

- 1.
- 2.
- 3.
4. 18
5. HFO-1234yf
- 6.
- 7.
- 8.
9. 320

17.

18.

19. 2

20.

21. VPS

22. 5

23. 5

24.

25.

26.

27.

28.

29. " "

30.

32. 2025 FCV

1.

" " 2020 10% 13.7

10%

"

E20

1.0

2.0

"

"

3.0

"

"

2020

15

"

"

2

1.7

10% 15%

2018

3000

6

5

"

"

2020

15

30

"

"

4800

6000

"

"

PPP

"

"

PPP

PPP

PPP

8

PPP

PPP

PPP

PPP

PPP

PPP

PPP

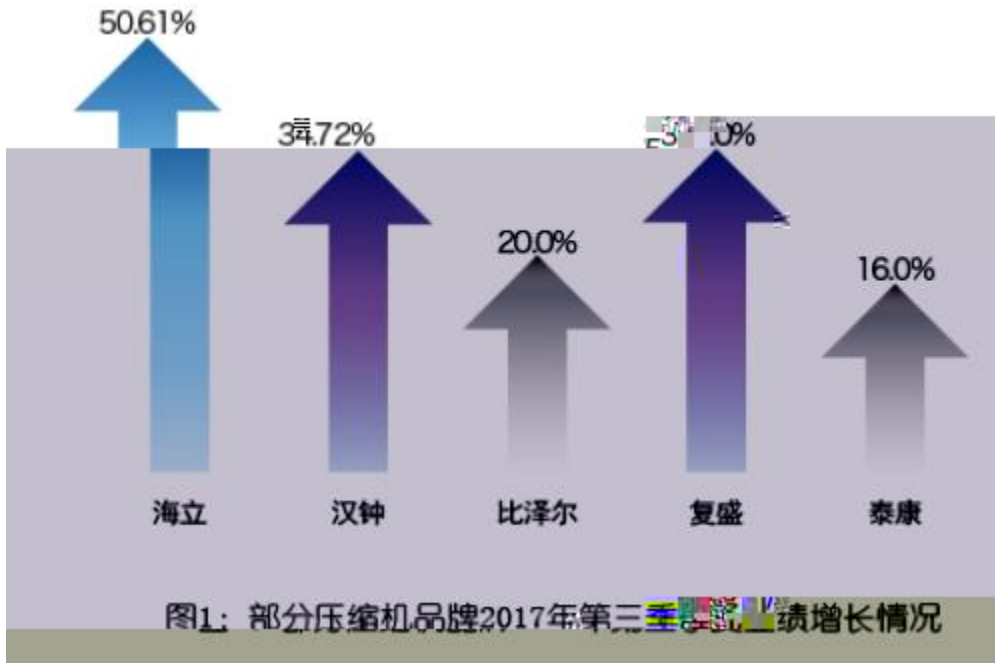
"

PPP

"

PPP

PPP



2017

2017

100%

2017

3-5

10-15

2018

80%

2017

3

9.5

34.72%

1.34

3.48%

2017

20%

2017

35%

2017

20%

2017

16%

2018

10%

2018

2018

2018

http://bao.hvacr.cn/201712_2074757.htmen-USht 90-USHtJET EMC /P AMCID 7B23 (en-US)BDC BT/F1 10.56 4m0 0

2018

TCL

2018

2018

“ ”

<http://news.ehvacr.com/news/2017/1219/103272.html>

Top

2015 7 1 DuPont Chemours ,
 85
 Chemours HFO-1234yf
 2010 6 3000 HFO-1234yf 2016 3
 6000 HFO-1234yf 6000 /
 2001 10
 ODS
 HFC-152a HFC-32
 HFC-227ea HCFC-22 HCFC-142b HFO-1234yf
 ()
 HFO-1234yf 10000 / 2018
 HFO-1234yf 2016
 4 7
 Solstice® yf
 2016
 3000 / 2017
 2014 10 12000 HFC-245fa
 1- -3,3,3- HCFO-1233zd LBA
 (HFC-245cb) HFO-1234yf

2- -3,3,3- (

HCFO-1233xf)

HFO-1234yf

HFO-1234yf

100 /

31 2016 12 7

3000

HFO-1234yf

GWP

GWP

HFO-1243zf,

HFO-1233xf, HFO-1233zd, HFO-1234yf, HFO-1234ze,

HFO-1234yf

HFO-1234yf

2017 1 1

150

HFO-1234yf

R134a

2021

<http://news.ehvacr.com/news/2017/1228/103358.html>

Top

6

2018

1

500

13

6500

2019

5

500

2020

30

3000

“ ”

<http://news.ehvacr.com/news/2017/1227/103348.html>

Top

7

70 80

" " " "

" "

“ ”

