

Common Q&A about VOC test

关于 VOC 测试的常见问题

1. About test methods 关于测试方法

1) Generally we have two test methods. 一般有两种：

i. Climate chamber: acc. to ISO 16000 3, 6, 9, 11

标准气候仓：依据 ISO 16000 3, 6, 9, 11

ISO 16000-3: method for testing formaldehyde emission 用于甲醛释放的测试

ISO 16000-6, 9: method for testing VOC emission 用于 VOC 释放的测试

ISO 16000-3, 6, 9: method for testing VOC emission and formaldehyde emission 用于甲醛和 VOC 释放的测试

PRG-0027: method for testing phenol and cresol 用于测试苯酚和甲酚

Notice: Once we load the sample into chamber, it's impossible to add test of formaldehyde emission or VOC emission.

注意：一旦样品进仓，无法加测甲醛测试或 VOC 测试。

ii. Micro chamber: ITTC in house method

微仓：ITTC 内部方法

Mainly tested samples: glue, ink, paint, powder coating, adhesive, hot-melt adhesive, cloth etc.. 主要测试样品：胶水，油墨，油漆，粉末涂料，胶黏剂，热熔胶，布料等等。

Notice: Micro-chamber test and climate chamber test are two different kinds of tests for VOC. The micro-chamber is used as a method to screen the raw material and it is only for prototype tests. To evaluate the tested sample "pass" or "fail", it should follow the ISO16000 and use the climate chamber test. There are no direct links of the detected compounds between the two kinds of VOC tests.

注意：微仓测试方法和标准仓测试方法是两种完全不同的用于测试 VOC 的方法。微仓测试用于对原材料进行预先扫描测试且测试类型仅为 'prototype'。若要判定测试样品是 'pass' 或者 'fail'，则应给依据 ISO 16000 使用标准仓进行测试。微仓测试结果和标准仓测试结果之间没有比较性。

2) Which IKEA specification is applied for product that has cover material with leather/ PU-coated fabric?

若样品中含有真皮或 PU 涂布织物，应当使用宜家哪个标准？

With only leather: Pls. choose the IOS-MAT-0011;

仅有真皮：请选择 IOS-MAT-0011;

With only PU-coated fabric: Pls. choose the IOS-MAT-0079;

仅有 PU 涂布织物：请选择 IOS-MAT-0079;

With both leather and PU-coated fabric: Pls. choose the IOS-MAT-0011;

既含真皮又含 PU 涂布织物：请选择 IOS-MAT-0011;

3) **Does the thickness of sample affect the VOC result? Does it mean that much thinner sample, less VOC?**

样品厚度大小差异是否影响 VOCs 结果？材料的厚度越薄 VOC 结果是否越小？

There're many factors such as producing process, production batch, storage parameters (temperature, humidity and ventilation etc.) and representation of the chose tested sample etc.. So we can't decide the specific factor resulting in such difference between the samples of different thickness and can't just consider the thickness.

However, if all the factors are consistent and ideal, then thinner sample, less VOC.

影响 VOC 测试结果的因素有很多，比如生产工艺，生产批次，生产后至送样测试前这一期间的样品存储状态（温度，湿度，通风条件等），送检样品有无典型代表性等等。

所以不能确定厚薄样品测试结果之间的差异是由哪一因素导致的，因此不能仅仅考虑厚度这一因素。如果以上所有条件均到达理想状态，均为一致，则样品越薄，物质越容易挥发。

2. Sample and chamber 样品和测试仓



1) How to choose the suitable chamber? 如何选择合适的测试仓

- i. Compare the sample's size with the chamber's size
比较样品的尺寸和测试仓的尺寸
- ii. Calculate the loading factor $L(m^2/m^3)$, and ensure $0.5m^2/m^3 \leq L \leq 2.0m^2/m^3$ using formula below:

