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

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						2017	
		2015		5000			25%
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"	"		<b>17</b>				
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						2017	
				2016			
	4.5	"	"			17	
					8.6	2016	
	1.15		20%				
	2030			3	4		
				"	"	10	20
							" "

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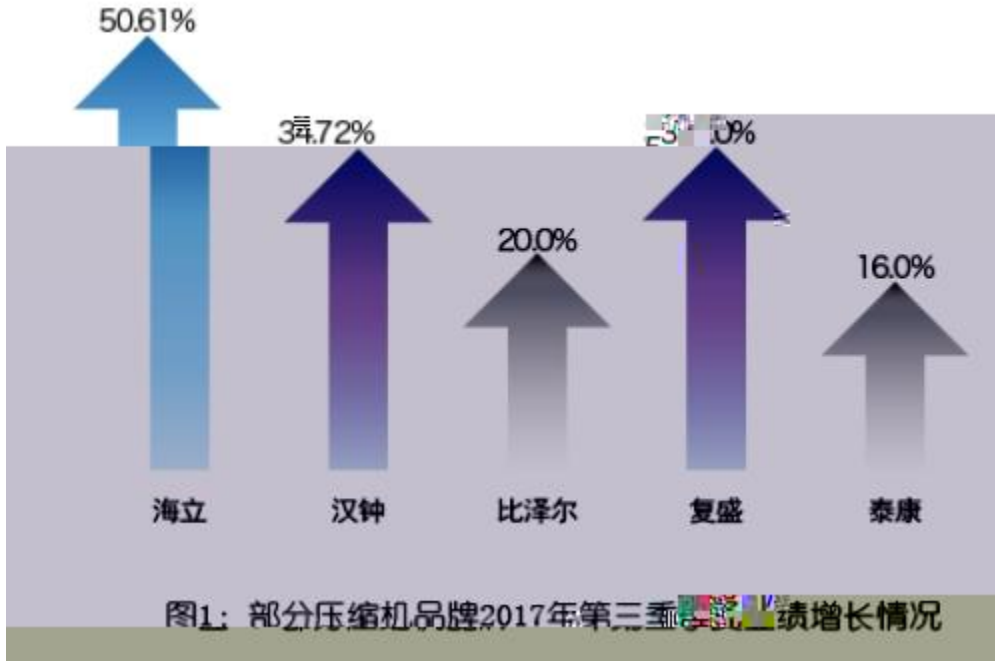
"

PPP

PPP

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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



2018

TCL

2018

2018

“ ”

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

Top

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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

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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

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500

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6500

2019

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

Top

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70 80

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

9

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2017

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320

143

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210

112

1

36

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2020

16

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

10

2021

70%

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2021

70%



“ ”

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“2 26”

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8-10 PM2.5 2013

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283

75

14.2

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

12

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

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

14

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4 21

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		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%			

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29

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CCLC

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

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2019

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<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

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2008

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62.5%

7

6.7%

6.7-6.8% “

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	100.5%		70320	2017	
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				3269	35.47%
	9625	50.96%	6		1706
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					“
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				21%	
		12%		2.5%	
104203	4.6%	1-5	0.5		79%

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

Top





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0 13 0 13

2017 19 44GW

2016 3 7 36

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14 67GW 1 7 27 7 10 64GW

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2017 102GW

37 2017

" 2017 2018 "

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2017

4 Suniva 5

Solarworld SunPower

2500

IPO

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2011

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

24

2016 26.2%

2025

"12" ( 12 )

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2019

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[http://www.semi.org.cn/news/news\\_show.aspx?ID=51698&classid=117](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](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

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2019

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SDI

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

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31485-2015

GB/T 31467.3-2015

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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	盐雾	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	过温保护	锂离子电池系统	8.2.11
14	过流保护	锂离子电池系统	8.2.12
15	外部短路保护	锂离子电池系统	8.2.13
16	过充电保护	锂离子电池系统	8.2.14

GB/T 31485 GB/T 31467.3

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80%

3-5

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2015

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100

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2016

2020

2025

2030

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

Top

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GB/T 9237—2017

“GB/T 9237—2017”

