



Capacity Analysis Reporting

产能分析报告

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CJLR Site STA

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思考：

- 何时提交产能分析报告？
- 客户的产能要求是什么？
- 跨平台项目如何计算产能？
- 不同配置如何计算产能？

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Capacity Analysis Reporting

--程序文件介绍



- CJLR-PUR-PS-F008 产能分析报告V03
- CJLR-PUR-PS-F009 供应商标准班次偏差许可V2
- CJLR-PUR-PS-M010 产能分析流程用户手册V02
- CJLR-PUR-PS-P012 供应商标准班次偏差管理程序V02
- CJLR-PUR-PM-F002 产能和产量信息表 V1
- CJLR-PUR-PP-F009 产能规划调查表V3
- **CJLR-PUR-PM-W035 规划产能计算作业指导书** *To be Released*



产能分析报告V03



供应商标准班次偏
差许可



产能分析流程用
户手册



供应商标准班次偏
差管理程序V02

Capacity Analysis Reporting

--PPAP对产能分析的要求



何时提交产能分析报告

PA

Kick off

Off tool

Off process

Phase 0
R@R

TT MRD

PP MRD

JOB 1

Phase 1
SW

Phase 3
PSW

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初始产能分析
Initial capacity study

R@R产能分析
R@R capacity study

Phase 3产能分析
Phase 3 capacity study

产能规划，确认供应商规划的生产班次和生产节拍能够满足项目产能需求.

使用R@R的生产数据验证过程/模具/设施能够在规划的生产节拍下生产出合格零件

使用Phase 3的生产数据验证供应商能够满足CJLR每天最高产能需求.

Capacity Analysis Reporting

--明确客户产能要求--



- 按周CPV(Capacity Planning Volume) 规划产能 (JIS供应商按JPH规划产能)
- 周班次安排不超过120小时
- 共线产能负荷率小于90%

注：不符合以上3点要求的，按标准班次偏差管理。超出偏差
偏差许可，需获得SIT STA总监以及生产采购总监批准。

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Capacity Analysis Reporting

--明确客户产能要求--CPV



术语：

中文	英文	解释
规划产能	CPV	供应商为满足CJLR需求，需要达到的周产能
生产能力	Line rate	CJLR产线的周产能
配置比例	take rate	
单车用量	Usage	
浮动系数	Flex Factor	

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案例：

L551项目，生产线的周产能 (Line Rate) 为 938/周，A零件的单车用量 (Usage) 为1，A零件的配置比例 (Take rate) 为100%，浮动系数 (Flex Factor) 为1.1。则，供应商为满足CJLR产能，需要达到的周产能 (CPV) 为：

$$\text{Line rate} \times \text{Take rate} \times \text{Usage} \times \text{Flex} = \text{CPV}$$
$$938 \times 100\% \times 1 \times 1.1 = 1031/\text{周}$$

CPV的计算：

$$\text{CPV} = \text{Line Rate} \times \text{take rate} \times \text{Usage} \times \text{Flex}$$

Capacity Analysis Reporting

--明确客户产能要求--CPV



Key update: 获取Line Rate信息

Option 1, SRM系统，项目数据表中获取

Line Rate	938
-----------	-----

Option 2, 查询**CJLR-PUR-PM-002**产台和产量信息表 V1, 或咨询Site STA

Carline	T&F	Peak Weekly Line Rate - excluding flex	Shift	JPH
X540 18MY	2	561	1 shift/ Day (2018)	18
X540 20MY	2	730	1 shift/ Day (2018)	18
X540 21MY	2	782	1 shift/ Day (2018)	18
X540 Platform Combined Maximum (E)		782	1 shift/ Day (2018)	18
Carline	T&F			
L551 20MY	2	339	2 shifts/ Day	18
L551 EWB	2	938	2 shifts/ Day	18
L551 Platform Combined Maximum (F)		938	2 shifts/ Day	18
E+F Constrain		1440	2 shifts/ Day	18
T&F 2 Constrain		1440	2 shifts/ Day	18

