NITROTHERMSPRAY

一項國際專利

EUROSIDER

Blutech Engineering Limited
天祥設備有限公司

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準備： Bob Chung

天祥發展之路


Dodwell Engineering
天祥工程設備有限公司
International Auto Engineering Limited
天祥工程設備有限公司
Blutech Engineering Limited
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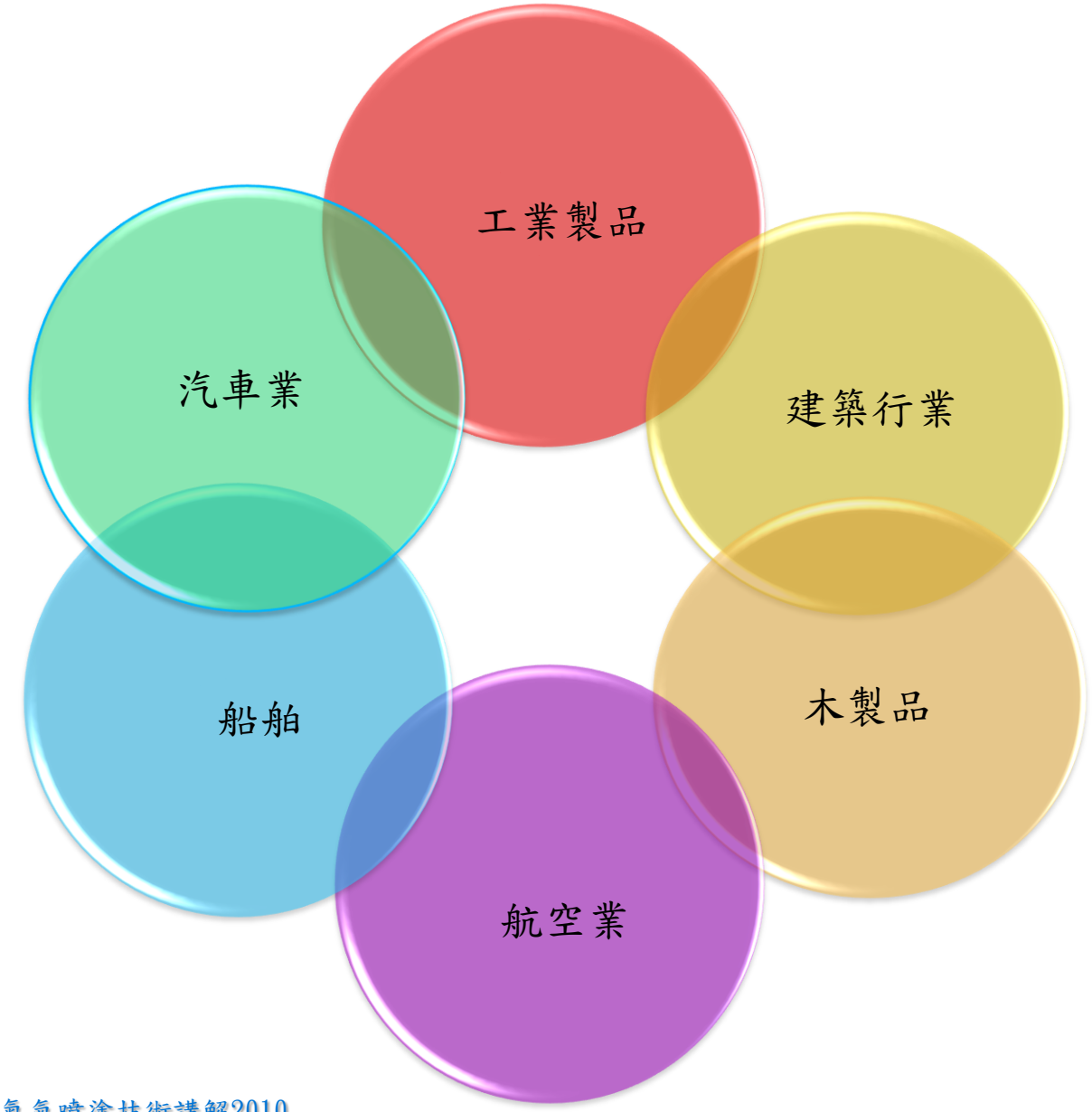
NitroThermSpray

各行名業的應用



怎樣能夠獲得充足的氮氣?

在我們呼吸的空氣中有七成八是氮氣, 兩成一是氧氣 以及其他雜質氣體.

聚合體膜 「分子組成的辨別者」三個原理:

- 中空的纖維物料: 最 有助的膜過程的幾何形式。

「擁有大表面密度, 低能量損耗」

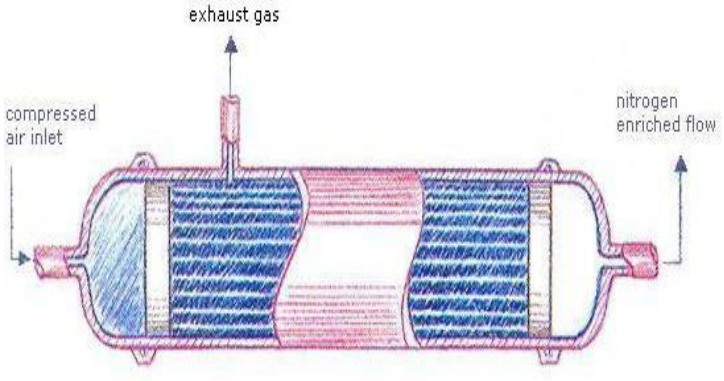
- 選擇性的滲透作用: 每一種氣體都有獨特的滲透速率, 而透過透釋膜就能把他們分解滲出來

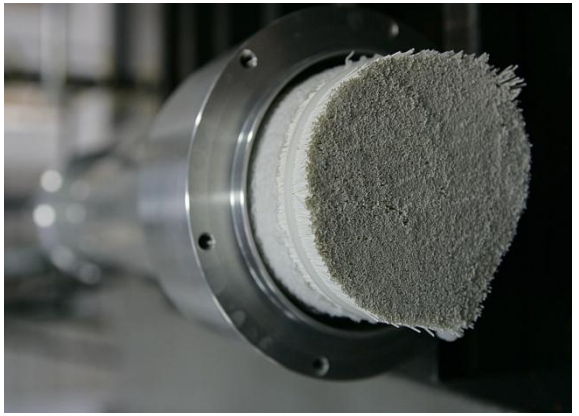
從低反應氣體(氮，氫)中分開, 所謂比較快反應的氣體(氧，氦，水蒸汽)