2017 12 29

2018 7 1

REV	GB/T 16484-2017	GB/T 16484-2017	2018-07-01	971	GI
10035-001	气液分离器	GB/T 10335.1-2008	2018-07-01		
GB/T 8871-2017	制冷剂	GB/T 10335.2-2008	2018-07-01		972
GB/T 8871-2017	制冷剂	GB/T 16971-2014	2018-08-01		973
GB/T 8254-2017	压缩机		2018-07-01		974
GB/T 8254-2017	压缩机		2018-07-01		975
GB/T 8254-2017	压缩机		2018-07-01		976
GB/T 8254-2017	压缩机		2018-07-01		977
GB/T 8254-2017	压缩机		2018-07-01		978
GB/T 8254-2017	压缩机		2018-07-01		979
GB/T 8254-2017	压缩机		2018-07-01		980
GB/T 8254-2017	压缩机		2018-07-01		981
GB/T 8254-2017	压缩机		2018-07-01		982

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

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2017

4 21

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8 24

10 13

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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%

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28.8

36.16%

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446

2018

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

3

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1959

TH16—59 TH17

—59 TH18—59

1959

4L—20/8 3L—10/8 5L—40/8 6L—60/8 7L—

" "

" "

3m<sup>3</sup> /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 <sup>3</sup> /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 <sup>3</sup> ·min <sup>-1</sup> )	主机比重 (kg/m <sup>3</sup> ·min <sup>-1</sup> )	润滑油 消耗量 (g/h)	备注		
中国	系列产品	1	Z-0.03/7	0.04	0.7	1	风冷	1,370	0.61	6	15.2	150	5	实测值, 比重量为 Z-0.0256的18.8%
中国	被取代产品	2	Z-0.0256	0.0256	0.6	1	风冷	700	0.87	20	12.5	800	5	实测值
德国	系列产品	3	T102	0.154	0.7	1	风冷	1,460	1.282	18	8.32	107	4	民德国标TGL-11534值 实测值, 比重量为 T102的33.1%
中国	被取代产品	5	T102	0.12	0.8	1	风冷	610	1.0	42	8.33	323	11	实测值

9m<sup>3</sup>/min

5.15

1.5

3



“ ”

80% 60%

90mm

11mm

112mm

2VY-4.5/7

2VY-6/7

—

2V-4.5/7 2V-

6/7

2V-4.5/7

3m<sup>3</sup>/min

2VY-6/7

2VY-6/7

— 2V-6/7

2VY-6/7

2VY—6/7

6m<sup>3</sup>/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 <sup>3</sup> /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 <sup>3</sup> ·min <sup>-1</sup> )
								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 90m<sup>3</sup>/min

20m<sup>3</sup>/min

10m<sup>3</sup>/min

20m<sup>3</sup>/min

" "

10m<sup>3</sup>/min

TH16—59

3 6 10 20 40 60 100m<sup>3</sup>/min

20m<sup>3</sup>/min

4L—20/8

TH16—59

L

5L—40/8 6L—60/8

7L—100/8

表 5 电动机用固定式水冷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 <sup>3</sup> /min)	10	20	40	60	100

L

GB762—65

" "

5

L

L

L

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L

L

L8—60/8

L2—10/8

4.663kW/m

<sup>3</sup>. 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. " "

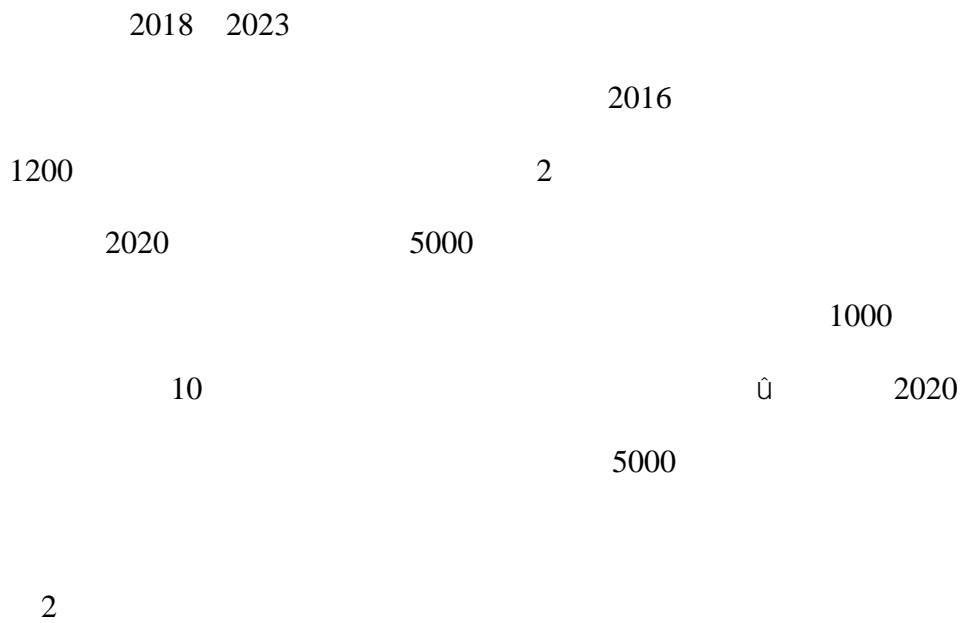
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2016			6710
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 1224 8 2015 104 9  
 634 1 2 3  
 665 2016 66  
 4 2012 2017 GW