- 零件仅供L551 20MY , line rate为339
- 零件供整个L551平台 , Line rate为938

Capacity Analysis Reporting

--明确客户产能要求--CPV



Key update: 不同的take rate对应不用的Flex Factor

产能和产量信息表中不同Take rate/Flex Factor对应表

% Take Rate of Build	Flex factor	% Take Rate of Build	Flex factor	% Take Rate of Build	Flex factor	% Take Rate of Build	Flex factor
0%	2.5	25%	1.38	51%	1.25	76%	1.19
<1%	2.5	26%	1.36	52%	1.25	77%	1.18
1%	2.5	27%	1.34	53%	1.25	78%	1.18
2%	2.5	28%	1.33	54%	1.25	79%	1.17
3%	2.5	29%	1.32	55%	1.25	80%	1.17
4%	2.5	30%	1.31	56%	1.25	81%	1.17
5%	2.2	31%	1.3	57%	1.25	82%	1.17
6%	2.1	32%	1.3	58%	1.25	83%	1.17
7%	2	33%	1.29	59%	1.25	84%	1.17
8%	1.9	34%	1.28	60%	1.25	85%	1.17
9%	1.8	35%	1.28	61%	1.24	86%	1.16
10%	1.77	36%	1.27	62%	1.24	87%	1.15
11%	1.74	37%	1.27	63%	1.23	88%	1.15
12%	1.7	38%	1.26	64%	1.23	89%	1.15
13%	1.66	39%	1.26	65%	1.23	90%	1.15
14%	1.63	40%	1.26	66%	1.22	91%	1.1
15%	1.6	41%	1.25	67%	1.22	92%	1.1
16%	1.57	42%	1.25	68%	1.21	93%	1.1
17%	1.55	43%	1.25	69%	1.21	94%	1.1
18%	1.53	44%	1.25	70%	1.21	95%	1.1
19%	1.51	45%	1.25	71%	1.2	96%	1.1
20%	1.49	46%	1.25	72%	1.2	97%	1.1
21%	1.46	47%	1.25	73%	1.2	98%	1.1
22%	1.44	48%	1.25	74%	1.2	99%	1.1
23%	1.42	49%	1.25	75%	1.2	100%	1.1
24%	1.4	50%	1.25				

案例：

L551项目，生产线的周产能（Line Rate）为938/周，A零件的单车用量（Usage）为1，A零件的配置比例（Take rate）为80%，浮动系数（Flex factor）为1.17。则，A零件为满足CJLR产能需求，达到的周产能（CPV）为：

$$\text{Line rate} \quad \text{Take rate} \quad \text{Usage} \quad \text{Flex} \quad \text{CPV}$$

$$938 \times 80\% \times 1 \times 1.17 = 878$$

Capacity Analysis Reporting

--明确客户产能要求--CPV



% Take Rate of Build	Flex factor	% Take Rate of Build	Flex factor	% Take Rate of Build	Flex factor	% Take Rate of Build	Flex factor
0%	2.5	25%	1.38	51%	1.25	76%	1.19
<1%	2.5	26%	1.36	52%	1.25	77%	1.18
1%	2.5	27%	1.34	53%	1.25	78%	1.18
2%	2.5	28%	1.33	54%	1.25	79%	1.17
3%	2.5	29%	1.32	55%	1.25	80%	1.17
4%	2.5	30%	1.31	56%	1.25	81%	1.17
5%	2.2	31%	1.3	57%	1.25	82%	1.17
6%	2.1	32%	1.3	58%	1.25	83%	1.17
7%	2	33%	1.29	59%	1.25	84%	1.17
8%	1.9	34%	1.28	60%	1.25	85%	1.17
9%	1.8	35%	1.28	61%	1.25	86%	1.17
10%	1.77	36%	1.27	62%	1.25	87%	1.17
11%	1.74	37%	1.27	63%	1.25	88%	1.15
12%	1.7	38%	1.26	64%	1.23	89%	1.15
13%	1.66	39%	1.26	65%	1.23	90%	1.15
14%	1.63	40%	1.26	66%	1.22	91%	1.1
15%	1.6	41%	1.25	67%	1.22	92%	1.1
16%	1.57	42%	1.25	68%	1.21	93%	1.1
17%	1.55	43%	1.25	69%	1.21	94%	1.1
18%	1.53	44%	1.25	70%	1.21	95%	1.1
19%	1.51	45%	1.25	71%	1.2	96%	1.1
20%	1.49	46%	1.25	72%	1.2	97%	1.1
21%	1.46	47%	1.25	73%	1.2	98%	1.1
22%	1.44	48%	1.25	74%	1.2	99%	1.1
23%	1.42	49%	1.25	75%	1.2	100%	1.1
24%	1.4	50%	1.25				

案例2：

L551项目，生产线的周产能 (Line Rate) 为938/周，A零件的单车用量 (Usage) 为1，A零件的高配比例为80%，低配比例为20%。则，A零件中高配部分涉及到的子零件CPV为：

$$938 \times 80\% \times 1 \times 1.17 = 878$$

A零件中低配部分涉及到的子零件CPV为：

$$938 \times 20\% \times 1 \times 1.49 = 280$$

A零件中高低配共用的子零件CPV为：

$$938 \times 100\% \times 1 \times 1.1 = 1031$$

Capacity Analysis Reporting

--明确客户产能要求--CPV



Key Point: 跨平台项目 (Cross Car Line) 的零件Line Rate如何确定?

