

i2Cool Electricity-Free Cooling Paint

Product Summary

With the support of HK Tech 300 incubation project of City University of Hong Kong, i2Cool Team has successfully invented the Electricity-Free Cooling Paint. As a series of newly invented product by applying the technology of Passive Radiative Cooling, it can reflect most of the solar heat and effectively emit thermal energy to the cold universe, hence helping buildings or outdoor facilities cooling down without energy input or refrigerant, saving energy consumption from HVAC system and avoiding deterioration of facilities, alleviating energy shortage and climate change, reducing global carbon emissions, and achieving the goals of sustainable development.

Base on the different requirements, i2Cool Electricity-Free Cooling Paint is available with Mini, Standard and Max versions.

Product Features

Items	Method	Results
Solar Reflectivity(250-2500nm)	GB/T 2680-2021 ASTM E1980-11(2019)	95.06%
Mid-infrared Emissivity(8-13 μ m)	GB/T 30127-2013	95.2%
Gloss	ISO 2813:2014	83
SRI	ASTM E1980-11(2019)	120
Pull-off Strength Test	ASTM D4541-17	7 MPa
Impact Resistance Test	ISO 2813:2014	60 kg·cm
VOC	GB/T 23986-2009	12g/L
Storage Stability 50 \pm 2 $^{\circ}$ C	HG/T 4758-2014	PASS (No Abnormality)
Brine Resistance 3% NaCl 96h	GB/T 9274-1988, GB/T 1766-2008	PASS (No blister or rust)
Artificial Weathering 500h	GB/T 1865-2009, GB/T 1766-2008	PASS (No blister, crack, flakes, chalking, discoloration, tarnish)
Water Resistance 24h	GB/T 1733-1993, GB/T 1766-2008	PASS (No blister or rust)
Cross Cut Test 1mm	GB/T 9286-1998	PASS (< 1)
Pencil Hardness Test	GB/T 6739-2006	PASS (> 2B)

RoHS (EU) Test Results

Comply with the limits as set by (EU) 2015/863 amending Annex II to Directive 2011/65/EU.



RoHS 10					
Item	Method	Unit	MDL	Limit	Results
Lead	IEC 62321-5:2013	mg/kg	2	1000	Not Detected
Cadmium	IEC 62321-5:2013	mg/kg	2	100	Not Detected
Mercury	IEC 62321-4:2013+AMD1:2017CSV	mg/kg	2	1000	Not Detected
Hexavalent Chromium	IEC 62321-7-2:2017	mg/kg	8	1000	Not Detected
Sum of PBBs	IEC 62321-6-2:2015	mg/kg	-	1000	Not Detected
Sum of PBDEs	IEC 62321-6-2:2015	mg/kg	-	1000	Not Detected
Dibutyl phthalate(DBP)	IEC 62321-8-2:2017	mg/kg	50	1000	Not Detected
Butyl benzyl phthalate(BBP)	IEC 62321-8-2:2017	mg/kg	50	1000	Not Detected
Bis(2-ethylhexyl)phthalate(DEHP)	IEC 62321-8-2:2017	mg/kg	50	1000	Not Detected
Diisobutyl Phthalates(DIBP)	IEC 62321-8-2:2017	mg/kg	50	1000	Not Detected

Halogen Four					
Item	Method	Unit	MDL	Limit	Results
Fluorine	BS EN 14582-2016	mg/kg	50	-	Not Detected
Chlorine	BS EN 14582-2016	mg/kg	50	-	Not Detected
Bromine	BS EN 14582-2016	mg/kg	50	-	Not Detected
Iodine	BS EN 14582-2016	mg/kg	50	-	Not Detected

REACH (EC) Test Results

SVHC screening is performed according to: Two hundred and twenty-four(224) Substances in the Candidate List of Substances of Very High Concern (SVHC) for authorization published by European Chemical Agency (ECHA) on and before Jun 10, 2022 and one potential Substance published by European Chemical Agency (ECHA) regarding regulation (EC) No. 1907/2006 concerning the REACH.



Chemical Substance	Results %(w/w)
All Tested 224 SVHCs in Chemical List	Not Detected (<Report Limit)
One potential Substance (Resorcinol)	Not Detected (<Report Limit)



GS2022 by Hong Kong ArchSD Test Results

Comply with the limits as set by Terms 21.91 in General Specification for building 2022 Edition (GS2022) about emulsion paint product, published by Architectural Services Department (ArchSD), Hong Kong in 2022