10

<http://hp.hvacrhome.com/news/show.php?itemid=21251> Top

9

320

2017

337

7

320

143

4

210

112

1

36

5

4

2020

16

<http://news.ehvacr.com/news/2017/1120/103013.html> Top

10

2021

70%

10

2021

70%

“ ”

2017

4.4

“ ”

“2 26”

4.4

10

“ ”

“2013-2015

PM2.5

1.3

6

”

2017

3-11 PM2.5

8-10 PM2.5 2013

50%

PM2.5

“ ”

10

20%

10

50%

300

12 1

9400

“ ”

11 28

3

2019

20

2017

“

”

2017 5

“ ”

1.29

“ ” 19.4

86

283

75

14.2

<http://hp.hvacrhome.com/news/show.php?itemid=21515> Top

12

2017

“ ”

2016

2017

2017

2017

2016

2017

2016

/

2017

2016

2017

60L

2017

<http://hp.hvacrhome.com/news/show.php?itemid=21598> Top

13

11 18

2017

“

”

“

”

“ ”

“ ”

”“ ”

“ ”

<http://www.chinaiol.com/cold/r/1122/85189314.html> Top

14

2017

2017

4 21

8 24

10 13

		1-9	184.8
6.9%	GDP	14.5%	
	6.3	13.3%	8.6
		2017	4775 11937
	13.7%	CCLC	2017
	13.4	1.9	
			3C
			2017
()	2017		851.4 2017
		1650	
			2011 2016
1662.4		33.0% 2017	2045.6
		2016	225
29.3%			

2018

29

10000

CCLC

20

<http://news.ehvacr.com/news/2017/1220/103288.html> Top

15

2017

—2019

2019

50

“ ” “ ”

“ +”

“ + + ” ”

<http://news.ehvacr.com/news/2017/1220/103287.html> Top

16

12 15 “ ”

40%

<http://news.ehvacr.com/news/2017/1218/103267.html> Top

17

2017

2025

GDP

?

“ ”

“ ”

2008

7

62.5%

7

6.7%

6.7-6.8% “

”

		2017		75069	()
	100.5%		70320	2017	
2012		2017			
				3269	35.47%
	9625	50.96%	6		1706
53.83%					
					“
”					
“					”
				21%	
		12%		2.5%	
104203	4.6%	1-5	0.5		79%

!

<http://www.cm188.com/news/22368.html>

Top

2025

2017

2017

"

"

№ 0-АНФ 1 0 0 1 80.664 657.94 Тm7 0 Тc [0D331E3D] Т.

№ 0-АНФ 1 0 0 1 80.664 657.94 Тm7 0 Тc [0D331E3D] Т.

2

3

4

5

21

VPS

Medicoat

VPS

VPS

19,000

VPS

Busch

2020

23

5

2017	"	"	53GW	2016	53 6
5		2017		130GW	3
			2011		
	5				
2017					2017
				2017	
53GW	2016	53 6		"	"
		1 24	2017		"
		"	"	"	2016
		2017			0 15
0 13	0 13				
	2017				19 44GW
		2016	3 7		36
			45 7		
	14 67GW	1 7	27 7		10 64GW
70	20		6 22 GW	36	
			2017		102GW
37	2017				

" 2017 2018 "

2017 " "

2017

4 Suniva 5

Solarworld SunPower

2500

IPO

"

" "

2011

" 2011 2012

<http://solar.ofweek.com/2018-01/ART-260006-8440-30193552.html> Top

24

2016 26.2%

2025

"12" (12)

“ ”

3

2020

10

2019

14

1400

300

http://www.semi.org.cn/news/news_show.aspx?ID=51698&classid=117 Top

25

SEMI 2018-2021 1000
60-80%
2000
17%
5G
A

http://www.semi.org.cn/news/news_show.aspx?ID=51690&classid=117 Top

26

1

JX/Nikko Praxair/MRC Honeywell Electronic

Materials Tosoh SMD

Plansee

H.C. Starck

Hitach metal

Sumitomo

ITO

TFT-LCD

ITO

600t

2025 50

"

"

2019

HIS Market

8

LG

SDI

<http://libattery.ofweek.com/2017-12/ART-36001-8420-30182013.html> Top

28

() ,

"

"

,

GB/T

31485-2015

GB/T 31467.3-2015

3 :

,

,

,

,

:

1

序号	试验项目	适用范围	试验方法章条号
1	过放电	锂离子电池单体	8.1.2
2	过充电	锂离子电池单体	8.1.3
3	短路	锂离子电池单体	8.1.4
4	加热	锂离子电池单体	8.1.5
5	温度循环	锂离子电池单体	8.1.6
6	挤压	锂离子电池单体	8.1.7