	2018	2019	2020	2021	2022
车型A	35,603	39,720	38,000	20,000	
车型B	13,000	49,000	54,000	57,700	60,000
车型C		11,951	28,249	30,291	29,777
车型D			50,500	47,800	42,200
A+B+C+D	48,603	100,671	121,749	132,651	131,949
(A+B+C+D) /50	972	2,013	2,435	2,653	2,639

车型A Line Rate : 794

车型B Line rate : 1154

车型C Line rate : 603

车型D Line rate : 844

Cross car Line Rate : **2653**

- 新项目查询**产能和产量信息表**获得Line Rate
- 老项目Line Rate , 使用CJLR生产排产表 (Op Structure) 获取line Rate , 规则TBD.

Capacity Analysis Reporting

--明确客户产能要求—CPV(JIS供应商)



- JIS供应商按JPH规划产能
- 各车型JPH查询 **CJLR-PUR-PM-F002 产能和产量信息表 V1** 或咨询Site STA获得
- JPH为净JPH要求

Carline	T&F	Peak Weekly Line Rate - excluding flex	Shift	J
X540 18MY	2	561	1 shift/ Day	
X540 20MY	2	730	1 shift/ Day	18
X540 21MY	2	782	1 shifts/ Day (2018)	18
X540 Platform Combined Maximum (E)		782	1 shifts/ Day (2018)	18
Carline	T&F			
L551 20MY	2	339	2 shifts/ Day	18
L551 EWB	2	938	2 shifts/ Day	18
L551 Platform Combined Maximum (F)		938	2 shifts/ Day	18
E+F Constrain		1440	2 shifts/ Day	18
T+F 2 Constrain		1440	2 shifts/ Day	18

- A零件仅供L551车型， JPH要求18
- A零件同时供L551和X540零件， JPH要求18
 - A零件有多个配置，若共线生产， JPH要求18，若分线生产，每条线的 JPH要求均为18

Capacity Analysis Reporting

--明确客户产能要求—CPV



练习：

A零件分有高低配两个配置，Take Rate分别60%和40%，单车用量为2. 仅使用在L551 20MY上，则CPV分别为多少？

Carline	T&F	Peak Weekly Line Rate - excluding flex
X540 18MY	2	561
X540 20MY	2	700
X540 21MY	2	780
X540 Platform Combined Maximum (E)		782
Carline	T&F	
L551 20MY	2	339
L551 EWB	2	938
L551 Platform Combined Maximum (F)		938
E+F Constrain		1440
T&F 2 Constrain		1440

% Take Rate of Build	Flex factor	% Take Rate of Build	Flex factor	% Take Rate of Build	Flex factor	% Take Rate of Build	Flex factor
0%	2.5	1.38		51%	1.25	76%	1.19
<1%		1.36		52%	1.25	77%	1.18
1%		1.34		53%	1.25	78%	1.18
2%		1.33		54%	1.25	79%	1.17
3%		1.32		55%	1.25	80%	1.17
4%		1.31		56%	1.25	81%	1.17
5%	2.2	1.3		57%	1.25	82%	1.17
6%	2.1	1.3		58%	1.25	83%	1.17
7%	2	1.29		59%	1.25	84%	1.17
8%	1.9	1.28		60%	1.25	85%	1.17
9%	1.8	1.28		61%	1.24	86%	1.16
10%	1.77	1.27		62%	1.24	87%	1.15
11%	1.74	1.27		63%	1.23	88%	1.15
12%	1.7	1.26		64%	1.23	89%	1.15
13%	1.66	1.26		65%	1.23	90%	1.15
14%	1.63	1.26		66%	1.22	91%	1.1
15%	1.6	1.25		67%	1.22	92%	1.1
16%	1.57	1.25		68%	1.21	93%	1.1
17%	1.55	1.25		69%	1.21	94%	1.1
18%	1.53	1.25		70%	1.21	95%	1.1
19%	1.51	1.25		71%	1.2	96%	1.1
20%	1.49	1.25		72%	1.2	97%	1.1
21%	1.46	1.25		73%	1.2	98%	1.1
22%	1.44	1.25		74%	1.2	99%	1.1
23%	1.42	1.25		75%	1.2	100%	1.1
24%	1.4						
50%	1.25						

