



## 輕毅 ISOFOR L001

### Light Weight Concrete System 輕質水泥混凝土系統

#### 1.0 Description 簡介

ISOFOR L001 is a system to produce low-density concrete (foamy or aggregate concrete) through a series of pre-mixing or on site-mixing procedure. This process includes adding of ISOFOR additive (L001F or L001P), cement and appropriate aggregates so as to form either foamy concrete or aggregate concrete.

輕毅 ISOFOR L001 是一種低密度水泥混凝土系統，包括“泡沫式”或“凝式”兩種。製造方法分為預拌式及現場拌製式。拌製過程需應用輕毅 ISOFOR L001F 或 L001P 添加劑、水泥及適合填充物，最後結合成泡沫或凝石尿。

While mixing **ISOFOR additive** (L001F Foamy or L001Pu Aggregate) with water and drilling, micro marble of airs will be generated and they will embed into the mixture evenly; the mixture will then finally form a homogeneous mortar. The concrete derived from ISOFOR system is different from traditional light weight concrete, it had closed cell structure, i.e. there is no path among cells to allow vapors be trapped inside the structure. ISOFOR L001 system has most of the properties as standard concrete, it will undergo a curing period of 28 days. Under normal conditions, ISOFOR concrete(L001F2 or above) is suitable for light traffic after 24 hours and will be ready for installation of new finish or floor tiles after 3 to 14 days depending on site situation.

當輕毅 ISOFOR L001F 添加劑混合水攪拌後會形成大量微型氣泡並能直接與水泥漿混合，氣泡會平均地混合水泥漿及將正常密度改變到較輕。輕毅 ISOFOR L001 所產生的低密度石尿與傳統低密度石尿分別主要在於其凝固成的一種“密室式”氣泡。每一“氣泡室”是互相獨立，凝固後水份不能從氣泡室與氣泡室之間通過，大大減低水份儲存於石尿層內而做成日後滲水問題。跟普通石尿一樣，輕毅 ISOFOR L001 需要 24 小時作初步凝固，整體凝固週期為 28 天。因此，在 24 小時後可作輕量行人踐踏，在第 3 天至 14 天內可作其它後期施工如新批濶層或瓦磚層等。

#### 2.0 Typical Application 一般應用範圍

	型號					
	L001F1	L001F2	L001F3	L001P1	L001P2	L001P3
Level Compensation, Raised up Floor 升高地台	✓*	✓	✓	✓*	✓	✓
Insulating Construction System 隔音/隔熱	✓	✓	✓°	✓	✓	✓°
Pipe/Voids Filing 填封建築物空隙	NC	✓	✓	NC	✓	✓
Room partition/Pre-casting 室內間隔	✓	✓	✓	✓	✓	✓
Roof Thermal Insulation 天面隔熱	✓*	✓	✓°	✓*	✓	✓°

✓\*For light traffic area only, 供輕型地台使用 ✓° Secondary Choice, 非優先選擇 NC : not recommend 不建議使用

#### 3.0 Formulation 物料配方

Due to the fact that production of light weight concrete is technical oriented and for quality control reasons, this literature does not mention full detail of the formulation of making above preset concrete model to avoid improper manipulation by those non-trained applicators. Please consult the technical department of Master Proofer Company Ltd or qualified applicators for necessary detail.

由於製造輕質水泥產品需要一定的技術和經驗及基於品質控制，此份技術資料不會將各型號配方列明，以防自行改動配方和錯誤使用。施工單位應查詢萬寶建築化工技術部或合格施工單位，他們會很樂意提供協助及有關資料。



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**4.0 Technical Data by Model, 不同型號的技術數據**



Depending on intended purpose of applying light weight concrete, ISOFOR System is divided into several preset model for user's option:

依據不同的應用要求，輕毅 ISOFOR L001 具備數種預設規格如下：

Physical properties at 28 <sup>th</sup> day 在第 28 天後的物理性質							
Model no. 型號	L001F1	L001F2	L001F3	L001P1	L001P2	L001P3	Tailor Made 需特製
Technical Data 技術指引							
Pre-Mortar w/c Ratio (L001F only) 預設源水泥漿灰水比 (只適用 L001F 型號)	33%	37%	39%	N/A	N/A	N/A	TBA
Ultimate Light Weight Concrete w/c Ratio 輕毅輕質混凝土灰水比	60%	58%	55%	50%	45%	38%	TBA
Initial Set 初步穩定 23°C 75%RH	4HRS	3.5HRS	3.5HRS	5HRS	4HRS	4HRS	TBA
Initial Curing 初步凝固 23°C 75%RH	18HRS	16HRS	16HRS	20HRS	18HRS	18HRS	TBA
Range of Relative Density 相對密度	0.5 - 0.7	0.7 - 1.0	1.0- 1.3	0.3 - 0.5	0.5 - 0.8	0.8 - 1.0	> 1.3,<0.5
Range of Compressive Strength 受壓強度 (Mpa)	1 - 3	3 - 5	5 - 7	1 - 2	2 - 3	3 - 6	> 7,<1
Range of Bending Strength 拗曲強度 (Mpa)	0.5 - 1	1 - 2	> 2	0.5 - 1	1 - 2	> 2	> 3,<0.5
Thermal Conductivity 傳熱量系數 (W/C)	0.05-0.10	0.10-0.15	0.15-0.20	0.05-0.10	0.10-0.15	0.15-0.18	>0.20,<0.05
Fire Resistance at 1200°C 抗火耐性 1200°C ASTM DeignationE119	100mm thickness	120min	120min	120min	120min	120min	120min
	150mm thickness	240min	240min	240min	240min	240min	240min

註: L001F1, L001F2,L001F3 denotes foamy concrete 為泡沫石屎; L001P1, L001P2, L001P3 denotes polystyrene aggregate concrete

為泡混凝土。\*Relative Density to water, ie 0.5 = 500 kg/m<sup>3</sup> etc. 相對密度(水為 1000kg/m<sup>3</sup>) N/A : NOT Applicable, 不適用

**5.0 Other relevant data 其它參考數據**

	Dry to saturated		<u>Over 3m Length (mm)</u> 每 3 米伸縮幅度			
	儲水飽和點					
Reversible moisture movement 可逆性水份流動	0.03 - 0.06 %		0.9 - 1.8 mm (± 0.05)			
	<u>Coefficient of Expansion per</u>					
	膨脹系數 °Cx10 <sup>-6</sup>	70°C	85°C	100°C		
Linear thermal Expansion 線性熱膨脹度	8.3 (± 0.1)	1.75mm	2.1mm	2.5mm (± 0.1)		
	3 <sup>rd</sup> days	7 <sup>th</sup> days	14 <sup>th</sup> days	21 <sup>st</sup> days	28 <sup>th</sup> days	
	第三天	第七天	第十四天	第廿一天	第廿八天	
Average % of drying Shrinkage (ASTM C596) 平均石屎“收水”百分率	L001F1	0.018%	0.032%	0.046%	0.057%	0.096%
	L001F2	0.009%	0.025%	0.036%	0.049%	0.078%
	L001F3	0.008%	0.022%	0.026%	0.047%	0.068%
	L001P1	0.012%	0.030%	0.040%	0.052%	0.090%
	L001P2	0.007%	0.019%	0.022%	0.043%	0.066%
	L001P3	0.006%	0.018%	0.020%	0.040%	0.058%

(suitable for small scale manual mixing operation)

應用步驟舉例 - 簡易現場拌製法(適合小量生產用):

Prepare a 100 Liters plastic Drum.

先預備一個約 100 公升桶。

1. Pour 20 Liters clean water into the drum.

先放入約 20 公升水。

2. Then infill 0.135kg ISOFOR L001P additive with water.

再放入 0.135 公斤“ISOFOR L001P”輕石屎添加劑。

3. To mix the mixture for about 30 seconds with an electrical hand mixer. Then, while the mixer is still rotating, pour one bag (45kg) of cement and mix for about 20 seconds until mortar is formed.