2

序号	试验项目	适用范围	试验方法章条号
1	振动	锂离子电池包或系统	8.2.1.1
2	振动	锂离子电池包或系统的电子装置	8.2.1.2
3	机械冲击	锂离子电池包或系统	8.2.2
4	模拟碰撞	锂离子电池包或系统	8.2.3
5	挤压	锂离子电池包或系统	8.2.4
6	湿热循环	锂离子电池包或系统	8.2.5
7	浸水安全	锂离子电池包或系统	8.2.6
8	热稳定性之外部火烧	锂离子电池包或系统	8.2.7.1
9	热稳定性之热扩散	整车或锂离子电池包或系统	8.2.7.2
10	温度冲击	锂离子电池包或系统	8.2.8
11	温度	锂离子电池包或系统	8.2.9
12	高海拔	锂离子电池包或系统	8.2.10
13	过流保护	锂离子电池包或系统	8.2.11
14	过温保护	锂离子电池包或系统	8.2.12

GB/T 31485 GB/T 31467.3

:

;

:

;

3

3

3 10

IEA

" " " "

"

"

2030

1000

1500

50

" "

"

"

" "

2007 100 Equinox

80

"

"

2050

55

"

"

"

"

2017 10 20

"

"

2017

"

"

2017 3

2017 12

2017 12

2017

2017

---"

"

"

" 863 "

"

2018 1

"

"

ASTM

“ ”

2017

2017 12

—

80%

3-5

“ ”

“ ” 500 ”

2015

2015

4

5

3

100

“

”

2016

2020

2025

2030

<http://china-hydrogen.org/hydrogen/mix/2017-11-23/6953.html>

Top

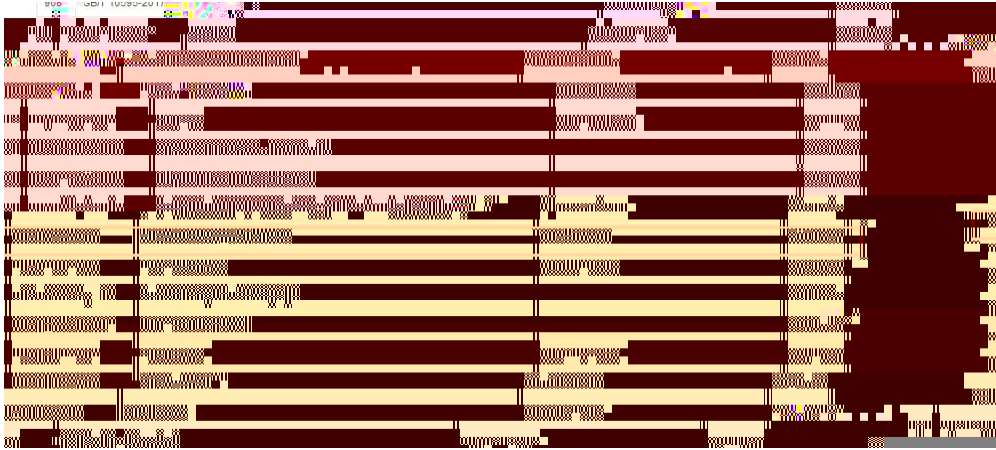
1

GB/T 9237—2017

“GB/T 9237—2017”

2017 12 29

2018 7 1



ISO 5149:2014

GB/T 9237—2017

GB/T 9237—2017

GB 9237—2001

ISO

5149:2014

(Refrigerating systems and heat pumps—safety and

environmental requirements)

GB/T 9237—2017

HCFCs

HCFCs

HCFCs

<http://cac.chinaiol.com/s/0103/70190947.html>

Top

2

2017

!

!

!

“ ”

2017

2017

4 21

(29)

8 24

10 13

;

1-9

184.8

6.9%

GDP

14.5%

6.3

13.3%

8.6

2017 4775 11937

13.7% CCLC 2017

13.4 1.9

3C

4

270 160 ; 11 11 1

1 220% (2017

() 2017 851.4

2017 1650 ()

2011 2016 1662.4

33.0% 2017 2045.6

2016 225 29.3%

4

;7

“ ”

11 20

28.8

36.16%

29

446

2018

29

() 2017 11 30

“ ”

!

!

<http://www.lenglian.org.cn/news/2017/26040.html> Top

3

” ”

1959

TH16—59 TH17

—59 TH18—59

1959

4L—20/8 3L—10/8 5L—40/8 6L—60/8 7L—

" "

" "

3m³ /min

1.0MPa

30~40

1

“ ”