Capacity Analysis Reporting

--明确客户产能要求—CPV



练习:

A零件分有高低配两个配置，Take Rate分别60%和40%，单车用量为2. 仅使用在L551 20MY上，则CPV分别为多少？

$$CPV = \text{Line Rate} \times \text{take rate} \times \text{Usage} \times \text{Flex}$$

高配CPV= $\text{Line Rate} \times \text{take rate} \times \text{Usage} \times \text{Flex}$
= 339 \times 60% \times 2 \times 1.25
= **508**

低配CPV= $\text{Line Rate} \times \text{take rate} \times \text{Usage} \times \text{Flex}$
= 339 \times 40% \times 2 \times 1.26
= **342**

Capacity Analysis Reporting

--正确填写产能分析报告



产能分析报告填写指南，请参考 *CJLR-PUR-PS-M010 产能分析流程用户手册V02*

输入

CPV

班次规划
换模/维护/检验时间规划

规划的理想节拍

R@R实际生产数据

Phase3实际生产数据

输出

满足客户产能要求所
需的最低节拍

规划的理想节拍小于满
足客户产能高要求所需
的最低节拍，初始产能
规划不通过

1. 实际生产节拍
2. 高于或低于客户产能
要求百分比
3. 每周可交付零件数量
4. OEE

百分比是负数，产能报
告不通过

Capacity Analysis Reporting

--正确填写产能分析报告



Section 1 Key information

I. Key Information 关键信息:	
	A) Product 产品
	Supplier 供应商名称
	Site Location 生产厂区
	Vendor Code 供应商代码
	Date of Study 分析日期
	Part # / Name 件名/件号
	Vehicle Program 项目名称

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I. Key Information 关键信息:	
PD Engine Co, LTD	A) Product 产品
Shanghai	Supplier 供应商名称
SH001	Site Location 生产厂区
2015/3/6	Vendor Code 供应商代码
BJ3200001AF	Date of Study 分析日期
L538	Part # / Name 件名/件号
	Vehicle Program 项目名称

Capacity Analysis Reporting

--正确填写产能分析报告



Section I B Customer Production

B) Customer Production 客户生产信息

X Customer Demand / Week 客户周需求	<input type="text"/>
Y # of days works per week 客户周工作天数	<input type="text"/>
Z Daily Production Volume (DPV) 每天产量	<input type="text"/>

CJLR Version 1.2



B) Customer Production 客户生产信息

X Customer Demand / Week 客户周需求	946
Y # of days works per week 客户周工作天数	5
Z Daily Production Volume (DPV) 每天产量	189.2

CJLR Version 1.2

CPV

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Capacity Analysis Reporting

--正确填写产能分析报告



Section I C Customer Revision Record 产能履历记录

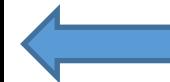
C) Capacity Revision Record (e.g. Run at Rate) 产量变更记录 (如节拍生产)		
Capacity 产量	Date 日期	Description 描述



C) Capacity Revision Record (e.g. Run at Rate) 产量变更记录 (如节拍生产)		
Capacity 产量	Date 日期	Description 描述
946	2015/3/6	Initial capacity study

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C) Capacity Revision Record (e.g. Run at Rate) 产量变更记录 (如节拍生产)		
Capacity 产量	Date 日期	Description 描述
946	2015/3/6	Initial capacity study
946	2015/9/10	R@R
946	2016/3/10	Phase 3
1200	2016/9/10	Capacity increase



C) Capacity Revision Record (e.g. Run at Rate) 产量变更记录 (如节拍生产)		
Capacity 产量	Date 日期	Description 描述
946	2015/3/6	Initial capacity study
946	2015/9/10	R@R

Capacity Analysis Reporting

--正确填写产能分析报告



II. Capacity Planning 产能计划

Operating pattern for the specific part 指定产品的操作模式:

Process description 过程描述

Dedicated or Shared process 专用或共用 (for shared process, show only the operating pattern for the specific part)

Process 工序 1	Process 工序 2	Process 工序 3
Casting	Machining	Assembly
SHARED	DEDICATED	DEDICATED

Cell : Process Description – Enter a brief description of the process / operation under study. **Normally key processes only (check process flow chart to ensure all key ops are covered)**

过程描述: 输入进行产能分析的过程/工序. 通常, 只对关键过程进行分析(评估过程流程图, 确认包含所有关键工序)

Cell : Dedicated or Shared process – Using the drop-down box indicate if process shared or dedicated to the part being analysed

专线还是共线: 从下拉框选择改工序是专线还是共线生产.