先用慢速電鑽攪拌 30 秒後，再加入 1 包水泥(45 公斤/包)，直至形成“ISOFOR L001P”水泥

4. Pour 0.9kg of MP Bead A931 polystyrene bead (03mm-0.5mm) into the mortar until homogenous mortar is formed.

放進約 0.9kg(大約 1/3 包發泡膠粒)然後繼續使用電鑽直至發泡膠粒和水泥漿形成均勻的粒字漿體

5. Pour ISOFOR light Weight to position and repeat procedure about.

將輕石屎漿體倒進適當位置，再重覆以上程序。

Yield: 20Liters water +0.135kg ISOFOR L001 additive + 45kg cement + 0.9 polystyrene  $\approx$  1/12 m<sup>3</sup>

生產量: 20 公升水 + 0.135 公斤 ISOFOR L001 添加劑 + 45 公斤水泥 + 0.9 公斤發泡膠粒  $\approx$  1/12 立方米

\*For bigger scale of productions, special mixing equipment is required to ascertain both the quality and efficient, it is highly recommended to employ qualified applicators of ISOFOR system to ensure smooth operation and satisfactory quality. The Technical office of Master Proofer Company Ltd. is readily available for advice on any of LABOND's products.

\*當需要較大量生產，須具備特殊混合工具以確保品質及施工效率。我們建議應聘用已受萬寶技術部訓練的合格的施工單位處理以上工程。

\* The above formulation is just suitable for small scale and hand-mixed application, formulation of other models are available at the request of customer from Technical Representative of Master Proofer Company Limited.

\*以上配方只適合小量及人手簡易製作用，其它型號配方可向香港萬寶建築化工技術代表索取。

## **7.0 Technical advisory notes to Contractors and Specifiers 技術要點**

7.1 The ISOFOR's pre-set models are not designed as the finish screeding. It has to be covered by either onward screeding carpets, floor tiles or for receiving waterproofing etc. For obtaining a fine and flat screeding, Floorflat F700 auto leveling mortar system is an ideal system to compatible with ISOFOR L001 System. Special formulated ISOFOR L001 may be designed as finish as finishing screed, please consult Technical Department of Master Proofer Company Ltd..

輕毅輕質水泥系統不適宜應用作終飾層。輕石屎層須蓋上水泥層、磚瓦、地板或防水層等。如想達至一個理想的平整地台，可應用“Floorflat F700 自動流平系統”，此系統與“輕毅輕石屎系統”具兼容性。

當考慮將“毅輕石屎系統”作終飾層，請聯系萬寶建築化工技術部有關配方。

7.2 It is recommended to put waterproofing underneath of ISOFOR's concrete.

建議將防水層置於“輕毅輕質水泥系統”下方。

7.3 While laying of lightweight concrete will follow same joints configuration of original flooring, where necessary, expansion joints (20x20mm) could be marked every 50M<sup>2</sup>. Either Master Proofer S333, Rallithane 862, Rallithane 850 or Rallikol 772 have been tested to be suitable for sealing the expansion joints of ISOFOR light weight concrete system. Please consult the technical literature of the above sealant system for application.

“輕毅輕質水泥系統”須跟隨原地台層的伸縮縫施工。如需自行設計，可每 50 平方米做一條(20mm 寬 x20mm 深)伸縮縫。萬寶 S333, 偉利 862, 偉利 850 及偉利 772 已驗證適合密封“輕毅輕質水泥系統”。