表2 微型空压机技术经济指标比较

序号	型号	容积量 (m ³ /min)	排气 压力 MPa	压缩 级数	冷却 方式	转速 (r/min)	轴功率 (kW)	主机 净重 (kg)	比功率 (kW/m ³ ·min ⁻¹)	主机比重 (kg/m ³ ·min ⁻¹)	润滑油 消耗量 (g/h)	备注
1	Z-0.025/7	0.025	0.7	1	风冷	1,370	0.61	6	15.2	150	5	实测值, 比功率为Z-0.025/6的18.8%
2	Z-0.025/6	0.025	0.6	1	风冷	700	0.20	20	20	200	5	实测值
3	1S1-526	0.05	1.0	1	风冷	950	0.45	13	9.0	260	5	民德国标TGL-1153
4	Z-0.15/7	0.154	0.7	1	风冷	1,460	1.282	18	8.32	107	4	实测值, 比功率为T102的33.1%
5	T102	0.12	0.8	1	风冷	610	1.0	42	8.33	323	11	实测值

9m³/min

5.15

1.5



表5 上海汉钟精机股份有限公司生产的系列压缩机

Model	Capacity (m³/min)	Displacement (mm)	Efficiency (%)	Notes
2VY-4.5/7	3	112	80	
2VY-6/7	3	112	60	
2V-4.5/7	3	90		
2V-6/7	3	11		
2VY-6/7	3			
2V-6/7	3			
2VY-6/7	3			

2VY—6/7

6m³/min W 6

370kg

600kg

38.4%

56%

4

表4 2VY-6/7型与被取代的老产品技术经济指标比较

序号	型号	主机结构	冷却方式	额定容积流量(m ³ /min)	额定排气压力(MPa)	额定转速(r/min)	行程(mm)	气缸数×缸径(mm)		比功率(带用户)(kW/m ³ ·min ⁻¹)
								一级	二级	
1	2VY-6/7	V型, 2缸	风冷	6	0.7	1,500	112	1×240	1×140	约6.5
2	2W-6/7	W型6缸	风冷	6	0.7	1,225	102	4×140	2×115	

2VY—6/7

10

20 40 90m³/min

20m³/min

10m³/min

20m³/min

" "

10m³/min

TH16—59

3 6 10 20 40 60 100m³/min

20m³/min

4L—20/8

TH16—59

L

5L—40/8 6L—60/8

7L—100/8

—

表 5 动力用固定式水冷L型空压机系列参数

空气压缩机型号	L2-10/8	L3.5-20/8	L5.5-40/8	L8-60/8	L12-100/8
活塞力 (kN)	20	3.5	5.5	80	120
额定排气压力 (MPa)	0.8	0.8	0.8	0.8	0.8
额定排气量 (m ³ /min)	10	20	40	60	100

L

GB762—65

" "

5

L

L

L

" "

L

L

L8—60/8

L2—10/8

4.663kW/m

³. min-1

0.8MPa

L3.5—20/8

500

L3.5—20/8

3L—10/8

3L—10/8

500

L3.5—20/8

4L—20/8

2.2t

2.6t

400kg

4L—20/8

650kg

L3.5—20/8

—

—

210kg

L3.5—20/8

4L—20/8

840kg

4L—20/8

L3.5—20/8

L3.5—20/8

4L—20/8

L5.5—40/8

500

“ ”