Dedicated processes

A “dedicated” process is one which is solely used for the manufacture of the part being analysed. An example would be a test station exclusively used on this part.

“专线”是指该过程/设备等是完全为该零件生产准备的，例如专用的检测工位

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Shared processes

A “Shared” facility is one which processes many different parts for multiple customers or part numbers and generally has more significant changeover times. It would be usual for such a process to manufacture parts in a batch production mode. Examples would be casting operation, injection moulding, heat treatment etc.

“共线”指在该过程/设备上, 还生产(其他客户)的其他零件, 因此该过程存在换模. 例如, 铸造, 注塑, 热处理等.

Capacity Analysis Reporting

--正确填写产能分析报告



Shared processes

If there's shared process, "Shared Production Line" analysis sheet must be complete. The objective of this exercise should be to confirm that the available capacity of the machine has not been oversold. We would typically expect to see the Total Machine Loading factor at below 90%.

如果是共线生产, 需要完成“共线生产”分析表. 目的是确认, 供应商产能没有超卖. 通常我们希望看到设备负荷小于90%

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--正确填写产能分析报告



List all parts for CJLR
列出所有共给奇瑞捷豹路虎的共线生产零件

Supplier / Process Information 供应商/过程信息	
Supplier Name 供应商名称	PD Engine Co. LTD
Site Location 工厂地址	Shanghai
Vendor Code 供应商代码	SH001
Process Description 过程描述	CASTING

Weekly Operating Pattern 生产模式							Capacity Revision Record 产能变更记录			
Mon.	Tue.	Wed.	Thur.	Fri.	Sat.	Sun.	Total Weekly Prod. Hrs	Date 日期	Description 描述	Machine Usage 设备利用率
2	2	2	2	2				6-Mar-2015	Initial capacity study	88.1%
12	12	12	12	12						
60	60	60	60	60						
22.0	22.0	22.0	22.0	22.0			110.0			

Part Information 零件信息		Part Requirements 零件需求			Changeover/Downtime 换型/停机		Operating Pattern of Specific Part 特定产品操作模式		Shared Equipment Measures 共用设备信息			
Part Description 零件名称	Part Number 零件号	Annual Production Volume (Units)	Production Weeks	Net Ideal Cycle Time (hrs)	Module Change-over (min)	Planned Maint. / Shift (min)	Other Downtime / Shift (min)	Days / Week	Shifts / Day	Personnel Breaks / Shift (minutes)	Available Time (hrs)	Required Prod. Hours / Week (based upon Net Ideal Cycle Time)
		A	B	C	D	E	F	G	H	I	J	K
L50 engine	BJ3200001AA	36	50	70	60	0.5	30	30	14	7.5	22.0	17.3
L50 engine	FJ3200001AA	55	50	78	60	0.5	30	30	12	60	15.0	29.6
Totals 总计		90									50.0	45.5%
												88.1%

NOTE: This form can be used to analyse machine usage for all products made (Chery Jaguar Land Rover products as well as other company's products).

备注：该表格可用于分析所用产品的设备利用率(包括奇瑞捷豹路虎及其他公司的产品)

Annual Production Volume = CPV × 50
年产量=规划产能×50

List hours allocated or Other customer
列出给其他客户的每周生产时间

Ensure machine usage does NOT EXCEED 90%
确保设备负荷率小于90%

Capacity Analysis Reporting

--正确填写产能分析报告



II. Capacity Planning 产能计划

Operating pattern for the specific part 指定产品的操作模式:

Process description 过程描述

Dedicated or Shared process 专用或共用(for shared process, show only the operating pattern for the specific part)

A Shifts/day 班次/天

B Total hours/shift 总小时数/班次

C1 Personal breaks 人员休息: lunch 午饭, breaks 休息 (minutes 分钟/shift 班次)

C2 Planned Maintenance 计划保养 (minutes 分钟/shift 班次)

D Days/week 工作天数/周

E Net available time (production hours/week)
[A*((B-((C1+C2)/60))*D] 净有效时间 (生产小时数/周)

	Process 工序 1	Process 工序 2	Process 工序 3
	Casting	Machining	Assembly
SHARED	▼	DEDICATED	DEDICATED
2	2	2	2
12	12	12	12
60	60	60	60
30	30	30	30
1	2	2	2
0	0	0	42.0

Cell (A) : Shifts per day

每天生产班次

Cell (B) : Total hours per shift

每班工作时间(小时)

Cell (C1) : Personal breaks

人员固定休息时间,如午饭,休息等

Cell (C2) : Planned Maintenance

计划保养时间

Cell (D) : Days/week

工作天数/周

Cell (E) : Net available time will be automatically calculated
净有效时间, 自动计算得出.