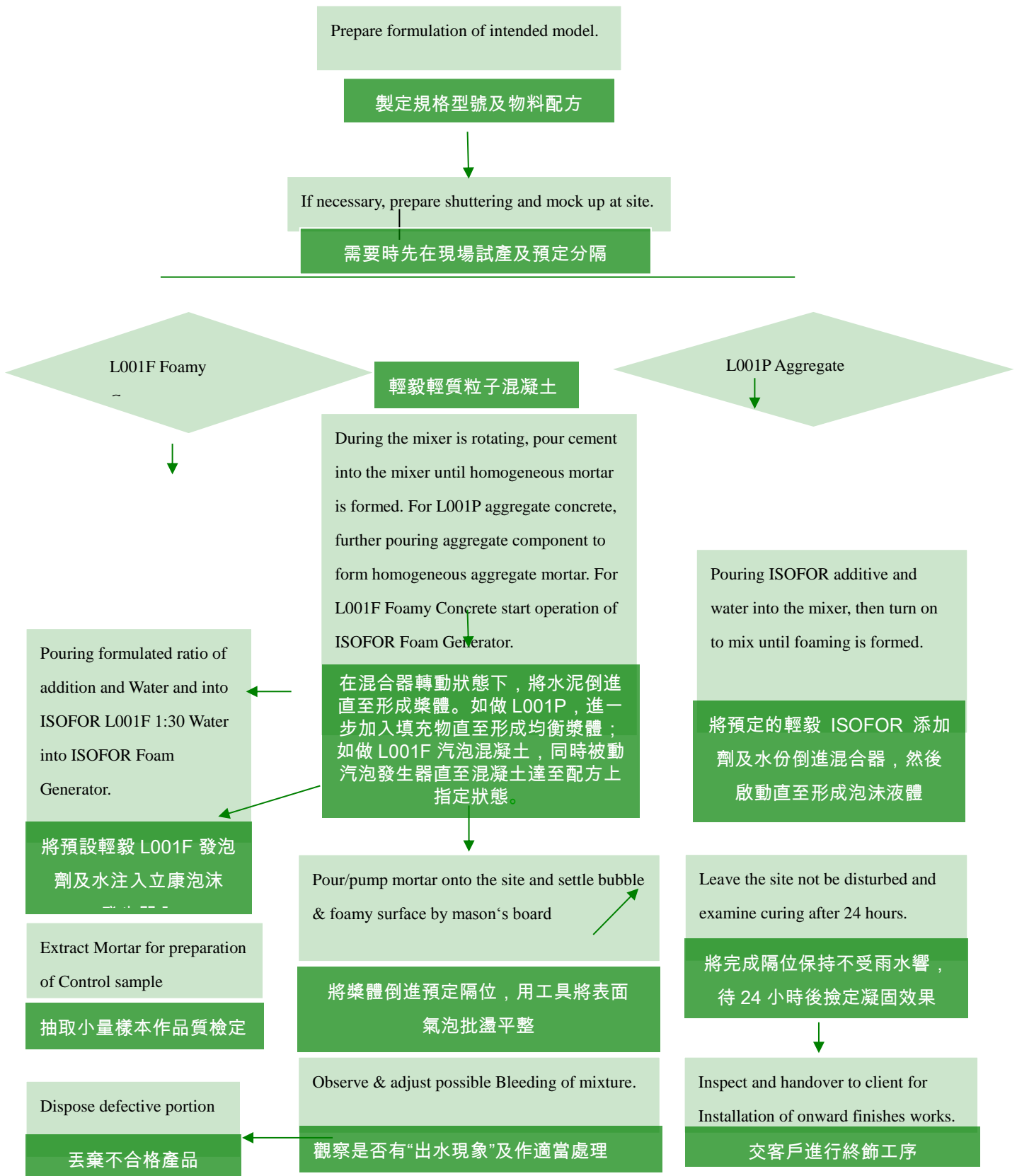
請參考有關密封膠技術資料。

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**8.0 Working Flow Chart 工序流程表**



For MACHINE Control Operation : Applied By PRE-SET LABOND MACHINE MODEL

預制機械：以立康供應或設定之機械為準



**\*Please consult MASTER PROOFER'S Technical Representative for mixing Formulation and quality Control procedure**

請向萬寶建築化工技術代表查詢混合配方及質控程序。

**\*ISOFOR L001F and L001P are available in liquid or Powder form and with specified mixing formulation**

輕殼輕質發泡劑 L001F 及 L001P 可提供液態或粉劑包裝，各型號及包裝須獨立混合配方施