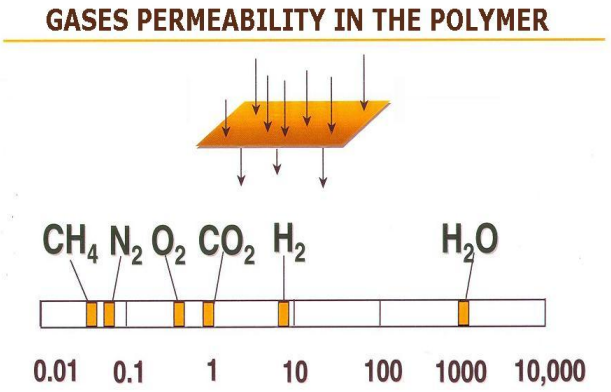
- 切線流動： 避免滲透的分子的累積。

因為廢氣被(在大氣壓力所)消除，膜不受進步的污染影響

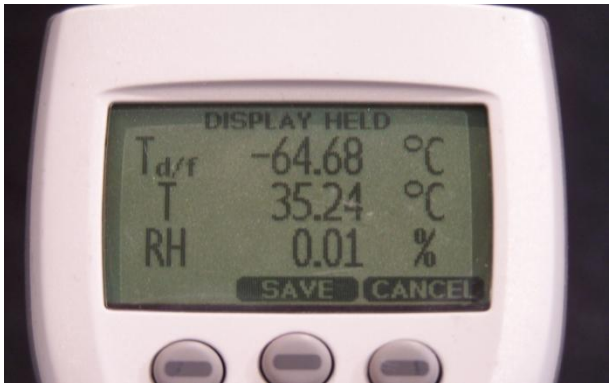
選擇的滲透







為什麼使用氮氣噴塗？



氮是無水和沒有雜質(灰塵，油，煙霧和其他化學污染物)
氮是一種惰性的和穩定的氣體

- 它的分子更快 = 較低的工作壓力：
- 增加在表面上傳送效率
- 較少油塵
- 有更好的工作環境和減低噴漆房維修保養以及減少更換過濾棉次數

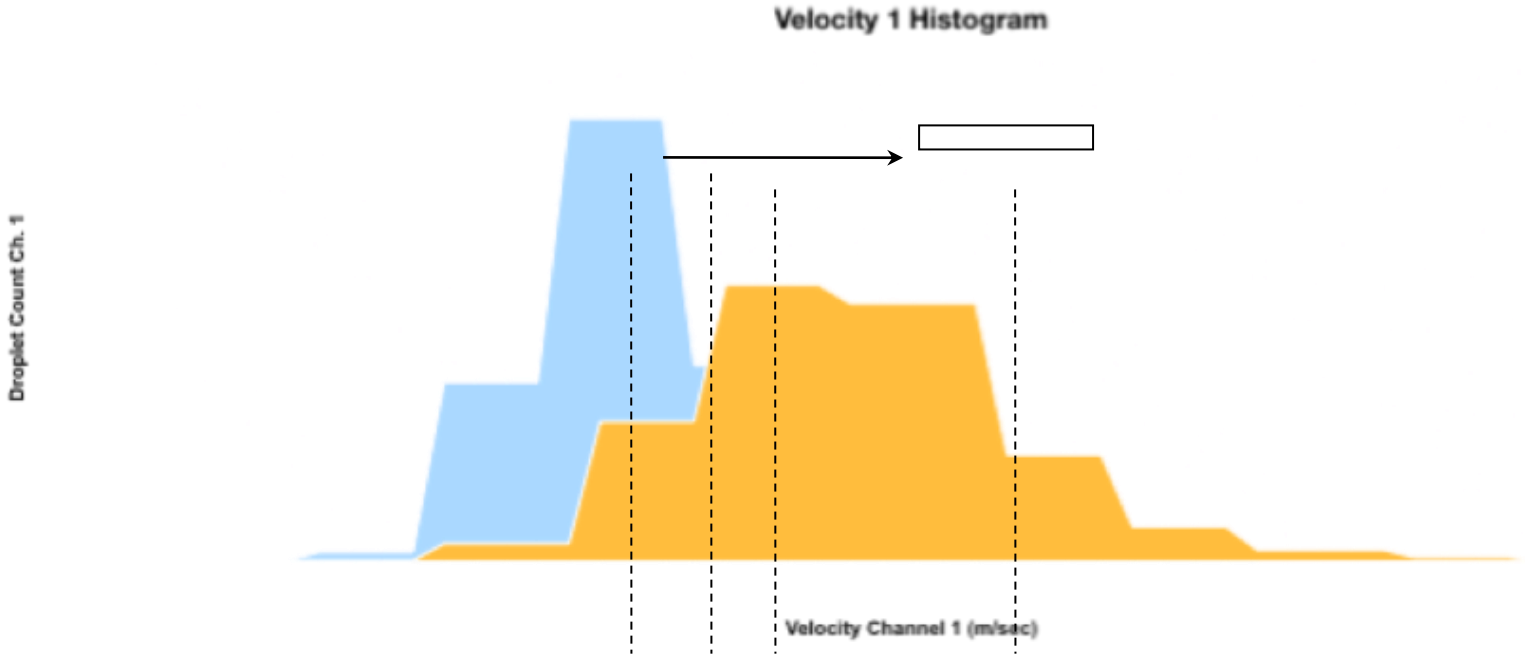
使用NTS 加熱氮氣：

- 可使油漆黏度降低
- 改善工作效率
- 減少使用溶劑(天拿水) =減低橙皮現象的影響和減低微細氣泡
- 減少有機揮發性化合物形成(VOC)
- 增加遮蓋率和減少噴塗層
- 能夠增加正或者負離子帶進氮氣

空氣與氮氣速度比較

Air	Channel 1	Channel 2	Channel 3
Velocity Mean (m/sec)	7.2452	0.0000	0.0000
Velocity RMS (m/sec)	**3.1451**	0.0000	0.0000
Turbulence Intensity (%)	**43.41%**	0.00	0.00
Frequency Mean (MHz)	5.1257	0.0000	0.0000
Frequency RMS (MHz)	0.4886	0.0000	0.0000
Frequency TI (%)	9.53	0.00	0.00
Gate Time Mean (usec)	10.71	0.00	0.00
Gate Time RMS (usec)	10.64	0.00	0.00
Data Rate (Hz)	9033	0	0
Valid Count	5000	0	0
Invalid Count	0	0	0
Elapsed Time (sec)	0.8304		