2017 6 5

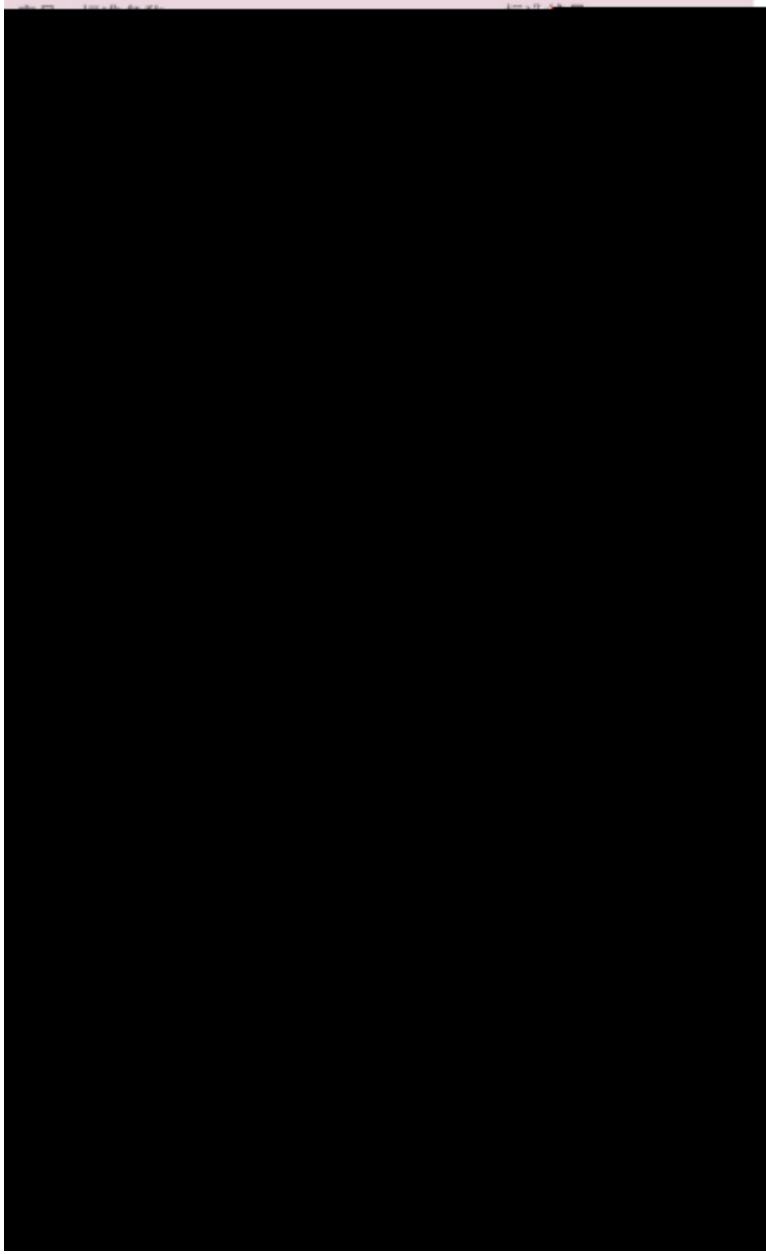
99

25

74

7

8



1.

2. " "

3.

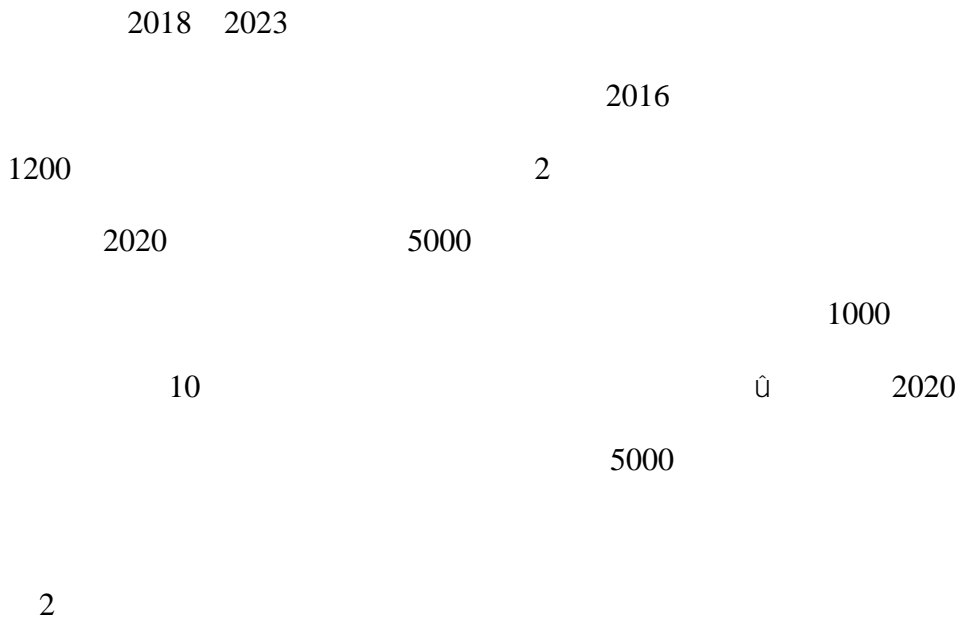
" " " " " "

" "

4.

" "

1



2

" ' ' "

2016		6710
1032	9	

2016

1224 8 2015 104 9

634 1 2 3

665 2016 66

4 2012 2017 GW



2020 5700

2 1000

100 600 400 200

2018

1-2

2017 3 20

GB50046

2017 4 17

8

2017 12 12

18

" "

2017 7 28

30kW

55%

10000h

3

-

1

2

50kW

-30

10000h

1000h

0-50km/h

20

15% 12

7.5kg/100km

400km

SOC

10%

" "

5

1

UNDP

2

100

2

5000h

1500h

40000km

5000km

3

UNDP

100

"

"

