Test	Result	Method Detection Limit
VOC Content ^a	6.0 g/L ^b	2 g/L

- a) Volatile organic compound (VOC) means any organic compound having an initial boiling point less than or equal to 250°C measured at a standard pressure of 101,3kPa.
 b) The result was calculated based on the specific gravity = 1.225 provided by the client

Table 5 : The analytical results for "CCC Anti-Condensation Coating".

Test	Result	Method Detection Limit
Halogenated solvents	Not Detected	0.01%
Epichlorohydrin	Not Detected	0.01%
Aromatic solvents	Not Detected	0.01%
N-methyl pyrrolidone	Not Detected	0.01%
Alkyl Phenol Ethoxylates	Not Detected	0.01%

MS CHOO SEOW YAH
 TECHNICAL EXECUTIVE

DR XIAO ZHOU
 PRODUCT MANAGER
 MICROCONTAMINATION DIAGNOSIS
 CHEMICAL & MATERIALS



TEST REPORT: 7191178814-CHM18/02-CSY
12 FEB 2018



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July 2011