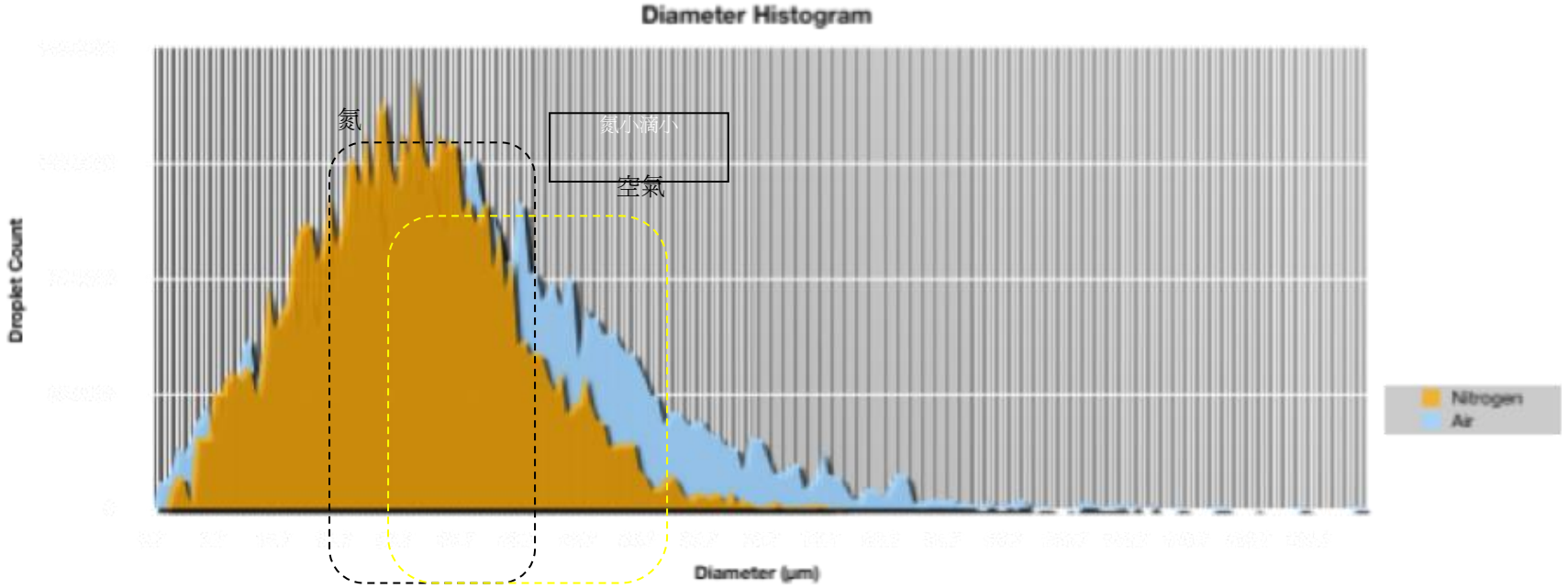
Nitrogen	Channel 1	Channel 2	Channel 3
Velocity Mean (m/sec)	13.1753	0.0000	0.0000
Velocity RMS (m/sec)	**4.7149**	0.0000	0.0000
Turbulence Intensity (%)	**35.79%**	0.00	0.00
Frequency Mean (MHz)	6.047	0.0000	0.0000
Frequency RMS (MHz)	0.7325	0.0000	0.0000
Frequency TI (%)	12.11	0.00	0.00
Gate Time Mean (usec)	6.08	0.00	0.00
Gate Time RMS (usec)	4.58	0.00	0.00
Data Rate (Hz)	5530	0	0
Valid Count	5000	0	0
Invalid Count	0	0	0
Elapsed Time (sec)	1.3566		



小滴直徑比較

Air	Channel 1	PVC	Spatial
D10 (痠)	32.91	27.95	26.08
D20 (痠)	36.94	32.87	30.71
D30 (痠)	40.93	37.30	34.88
D32 (痠)	**50.24**	48.02	44.98
D43 (痠)	60.04	57.78	
Size Data Rate (Hz)	9019		
Size Vaild Count	5000		
Epsilon Exception	149		
Diameter Exception	363		
Intensity Invalid	988		

Nitrogen	Channel 1	PVC	Spatial
D10 (痠)	29.73	28.18	27.40
D20 (痠)	32.48	31.21	30.42
D30 (痠)	35.01	33.89	33.07
D32 (痠)	**40.68**	39.94	39.09
D43 (痠)	46.3	45.50	
Size Data Rate (Hz)	5521		
Size Vaild Count	5000		
Epsilon Exception	177		
Diameter Exception	431		
Intensity Invalid	319		