Important Note : The operating pattern should only report the production time available for the part being analysed even it's shared
即使是Shared line, 填写仅用于生产该零件的生产天数/班次.

Capacity Analysis Reporting

--正确填写产能分析报告



Projected Downtime

F	Tool / Variant Changeover (minutes)
G	Changeovers / shift
H	Inspections of facilities / shift (minutes)
I	Breakdowns / shift (unscheduled downtime)
J	Total projected downtime/week (hours) [(FxG+H+I)/60xAxD]
K	Equipment Availability [(E-J)/E]

60	0	0	0
0.17	0	0	0
0	0	3	0
5	3	8	10
1.5	0.8	2.8	0.3
96.5%	99.3%	74%	97.8%

Cell (F) : *Tool changeover* – 换模时间.

This must be expressed as the total time elapsed from last good part to first approved new part.

指上一批次最后一件合格件到新批次的首件合格件

Cell (G) : *Changeovers / shift* – 每班换模次数

Cell (H) : *Inspections per shift* – 每班停机检查零件或调整工艺的时间.

Cell (I) : *Unscheduled downtime* – 计划外停机时间

Cell(J):*Total projected downtime* – 总计停机时间, 自动计算得出

Cell(K):*Equipment Availability* – 设备使用效率, 自动计算得出

Capacity Analysis Reporting

--正确填写产能分析报告



Projected Quality Rate (%) 预计质量表现

Projected percent of parts scrapped and/or reworked 预计
零件报废及或返修率 For linked processes, see notes.

L Projected Quality Rate (%) 预计合格率

5.00%	1.00%	0.00%
95.0%	99.0%	100.0%

Cell : *Projected quality rate* – 预计零件报废或返修率
单道工序报废率? 还是累计报废率?

Projected Quality rate calculated automatically.
预计合格率自动计算得出.

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Capacity Analysis Reporting

--正确填写产能分析报告



Planned Cycle time / Capacity计划节拍/产能

Required Cycle time needed to cover exact customer demand (sec/ part) [E*3600*K/X*L]
为满足客户需求所需的节拍

M Net Planned Ideal Cycle Time (sec/part) 理想的计划节拍
(秒/件) For multiple cavities in one tool, see notes.
Planned production capacity/week 每周计划产能 [(E-
.JY*3600/M*1 1
Planned production capacity / day 每天计划产能 [(E-
.JY*3600/M*1 /D1]

65.07	145.67	149.68
60	130	135
1026	1060	1049
1026	530	524

Cell (M) : *Planned Cycle time* – 规划节拍
Enter the best estimate of cycle time for each process stream. This could be established via synthesis or direct time taken with a stopwatch at each operation.

输入每道工序预估的**最理想**节拍,可以通过经验,或者直接在线上测节拍得到

This should always include the total time for loading / unloading and inspection of the part.

必须包括上下件以及检验时间

For multiple cavity tools the cycle time should be divided by the number of cavities.

如果是一模多穴,节拍必须除以模穴数

Capacity Analysis Reporting

--正确填写产能分析报告



Planned Cycle time / Capacity 计划节拍/产能			
Required Cycle time needed to cover exact customer demand (sec/part) [E*3600*K/X*L] 为满足客户需求所需的节拍			
M Net Planned Ideal Cycle Time (sec/part) 理想的计划节拍 (秒/件) For multiple cavities in one tool, see notes.			
	65.07	145.67	149.68
M	60	155	135
	1026	889	1049
	1026	445	524

Cell (M) : Required Cycle time needed to cover exact customer demand, Planned production capacity per week and planned production capacity per day are now automatically calculated.
为满足客户需求所需的节拍, 每周计划产能, 每天计划产能, 自动计算得出

The planned number of parts available per week at each process stream must now be compared with the customer demand. Any shortfall in planned capacity (highlighted in red) must be addressed and the capacity planning exercise completed once again to verify effectiveness of actions taken.

