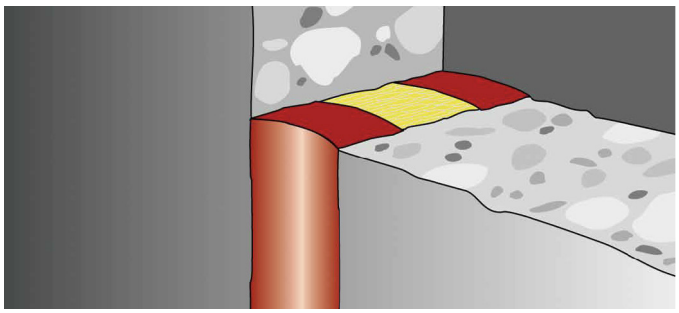
Hilti CP 601S Firestop Silicone Sealant

Submission Folder

Hilti (HK) | askHilti 工程師技術支援平台 ask.hilti.com.hk | 香港客戶熱線 +852 8228 8118 澳門客戶熱線(免費) 00800 8228 8118 | 香港門市：大角咀洋松街1號形品星寓地下2號舖 澳門門市：澳門布魯塞爾街70號建興龍廣場地下W座地舖 | 電郵：hksales@hilti.com 傳真：+852 2954 1751

Elastomeric silicone sealant CP 601S



APPLICATIONS

- Expansion or stretched connection joints in fire compartment walls and floors
- Uninsulated metal pipes in penetrations through fire compartment walls and floors
- Acoustic insulation of pipes
- Suitable for outdoor use
- For use on concrete and masonry (indoors/outdoors)

ADVANTAGES

- Weather and UV-resistant
- Excellent movement capability
- Smoke, gas and water-resistant

Technical data	
Chemical basis	Neutral elastic silicone
Base materials	Masonry, Metal, Concrete, Glass
Movement[1)]	± 25% (ISO 11600)
Approx. tack-free time (ventilated at 77°F, 80% rel. humidity)	15 min
Approx. curing time[2)]	2 mm/3 days
Average volume shrinkage	5 %
Application temperature range	5 - 40 °C
Temperature resistance range	-40 - 160 °C
Storage and transportation temperature range	5 - 25 °C
Shelf life[3)]	12 Months

[1)] according to HTC 1250
[2)] at 75°F/24°C, 50% relative humidity
[3)] at 77°F/25°C and 50% relative humidity; from date of manufacture

Smoke | Water Tight | Acoustic | Siesmic

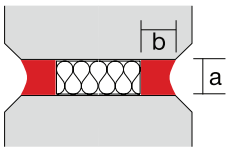
Low VOC | Mould & Mildew

Consumption Guide

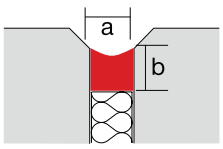
Cartridge volume = 310 ml (CP 601S)
a = Joint width in mm
b = Sealant depth in mm

$$\text{Linear metre per cartridge} = \frac{\text{Cartridge volume in ml}}{a \times b}$$

e.g.a floor 50mm wide with product depth of 10mm; with 310ml cartridge
Therefore linear metres per cartridge = 310/(50 x 15) = 0.41 metre per cartridge for one side of the floor



Wall

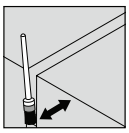


Floor

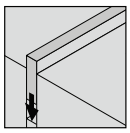
Joint width (mm)	0-15	16-100
Sealant depth (mm)	6	15

Application Procedure

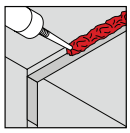
Joint installation



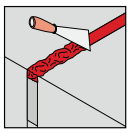
1. Clean opening



2. Insert backing material

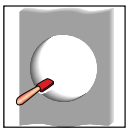


3. Apply CP 601S



4. Smooth CP 601S

Pipe installation (non-combustible pipes only)



1. Clean opening

2. Insert backing material

3. Apply CP 601S

4. Smooth CP 601S

Order Now

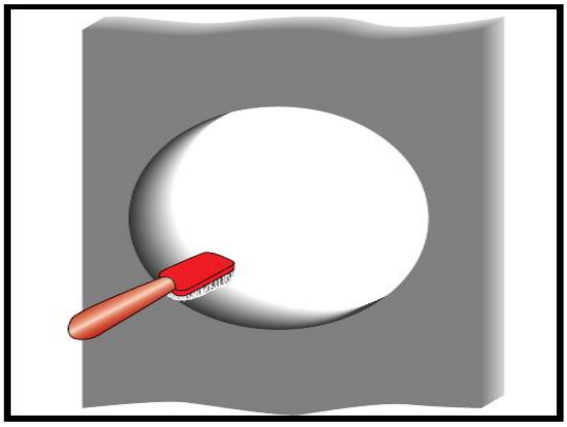
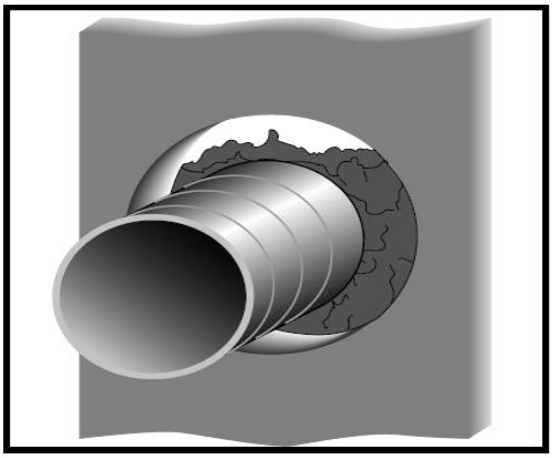
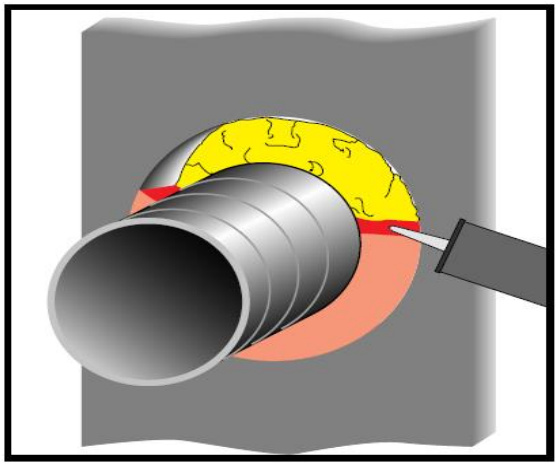
Ordering designation	Colour	Volume per unit	Packaging	Sales pack quantity	Item number
CP 601S 310ML grey	Grey	310 ml	Cartridge	1 pc	**310635**
CP 601S 600ML grey	Grey	600 ml	Foil pack	1 pc	**312111**[1)]
CP 601S 310ML white	White	310 ml	Cartridge	1 pc	**310633**
CP 601S 600ML white	White	600 ml	Foil pack	1 pc	**310637**[1)]

[1)] For detailed stock availability and lead time information please contact your Hilti representative.

Please visit Hilti website for the latest item numbers and related products

Customer Hotline: Hong Kong 8228 8118, Macau 00800 8228 8118 Email: hksales@hilti.com

Subject: **Method Statement of CP 601S for Penetration Seal.**
Material: CP 601S firestop sealant
Accessory: Hilti Dispenser CFS-DISP or Hilti Dispenser CS 270-P1 or equivalent.

<table>
<tr><td colspan="3">Setting Operation</td></tr>
<tr><td>1</td><td>Clean the opening. Surfaces to which CP 601S will be applied should be cleaned of loose debris, dirt, oil, wax and grease. The surface should be moisture and frost free.</td><td>  </td></tr>
<tr><td>2</td><td>Insert the required fill of mineral wool and backer.</td><td>  </td></tr>
<tr><td>3</td><td>Apply firestop CP 601S over backer.
<table>
<tr><td>Joint width (mm)</td><td>0-15</td><td>16-100</td></tr>
<tr><td>Sealant thickness (mm)</td><td>6</td><td>15</td></tr>
</table></td><td>  </td></tr>
</table>