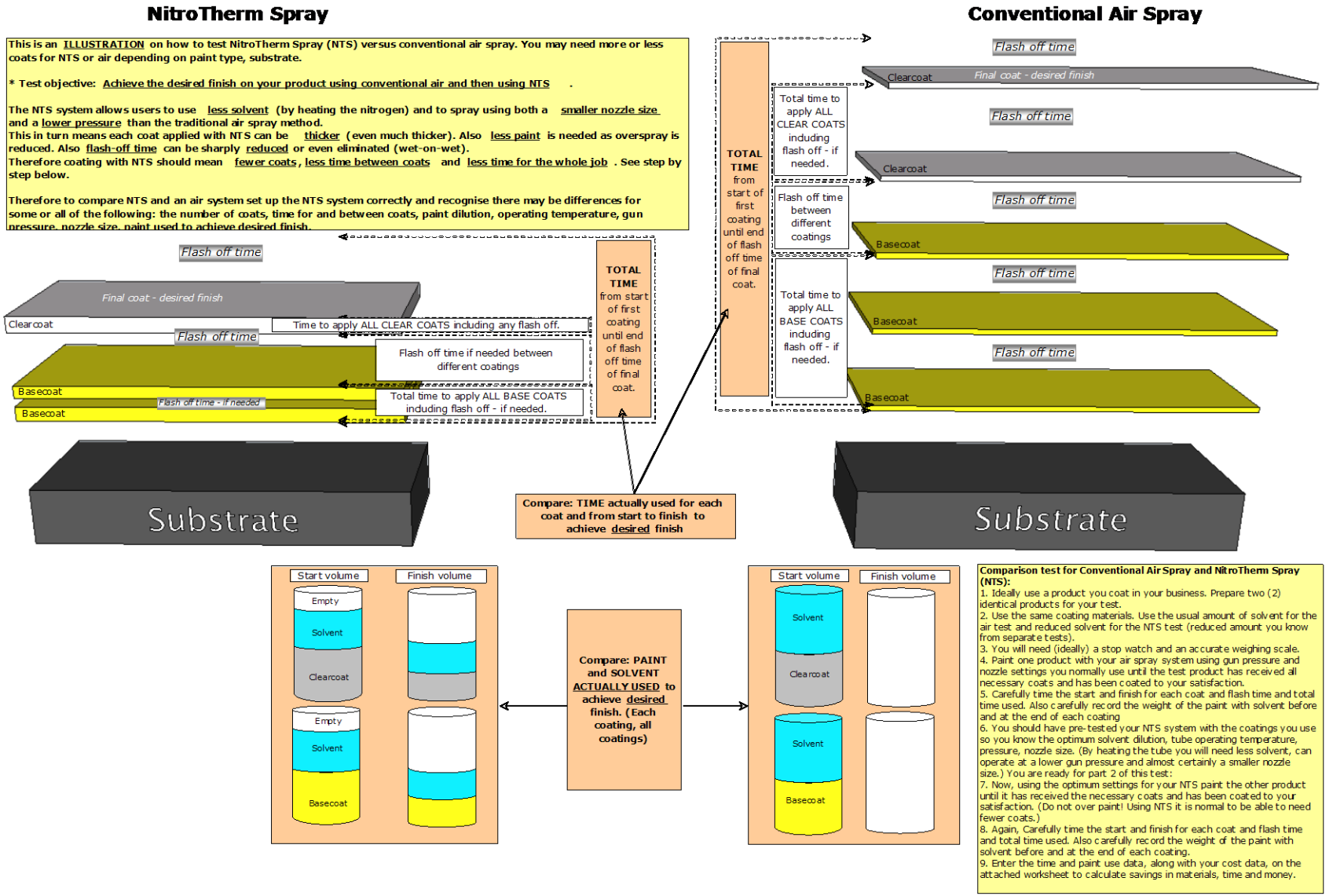


D10 =平均直徑　　D20 =平均表面積　　D30 =平均體積

D32 = 體積/地區　　(更低的數值 =改善風乾速度)。

測試

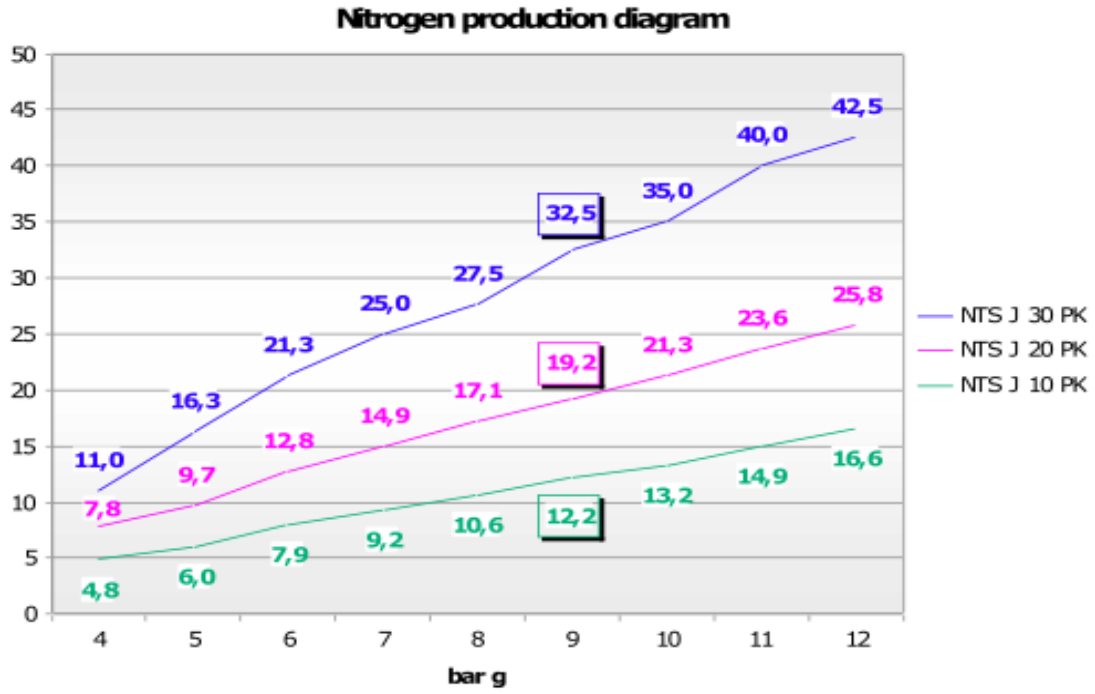
首先： 透過爲溶劑，溫度，工作壓力，噴嘴尺寸，離子測試各種各樣的設置優化NTS系統



NTS產生氮氣的能力

NITROTHERMSPRAY by Eurosider sas *Minum nitrogen purity 95%*						
Model	**Air inlet pressure**		**Air inlet consumption**		**Nitrogen outlet**	
	bar g	*psi g*	*Nm³/h*	*cuft/h*	*Nm³/h*	*cuft/h*
NTS J 10 PK	6	87	20,6	727,4	7,9	278,9
	7	101,5	24,0	847,4	9,2	324,9
	8	116	27,4	967,5	10,6	374,3
	9	130,5	31,8	1.122,9	12,2	430,8
NTS J 20 PK	6	87	33,3	1.175,8	12,8	452,0
	7	101,5	38,8	1.370,0	14,9	526,1
	8	116	44,4	1.567,8	17,1	603,8
	9	130,5	51,9	1.832,6	19,2	678,0
NTS J 30 PK	6	87	55,3	1.952,6	21,3	752,1
	7	101,5	65,0	2.295,2	25,0	882,8
	8	116	71,5	2.524,7	27,5	971,0
	9	130,5	84,5	2.983,7	32,5	1.147,6
NTS J 40 PK	6	87	66,6	2.351,6	25,6	903,9
	7	101,5	77,6	2.740,1	29,8	1.052,2
	8	116	88,8	3.135,5	34,2	1.207,6
	9	130,5	103,8	3.665,2	38,4	1.355,9
NTS J 60 PK	6	87	110,6	3.905,3	42,6	1.504,2
	7	101,5	130,0	4.590,3	50,0	1.765,5
	8	116	143,0	5.049,3	55,0	1.942,1
	9	130,5	169,0	5.967,4	65,0	2.295,2
NTS J 90 PK	6	87	165,9	5.857,9	63,9	2.256,3
	7	101,5	195,0	6.885,5	75,0	2.648,3
	8	116	214,5	7.574,0	82,5	2.913,1
	9	130,5	253,5	8.951,1	97,5	3.442,7
NTS J 120 PK	6	87	221,2	7.810,6	85,2	3.008,4
	7	101,5	260,0	9.180,6	100,0	3.531,0
	8	116	286,0	10.098,7	110,0	3.884,1
	9	130,5	338,0	11.934,8	130,0	4.590,3

Attention: ambient temperature range 2-50 °C (36-112 °F), ambient pressure 1013 mbar, max operating air inlet pressure 11 bar g (159.5 psi g)



- 氮氣量的生產取決於壓縮空氣的進風壓力和體積 (一定是至少6巴壓力)
- 更多的壓力和更多的空氣 = 更多的氮氣
- 最佳入口壓力9巴壓力

基本條件

- 空氣壓縮機最小生產每小時21平方米(3千瓦，7.5巴壓力)
- 壓縮空氣缸大於275公升
- 電源 220 V(或者110 V)，50-60赫茲
- 連接喉管子需要12毫米外徑，10毫米內徑
- 氮氣缸大於275公升 。