2020 5700  
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 100 600 400 200



2018

1-2

2017 3 20

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18

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2017 7 28







30kW

55%

10000h

3

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1

2

50kW

-30

10000h

1000h

0-50km/h

20

15% 12

7.5kg/100km

400km

SOC 10%

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" "

5

1

UNDP

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5000h

1500h

40000km

5000km

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UNDP

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400

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70MPa

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2017 11 29

MCI 10

Gianni Parlanti

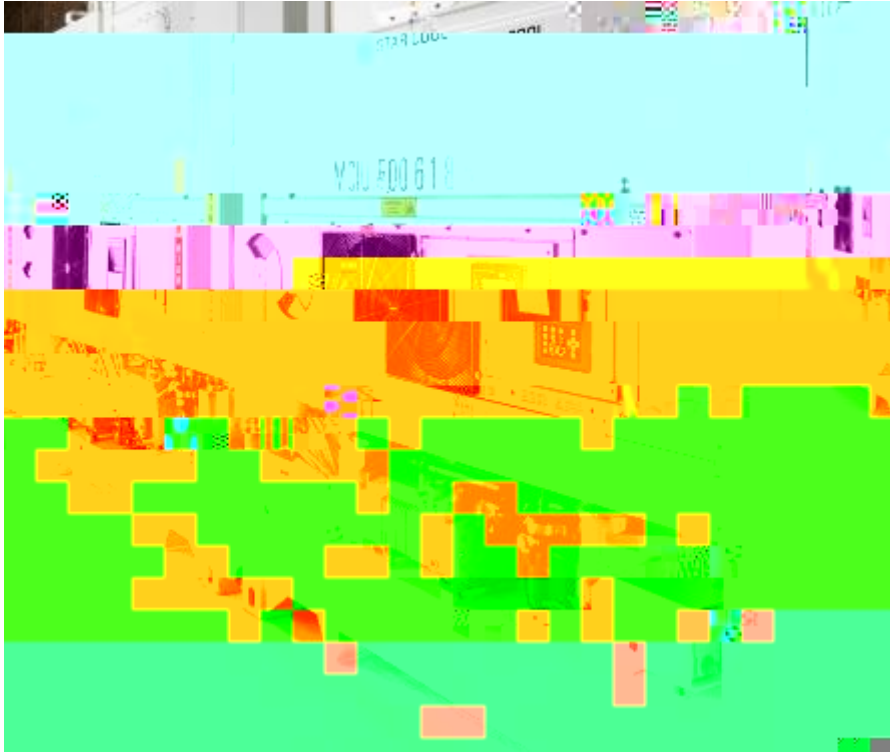
Lars Heineke

Star Cool™

Star Cool™

Lodam

Star Cool



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Star Cool™

40



Star Cool™

Oliver Rathfelder

“Star Cool

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Gianni Parlanti

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Star Cool™

Star Cool™

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Soren Leth Johannsen

2016

3400

6.8

[www.bitzer.cn](http://www.bitzer.cn)

MCI

MCI

Star Cool™

Star Cool Integrated™

CA

5000



GMV Star

GMV

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MC



20-600RT

20Hz-80Hz

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IPLV

7.8

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R134a

ODP

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

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MDM

AAF

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PSS

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PSS

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PSS

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N4 M44

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2.0

EH



8

150kg

500kg

2017

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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

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

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12 11

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2013

3.3

7550



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LIP-

(Asslar)2017 12 7 2017 9 9

(LIP)

(Asslar)

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(CAST)

LIP

LIP

2017 10 17 LIP-

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2025"

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Vic Chen

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

19

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TwisTorr

704FS

TwisTorr 704FS

" "

TwisTorr 704 FS

0.0001Pa 0.00001Pa

0.00000001Pa

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

SEM TEM

FIB

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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](mailto:info@busch-china.com)

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



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2017 12 21

2018 6

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, 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

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 2017 1~3Q 16.72%, 2016 ,  
 11.68%, 0.68 ; 5.46%, 0.23 ,

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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%

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2017-11-06

(2017—2020 )