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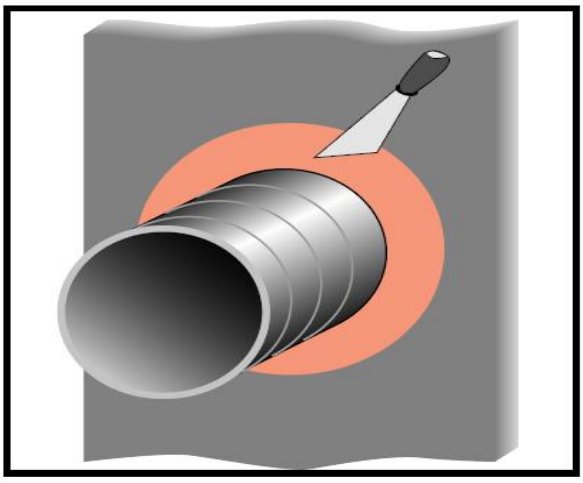
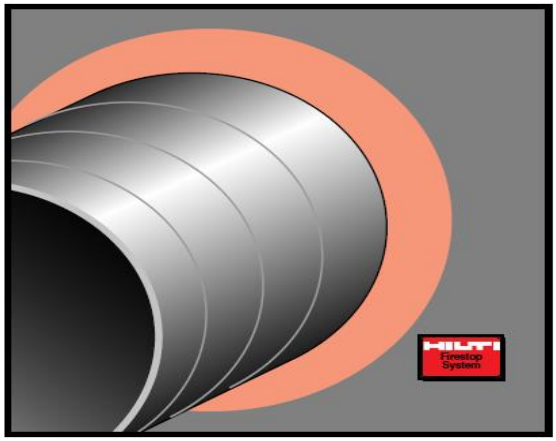
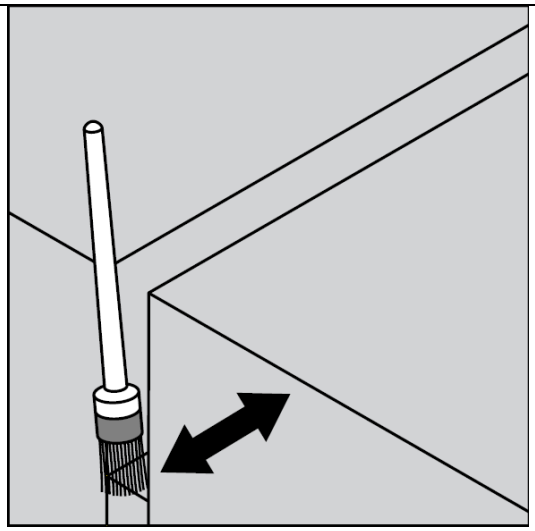
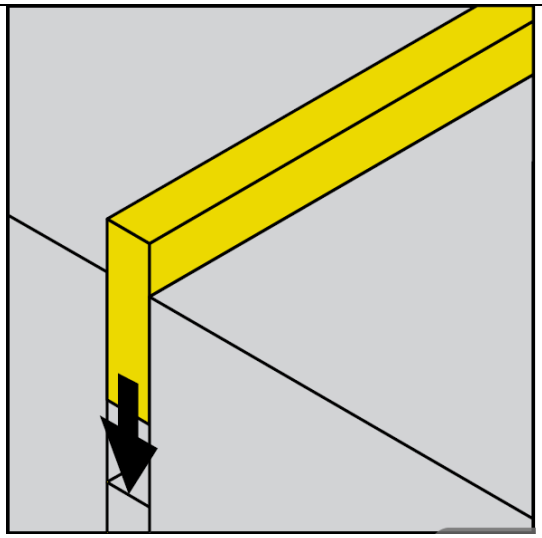
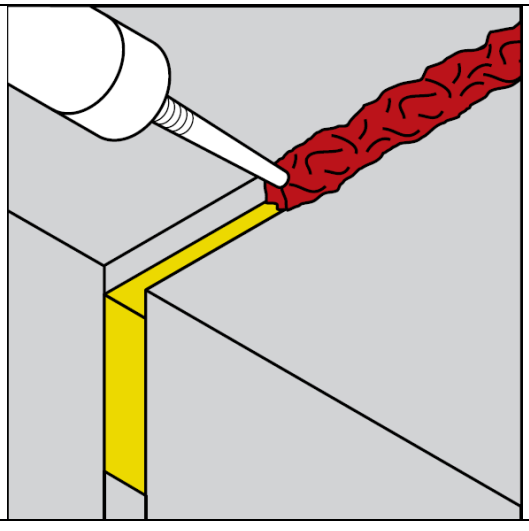
www.hilti.com.hk

4	Smooth the firestop sealant with a trowel before the skin forms. Once cured, CP 601S can only be removed mechanically.	
5	For maintenance reasons, a penetration seal could be permanently marked with an identification plate. In such a case, mark the Identification plate and fasten it in a visible position next to the seal.	

Safety precautions:

- Never use in areas immersed in water
- Keep out of reach of children
- Read the Material Safety Data Sheet
- Eyes sand hands must be suitably protected
- Avoid contact with eyes/skin
- Only use in well ventilated areas

Subject: **Method Statement of CP 601S for Linear Joint Seal**
Material: CP 601S firestop sealant
Accessory: Hilti Dispenser CFS-DISP or Hilti Dispenser CS 270-P1 or equivalent.

Setting Operation		
1	Clean the opening. Surfaces to which CP 601S will be applied should be cleaned of loose debris, dirt, oil, wax and grease. The surface should be moisture and frost free.	
2	Insert fill of mineral wool or backing material (if required)	
3	Apply CP 601S over the backing material . Joint width (mm) | 0-15 | 16-100 Sealant thickness (mm) | 6 | 15	

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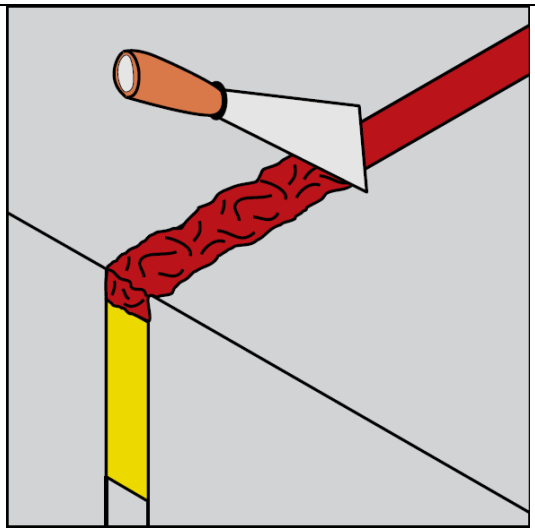
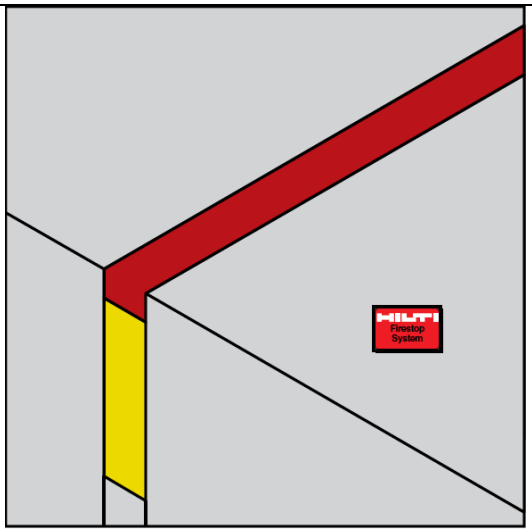
4	Smooth CP 601S using a trowel before the skin forms. It can only be removed mechanically once it is cured.	
5	For maintenance reasons, a penetration seal would be permanently marked with an identification plate. In such a case mark the identification plate and fasten it in a visible position next to the seal	

Safety precautions:

- Never use in areas immersed in water
- Keep out of reach of children
- Read the Material Safety Data Sheet
- Eyes and hands must be suitably protected
- Avoid contact with eyes/skin
- Only use in well ventilated areas

檢驗報告

No. 2005-FRT40

產品名稱: CP 601S Elastic Firestop Sealant

報告發致下列單位:

送檢單位: 喜利得(香港)有限公司
製造商 : Hilti

報告日期: 2006 年 1 月 18 日

澳門大學

檢驗報告

No: 2005-FRT40

產品名稱	CP 601S Elastic Firestop Sealant
送檢單位名稱	喜利得(香港)有限公司
產品銷售代理	喜利得(香港)有限公司
製造商	Hilti
試件產地	德國
樣本技術數據	密度： 約 1.4 g/cm^3 體積收縮率 (固化後)： 0 - 5 % 容許變形： ± 25% 表皮型成時間： 約 15 分鐘 固化速度： 約 2mm/3 天
送檢日期	2005 年 12 月 2 日
送檢時附上報告	Warrington Fire Research Centre Ltd. 報告號碼 : WARRES NO.71151/B
檢驗項目	耐火性能
檢驗依據	BS476:Part 20
檢驗日期	2005 年 12 月 5 日
檢驗結論	經檢驗，此彈性防火膠的隔熱性及完整性均能達到 245 分鐘。