Test Item	Test Method	Acceptance Standards	Results
Preliminary Examination of paint			
Surface Skin	BS EN ISO 1513:2010	No Surface Skin	No Surface Skin
Consistency	BS EN ISO 1513:2010	No Gelling	No Gelling
Colour separation into layers	BS EN ISO 1513:2010	No colour separation	No colour separation
Visible impurities	BS EN ISO 1513:2010	No visible impurities	No visible impurities
Sediment	BS EN ISO 1513:2010	No hard setting	No hard setting
Drying times			
Hard drying(min)	BS EN ISO 9117-1:2009	≤1h	<1h
Others			
Fineness of grind	BS EN ISO 1524:2020	≤50µm	30µm
Hiding power(contrast ratio %)	BS EN ISO 2814:2006	≥75%	87%
Specular Gloss (85°)	BS EN ISO 2813:2014	≤20GU	19.0GU
Viscosity(procedure B)	ASTM D562:2010	65~85KU	82.6KU
Scrub resistance(cycle)	ASTM D2486:2017	≥400cycle	>400cycle



Hong Kong Eco Mark License Test Result

Comply with the standards of Hong Kong Eco Mark published by Hong Kong Certification Centre (HKCC), about the environmental requirements of product design, production and management.

Phthalates Content

Test Item	Maximum Allowable Limit	Results
Di(2-ethylhexyl) phthalate (DEHP)	<0.1%	Not Detected
Benzyl-n-butyl phthalate (BBP)	<0.1%	Not Detected
Di-n-butyl phthalate (DBP)	<0.1%	Not Detected
Diisononyl phthalate (DINP)	<0.1%	Not Detected
Diisodecyl phthalate (DIDP)	<0.1%	Not Detected
Di-n-octyl phthalate (DNOP)	<0.1%	Not Detected

Formaldehyde Content

Maximum Allowable Limit	Results
0.01%	0.006%

Certain hazardous substance content – European council directive 2011/65/EU on the Restriction of the use of certain hazardous substances in electrical and electronic equipment & EU 2015/863 (RoHS 2.0): All results passed, see details at the “RoHS (EU) Test Results” part.

HJ 2537-2014 technical requirements for environmental labeling products water base coatings

Test Item	Method	Limit	Results
Free formaldehyde(mg/kg)	GB/T 23993-2009	≤50	Not Detected
Total content of ethylene glycol and ether ester(mg/kg)	GB 24409-2009	≤100	Not Detected
Total amount of benzene, toluene, ethylbenzene and xylene(mg/kg)	GB 18582-2020	≤100	Not Detected
Soluble lead(mg/kg)	GB 18582-2020	≤90	Not Detected
Soluble cadmium(mg/kg)	GB 18582-2020	≤75	Not Detected
Soluble chromium(mg/kg)	GB 18582-2020	≤60	Not Detected
Soluble mercury(mg/kg)	GB 18582-2020	≤60	Not Detected

1. MDL: Method Detection Limit
2. Welcome to ask for the detailed content of the test reports.

Application Method

Electricity-Free Cooling Paint Mini

After cleaning the surface thoroughly, mix 5% weight of water with the paint, applying with roller for two layers, wait for at least five hours (25°C) for drying. According to different types of surfaces, every kilo of the paint can cover 6~7 meter squared of area.

Electricity-Free Cooling Paint Standard & Max

After cleaning the surface thoroughly, mix 5% weight of water with the Bottom Coat paint, applying with roller for two layers, wait for at least five hours (25°C) for drying. After the Bottom Coat is dried, mix 10% weight of water with the Top Coat paint, applying with roller for one layers, wait for at least five hours (25°C) for drying. According to different types of surfaces, every kilo of the Standard Version paint can cover 4.5~5.5 meter squared of area, and every kilo of the Max Version paint can cover 2.5-3.5 meter squared of area.

Notes on Use

Keep container tightly sealed

Keep out of reach from children

Keep away from food and drink

Ensure good ventilation during application and drying

Use appropriate personal protective equipment

If get paint in your eyes, immediately flush with plenty of water and seek medical attention

Stir thoroughly before use

Avoid excessive dilution

Once diluted, DO NOT pour back into original container

Use the paint as soon as possible after mixing with water

DO NOT sand the final coating

Dry paint at above 10°C

Declaration

The information provided in this sheet is not comprehensive enough to cover all cases, It builds on existing laws and the current state of knowledge. Anyone who intends to use the product in areas other than those recommended by this sheet without prior written confirmation of the product's suitability from us shall be responsible for the consequences. It is the responsibility of the user to take the necessary measures to meet the requirements of local laws and regulations. Please keep reading the material safety data sheets and technical data sheets of our products. We make every effort to ensure that all guidelines (on or off the sheet) for our products are correct, but we do not have complete control over the quality or condition of the substrate and the many factors that can affect the use of our products. Therefore, unless we specifically confirm in writing, we are not liable for loss of performance or any other loss or damage arising from the use of the product. All products and technical advice we offer are subject to our standard terms and conditions of sale, please obtain a copy of this document and read it carefully. The content in this table will be supplemented with our accumulated experience and updated policies. Before using the product, the user should verify that the data in this sheet is up to date.

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