2020	3	2020
2260	1696	



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

Top

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2017

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[http://bao.hvacr.cn/201711\\_2073932.html?from=timeline](http://bao.hvacr.cn/201711_2073932.html?from=timeline) Top

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

16 " " 8 "

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<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

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10.0% 10.0% 10.0%

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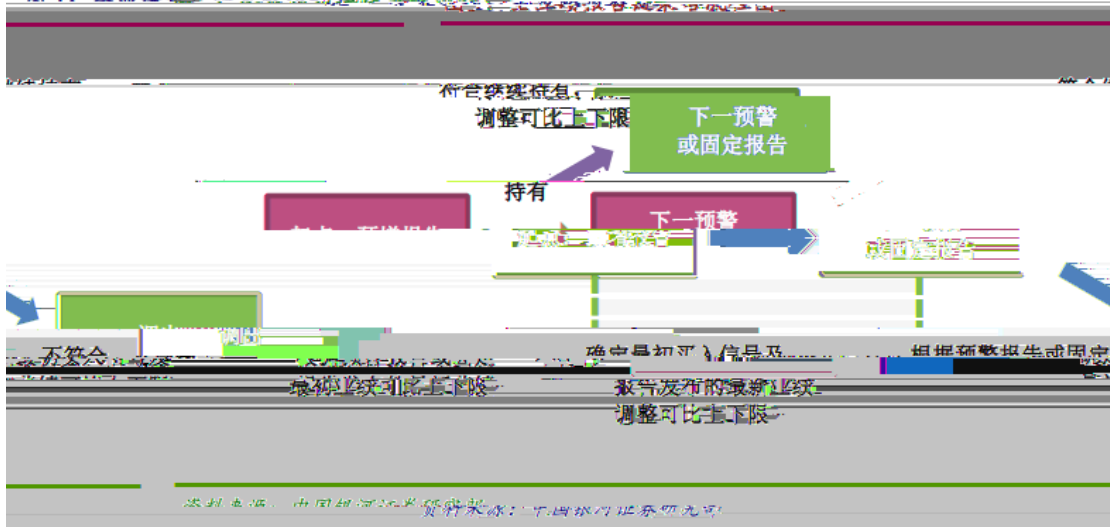
VS

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图 1. 企业级资产绩效管理流程图



-2.28%

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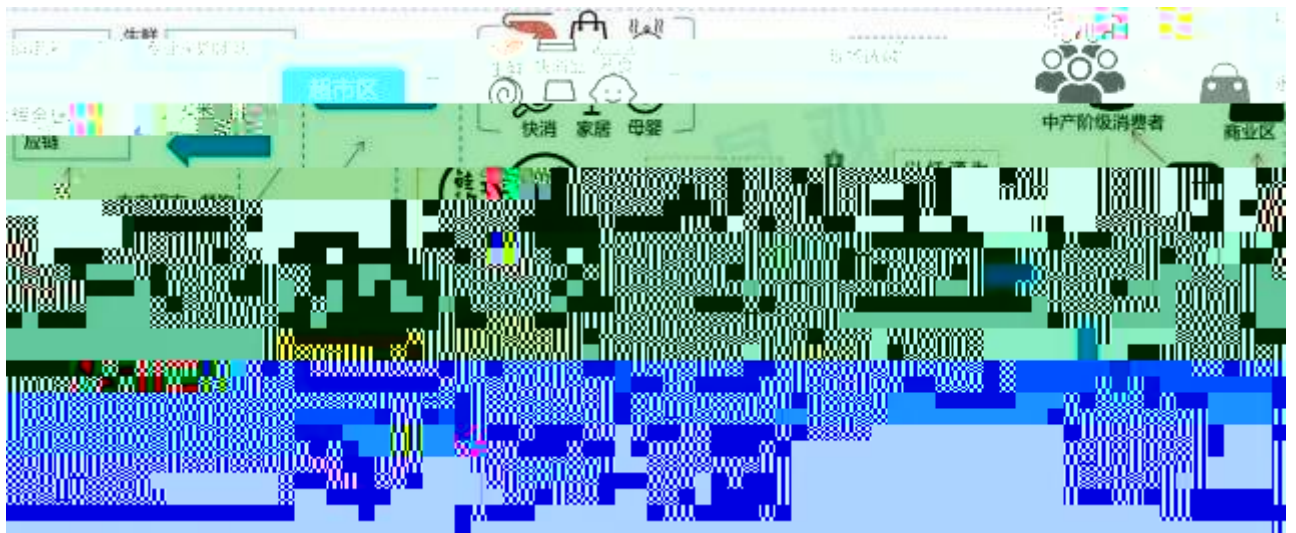
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