檢測人員，

黃傑勇
澳門大學實驗員

審核，

譚立武
澳門大學機電工程系主任

1 檢測目的

1.1 根據英國標準 BS476 第 20 部份:1987，測試 CP 601S 彈性防火膠之耐火性。

2 引言

2.1 根據送檢單位的要求，彈性防火膠之耐火測試需滿足英國標準 BS476 第 20 部份:1987 之要求。

2.2 試件由製造商於 2005 年 12 月 2 日安裝， 並於 2005 年 12 月 5 日進行測試。

3 試件構造

3.1 試件由輕質混凝土、防火泥及彈性防火膠等組成。主要測試試件尺寸爲 600mm x 600mm x 150mm，由兩段闊度分別爲 100 mm 及 50 mm 的彈性防火膠組成，彈性防火膠的厚度爲 15 mm。試件以輕質混凝土及防火泥安裝於檢測框內。詳細圖則及試件構造可參照附錄 A。

3.2 本報告所繪製之圖則及其材料是根據製造商所提供的資料而作。試件之厚度及結構由本中心之檢測員驗証。

3.3 試件由送檢單位安裝於檢測框上進行測試，該檢測框由檢驗單位提供。

3.4 試件在測試前數天內安裝。

4 測試設備及程序

4.1 測試設備按照英國標準 BS476 第 20 部份:1987 的要求設置。

4.2 爐體內部之平均溫度值由 5 個平均分佈於爐內的熱電偶取得，根據英國標準 BS476：第 20 部分：1987 所指定之溫度時間關係而操控升溫。溫度時間記錄圖見附錄 B。

4.3 爐體內設有壓力計以監察爐體壓力。小型檢測爐的壓力變化並不明顯。

4.4 試件的背火面均設有熱電偶，以作監察溫度之用，熱電偶分佈位置見附錄 A 之圖 3。背火面所有熱電偶均用作判斷試件的絕熱性。

4.5 測試過程中，棉墊及縫隙測量探棒用作評估試件的完整性。

4.6 測試過程中，應記綠試件的變形情況和試件出現全部或部分毀壞時的時間。試件背火面如有火焰並持續 10 秒或以上，以及有煙散發出的情況也應記錄。

4.7 背火面及向火面於測試前後需拍照記錄。測試過程中，需拍照及用攝錄機記錄背火面情況以作日後評估之用。

5 測試數據及資料

5.1 測試過程所記錄之數據可參考附錄 B, 記錄內容如下:

5.1.1 實際爐溫按照英國標準 BSI 所指定溫度時間關係圖。

5.1.2 由熱電偶所記錄背火面的溫度。

5.2 在測試過程中, 試件的實驗狀況已詳細記錄於附錄 C 中以供參考。

5.3 有關試件圖片, 見附錄 D。

5.4 測試開始時周圍環境温度爲 16°C。

5.5 在送檢單位的同意下, 試件在 245 分鐘終止整個測試。

6 耐火極限之評定條件

6.1 按英國標準 BS476 第 20 部份:1987 之標準，試件之耐火表現將會根據以下之條件作評定:

6.1.1 完整性 - 當測試過程中, i) 在試件之背火面進行棉墊點燃測試; ii) 如背火面出現較大的裂縫, 用 6mm 及 25mm 直徑之量測棒來量測裂縫之寬和深度。如棉墊沒有被背火面之高温點燃及試件背火面未出現能讓量測棒插入貫通之裂縫, 試件之完整性才被判斷爲合格。

6.1.2 絕熱性 - 背火面最高平均溫度及單點溫度與超始温度之升幅不得超過 140°C 和 180°C。

7 結論

7.1 根據 BS476 英國標準第 20 部分所制定的準則 — 完整性和絕熱性評估試樣的耐火性能測試結果如下：

完整性	不少於 245 分鐘
絕熱性	不少於 245 分鐘

8 限制說明

8.1 本測試結果僅反映特定測試條件下, 建築構件之試驗情況。此測試結果並非判斷試件在實際應用時防火特性的唯一標準，同時亦不反映試樣在實際火場上所能表現的防火性能。

8.2 本試驗結果只反映與報告相同之物料、結構、厚度及安裝方法之系統，如將此試驗結果應用於試件組合型式不同的情況時, 應按照實際用途而作出相應之評估。

附錄 A

試件構造說明及附圖

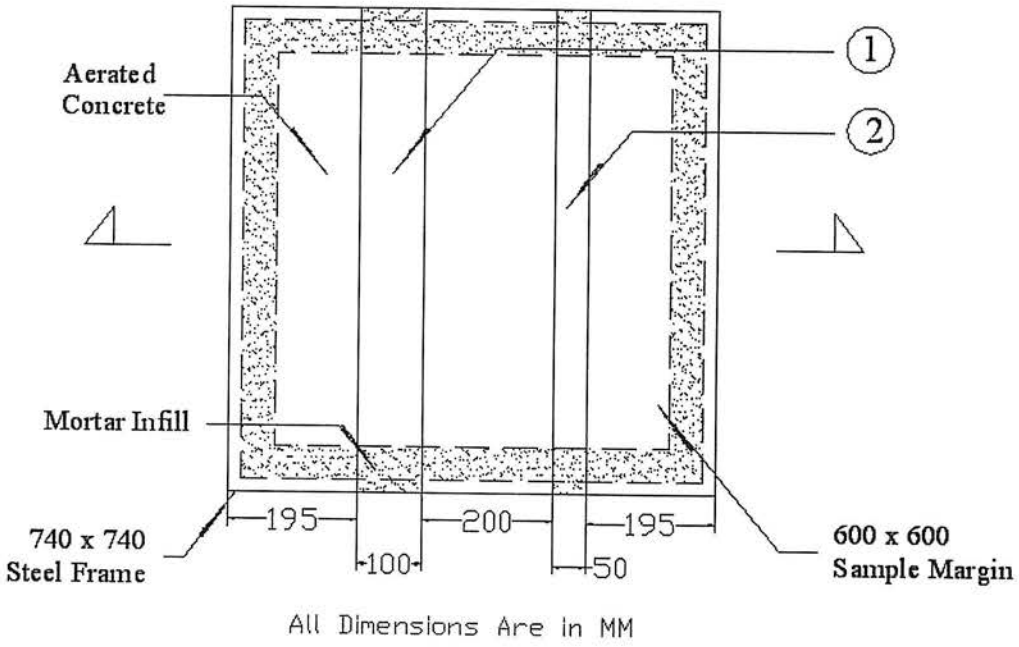


圖 1　試件之正視圖

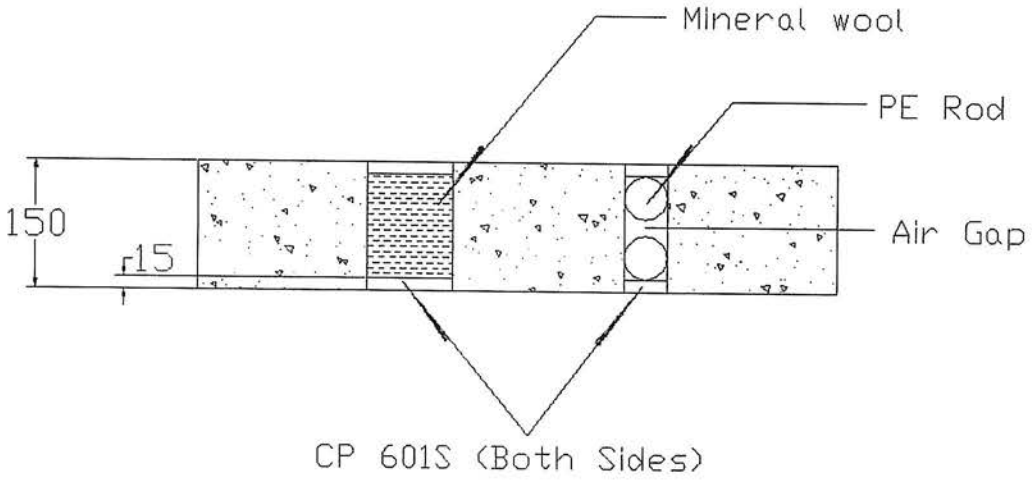


圖 2　試件之截面圖

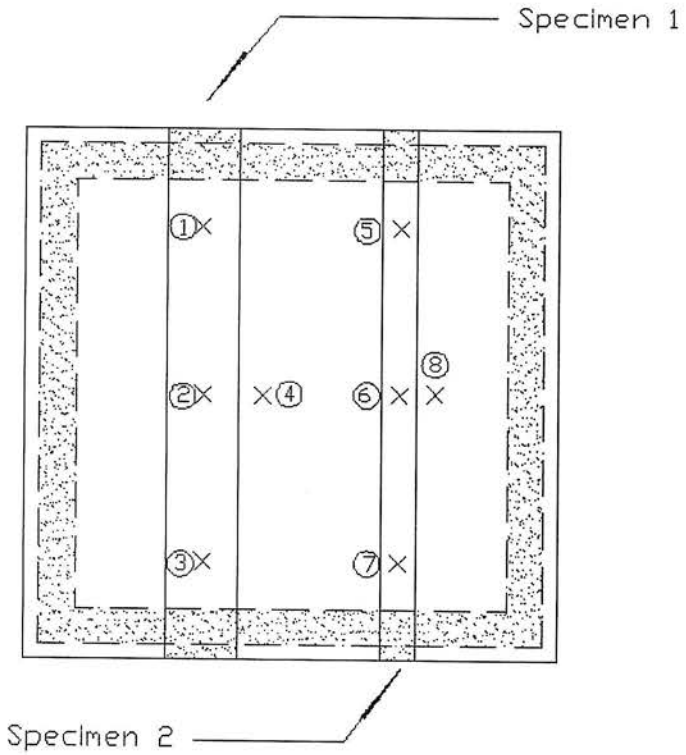


圖 3　熱電偶分佈位置圖

試件資料

(參照圖 1 至圖 3)