安裝例子

Example 1

1 AIR COMPRESSOR 2 NITROTHERM 3 BOOTH A

Example 2

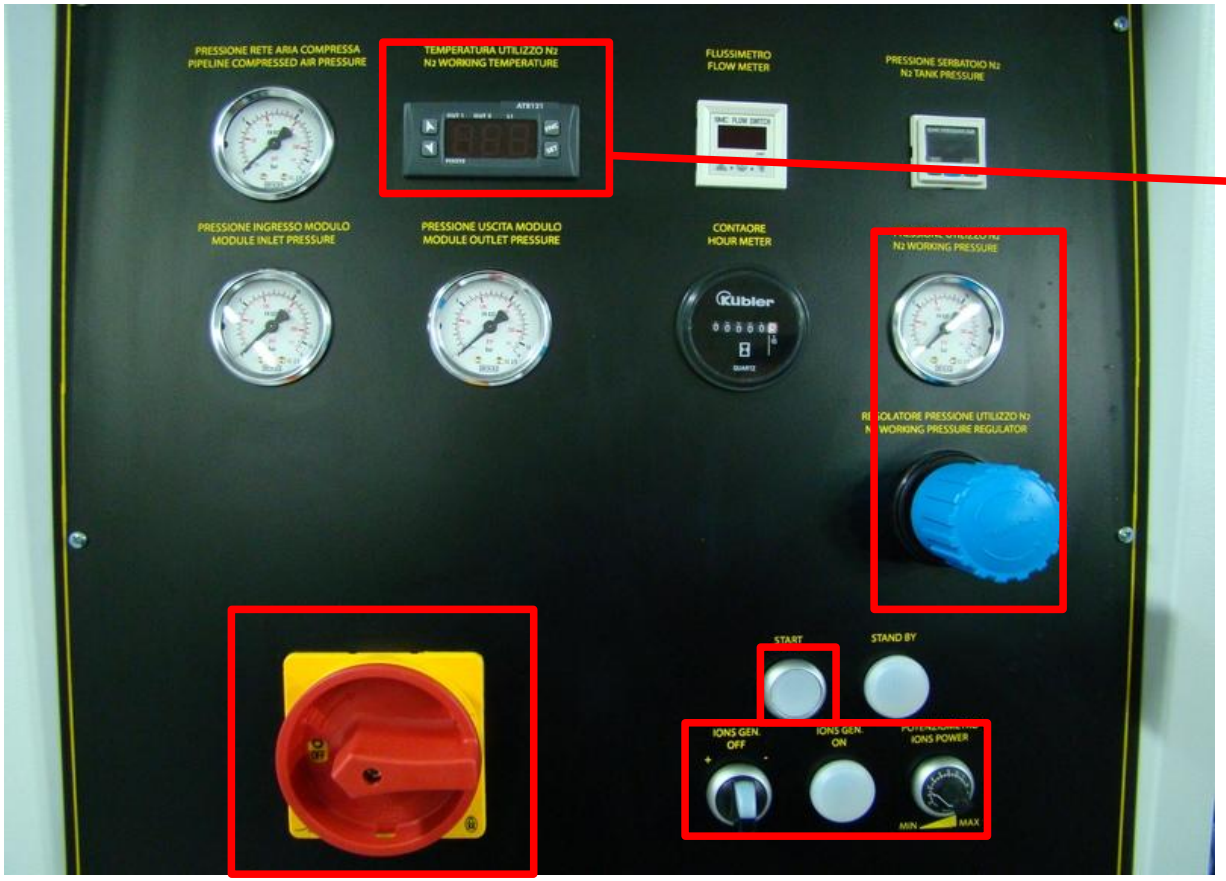
1 AIR COMPRESSOR 2 NITROTHERM 3 BOOTH A 4 TOPSPRAY 5 BOOTH B

Example 3

1 AIR COMPRESSOR 2 NITROTHERM 3 BOOTH A 4 TOPSPRAY 5 BOOTH B 6 TOPSPRAY 7 BOOTH C

NITROTHERMSPRAY

NTS 控制面板

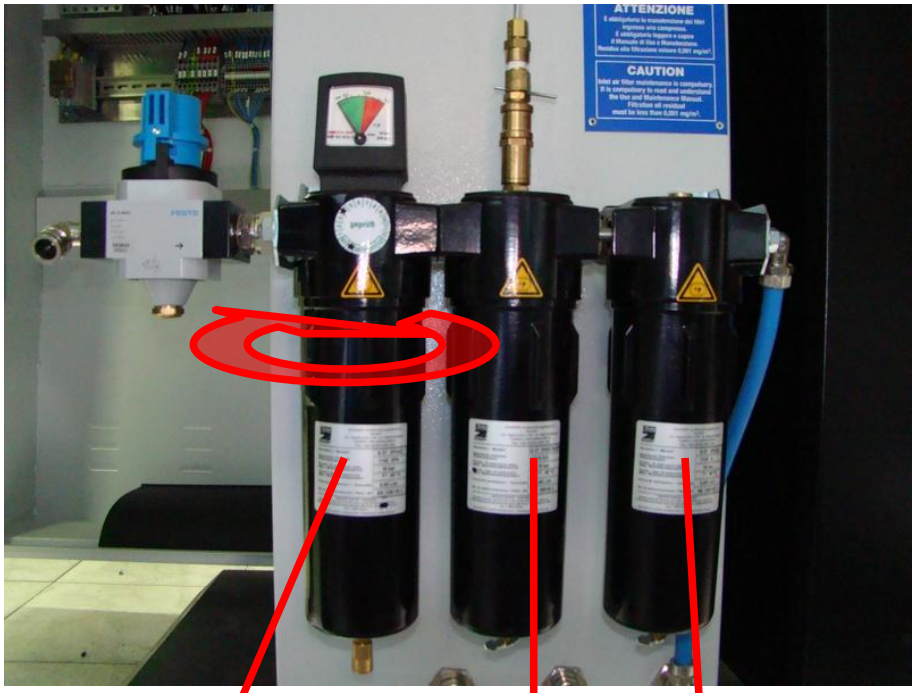


調節 NTS加熱管溫度

調節NTS 的工作壓力

選擇電離器極性

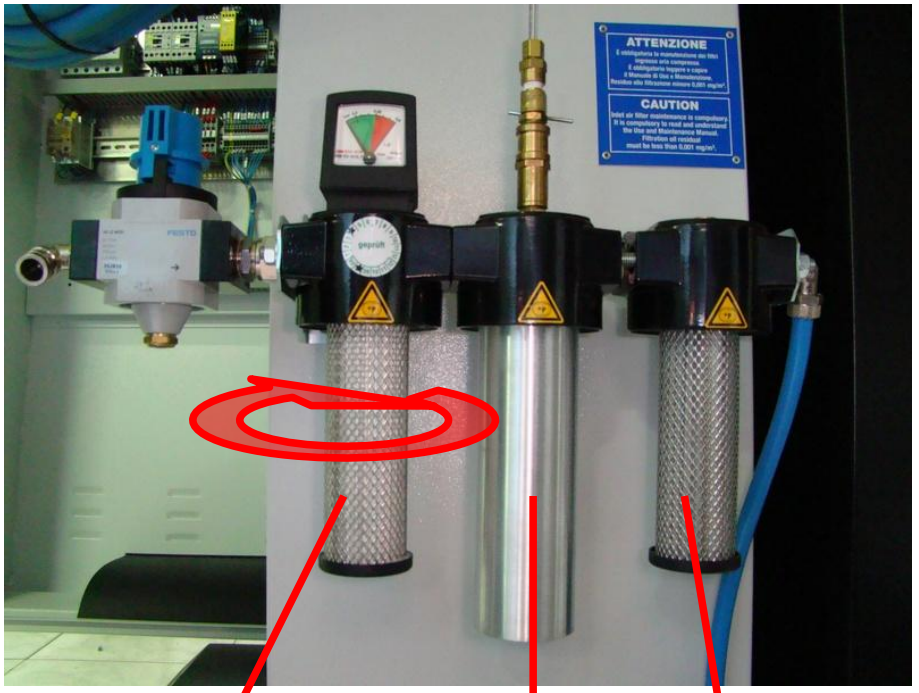
壓縮的空氣過濾系統



液體/ 粒子的極細過濾器

活性的碳過濾器

活性碳過濾器



大概每一年更換一次或者顯示器箭在紅色區域上

大概每6個月或者每3，000 工作時間

大概每3個月或者每1，500 工作時間

NTS 的內部的部分

適合工具

適合任何類型噴槍：

高流量低風壓(HVLP)

空氣混合噴槍

靜電噴槍

噴槍會被連接到 13.33米加熱喉管(有額外長度可供選擇的：20米或40米)