$$L = \frac{\text{Surface area}_{\text{sample}}}{\text{chamber volume}}$$

计算承载率 $L(m^2/m^3)$ ，保证 $0.5m^2/m^3 \leq L \leq 2.0m^2/m^3$

；使用如下公式进行计算：

$$\text{承载率} = \frac{\text{样品表面积}}{\text{测试仓体积}}$$

Chamber-A 测试仓-A	5m3-1	5m3-2	1m3
Suitable sample size H(m)*W(m)*D(m) 合适的样品尺寸 高度*宽度*深度	1.8*0.8* 1.5	1.4*1.1* 2.1	0.75*0.75*1.5
Suitable surface area(m ²) 合适的样品表面积(m ²)	2.5~10	2.5~10	0.7~2.0
Typical samples 典型样品	STALL shoe cab 3 comp 79x148	sofa: 2 seats	pillow
	cover	sofa: small 3 seats	foam
	sofa: big single seat		Wood panel
	Mattress: 0.8m*2m (thickness ≥0.05m)		work chair
	Mattress: (0.9m~1.4m)*2m (no limited thickness)		BATH MAT 60*90(1piece) 40*60(2piece)
	Mattress: (0.9m~1.4m)*2m (no limited thickness)		rug
	Mattress: 1.5m*2m (thickness ≤0.28m)		POANG ach child

Chamber –B 测试仓-B	500L	250L	25L
Suitable sample size H(m)*W(m)*D(m) 合适的样品尺寸 高度*宽度*深度	0.70*0.70*0.60	0.55*0.55*0.55	0.25*0.25*0.15
Suitable surface area(m ²) 合适的样品表面积(m ²)	0.3~0.8	0.13~0.4	0.013~0.04
Typical samples 典型样品	BRANKIS basket	MÅNGFALD note- book	Artificial leather- raw material
	STUVA MÅLAD drawer frt	DRAGAN bthr s2 bamboo	glove
	LATTJO playing cards	photo frame	Fabric/ Artificial leather/Leather- raw material
	NESNA bds table 36x35	Door mat	PCB
	Door mat	hanger	Dragan N soap dish bamboo
	gloves	Baby clothes	toy

2) How to pack the samples? 如何包装样品？



- i. Package material: PE membrane/ aluminum foil/original packing/paper/cardboard 包装材料：PE 膜/铝箔纸/原始包装/纸/硬纸板
- ii. When sent different samples at the same time, keep them wrapped separately.
如果同时寄送不同的样品，请把它们分开独立包装。
- iii. Ensure the wrapping package is sealed and not broken.
保证包装密封且包装无破损。
- iv. Pls. mark 'for VOC test' on the package
请在包装外注明 '用于 VOC 测试' 。

3) When should the suppliers send the sample after being produced? 样品生产完成后，何时寄送样品？

Acc. to IKEA Specification, the taking of a sample from production should reflect a realistic worst case in comparison to when the product could reach a customer (i.e. normal handling in factory, storage time, packaging and transport to the nearest destination). So pls. send the sample to Lab as soon as possible. 根据宜家规范要求，从生产线上所取样品应反映出实际产品到达顾客手中最差的情况（即：在工厂生产、存储和运输到最近的目的地期间都为常规操作的情况下）。因此，寄送时间越快越好。

4) How to book chamber in advance? 如何提前预定测试仓？

- i. Pls. contact our CS and provide the specific information of sample meanwhile, e.g. article no.. 请联系 CS 并提供样品的详细信息，比如 article no.。
- ii. Pls. ensure the sample arrived in ITTC two weeks before the test date. Otherwise we'll cancel the chamber you booked and pls. book it again if needed.
保证样品能够在测试日期的两周前到达 ITTC。否则预定好的测试仓会被取消，如有需要请重新预定测试仓。

5) Cut or no cut if the samples is too big to test in small chamber? 如果样品太大不能使用小仓进行测试，是否可以裁剪？

Usually, we suggest not to cut the sample. But if the material is homogeneous, it's applicable to choose the representative part to test. Meanwhile, the supplier should consult IKAE related technician. 通常实验室不提

倡对样品进行剪裁。但理论上如果一个样品所有的材质都是均一的，是可以选取代表性样品做测试的。但还需要供应商咨询宜家技术员，征求他们的意见和建议。

6) Is it possible to test a small model of a big finished product? 若样品较大，能否对专门制作的模型样品进行测试？

No. 不接受此类做法。

3. How to read test report? 怎么阅读测试报告？

To know more about why the report is 'pass' or 'fail', pls. see the result part and evaluation part.