(除非特別指定, 否則全部數值都爲標準值)

(全部資料和數值由喜利得(香港)有限公司提供)

表 1　材料列表

Item		**Description**	
1.	Specimen 1	(i) Mastic	CP601S (both sides)
		(ii) depth of mastic	15mm
		(iii) backing material	Mineral wool, Density = 60 kg/m^3
		(iv) aperture size	Length = 600mm Width = 100mm Depth = 150mm
		(v) gap faces	AAC/AAC
2.	Specimen 2	(i) mastic	CP601S (both sides)
		(ii) depth of mastic	15mm
		(iii) backing material	PE Rod = 50mm (Polyethylene foam)
		(iv) aperture size	Length = 600mm Width = 50mm Depth = 150mm
		(v) gap faces	AAC/AAC

附錄 B

測試數據

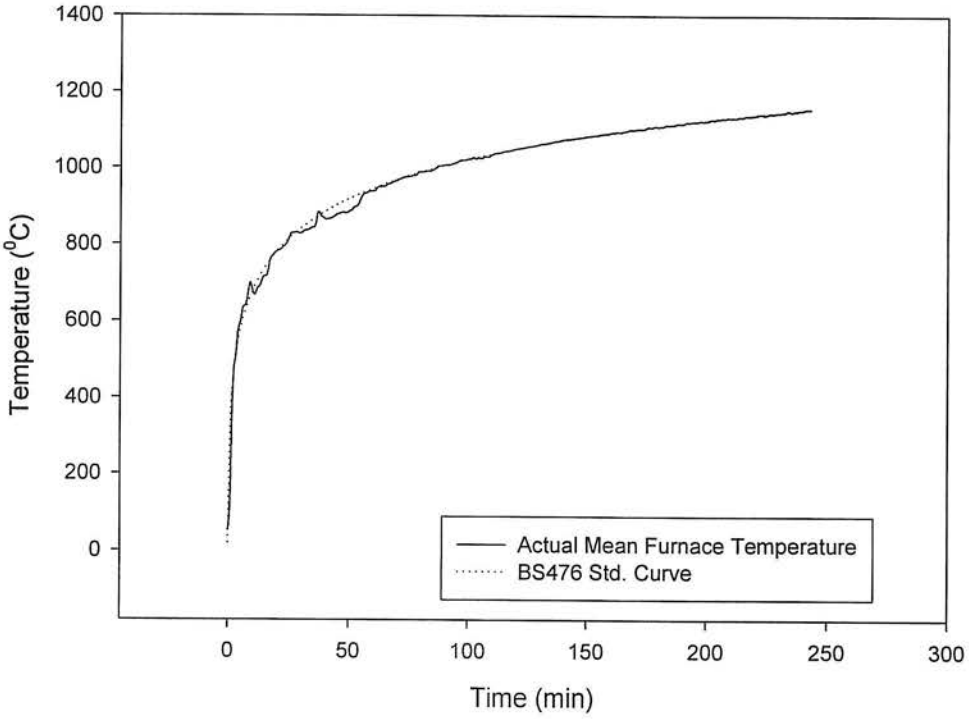


圖 4　平均爐溫與標準(溫度/時間)曲線圖

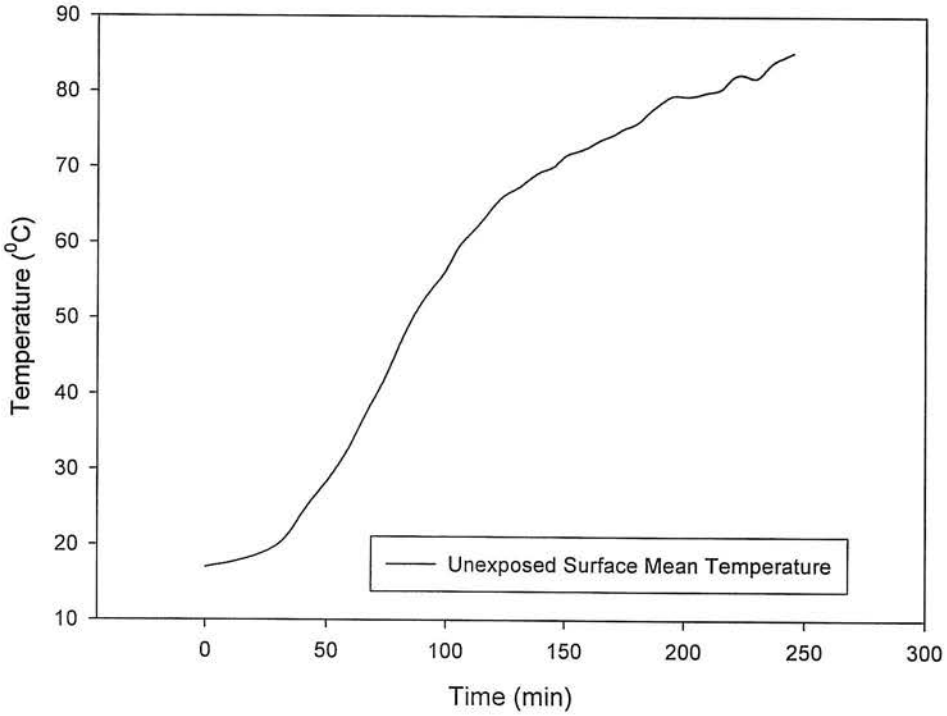


圖 5　背火面平均溫度/時間曲線圖

表 2　平均爐溫與標準溫度之比較

Time (minute)	Standard Furnace Temperature (°C)	Actual Furnace Temperature (°C)	BS476 Tolerance (%)	Percentage Difference (%)
0	20.00	51.44		
1	349.21	144.42		
2	444.50	429.98		
3	502.29	500.17		
4	543.89	571.36		
5	576.41	596.54		
6	603.12	633.36		
7	625.78	640.40		
8	645.46	664.35		
9	662.85	698.90		
10	678.43	678.08	±15	3.53
12	705.44	684.77		
14	728.31	709.13		
16	748.15	720.50		
18	765.67	767.94		
20	781.35	781.65		
22	795.55	788.10		
24	808.52	801.04		
26	820.45	829.15		
28	831.50	831.58		
30	841.80	827.81	±10	-0.06
35	864.80	844.25		
40	884.74	864.96		
45	902.34	878.48		
50	918.08	886.20		
55	942.83	920.47		
60	945.34	938.26		
65	957.31	951.01		
70	968.39	965.00		
75	978.71	976.33		
80	988.37	988.51		
85	997.44	993.46		
90	1005.99	1006.55		
95	1014.08	1013.21		
100	1021.75	1022.91		
105	1029.06	1023.89		
110	1036.02	1035.02		
115	1042.67	1042.65		
120	1049.04	1049.63		
130	1061.02	1055.00		
140	1072.11	1061.48		
150	1082.44	1073.85		
160	1092.10	1082.54		
170	1101.18	1092.72		
180	1109.74	1101.00		
190	1117.84	1108.63		

表 2　平均爐溫與標準溫度之比較 (續)

Time (minute)	Standard Furnace Temperature (°C)	Actual Furnace Temperature (°C)	BS476 Tolerance (%)	Percentage Difference (%)
200	1125.52	1116.11		
210	1132.82	1124.46		
220	1139.79	1130.84		
230	1146.44	1138.78		
240	1152.82	1145.24		
245	1156.52	1153.61	±5	2.25

表 3　背火面單點及平均溫度 (°C)