任何類型性油漆：

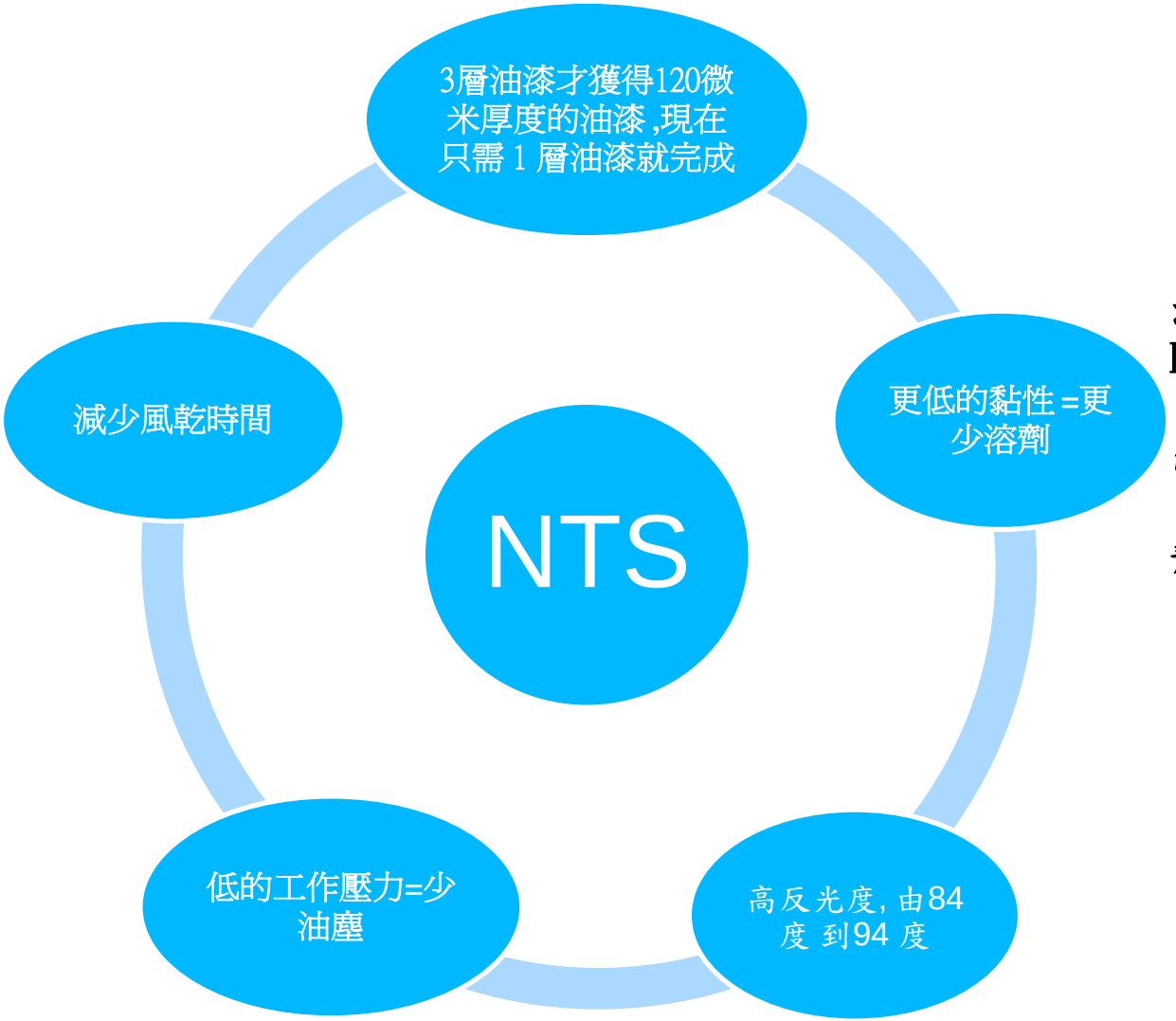
油溶性

高黏性

水溶性

參考1

生產推土機或其他重型挖土機械，噴塗於機體和底盤，以及半製成組件



油漆:

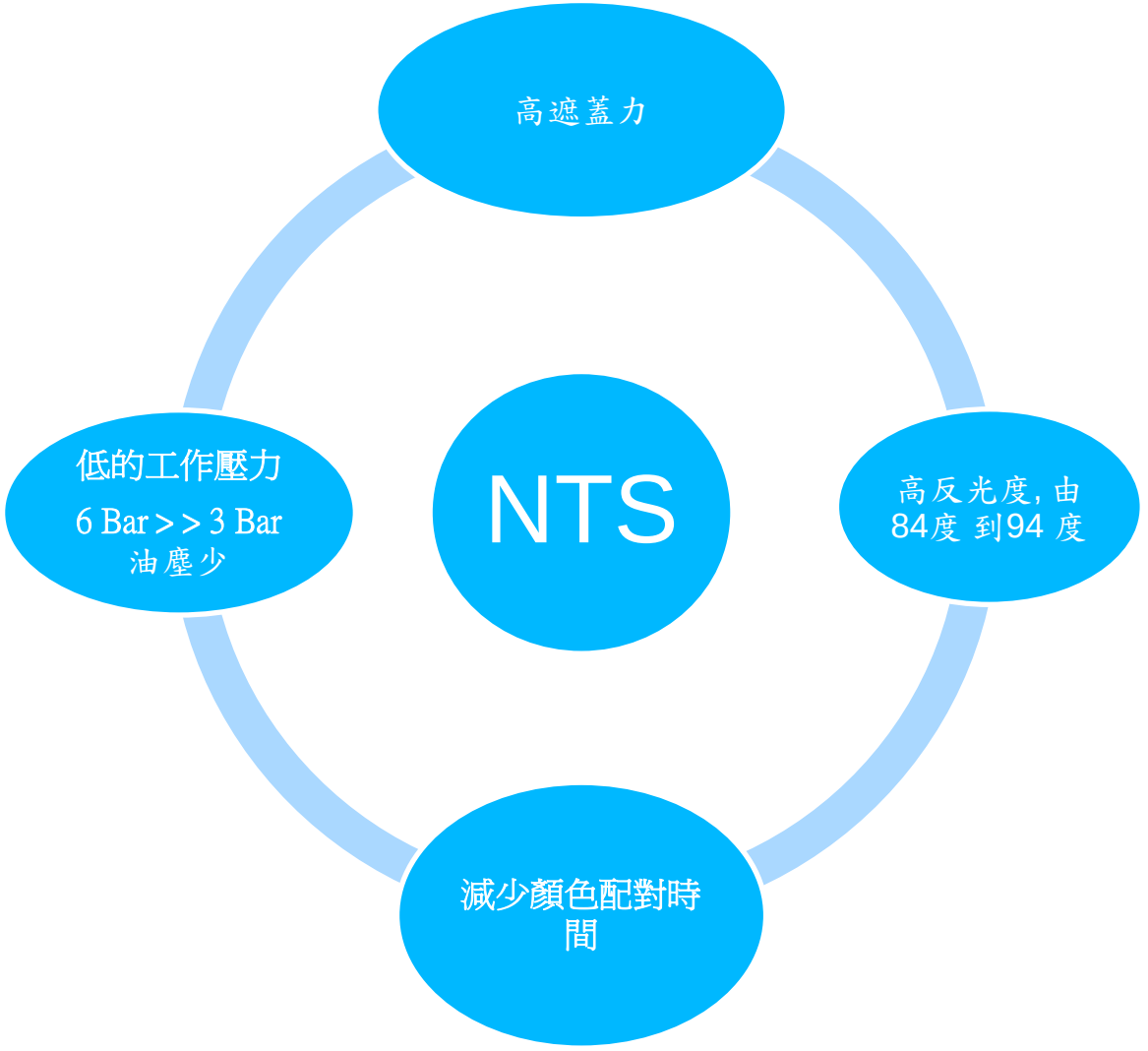
Bicomponent epoxidic 底漆(70微米)

丙烯酸的搪瓷完成的面漆(50微米)

靜電應用

參考2

汽車的塑膠部件的完成品。



油漆:

水溶性底漆
油溶性光漆

參考 3

閉鎖及(門窗)的製造商

使用: 空氣混合槍

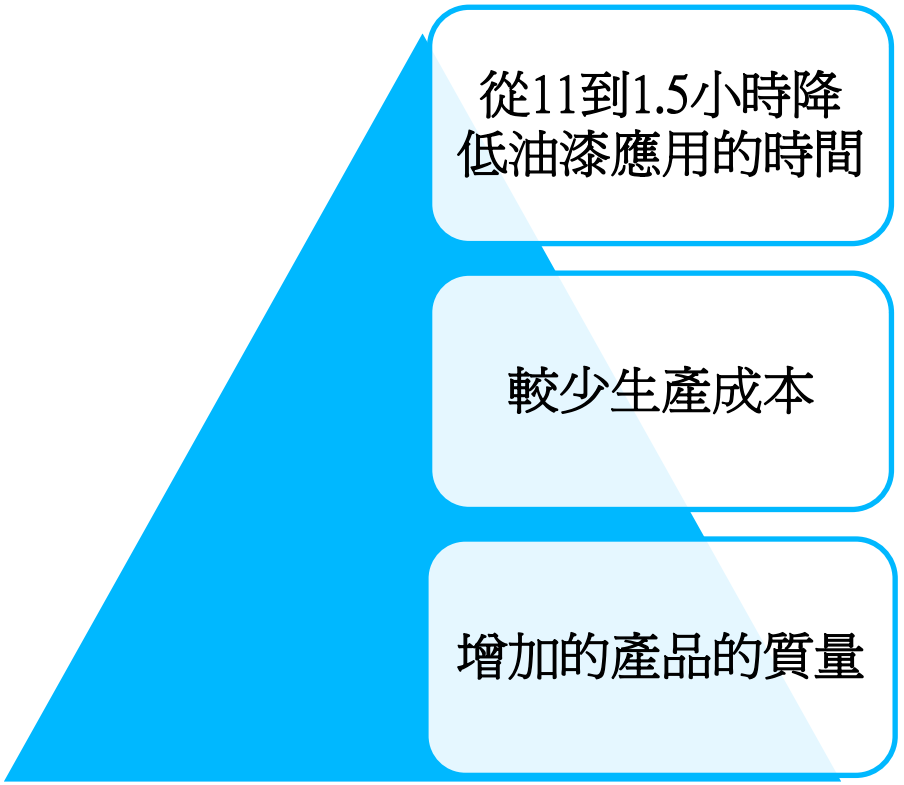
水溶性油漆

保持給濃度和垂直狀態的黏性的重分子

- 在电子顯微鏡下, 顯示出油漆表面的微細氣泡減少了50% ,即是有更好的保護能力
- 能夠噴塗一層500微米厚的油漆,相對以往傳統方式下相比3層油漆亦只有300微米; 和沒有凹下現象
- 減少噴房清潔及更換濾棉 =增加利益

參考 4

製造商業和軍用的飛機,以及飛機內部更換工作。



油漆:

水溶性油漆和油溶性油漆

公司有一半的工作放於表面修上。他們的座右銘“品質是客所想說的”,因此有需時他們將噴漆層類多達20層才有高水準的質量。

當今的例子 - 日本(車輛薄層)

Waterborne

Conventional Air (40% standard dilution)

Basecoat	Paint time	Blow gun time	Flash-off	Total time
Coat 1	00:55	00:00	00:00	
Coat 2	01:42	00:00	00:00	
Coat 3	01:13	09:53	00:00	
Coat 4	01:40	11:22	10:00	
4 Coats	05:30	21:15	10:00	36:45
Clearcoat				
Coat 1	01:05	00:00	00:00	
Coat 2	01:25	00:00	00:00	
2 Coats	02:30	00:00	00:00	02:30
Total Time				39:15

Summary	Coats	Product	Time
Basecoat	4	354.1gm	36:45
Clearcoat	2	151.3gm	02:30
Total			39:15

NitroThermSpray (20% dilution)

Basecoat	Paint time	Blow gun time	Flash-off	Total time
Coat 1	01:00	04:46	00:00	
Coat 2	01:38	12:46	00:00	
-	-	-	-	
-	-	-	-	
2 Coats	**02:38**	**17:32**	**00:00**	**20:10**
Clearcoat				
Coat 1	01:04	00:00	00:00	
-				
1 Coats	**01:04**	**00:00**	**00:00**	**01:04**
Total Time				**21:14**

Summary	Coats	Product	Time
Basecoat	2	194.4gm	20:10
Clearcoat	1	92.0gm	01:04
			21:14

SAVINGS USING NITROTHERMSPRAY	Coats	Product	Time
Basecoat	**-2**	**-45%**	**-45%**
Clearcoat	**-1**	**-39%**	**-57%**

Solvent borne

Conventional Air (50% solvent)

Basecoat	Paint time	Blow gun time	Flash-off	Total time
Coat 1	01:00	-	01:00	
Coat 2	01:00	-	03:30	
Coat 3	02:10	-	08:50	
Coat 4	01:10	-	13:50	
4 Coats	05:20	-	27:10	32:30
Clearcoat				
Coat 1	01:30	-	04:45	
Coat 2	01:15	-	00:00	
2 Coats	02:45	-	04:45	07:30
Total Time				40:00

Summary	Coats	Product	Time
Basecoat	4	412.2gm	32:30
Clearcoat	2	247.0gm	07:30
			40:00

NitroThermSpray (25% solvent)

Basecoat	Paint time	Blow gun time	Flash-off	Total time
Coat 1	01:25	-	00:00	
Coat 2	01:20	-	15:30	
-	-	-	-	
-	-	-	-	
2 Coats	**02:45**	**-**	**15:30**	**18:15**
Clearcoat				
Coat 1	01:20	-	00:00	
-				
1 Coats	**01:20**	**-**	**00:00**	**01:20**
Total Time				**19:35**

Summary	Coats	Product	Time
Basecoat	2	312.4gm	18:15
Clearcoat	1	195.2gm	01:20
			19:35

SAVINGS USING NITROTHEMSPRAY	Coats	Product	Time
Basecoat	**-2**	**-24%**	**-44%**
Clearcoat	**-1**	**-21%**	**-82%**

Conventional Air (40% standard dilution)

Basecoat	Paint time	Blow gun time	Flash-off	Total time
Coat 1	00:50	00:00	00:00	
Coat 2	01:33	00:00	00:00	
Coat 3	01:25	08:57	00:00	
Coat 4	01:27	10:25	10:00	
4 Coats	05:15	19:22	10:00	34:37
Clearcoat				
Coat 1	01:02	00:00	00:00	
Coat 2	01:32	00:00	00:00	
2 Coats	02:34	00:00	00:00	02:34
Total Time				37:11

Summary	Coats	Product	Time
Basecoat	4	378.1gm	34:37
Clearcoat	2	153.6gm	02:34
			37:11

NitroThermSpray (20% dilution)

Basecoat	Paint time	Blow gun time	Flash-off	Total time
Coat 1	01:23	03:12	00:00	
Coat 2	02:03	10:22	00:00	
-	-	-	-	
-	-	-	-	
2 Coats	**03:26**	**13:34**	**00:00**	**17:00**
Clearcoat				
Coat 1	01:22	00:00	00:00	
-				
1 Coats	**01:22**	**00:00**	**00:00**	**01:22**
Total Time				**18:22**

Summary	Coats	Product	Time
Basecoat	2	198.9gm	17:00
Clearcoat	1	92.0gm	01:22
			18:22

SAVINGS USING NITROTHEMSPRAY	Coats	Product	Time
Basecoat	**-2**	**-47%**	**-51%**
Clearcoat	**-1**	**-40%**	**-47%**

Conventional Air (50% solvent)