100

10

400

100

70MPa

1

10

2017 11 29

MCI 10

Gianni Parlanti

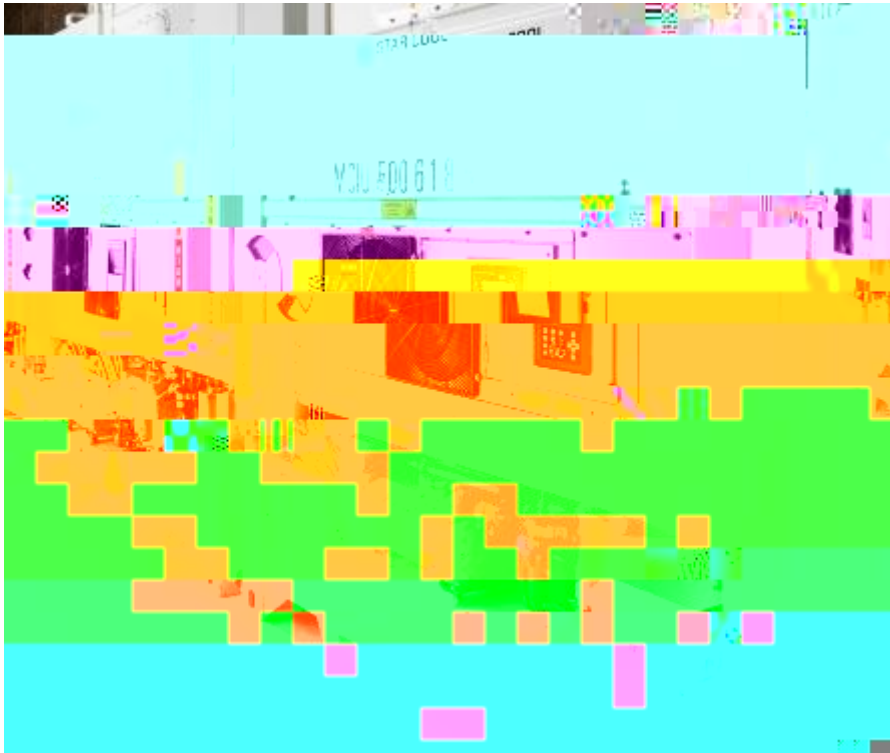
Lars Heineke

Star Cool™

Star Cool™

Lodam

Star Cool



25

15

Star Cool™

40



Star Cool™

Oliver Rathfelder

“Star Cool

”

“ 10

——

”

Gianni Parlanti

“

Star Cool™

Star Cool™

”

Soren Leth Johannsen

2016

3400

6.8

www.bitzer.cn

MCI

MCI

Star Cool™

Star Cool Integrated™

CA

5000

"

!

GMV Star

GMV

GMV Star

GMV

" "

2013

" "

G-IEMS

" G-IEMS

" 2017

(G-IEMS

Leo Lorenz

4 2017

11 16 —2017 () ()
“ ”)

600

“ ” 5

“2017 () ”

“ ”

()

126312

7/15

6000RT

5

1~5

MC

20-600RT

20Hz-80Hz

:

IPLV

7.8

99%

R134a

ODP

0

<http://cac.chinaiol.com/r/1219/94190402.html> Top

7

5

7

WPS

90

&

MDM

AAF

<http://cac.chinaiol.com/r/1227/40190744.html> Top

8

“ ” ,

PSS

2-4

PSS

40%

PSS

01

1

2

3

4

02

1

5.7

2

3

4

ZL201120203857.5

03

1

ABS

2

(ZL201 1 201 1 7549 O)

3

<http://cac.chinaiol.com/r/1128/07189483.html> Top

9

11 2

N4 M44

"

"

"

"

2.0

EH

8

150kg

500kg

2017

"

"

14

JAGUAR

IE4

50%

6-Sigma TPM

TQM

QC

ISO9001

ISO14001

IE3

IE4

50

IE4

ZLS-Hi

ZLS-2i

15

51%

51%

51%

3:3

2018 01 01

22

45

56

"

"

<http://www.compressor.cn/News/hykx/2018/0101/101809.html> Top

16

12 11

()

1979

2013

3.3

7550

(LIP)

LIP-

(Asslar)2017 12 7 2017 9 9

(LIP)

(Asslar)

LIP

1968

(CAST)

LIP

LIP

2017 10 17 LIP-

LIP

"

2025"

" 4.0"

"

"

Vic Chen

<http://zixun.ibicn.com/d1332486.html> Top

19

"

"

—

TwisTorr

704FS

TwisTorr 704FS

" "

TwisTorr 704 FS

0.0001Pa 0.00001Pa

0.00000001Pa

GC/MS LC/MS ICP/MS TOF...

SEM TEM

FIB

"

" " " "

TwisTorr

" " N 1 176.69 3A

TwisTorr 704 FS

" " No.4 " 3D"

2D

704FS

3D

704FS

804FS

404FS

84FS

304FS

<http://zixun.ibicn.com/d1335498.html> Top

20

CCTV 1

" "