Time (minute)	Thermocouple Number								Average Temperature (°C)
	1	2	3	4	5	6	7	8	
0	16.80	16.85	16.96	17.39	16.83	16.94	17.18	17.10	17.01
5	17.03	17.10	17.23	17.30	17.12	17.22	17.27	18.07	17.30
10	17.33	17.37	17.51	17.73	17.42	17.48	17.46	18.34	17.58
15	17.71	17.89	17.96	18.43	17.80	17.74	17.62	18.77	17.99
20	18.21	18.34	18.41	18.84	18.16	18.34	18.23	19.16	18.46
25	19.09	19.11	19.14	19.68	18.68	18.45	18.56	20.20	19.11
30	21.32	20.40	20.65	19.86	19.11	19.21	19.32	20.29	20.02
35	25.97	22.89	25.30	20.35	19.54	19.43	19.52	20.67	21.71
40	32.48	26.78	32.06	20.98	20.24	19.54	19.88	21.68	24.21
45	37.40	29.93	37.02	21.61	21.32	20.44	20.67	22.71	26.39
50	40.44	31.95	39.71	22.58	23.43	22.56	22.13	24.17	28.37
55	43.23	33.73	41.30	23.66	26.49	25.79	24.58	26.24	30.63
60	46.61	35.77	42.89	25.10	30.42	28.71	27.13	29.21	33.23
65	50.04	38.11	44.73	26.08	34.66	32.95	31.22	33.55	36.42
70	51.90	40.02	45.79	28.47	38.80	36.22	35.42	38.57	39.40
75	53.83	42.23	47.69	31.48	43.27	41.48	39.62	39.77	42.42
80	55.41	44.53	49.57	34.15	47.94	45.39	43.27	47.96	46.03
85	57.36	47.05	52.08	38.40	53.17	50.23	46.55	50.46	49.41
90	58.72	49.31	54.27	41.34	58.26	51.94	48.01	55.32	52.15
95	59.29	50.72	55.54	45.75	62.63	53.66	49.43	57.54	54.32
100	59.45	51.92	56.71	47.78	66.25	57.83	53.00	58.48	56.43
105	60.41	53.44	58.09	53.79	70.24	61.52	56.19	60.98	59.33
110	60.32	54.62	59.10	54.95	73.34	64.97	58.96	62.89	61.14
115	60.83	55.70	60.13	57.89	75.76	67.83	61.84	63.20	62.90
120	61.22	56.84	61.11	60.92	78.58	71.26	65.20	63.64	64.85
125	61.35	57.39	61.68	62.01	81.09	73.12	67.17	67.30	66.398
130	61.44	57.89	61.90	60.28	83.76	75.77	69.98	66.86	67.24
135	60.98	58.02	61.68	62.78	86.10	78.21	72.86	66.60	68.40
140	60.98	58.26	61.84	62.78	88.84	79.88	74.75	68.17	69.43
145	60.89	58.64	62.32	63.02	90.50	81.28	76.19	67.71	70.07
150	60.87	58.96	62.80	64.27	92.71	83.45	78.22	70.76	71.50
155	60.59	59.03	62.76	65.76	94.32	85.06	79.95	69.38	72.10
160	60.70	59.49	63.26	66.79	96.29	85.73	80.78	68.99	72.75
165	60.32	59.38	63.13	65.81	97.17	88.33	83.74	71.48	73.67
170	60.61	59.49	63.37	66.14	99.14	89.78	85.38	70.50	74.30
175	60.81	59.75	63.53	66.88	101.2	90.96	86.86	71.63	75.20
180	60.70	59.67	63.50	67.25	102.8	92.48	88.92	71.52	75.85
185	61.09	60.00	63.81	68.66	104.8	94.84	91.95	73.34	77.31
190	61.68	60.61	64.67	68.79	107.4	96.77	94.47	74.06	78.55
195	61.88	61.00	65.06	71.09	109.5	97.29	95.21	75.13	79.52
200	61.75	60.85	64.75	68.68	110.5	98.69	96.83	73.60	79.45
205	61.27	60.28	64.23	69.38	111.8	98.88	97.19	73.71	79.59
210	61.25	60.32	64.18	68.81	114.0	99.41	97.87	74.27	80.01
215	61.00	60.21	63.88	69.14	115.2	100.8	99.39	73.93	80.43
220	61.22	60.70	64.51	70.61	117.7	103.2	102.4	75.65	81.99

表 3　背火面單點及平均溫度 (°C) (續)

Time (minute)	Thermocouple Number								Average Temperature (°C)
	1	2	3	4	5	6	7	8	
225	61.09	60.43	64.18	71.94	119.7	102.9	101.8	75.72	82.22
230	60.48	59.95	63.61	70.28	119.4	104.1	103.3	74.25	81.91
235	60.74	60.13	63.88	72.31	122.7	106.8	106.2	75.67	83.55
240	60.89	60.28	63.88	73.05	125.7	107.8	107.6	77.16	84.53
245	61.40	60.70	64.23	72.18	127.4	109.5	109.5	77.16	85.25

附錄 C

觀察情況

表 4　　測試過程中，觀察試件情況如下

時間 (小時:分鐘)	事件
-0:01	攝錄機、監察和操控儀器啓動。
0:00	開啓石油氣閥，測試開始。周圍環境温度爲 16°C。
0:05	背火面週邊有少量煙溢出。
0:15	背火面情況沒有顯著變化。
0:30	棉墊測試 -- 棉墊沒有被點燃。
0:35	背火面情況沒有顯著變化。
0:58	背火面右邊輕質混凝土出現裂縫。
1:00	棉墊測試 -- 棉墊沒有被點燃。 試件之隔熱性及完整性均能達到標準。
1:15	背火面情況沒有顯著變化。
1:30	棉墊測試 -- 棉墊沒有被點燃。
2:00	試件之隔熱性及完整性仍能達到標準。
2:05	棉墊測試 -- 棉墊沒有被點燃。
2:30	背火面情況沒有顯著變化。
3:00	試件之隔熱性及完整性仍能達到標準。
3:15	棉墊測試 -- 棉墊沒有被點燃。
3:40	背火面情況沒有顯著變化。
4:00	試件之隔熱性及完整性仍能達到標準。
4:05	在送檢單位同意情況下，測試結束。
備註	*背火面結構仍完整(見圖 12)*

附錄 D

圖片

圖 6　測試前試件背火面

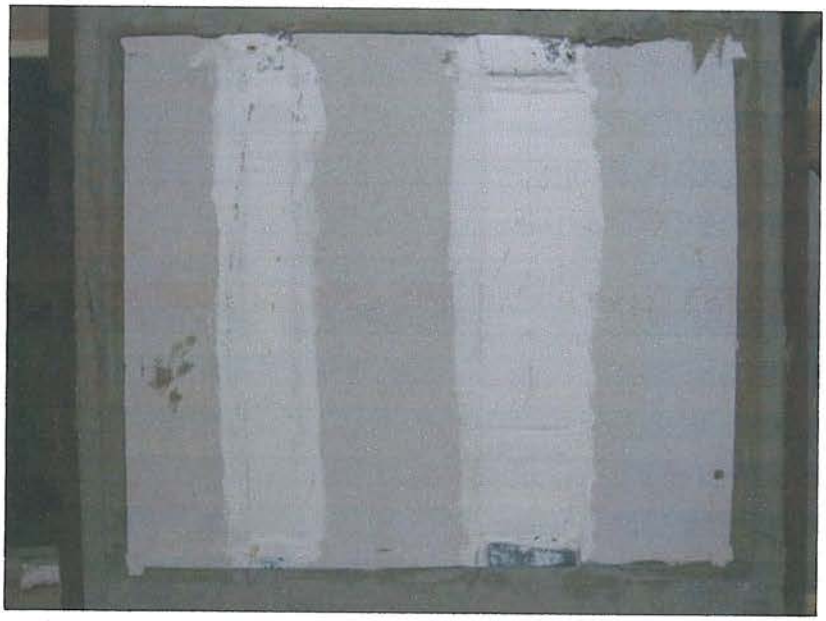


圖 7　測試前試件向火面

圖 8　測試 60min 時試件背火面

圖 9　測試 90min 時試件背火面

圖 10　測試 150min 時試件背火面

圖 11　測試 180min 時試件背火面

圖 12　測試 245min 時試件背火面

圖 13　測試後試件向火面

Weck Laboratories, Inc.
Environmental and Analytical Services - Since 1964

Report Date: Tuesday, December 3, 2002
Received Date: Tuesday, November 12, 2002
Received Time: 12:06 pm