若想了解更多关于报告'pass'或'fail'的信息，请参考结果部分和判定依据部分。

1) Result part: evaluation per concentration after 48h

结果部分：依据 48 小时的数据进行判定

Compound 检测物质	CAS No.	Concentration after 5h ($\mu\text{g}/\text{m}^3$) 5 小时浓度	Concentration after 24 h ($\mu\text{g}/\text{m}^3$) 24 小时浓度	Concentration after 48 h ($\mu\text{g}/\text{m}^3$) 48 小时浓度	Info. 物质信息
*****	*****	*	*	*	*
Sum of all detected compounds: 所有检测物质总和：		*	*	*	/
Sum of VVOC (<C6): 所有 VVOC 总和：		*	*	*	/
Sum of VOC (C6~C16): 所有 VOC 总和：		*	*	*	/
Sum of SVOC (>C16): 所有 SVOC 总和：		*	*	*	/
TVOC (toluene equivalent): TVOC (甲苯半定量)		*	*	*	/

NOTICE: 'Sum of VOC means' sum of the individual concentrations of VOC detected in the chromatography between and including n-hexane and n-hexadecane. "TVOC (toluene equivalent)" means a single concentration value of total area of the chromatography between and including hexane and n-hexadecane quantified by using the chromatographic response factor for toluene.

注意：'Sum of VOC means' 在指的是对于正己烷和正十六烷之间（包括正己烷和正十六烷）出现的每一个色谱峰进行面积积分计算，然后把每一个数值进行加和。

'TVOC (甲苯半定量)' 指的是使用甲苯响应因子，对正己烷和正十六烷之间（包括正己烷和正十六烷）出现的色谱峰进行整体面积的积分计算。

2) Clarification of each detected substance 每个检测物质的分类

Information: (a) Toxic substance: CMR Cat. 1A or 1B, STOT RE 1, STOT SE 1, or Acute Tox Cat. 1-3; (b) German LCI list; (c) safe sampling volume too low to quantify without tube breakthrough; (d) odor relevant; (e) compound boiling point exceeds thermal limit of the TD, underestimation likely; (f) terpene, possibly wood-related; (g) CMR Cat. 1A or 1B; (h) All C6~C9 Aromatic substance according to IOS-MAT-0054/IOS-PRG-0010; (i) Chlorinated solvent according to IOS-MAT-0054/IOS-PRG-0010; (<C6) VVOC compound; (>C16) SVOC compound.

物质信息: (a) 类毒性物质: CMR Cat. 1A or 1B, STOT RE 1, STOT SE 1, 或者 Acute Tox Cat. 1-3; (b) 德国 LCI 列表; (c) 保证采样管不被击穿的情况下, 该物质安全采样体积太低而无法定量; (d) 气味相关; (e) 物质沸点超过热脱附仪的限值, 无法判定; (f) 萜烯类物质, 与木材相关; (g) 致癌, 致基因突变或生殖毒性

(CMR): CMR Cat. 1A or 1B; (h) 依照 IOS-MAT-0054/IOS-PRG-0010, 所有的 C6~C9 芳香化合物; (i) 依照 IOS-MAT-0054/IOS-PRG-0010, 所有含氯的物质; (<C6) 非常容易挥发的物质; (>C16) 半挥发物质。

3) Evaluation part: e.g. IOS-MAT-0010 判定部分, 举例 IOS-MAT-0010

IF some item is 'NOK', i.e. the evaluation of this report is 'fail', to know more about the reason, pls. refer to the details in result part.

若某一项结果是'NOK', 即报告判定结果是'Fail', 若想了解导致'Fail'的原因, 请参考结果部分里列出的详情。

Item 条款	Conclusion
Sum of VOC \leq 1.2mg/m ³ after 48 h	OK
Sum of VOC \leq 0.6mg/m ³ after 28 day (if need)	/
Each individual CMR-Substance \leq 10 μ g/m ³ after 48 h	NOK
The Sum of all CMR-Substance \leq 50 μ g/m ³ after 48 h	OK
Each individual T-Substance (excl. CMR Cat. 1A and 1B) \leq 30 μ g/m ³ after 48 h	OK

4) If one substance is not presented in the result, does it mean this substance is not detected? 报告中未显示某个物质的含量, 可不可以理解为未测出该物质?

If one substance is not presented in the result, it means that the concentration of it is below the report limit and no need to list it in the result. 检测结果中未显示某个物质的含量, 可以理解为: 该物质的含量低于我们的检测限, 因此不需在结果中列出。