VRD

<http://zixun.ibicn.com/d1335002.html> Top

21 Busch

Busch

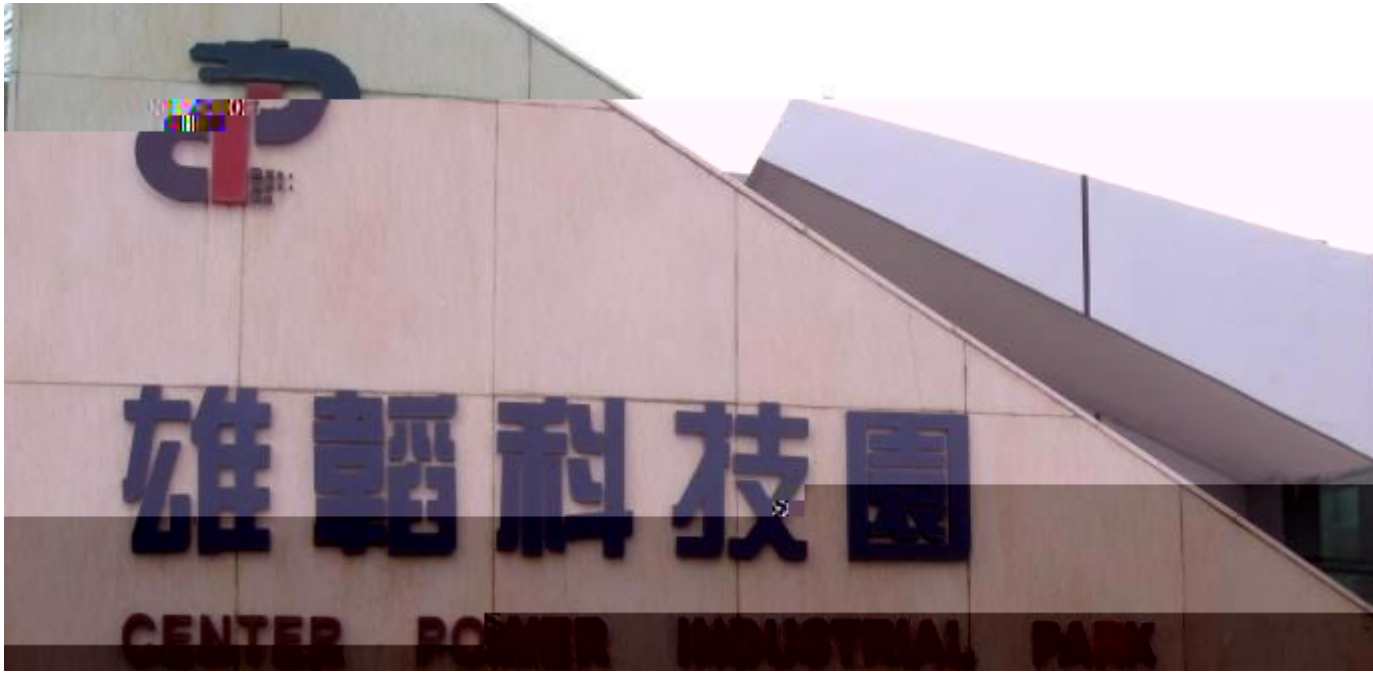
Mink MA 0018 A WR 0070

Busch

Busch

info@busch-china.com

<http://www.chinesevacuum.com/portal.php?mod=view&aid=50> T



3 5 150 15
3000 5000 2
2018 1 4 2018
10
20 1 5

<http://libattery.ofweek.com/2018-01/ART-36007-8460-30186675.html> Top

23

2017 12 21

2018 6

" "

..... 2050

" "

"

"

30 60

80

5

10

1 2

100

" 2018

1 : , ---

2017-11-01

, 2015 ,2017 1~3Q

9.5 / +34.72%, 1.34 / +3.48%; 0.252

3.9 / +45.23%, +15.68%; 5111 / +6.34%,

-12% , 2017 1~3Q 32.54%, 2016

3.75 , 30.55%, 5.61 , 3.27

,

2017 1~3Q 16.72%, 2016 ,

11.68%, 0.68 ; 5.46%, 0.23 ,

2016 ,

, ;2017 ,

, 40 , 500 ,

, 2016 ,2017

,

, 2016 ,

,

“ ” ,

2017~2019 1.66 2.14 2.83 ,EPS 0.31 0.4 0.53 ,PE 45 35 26

2016~2018
 1.67 1.913 2.071 , 2017~2019 2.06
 2.37 3.34 ,PE 36.5 31.7 22.5 , PE
 35~40 , 2018 35~40 PE,
 15.7~17.9 / ,

<http://stock.qq.com/a/20171101/030187.htm> Top

2

2017-11-01

(002158)

2017 3Q 9.51 34.72% 1.34
 3.84% 0.25 /

,

1

17 3Q 9.51 34.72% 2637
 120.77% 14 Q3 3.92 45.23%
 17Q1-2 33% 25%

2

3Q

1.34

3

2017-11-06

(2017—2020)

2020	3	2020
2260	1696	

<http://www.compressor.cn/News/scdt/2017/1107/100558.html>

Top

5

2017-11-06

1

2

3

4

5

6

7

8

80% Top

6

2017-11-08

2017

2017

1998

2000

2005

12

,

“ ” “Hanbell”