Turnaround Time: Normal

Client: Hilti Incorporated
5400 South 122nd E. Avenue
Tulsa, OK 74146

Phone: (918) 252-6704
FAX: (918) 252-6520

Attn: Jerry Metcalf

Project: CP 601 S VOC Content

P.O.#: 17381538

Certificate of Analysis

Work Order No: 2111218-01 **Sample ID:** CP 601 S. Firestop Sealant **Matrix:** Solid

Sampled By: Client **Sampled:** 12-Nov-02 00:00 **Sample Note:**

Analyte	Result	Qualifiers	Units	Dilution	Reporting Limit	Method	Prepared	Analyzed		Batch
Density by ASTM D1475	1.4019		g/ml	1		EPA 24	22-Nov-02	26-Nov-02	ac	W212070
Total VOC	3.00		g/L	1	1.00	EPA 24	22-Nov-02	26-Nov-02	ac	W212070
VOC less Water	3.00		g/L	1	1.00	EPA 24	22-Nov-02	26-Nov-02	ac	W212070
Volatile Content by ASTM D2369	0.190	J	%w/w	1	1.00	EPA 24	22-Nov-02	26-Nov-02	ac	W212070
Water Content by GC	ND		%w/w	1	1.00	EPA 24	22-Nov-02	26-Nov-02	ac	W212070

Case Narrative:

Authorized Signature

ELAP # 1132
LACSD # 10143

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Notes:
The Chain of Custody document is part of the analytical report.
Any remaining sample(s) for testing will be disposed of one month from the final report date unless other arrangements are made in advance.
All results are expressed on wet weight basis unless otherwise specified.
ND=Not detected, below the reporting limit.
Sub=Subcontracted analysis, original report enclosed.

Flags for Data Qualifiers:

J = Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).

Lab#: 2111218

14859 East Clark Avenue, City of Industry, California 91745-1396 (626) 336-2139 FAX (626) 336-2634
www.wecklabs.com

澳門特別行政區政府
Governo da Região Administrativa Especial de Macau
消 防 局
Corpo de Bombeiros

審閱 /Visto
於 Em 14/02/2006
技術廳廳長
O Chefe do D.T.

意見書

事由： 要求審批"HILTI" 喜利得防火延燒產品 – CP 601S Elastic Firestop Sealant

參件： 進入編號 1106 (25/01/2006)
喜利得(香港)有限公司來函編號：M-AL_LE02_06(18/01/2006)
意見書編號 248/DT/2006 (09/02/2006)

Ø1. 上述公司交來以下 CP 601S Elastic Firestop Sealant 的資料：

a. 澳門大學按照 BS476 Part20：1987 檢驗依據測試標準發出的 CP 601S Elastic Firestop Sealant(彈性防火膠泥)檢驗報告複印本(No2005-FRT40)；

b. Underwriters Laboratories(UL Online Certifications Directory)XHHW.R13240 Fill, Void or Cavity Materials – CP 601S Sealant for use in Joint System & CP 601S Sealant for use in Through –Penetration Firestop System 資料；

c. Warrington 防火研究中心發出的測試報告複印本，編號爲 WARRES No.71151/B；

Ø2. 根據上述的資料分析後，CP 601S Elastic Firestop Sealant(彈性防火膠泥)於試驗結果中顯示具 CRF245 能力。然而，如將此組件應用於不同組合形式使用時，應按照實際用途而作出相應評估；

Ø3. 本局對 CP 601S Elastic Firestop Sealant(彈性防火膠泥)使用於合符《防火安全規章》規範的標準時沒有異議。但最終決定仍須徵詢權限部門(土地工務運輸局)之意見。

二零零六年二月十三日，於技術廳研究暨試驗科

研究暨試驗科科長

黃勁松

黃勁松
副一等消防區長

FM APPROVED

Certificate of Compliance

This certificate is issued for the following firestopping products:

FS-ONE High Performance Intumescent Firestop Sealant
CP680 Cast-In Firestop Device
CP680-N Cast-In Firestop Device
CP680-P Cast-In Firestop Device
CP682 Cast-In Firestop Device
CP 648E Wrap Strip
CP617 Firestop Putty Sticks
CP601 S Elastomeric Firestop Sealant
CP636 Firestop Mortar
CP 604 Self Leveling Firestop Sealant
CP611A High Performance Intumescent Firestop Sealant
CP 643N Firestop Collar
CP606 Flexible Firestop Sealant
CP-672 Firestop Joint Spray
CP620 Firestop Foam
CP680-M Cast-In Firestop Device
CP 675T Firestop Board
CP618 Firestop Putty Sticks
CP619T Putty Roll
CP670 Firestop Board
CP673 Firestop Coating

Prepared for:

Hilti AG
Feldkircherstrasse 100
FL-9494 Schaan
Liechtenstein

FM Approvals Class: 4990

Approval Identification: 3051456

Approval Granted: June 4, 2014

To verify the availability of the Approved product, please refer to www.approvalguide.com.

Said Approval is subject to satisfactory field performance, continuing Surveillance Audits, and strict conformity to the constructions as shown in the Approval Guide, an online resource of FM Approvals.

Cynthia E. Frank
AVP - Manager, Materials
FM Approvals
1151 Boston-Providence Turnpike
Norwood, MA 02062

FM Approvals®

Member of the FM Global Group

Issued: June 30, 2016

Certificate of Compliance

Certificate Number **20060214-R13240**
Report Reference **2006 February 14**
Issue Date **2006 February 14**

Underwriters Laboratories Inc.®

Issued to: **Hilti, Inc.**
5400 S 122ND East Ave
Tulsa, OK 74146 USA

This is to certify that representative samples of **Fill, Void or Cavity Materials**
CP601S

Have been investigated by Underwriters Laboratories Inc.® in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: ANSI/UL 1479, ANSI/UL 2079, CAN/ULC-S115-05

Additional Information: CP601S Sealant for use in Joint Systems and CP601S Sealant for use in Through-Penetration Firestop Systems as currently described in the UL Fire Resistance Directory.

Only those products bearing the UL Classification Mark should be considered as being covered by UL's Classification and Follow-Up Service.

The UL Classification Mark includes: UL in a circle symbol: with the word "CLASSIFIED" (as shown); a control number (may be alphanumeric) assigned by UL; a statement to indicate the extent of UL's evaluation of the product; and, the product category name (product identity) as indicated in the appropriate UL Directory.

Look for the UL Classification Mark on the product

Issued by:
Mona Couloute
Mona Couloute
Underwriters Laboratories Inc.

Reviewed by:
Christopher Johnson
Underwriters Laboratories Inc.

Attn. : To whom it may concern

Date : 26 September 2023
Ref. : 102/FP/DY/23

Subject : Country of Origin- Hilti CP601S Firestop Silicone Sealant

Dear Sir / Madam,

Enclosed please find the information of Hilti CP601S Firestop Silicone Sealant.

Brand Name : Hilti

Model Name : Hilti CP601S Firestop Silicone Sealant

Manufacturer : Hilti Corporation

Address of Manufacturer : FL-9494, Principality of Liechtenstein.

Manufacturer Contact Person : Dennis Yeung

Supplier : Hilti (Hong Kong) Ltd

Address of Supplier : 701-704, 7/F, Tower A, Manulife Financial Centre,
223 Wai Yip Street, Kwun Tong, Kowloon, Hong Kong

Supplier Contact Person : Dennis Yeung (+852 9723 4621)

Country of Origin : Germany

Should you have further questions, please do not hesitate to contact our Technical Representatives, Customer Service Hotline at 8228-8118, or email us at hksales@hilti.com.

Yours faithfully,

Dennis Yeung
Head of Product Leadership Strategy, F&P

Hilti (Hong Kong) Ltd.
701-704 | Tower A | Manulife Financial Centre
223 Wai Yip Street | Kwun Tong
Kowloon | Hong Kong
P +852-8228 8118 I **F** +852-2954 1751
www.hilti.com.hk

July 30, 2014

To Whom It May Concern:

Re: Hilti CP 601S Elastomeric Firestop – LEED Info.

- The Hilti CP 601S Elastomeric Firestop is manufactured in Germany.
- The package of Hilti CP 601S Elastomeric Firestop can be completely recycled.
- There is no recycled content in Hilti CP 601S Elastomeric Firestop and it cannot be recycled.
- The Hilti CP 601S Elastomeric Firestop does not share any rapidly renewable materials.
- The VOC content of Hilti CP 601S Elastomeric Firestop is 3 g/l.

If you would like to know more about Hilti solutions for LEED buildings or should you have any further question please feel free to contact me at my email or mobile number as shown below.