理想的计划节拍, 会和CELL M单元格进行比较, 如果显示红色, 表示规划节拍无法满足项目需求. 应重新评估.

PRODUCTION RUN – section iii 实际生产

Prior to performing Run-at-Rate (phase 0) or Capacity Verification (phase 3) the supplier and STA should agree the following key parameters :

在进行Run at Rate(Phase 0)或者产能验证(Phase 3)前, 供应商应与STA确认以下关键信息:

Quantity of parts to produce 生产数量

Process points that will require measurement, 需要进行产能评估的工序

Duration of production run 生产持续时间

Review of personnel involved (qualified operators) 参与人员(合格操作者)

Data analysis and reporting structure. 数据分析以及如何报告

The objective of the production run is to determine if the supplier can produce quality parts at the required production speeds and feeds.
实际生产的目的是确认供应商能够在要求的生产节拍下生产出合格的零件.

Capacity Analysis Reporting

--正确填写产能分析报告



III. Production Run 实际生产		(Select One) 选择一项		
Duration data of production run 实际生产数据		<input checked="" type="radio"/> Run-at-Rate (Phase 0) <input type="radio"/> Capacity Verification (Phase 3)		
N	Total duration of production run (min) 生产总运行时间(分钟)	150	270	300
O1	Planned downtime (lunch, breaks, maint.) (min) 计划停机时间(午餐、休息、保养等)	15	25	60
O2	(changeovers, inspections) (min) 分钟 换型, 检验	0	0	0
P	Total Unplanned downtime (breakdowns, unscheduled adjustments/setups, etc.) (min) 非计划停机时间(故障、非计划的调整或重置等)	15	5	15
Reasons for Breakdown 故障原因				

Cell (N) : Duration of production run – 实际生产持续时间(分钟)

Cell (O1) : Planned downtime (lunch, breaks, maint) – 实际计划停机时间(午餐,休息,维护等)

Cell (O2) : (changeovers, inspection) – 实际换模,停机检验时间

Cell (P) : Total unplanned downtime – 实际非计划停机时间

Reasons for breakdowns / unplanned stoppages should be recorded and action taken to resolve issues identified

非计划停机的原因必须被记录下来, 并采取应对措施

Capacity Analysis Reporting

--正确填写产能分析报告



Part quantity data of production run 实际生产零件数量

Q Total parts run 总生产零件数量

R Total scrapped parts 总报废零件数

S Total parts reworked, retested or repaired off line 线下返工
、重新测试或返工零件数

T Total good parts (first time through only - does not include parts that were scrapped or reworked) 总合格零件数 (一次性合格产品-不包括报废或返工产品)

Reasons for scrapped or reworked parts 报废或返工原因

U Process total actual cycle time (sec/part) 实际加工节拍(秒/件) $[(N-01-02-P) \times 60 / Q]$

115	107	100
0	7	0
8	0	5
107	100	95
Burrs	hole mis alignment	bushing missing
62.6	4.6	135.0

Cell (Q) : Total parts ran – 实际生产零件数(合格件+不合格件)

Cell (R) : Total reject part – 报废零件总数

Cell (S) : Total parts reworked – 返工零件总数

Cell (T) : Total good parts produced (First Time Through) during production trial run will automatically calculate. 合格零件总数(一次合格零件) 自动计算得出

Reason for rejected parts should be recorded and action taken to resolve issues identified. 报废以及返工零件原因须记录并采取解决措施

Cell (U) : Process actual cycle time will automatically calculate.

工序实际节拍, 自动计算得出

Capacity Analysis Reporting

--正确填写产能分析报告



CAPACITY CALCULATION – section iv

IV. Capacity Calculation 产能计算		
V Weekly Parts Available for Shipment 周可交付产品	963	967
W Daily Parts Available for Shipment 日可交付产品 [D/Y]	193	193
Z Daily Production Volume (DPV) 每天产量	189	189
AA Percent above/below DPV 高于或低于DPV的百分比 $(W/Z) - 1$	1.8%	2.2%
AB Supplier Oper. Pattern above/below Customer 供应商与客户生产天数的比率 [D/Y]	20%	40%

The spread sheet will automatically calculate weekly parts available for shipment (V), Daily parts available for shipment (W) and Daily planned volume (Z).

这部分会自动计算出每周可发运零件数(V),每天可发运零件数(W) 和 每天产量(Z)

The percentage above/below DPV will also be shown for each process stream. Any process not able to achieve the DPV will be highlighted in "RED" and marked as the bottleneck process or processes (AA).