CO2

1

2

http://bao.hvacr.cn/201711_2073932.html?from=timeline Top

7

"

"

2017-11.04 Tf1 0 0 1 392.62 382.251F/MCID4/P /MCID 30/Lang (en-US)MCI3(-)-249(-)-249(-)-249(-)-

16 " " 8 "

" 8 "

"

<http://www.compressor.cn/News/qyzc/2017/1113/100661.html> Top

2017-11-20

2017 11 17 13 50 002158 5.05%

e{ 7.09%

2017-11-16 54994.01 3923.64

25.19 2.1

2017 9 30 9.51 1.34

0.25 63.08

2 1

" 22.22%

2 1 1 50.00%

50.00%

2.26%

10.0% 10.0% 10.0%

37.5% 33.5% 28.3%

					10
		23.3%		24.5%	1-9
2.6					
					PPP
				10	10541
81%		80%			17Q3
6.4	17Q2	55%		311	
31.4		15%			
					3 3500
“ ”			95%		
					2020
	7000		2015	2.5	2600
“ ”					500
12					
11		-5.32%		-5.49%	300 -0.02%

Top

13 :

2017-12-06

1

6

2716.49

20

002645

002009

AR

			5.94		3303.68		159.79
	10854.76		39.18		1758.59		
	4825						
			50				
							50
	0.18%	2435		1.45%	2392		
2.18%		14	23				
	K						50
8-9			5 10				

2 601318

3 002302

3-5

5

333

14.8

IDC

100%

5%

1

57

2.156%

2%

5%

62.5

Top

14

|

VS

2017-12-12

"

"



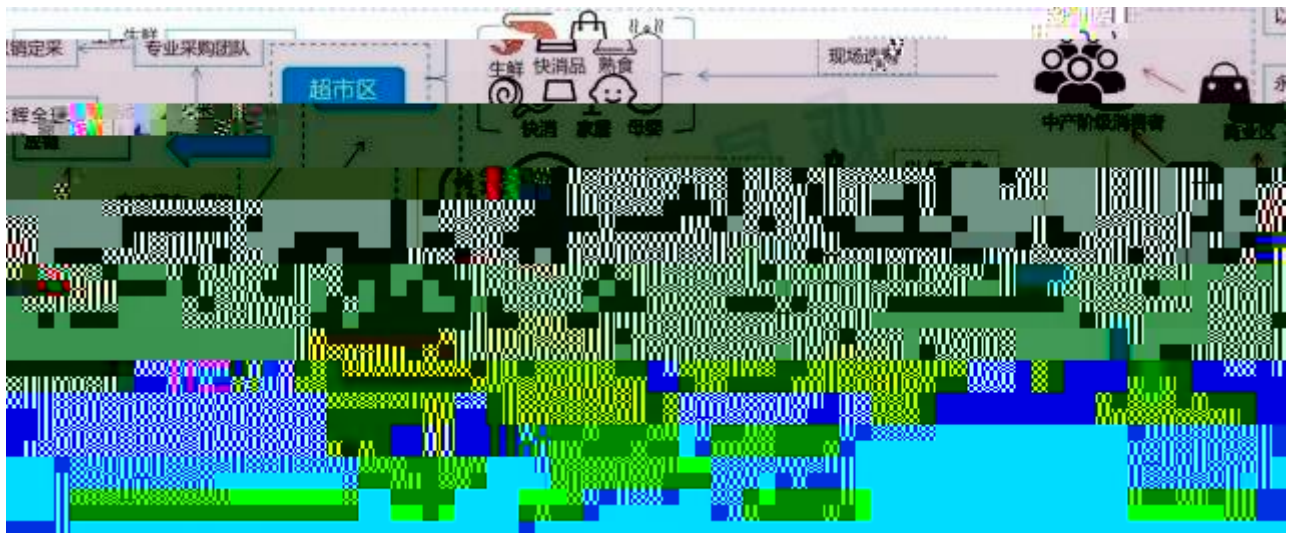
..... Top

16

2017-12-15

1

" "



— —

" "

0.07

0.36

0.33

1/11

" "

2010

4.2

2016

913.9

2015

80% 2017

1500

2016 3.36
 6762 20% 10 8.07%



PEG

PE

$28.58/31.42=0.9$

7000 80 100

650 1200

1 5

1	002011			4.0
2	000404		--	--
3	300263			OLED

4 300217

13.69% Top

19

100

2017-12-26

12 22

2016

2017

2017

100

130

170

2017

2017

TOP3

2017

47%

42%

88%

669%

2017

“ ”

“ ”

2018

;

;

12 22 2018

10

“ ”

“ ”

“ ”?

2018

10% COP

6.0

9

CO2

90

-25

5%

80%

-35