Sincerely,

Andrew Lau

Product Manager - Firestop

Hilti (Hong Kong) Limited

Email: andrew.lau@hilti.com

Mobile: (852) 9843-6291

Hilti (Hong Kong) Ltd.
701-704 | Tower A | Manulife Financial Centre
223 Wai Yip Street | Kwun Tong

Kowloon | Hong Kong

P +852-8228 8118 I **F** +852-2954 1751

www.hilti.com.hk

To whom it may concern

Date: 22nd April 2016

Dear Sir / Madam,

Subject: Hilti Firestop Products non-CFC and Ozone Confirmation

Referring to your enquiry about the captioned subject, please be advised that:

Hilti firestop products, CP601S Elastic Firestop Sealant Precast Facade Joint is free of CFC, HCFC nor other ozone depletion elements.

CFC, HCFC and ozone depletion elements were not used during the product process neither.

Should you have further questions, please do not hesitate to contact our Technical Representatives or Customer Service Hotline at 8228-8118.

Yours sincerely,

Andrew Lau
Product Manger

Hilti (Hong Kong) Ltd.
701-704 & 708A&B | Tower A | Manulife Financial Centre
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Kowloon | Hong Kong
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CFS-S SIL; CP 601S

Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

Issue date: 08/02/2021 Revision date: 08/02/2021 Supersedes: 23/10/2017 Version: 7.3

SECTION 1: Identification

1.1. GHS Product identifier

Product form	Mixture
Trade name	CFS-S SIL; CP 601S
Type of product	Sealants
Product code	BU Fire Protection

1.2. Other means of identification

No additional information available

1.3. Recommended use of the chemical and restrictions on use

Recommended use	Adhesives, sealants

1.4. Supplier's details

Supplier
Hilti (Hong Kong) Ltd.
701-704, 7/F, Tower A, Manulife Financial Centre
223 Wai Yip Street, Kwun Tong
Kowloon - Hong Kong
T +852 27734 700
hksales@hilti.com

Department issuing data specification sheet
Hilti AG
Feldkircherstraße 100
9494 Schaan - Liechtenstein
T +423 234 2111
chemicals.hse@hilti.com

1.5. Emergency phone number

Emergency number	Schweizerisches Toxikologisches Informationszentrum – 24h Service +41 44 251 51 51 (international) +852 27734 700

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

Classification according to the United Nations GHS

Not classified

2.2. GHS Label elements, including precautionary statements

Labelling according to the United Nations GHS

2.3. Other hazards which do not result in classification

Other hazards not contributing to the classification	Product hydrolyses under formation of methanol (CAS no. 67-56-1). Methanol is toxic by inhalation, in contact with skin and if swallowed. Methanol causes damage to organs. Methanol is highly flammable.

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Name	Product identifier	%	Classification according to the United Nations GHS
bis(ethyl acetoacetato-O1',O3)bis(2-methylpropan-1-olato)titanium	(CAS-No.) 83877-91-2	< 3	Flammable liquids, Category 3, H226 Skin corrosion/irritation, Category 2, H315 Serious eye damage/eye irritation, Category 1, H318 Specific target organ toxicity — Single exposure, Category 3, Narcosis, H336 Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation, H335

Full text of H-statements: see section 16

SECTION 4: First-aid measures

4.1. Description of necessary first-aid measures

First-aid measures general: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

First-aid measures after inhalation: Get medical advice/attention if you feel unwell. Allow affected person to breathe fresh air. Allow the victim to rest.

First-aid measures after skin contact: Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse. If skin irritation occurs: Get medical advice/attention.

First-aid measures after eye contact: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. Rinse immediately with plenty of water. Obtain medical attention if pain, blinking or redness persists.

First-aid measures after ingestion: Drink plenty of water. Do NOT induce vomiting. Get immediate medical advice/attention. Rinse mouth. Obtain emergency medical attention.

4.2. Most important symptoms/effects, acute and delayed

Symptoms/effects: Not expected to present a significant hazard under anticipated conditions of normal use.

Potential adverse human health effects and symptoms: Based on available data, the classification criteria are not met.

4.3. Indication of immediate medical attention and special treatment needed, if necessary

Methanol (CAS 67-56-1) is readily and rapidly absorbed at all exposure routes and is toxic by all routes. Methanol may cause irritation of the mucosa, as well as nausea, vomiting, headaches, vertigo and visual disorders, including blindness (irreversible damage to the optic nerve), acidosis, spasms, narcosis and coma. There may be a delay in the onset of these effects after exposure. Further toxicology information in section 11 must be observed.

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media

Suitable extinguishing media: Water spray. Carbon dioxide. dry chemical powder, alcohol-resistant foam, carbon dioxide (CO2). Sand. Foam. Dry powder.

Unsuitable extinguishing media: Do not use a heavy water stream.

5.2. Specific hazards arising from the chemical

Hazardous decomposition products in case of fire: Carbon dioxide. Carbon monoxide.

5.3. Special protective actions for fire-fighters

Firefighting instructions: Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire fighting water from entering the environment.

Protection during firefighting	Self-contained breathing apparatus. Complete protective clothing. Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Protective equipment	Wear recommended personal protective equipment.
Emergency procedures	Avoid contact with skin and eyes. Do not breathe dust/fume/gas/mist/vapours/spray. Do not touch or walk on the spilled product. Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment	For further information refer to section 8: "Exposure controls/personal protection". Equip cleanup crew with proper protection.
Emergency procedures	Ventilate area.

6.2. Environmental precautions

Avoid release to the environment. Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and materials for containment and cleaning up

For containment	Absorb spilled material with sand or earth. Collect spillage.
Methods for cleaning up	Take up mechanically (sweeping, shovelling) and collect in suitable container for disposal. Clean contaminated surfaces with an excess of water. On land, sweep or shovel into suitable containers. Minimise generation of dust. Store away from other materials.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling	Wear personal protective equipment. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapour.
Hygiene measures	Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions	Keep cool. Store in a dry place. Keep only in the original container in a cool, well ventilated place away from : Keep container closed when not in use.
Incompatible products	Strong bases. Strong acids.
Incompatible materials	Sources of ignition. Direct sunlight.
Storage temperature	5 – 25 °C

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Additional information	The product has a pasty consistency. Exposure limit values for respirable dusts are not relevant for this product.

8.2. Appropriate engineering controls

Environmental exposure controls	Avoid release to the environment.
Other information	Do not eat, drink or smoke when using this product. Do not eat, drink or smoke during use.

8.3. Individual protection measures, such as personal protective equipment (PPE)

Hand protection: Protective gloves. EN 374. The permeation time is not the maximum wearing time! Generally speaking, it must be reduced. Contact with either mixtures of substances or different substances may shorten the protective function's effective duration. Wear protective gloves.

Type	Material	Permeation	Thickness (mm)	Penetration	Standard
Disposable gloves	Butyl rubber	6 (> 480 minutes)	>0.3		EN ISO 374
Disposable gloves	Nitrile rubber (NBR)	1 (> 10 minutes)	>0.4		EN ISO 374

Eye protection: Chemical goggles or safety glasses

Type	Use	Characteristics	Standard
Safety glasses			EN 166, EN 170

Skin and body protection: Wear suitable protective clothing

Respiratory protection: No respiratory protection needed under normal use conditions. Where exposure through inhalation may occur from use, respiratory protection equipment is recommended. Wear appropriate mask

Device	Filter type	Condition	Standard
Full face mask	ABEK		EN 136

Personal protective equipment symbol(s)

8.4. Exposure limit values for the other components

No additional information available

SECTION 9: Physical and chemical properties

9.1. Basic physical and chemical properties

Physical state	Solid
Appearance	Pasty
Molecular mass	Not determined
Colour	Various.
Odour	slight.
Odour threshold	Not determined
Melting point	Not applicable
Freezing point	Not available
Boiling point	Not available
Flammability (solid, gas)	Not applicable,Non flammable.
Explosive limits	Not applicable
Lower explosive limit (LEL)	Not applicable
Upper explosive limit (UEL)	Not applicable
Flash point	Not applicable
Auto-ignition temperature	400 °C
Decomposition temperature	Not available
pH	≈ Not applicable

pH solution	Not available
Viscosity, kinematic (calculated value) (40 °C)	Not applicable
Partition coefficient n-octanol/water (Log Kow)	Not available
Vapour pressure	Not available
Vapour pressure at 50 °C	Not available
Density	1.5 – 1.54 g/cm³
Relative density	Not available
Relative vapour density at 20 °C	Not applicable
Solubility	insoluble in water.
Particle size	Not available
Particle size distribution	Not available
Particle shape	Not available
Particle aspect ratio	Not available
Particle specific surface area	Not available

9.2. Data relevant with regard to physical hazard classes (supplemental)

Additional information: Explosion limits for released methanol: 5.5 - 44%(V)

SECTION 10: Stability and reactivity

10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

10.2. Chemical stability

Stable under normal conditions. Not established.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use. Not established.

