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建興無鹵標準
LITE-ON IT Halogen Free (HF)
Specification

Revision: D
9713100002

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版次 Revision	改版簡述 Brief Description of change	發行日期 Date
A	<p>本標準為無鹵計劃的相關需求。為配合文件E化，文號重新編碼，版本亦重新由A版發行。</p> <p>The document is issued as Halogen Free Project related requirement. To introduce e-doc, the document No. and Revision have been changed to 9713100002 Rev. A.</p>	2008.11.03
B	<ol style="list-style-type: none"> 修改2, 擴大未來無鹵產品定義由光碟機→光碟機及家用多媒體產品 Revised 2, extend definition of HF products from ODD to ODD and Home-used multimedia products. 伴隨承認不使用證明改H版，納入無鹵要求，因此廢除使用無鹵不使用證明，並修改4.2, 8.3的一些描述 After adapting Non-Use certificate for Halogen Free into Non-Use certificate for Parts Approval (H version), therefore Non-Use certificate for Halogen Free will no longer use and revised some minor description in 4.2 and 8.3 修改4.5部份描述 Revised some description in 4.5 修改4.7, “必須”→ “建議” Revised “required” to “recommended” 修改4.8的包材無鹵需求 Revised the HF requirement for packing material in 4.8 修改5.1內容描述，並刪除5.2 Revised some description in 5.1, and deleted 5.2. 	2008.11.19
C	<ol style="list-style-type: none"> 新增BFR/CFR及修改PVC的需求於表2，並刪除2.3 Add requirement of BFR/CFR and revise requirement of PVC in Table 2 and delete 2.3 新增零件標示需求於3.1.2 Add marking requirement for HF parts in 3.1.2 新增7. 無鹵零件的進料檢驗 Add 7. Incoming Inspection for HF Part 將無鹵包材需求，重新定義於2.4 Redefine Requirement for HF Packaging Materials in 2.4 	2009.07.07

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D	<ol style="list-style-type: none"> 1. 將文件英文名稱Standard修正為Specification Revise the name from “Standard” to “Specification” of this document 2. 修改表1. Revised Table 1 3. 修改金屬和陶瓷為“排外”，改為“不適用” Revised metals and ceramics are “exception, exemption” to “not applicable” 4. 於2.1加入固態硬碟 Added SSD into 2.1 5. 新增2.4.3，無鹵機種包材的例外 Added exception of packing material of HF model into 2.4.3 6. 由於無鹵零件可簡易由其外箱Barcode上的料號直接判定是否為無鹵料，故刪除3.1.3對於外箱貼上HF標籤的要求 Since HF part can be easily distinguished by part number on Barcode of packing box, deleted 3.1.3 about pasting HF label on packing box 7. 修改4.4 新增無鹵報告的有效期為兩年 Added “HF test reports are valid for two years” into 4.4 8. 因無鹵零件料號有做區別，故刪除4.6 Since HF P/N has a postfix “H” to be distinguished, deleted 4.6 9. 新增無鹵PCB料號編碼原則於6.2 Added coding rule of HF PCB in 6.2 	2011.11.11
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Table of Contents

1. 範疇
Scope
2. 無鹵產品的需求
Requirements for HF Products
3. 無鹵零件的標示需求
Marking Requirements for HF Parts
4. 無鹵零件的承認需求
Approval Requirements for HF Parts
5. 無鹵時程表
Halogen-Free Schedule
6. 無鹵零件料號及無鹵機種名稱的區別
The difference of P/N and Model name between HF and non-HF
7. 無鹵零件的進料檢驗
Incoming Inspection for HF Part
8. 附件
Attachments
9. 常見問題
FAQ

1 範疇 Scope

1.1 在電子設備中，最常見含鹵素的應用，為聚氯乙炔(PVC)及塑膠件所添加之溴化耐燃劑(BFRs)。可能的應用如表1所述：

The most common applications of halogenated substances in electronic equipment are polyvinyl chloride (PVC) and brominated flame retardants (BFRs) additives in plastics. Examples of potentially brominated and chlorinated materials include:

表1: 具有高風險使用氯及溴的項目

Table 1: High risk applications using bromine and chlorine

物質 Substance	應用 Application	建興料號開頭 LITE-ON IT P/N Prefix
溴 Bromine (Br)	Printed circuit board (PCB) laminates	68
	Flexible printed circuit (FPC) boards	7804, 78106
	Integrated circuits or other electrical components with plastic packages	64
	Connectors	66
	Insulators (including Rubber)	78132,78121
	Plastics parts	7800, 78111, 78112, 78113,78122, 78185, 7805, 7818
	EMI gaskets	78132, 7807
	Labels, adhesives and tapes	78195, 7811
氯 Chlorine (Cl)	Internal cables (including FFC, wire, jump wire)	65,67
	Power cords and external cable assemblies	6715, 6716
	SOLENOID PULL	7802
	Chip-R	625X
	RESONATOR	6449
	DIODE SCHOTTKY	6413
	LABEL SAFETY	7824
	FPC	6830
MAIN PCB	68PX	
溴及氯 Bromine and Chlorine	Power adapters, optical drives, and other modules containing components listed above	6717, 672,6896, 7805, 78102, 78107, 7814, 7815, 7818, 78181, 78183

*上表所列並非完全無遺漏的。所有的塑膠件、墨水、塗料、膠水及其他物質，必須要測試總溴及總氯的含量。但金屬和陶瓷不適用。

*The list in Table 1 is not exhaustive. All plastics, inks, paints, glues, and other materials shall be tested for total bromine and chlorine content. But metals and ceramics are not applicable to this policy.