Basecoat	Paint time	Blow gun time	Flash-off	Total time
Coat 1	00:35	-	01:15	
Coat 2	01:15	-	06:25	
Coat 3	02:10	-	13:00	
Coat 4	-	-	-	
4 Coats	04:00	-	20:40	24:40
Clearcoat				
Coat 1	01:30	-	06:20	
Coat 2	01:15	-	00:00	
2 Coats	02:45	-	06:20	09:05
Total Time				33:45

Summary	Coats	Product	Time
Basecoat	4	402.3gm	24:40
Clearcoat	2	259.0gm	09:05
			33:45

NitroThermSpray (25% solvent)

Basecoat	Paint time	Blow gun time	Flash-off	Total time
Coat 1	01:25	-	00:05	
Coat 2	01:20	-	21:15	
-	-	-	-	
-	-	-	-	
2 Coats	**02:45**	**-**	**21:20**	**24:05**
Clearcoat				
Coat 1	01:20	-	00:00	
-				
1 Coats	**01:20**	**-**	**00:00**	**01:20**
Total Time				**25:25**

Summary	Coats	Product	Time
Basecoat	2	281.5gm	24:05
Clearcoat	1	200.2gm	01:20
			25:25

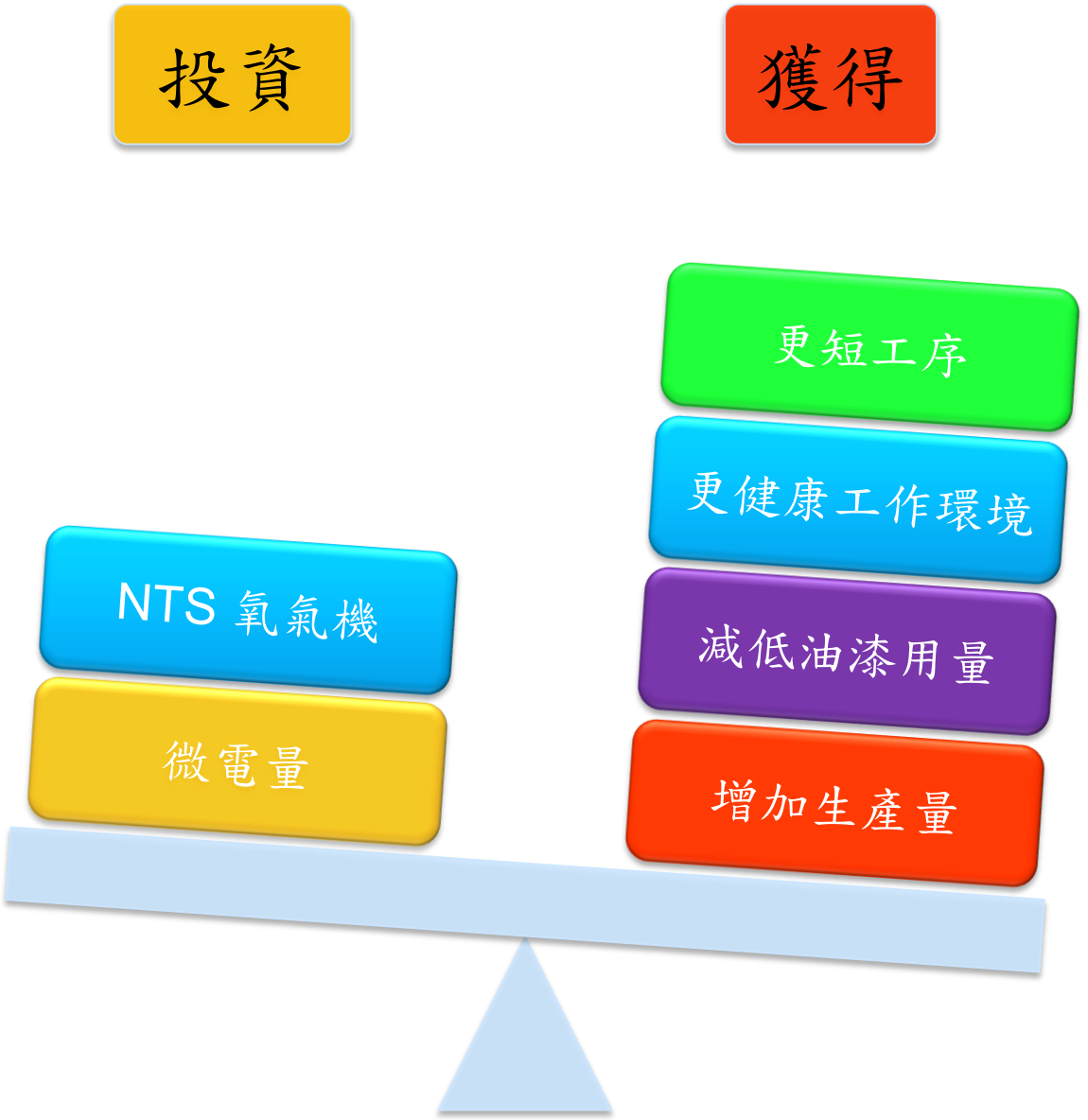
SAVINGS USING NITROTHEMSPRAY	Coats	Product	Time
Basecoat	**-2**	**-30%**	**-2%**
Clearcoat	**-1**	**-23%**	**-85%**

當今的例子 - 各種各樣

		Liquid Per Paint Hr.	Average		
			Base Coats	Clear Coats	Spray Time
	Customer 1	28%			
	Customer 2	18%			
	Customer 3	52%			
	Customer 4	64%			
	Customer 5	31%			
	Customer 6	46%			
	Customer 7	21%			
	Customer 8	31%			
	Customer 9	38%			
	Customer 10	8%			
	Customer 1	N/A	28%	0%	39%
	Customer 2	7%	22%	0%	62%
	Customer 3	20%			N/A
	Customer 4	20%			66%
	Customer 5	63%	52%	0%	28%
	Customer 6	8%			38%
	Customer 7	17%	21%	3%	20%
	Customer 8	25%	14%	0%	10%
	Customer 9	29%	31%	3%	18%
	Customer 1	7%	40%	0%	48%
	Customer 2	20%			25%
	Customer 3	35%	27%	0%	32%
	Customer 4	30%	25%	1%	19%
	Customer 5	31%	20%	0%	
	Customer 6	29%	31%	3%	18%
	Customer 7	22%	20%	0%	63%
	Customer 8 *	58%	7%	0%	61%
Sherwin Williams	Customer 1	24%	25%	18%	17%
	Customer 2	30%			15%
	Customer 1	28%	12%	0%	N/A
	Customer 2	24%	20%	5%	75%
	Customer 3	22%	14%	0%	85%
	Customer 4	26%	31%	0%	N/A
	Customer 5	49%	34%	0%	46%
	Customer 6	30%	26%	1%	19%
	Customer 7	15%			32%
	Customer 8	20%	11%	4%	69%

* Water borne

Liquid Per Paint Hour reflects the savings in liquids using Nitrothermspray versus using Compressed Air
Average Base Coats reflects the savings in **number** of coats used to cover using Nitrothermspray versus Compressed Air
Average Clear Coats reflects the savings in **number** of coats used to cover using Nitrothermspray versus Compressed Air
Average Spray Time reflects the savings in **spray time** required using Nitrothermspray versus Compressed Air


投資
獲得
更短工序
更健康工作環境
減低油漆用量
增加生產量
NTS 氧氣機
微電量

謝謝!