10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7). Direct sunlight. Extremely high or low temperatures.

10.5. Incompatible materials

Strong acids. Strong bases.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced. fume. Carbon monoxide. Carbon dioxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	Not classified
Acute toxicity (dermal)	Not classified
Acute toxicity (inhalation)	Not classified
Additional information	Based on available data, the classification criteria are not met

CFS-S SIL; CP 601S	
LD50 oral rat	> 2000 mg/kg

bis(ethyl acetoacetato-O1',O3)bis(2-methylpropan-1-olato)titanium (83877-91-2)	
LD50 oral rat	> 5000 mg/kg bodyweight (Rat, Oral)

Skin corrosion/irritation	Not classified Based on available data, the classification criteria are not met pH: ≈ Not applicable
Serious eye damage/irritation	Not classified (Based on available data, the classification criteria are not met) pH: ≈ Not applicable
Respiratory or skin sensitisation	Not classified Based on available data, the classification criteria are not met
Germ cell mutagenicity	Not classified
Carcinogenicity	Not classified
Reproductive toxicity	Not classified
STOT-single exposure	Not classified
STOT-repeated exposure	Not classified
Aspiration hazard	Not classified
Potential adverse human health effects and symptoms	Based on available data, the classification criteria are not met.
Other information	Hydrolysis product / impurity: Methanol (CAS 67-56-1) is readily and rapidly absorbed at all exposure routes and is toxic by all routes. Methanol may cause irritation of the mucosa, as well as nausea, vomiting, headaches, vertigo and visual disorders, including blindness (irreversible damage to the optic nerve), acidosis, spasms, narcosis and coma. There may be a delay in the onset of these effects after exposure.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general	The product is not considered harmful to aquatic organisms nor to cause long-term adverse effects in the environment.
Hazardous to the aquatic environment, short-term (acute)	Not classified
Hazardous to the aquatic environment, long-term (chronic)	Not classified

bis(ethyl acetoacetato-O1',O3)bis(2-methylpropan-1-olato)titanium (83877-91-2)	
EC50 Daphnia 1	> 100 mg/l (OECD 202: Daphnia sp. Acute Immobilisation Test, 48 h, Daphnia magna, Static system, Fresh water, Experimental value, Reaction product)

12.2. Persistence and degradability

CFS-S SIL; CP 601S	
Persistence and degradability	Silicone content: biologically not degradable. The product of hydrolysis (methanol) is readily biodegradable. . Not established.

bis(ethyl acetoacetato-O1',O3)bis(2-methylpropan-1-olato)titanium (83877-91-2)	
Persistence and degradability	Biodegradability: not applicable.

12.3. Bioaccumulative potential

CFS-S SIL; CP 601S	
Bioaccumulative potential	Not established.

bis(ethyl acetoacetato-O1',O3)bis(2-methylpropan-1-olato)titanium (83877-91-2)	
Bioaccumulative potential	Bioaccumulation: not applicable.

12.4. Mobility in soil

CFS-S SIL; CP 601S	
Mobility in soil	No additional information available

bis(ethyl acetoacetato-O1',O3)bis(2-methylpropan-1-olato)titanium (83877-91-2)	
Ecology - soil	No (test)data on mobility of the substance available.

12.5. Other adverse effects

Ozone	Not classified
Other adverse effects	No additional information available
Other information	Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Disposal methods

Waste treatment methods	Dispose of contents/container in accordance with licensed collector's sorting instructions.
Product/Packaging disposal recommendations	Dispose in a safe manner in accordance with local/national regulations.
Ecology - waste materials	Avoid release to the environment.

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

ADR	IMDG	IATA	RID
14.1. UN number			
Not applicable	Not applicable	Not applicable	Not applicable
14.2. UN proper shipping name			
Not applicable	Not applicable	Not applicable	Not applicable
14.3. Transport hazard class(es)			
Not applicable	Not applicable	Not applicable	Not applicable
14.4. Packing group			
Not applicable	Not applicable	Not applicable	Not applicable
14.5. Environmental hazards			
Dangerous for the environment : No	Dangerous for the environment : No Marine pollutant : No	Dangerous for the environment : No	Dangerous for the environment : No
No supplementary information available			

14.6. Special precautions for user

Overland transport

No data available

Transport by sea

No data available

Air transport

No data available

Rail transport

No data available

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations specific for the product in question

No additional information available

SECTION 16: Other information

SDS Major/Minor	None
Issue date	08/02/2021
Revision date	08/02/2021
Supersedes	23/10/2017

Section	Changed item	Change	Comments
3		Modified	

Other information None.

Full text of H-statements:	
H226	Flammable liquid and vapour
H315	Causes skin irritation
H318	Causes serious eye damage
H335	May cause respiratory irritation
H336	May cause drowsiness or dizziness

SDS_UN_Hilti

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

Hilti CP 601S Firestop Silicone Sealant Job Reference

Year	Project Name	Customer Name	Project type
2020	TKO STAFF QUARTERS (FIRE DEPT)	YAU LEE CONSTRUCTION CO LTD	Residential
2020	YUEN LONG STATION YLTL 510	SIU MING CONSTRUCTION WORKS CO LTD	Residential
2020	KAI TAK AREA 1K1 (6567)	ABLE CONTRACTORS LIMITED	Residential
2020	TAI WAI STATION NW RES	MAJESTIC PLUMBING ENGINEERS LTD	Residential
2020	M PLUS-WEST KLN	WAH LAM (INTERNATIONAL)	Community & Cultural
2020	TKO LOHAS PARK PH11 (SITE C2)	EXCEL ENGINEERING COMPANY LIMITED	Residential
2020	1-11 AU PUI WAN ST, FO TAN	CHINA OVERSEAS BUILDING	Residential
2020	7 MUK TAI ST, KAI TAK 1K3 (6565)	MAJESTIC PLUMBING ENGINEERS LTD	Residential
2020	SCL 1128 CAUSEWAY BAY TUNNEL	S & Y (HONG KONG) ENGINEERING	Transport
2020	SCL 1123 EXHIBITION STATION	WAI TAI ENGINEERING (H.K.) CO LTD	Infrastructure
2021	SIU HONG, AREA 54 DD 132 TMTL 483	SANFIELD (MANAGEMENT) LIMITED	Residential
2021	TUEN MUN HOSPITAL EXT	CHEVALIER (CONSTRUCTION) CO LTD	Health
2021	KAI TAK AREA 1L2 (6563)	GAMMON ENGINEERING & CONSTRUCTION	Residential
2021	AREA 54 TUNG CHUNG HOUSING	AGGRESSIVE CONSTRUCTION COMPANY	Residential
2021	YUEN LONG STATION YLTL 510	SIU MING CONSTRUCTION WORKS CO LTD	Residential
2021	CASTLE PEAK RD, AREA 48 (547)	AGGRESSIVE CONSTRUCTION ENGINEERING	Residential
2021	HK POST HEADQUARTERS	AGGRESSIVE CONSTRUCTION COMPANY	Office
2021	SCL 1123 EXHIBITION STATION	WING YIP BUILDING MATERIALS	Infrastructure
2021	TAI WAI STATION NW RES	PYROFOE ENGINEERS LTD	Residential
2021	CHUN YAT ST & CHUN CHEONG ST AMC	GAMMON E&M LIMITED	Office
2022	SIU HONG, AREA 54 DD 132 TMTL 483	SANFIELD (MANAGEMENT) LIMITED	Residential
2022	TUEN MUN AREA 54 HOUSING SITE 3,4	CHINA STATE CONSTRUCTION	Residential
2022	CINGLEOT LOGISTICS CENTRE, AIRPORT - ALIBABA	ALGA (FAR EAST) LIMITED	Industrial
2022	KAI TAK SPORTS PARK	KPA ENGINEERING LIMITED	Sport & Recreation
2022	TPTL 244, YAU KING LANE & POK YIN RD	SANFIELD (MANAGEMENT) LIMITED	Residential
2022	HKIA 3508 TERMINAL 2	EASY SMART ENGINEERING LIMITED	Transport
2022	R6 TKO-LAM TIN TUNNEL NE/2015/01	LEIGHTON - CHINA STATE JOINT	Infrastructure
2022	PO LEUNG KUK YOUTH HOSTEL	HO PAK KEE ENGINEERING LIMITED	Hospitality
2022	HK POST HEADQUARTERS	AGGRESSIVE CONSTRUCTION COMPANY	Office
2022	R6 TKO BRIDGE & P2 ROAD NE/2015/02	GOOD MIND ENGINEERING LIMITED	Infrastructure