2 無鹵產品的需求 Requirements for HF Products

2.1 所有組成建興之光碟機、固態硬碟及家用多媒體產品的零件，必需滿足下列由建興所認定之無鹵規範

All homogeneous materials within a component for LITE-ON IT ODD, SSD and Home-used multimedia products shall meet the criteria below to be considered halogen-free by LITE-ON IT.

2.2 無鹵產品及零件的物質限制，如表2所述：

Substance restrictions for halogen-free products and components are defined in Table 2:

表2: 無鹵產品及零件的物質限制

Table 2: Substance restrictions for halogen-free products and components

應用 Application	物質 Substances	限值 Permissible Limit (by weight)
All Components and PCB 所有零件及印刷電路板	Bromine (Br) 溴	≤ 900 ppm (0.09%)
	Chlorine (Cl) 氯	≤ 900 ppm (0.09%)
	Bromine (Br) + Chlorine (Cl) 溴及氯總含量	≤ 1500 ppm (0.15%)
	BFR 溴化耐燃劑	≤ 1000 ppm (0.10%)
	CFR 氯化耐燃劑	≤ 1000 ppm (0.10%)
All Components except PCB 所有零件但不包含印刷電路板	PVC 聚氯乙稀	≤ 1000 ppm (0.10%)

*A listing of BFR compounds can be found in the Joint Industry Guide (JIG-101A)

*溴化耐燃劑化合物的列表可以參考JIG-101A

2.3 無鹵替代材料的限制，如表3所述：

Additional restrictions of Halogen-Free substitute materials are defined in Table 3:

表3: 額外物質的限制 Table 3: Additional substance restrictions

物質 Substances	限值 Permissible Limit (by weight)
Antimony Trioxide三氧化二銻 (Sb_2O_3)	≤ 1000 ppm (0.1%)
Red Phosphorus紅磷 (Red-P)	≤ 1000 ppm (0.1%)

*使用在玻璃中的三氧化二銻為排外，在2011前仍可以使用。

*As to Sb_2O_3 , it's an exemption to use in glass by 2011.

2.4 無鹵包材需求 Requirement for HF Packaging Materials

會輸出至建興客戶端的包裝材料(如厚紙板、塑料等)，外加使用手冊及光碟片，必須符合本無鹵標準。不會輸出至建興客戶端的包材(如零件捲帶包裝、盤狀包裝等)，並不在本標準範疇內。區分如下：

Packaging materials (e.g. corrugate cardboard, plastic, etc.), plus user guides and optical discs that are shipped to LITE-ON IT's end-customers shall comply with the Halogen-Free Standard. Packaging that is not intended to ship to LITE-ON IT's end customers (e.g. tape and reel, part trays, etc.), are outside the scope of this standard. The classification is as follows:

2.4.1 有彩盒包裝者，機台及彩盒包材須為無鹵 (金屬及陶瓷件不適用)

For Giftbox drive, drive and package shall be HF. (metal and ceramic are not applicable)

2.4.2 無彩盒包裝者，僅機台本身及其PE袋須為無鹵
For bare drive, only drive and its PE bag shall be HF.

2.4.3 若客戶有特殊需求者，則依客戶需求為準
If customers have special requirements, exceptions can be made to this policy.

3 無鹵零件的標示需求 Marking Requirements for HF parts

3.1 下列零件，供應商應於易識別處，標示清晰可見之標識如圖1，以表明其零件符合無鹵要求
The following parts, supplier shall mark as *Figure 1* on the area that is easily identified to indicate the components meet HF substance restrictions. The marking shall be large enough to be easily visible.

3.1.1 PCB、FPC、Connectors

Printed circuit board (PCB) laminates, flexible printed circuits (FPC) and Connectors

3.1.2 其他各種零件，其大小允許加註標示者，請標示“HF”或“H”。

Any other parts which size is big enough to be marked, please mark “HF” or “H”.

圖1. 無鹵標示

Figure 1: Halogen-free mark



4 無鹵零件的承認需求 Approval Requirements for HF Parts

4.1 供應商必須提供所有組成零件之均質材質(原材質)，其溴及氯的測試報告(範本如附件8.1)，證明其滿足建興無鹵標準。但金屬和陶瓷不適用(即無需提供鹵素測試報告)

Suppliers are required to perform analytical testing and provide test reports (sample as attachment 8.1) for bromine and chlorine at a homogeneous material (raw material) level to demonstrate compliance with the LITE-ON IT Halogen-Free criteria. But metals, ceramics are not applicable to provide Halogen test reports.

4.2 供應商必須於承認不使用證明書(如附件8.2)內，回答無鹵相關問題

Suppliers shall answer the HF related questions in Non-use certificate for Parts Approval (8.2).

4.3 可接受測試方法為EN14582:2007或IEC 61189-2:2006或US EPA SW-846 Method 5050或EN 50267-2-1:1999 (建議使用: EN14582)。

註：EN 14582：2007 Annex A 不適合作為前處理的方法

Acceptable test methods are EN14582 or IEC 61189-2:2006 or US EPA SW-846 Method 5050 or EN 50267-2-1:1999. (EN14582 is preferred)

Remark: EN 14582：2007 Annex A is not acceptable for the method of preconditioning

4.4 鹵素測試報告必須是由取得ISO 17025認證之獨立第三方實驗室所發行，其有效期限為兩年
Halogen test reports shall be from an independent third-party lab certified to ISO 17025, and test reports are valid for two years.

4.5 不接受使用XRF的測試方法做為佐證方式

Test reports using X-ray Fluorescence Spectroscopy (XRF) as the test method are not acceptable as a form of compliance documentation.

5 無鹵時程表 Halogen-Free Schedule

5.1 建興新開發之儲存機種，將視客戶需求導入無鹵，請參閱PM發行之Roadmap (建興內部文件，不對外公開)。供應商會被通知是否需要提供無鹵料。

LITE-ON IT new developing models will be based on customer request to phase-in Halogen Free, please sees Roadmap released by PM. (internal document of LOIT, not for public). Suppliers will be noticed whether HF parts are needed.

6 無鹵零件料號及無鹵機種名稱的區別

The difference of P/N and Model name between HF and non-HF

6.1 一般而言，無鹵料號及無鹵機種名稱，都會在原編碼後加上“H”以茲區別。

Normally, the naming rule of HF P/N and Model Name is to add a postfix “H” to be distinguished.

6.2 PCB零件，依料號最後第5碼，若有帶"H"，則為無鹵PCB。

PCB can be distinguished by the last 5th code, if it is “H”, then it means a HF PCB part.

(e.g. 68P22S8A5SHM01A: HF PCB, 68P32DY8A8NK01X: non-HF PCB)

7 無鹵零件的進料檢驗 Incoming Inspection for HF Parts

7.1 具備無鹵料號的零件，進料時必須進行XRF的檢驗。檢測限制如表4所述

The parts with HF P/N, while part is incoming, need to be conducted XRF incoming inspection.

The limits are defined in *Table 4*.

表4: 無鹵零件進料的XRF檢測限值

Table 4: XRF inspection threshold for incoming HF parts

Substances	Permissible Limit (by weight)
Cl (氯)	≤ 600 ppm (0.06%)
Br (溴)	≤ 300 ppm (0.03%)

7.2 若XRF檢測結果超出以上規範，廠商須送該批樣品至取得ISO 17025認證之獨立第三方實驗室，以4.3可接受的測試方法，檢測可疑部位的原材質，以證明該零件符合2.2的要求。

If the XRF test result is over *Table 4* above, supplier shall send the same batch of sample to an

independent third-party lab certified to ISO 17025, using the acceptable test methods to test the suspicious portion of raw material and then to show this part can meet the criteria of 2.2

8 附件 Attachments

8.1 溴及氯的測試報告範本 Bromine and chlorine test report sample:

[http://gsm.liteonit.com.tw:8080/doc/Halogen-BSEN14582\(C E\)-20080513.pdf](http://gsm.liteonit.com.tw:8080/doc/Halogen-BSEN14582(C E)-20080513.pdf)

8.2 承認不使用證明書 Non-use certificate for Parts Approval:

http://gsm.liteonit.com.tw:8080/doc/Non-Use_for_Parts_Approval.doc

9 常見問題 FAQ

9.1 鐵氟龍是否為此次管制對象? Is Teflon controlled target?

Ans.: 否。請參考表2，氟並非於此次無鹵計劃的管制對象。

No. Please refer to *Table 2*, Fluorine is not the controlled target for this Halogen-Free plan.

9.2 磷青銅是否為此次管制對象? Is phosphor bronze controlled target?

Ans.: 否。請參考表3，磷的管制對象僅有紅磷。

No. Please refer to *Table 3*, controlled target for phosphor is only Red Phosphorus.

9.3 無鹵零件需要什麼額外的文件保證? What are ultra approval data for Halogen-Free component?

Ans.: 請參考“4. 無鹵零件的承認需求”，即

①均質材質之溴及氯的測試報告(測試樣本如附件7.1)

②承認不使用證明書(如附件7.2)。

Please refer to “4. Approval Requirements for HF Parts”, that is

①test reports for bromine and chlorine at a homogeneous material level (sample as attachment 7.1)

②Non-use certificate for Parts Approval (attachment 7.2).

9.4 測試碟片是否接受混測的鹵素報告? For test-discs, is it acceptable for Halogen test report in mixed whole materials?

Ans.: 是。Yes.