AA行还计算得出高于或低于(DPV)的百分比. 任何不能达到DPV的工序都会标红, 并被识别为瓶颈工序.

Capacity Analysis Reporting

--正确填写产能分析报告



OVERALL EQUIPMENT EFFECTIVENESS – section v

V. Overall Equipment Effectiveness(OEE)设备总利用率			
AC Equipment Availability设备可用率 [(N-01-O2-P)/(N-01-O2)]	88.9%	98.0%	94.4%
AD Performance Efficiency运行效率[(M*Q)/(N-01-O2)]	95.8%	96.6%	88.2%
AE Quality Rate 质量合格率 [T/Q]	93.0%	93.5%	95.0%
AF OEE设备总利用率	79.3%	84.4%	79.2%

The spread sheet will automatically calculate Overall Equipment Effectiveness (OEE) from the data gathered during the production verification run.

该页自动计算出OEE设备总利用功率.

Capacity Analysis Reporting

--正确填写产能分析报告

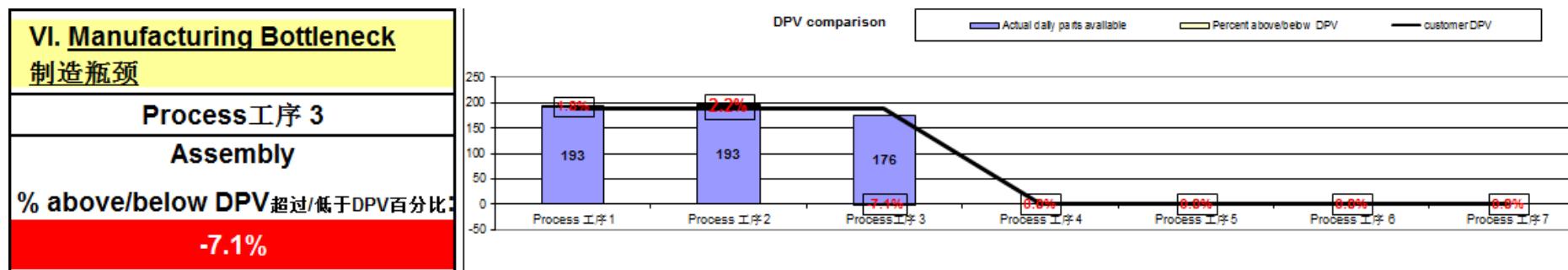


MANUFACTURING BOTTLENECK – section vi

The spread sheet will produce a graphical representation of Daily parts available versus the customer DPV. The bottleneck operation(s) will also be highlighted and performance against DPV stated.

该页会在自动生成“每日可生产零件”对比“客户每天需求量”并显示出瓶颈工序,以及高于或低于客户每天需求的百分比。

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Capacity Analysis Reporting

--正确填写产能分析报告



VII. SUPPLIER OPERATION MANAGEMENT APPROVAL 供应商运营管理批准		FOR CJLR STA USE 供奇瑞捷豹路虎STA评判	
Authorised Representative 授权的代表姓名	Title 职位	CJLR STA Review 评判结果	
Email 邮件地址	Phone Number 电话号码	CJLR Site Engineer STA 姓名	
Signature 签字	Date 日期	Signature 签字	Date 日期

SUPPLIER OPERATIONS MANAGEMENT APPROVAL – section vii

It is intended that the supplier senior operational management formally commit to meeting ALL customer performance requirements. The report must also be approved by the STA for PPAP sign off

要求供应商负责运营的高层管理人员签字确认满足所有客户要求。
在提交PPAP之前, CAR报告必须得到STA批准.

Capacity Analysis Reporting

--常见问题



Planned Cycle time / Capacity计划节拍/产能

Required Cycle time needed to cover exact customer demand (sec/part件) [E*3600*K/X*L]
为满足客户需求所需的节拍

M Net Planned Ideal Cycle Time (sec/part)理想的计划节拍
(秒/件) For multiple cavities in one tool, see notes.

Planned production capacity/week 每周计划产能 [(E-J)*3600/M*1]

Planned production capacity / day 每天计划产能 [(E-J)*3600/M*1/D]

65.07	145.67	149.68
60	155	135
1026	889	1049
1026	445	724

产能规划不足

IV. Capacity Calculation产能计算

V Weekly Parts Available for Shipment 可交付产品

W Daily Parts Available for Shipment 日可交付产品 [V/Y]

Z Daily Production Volume (DPV)每天产量

AA Percent above/below DPV 高于或低于DPV的百分比

$\frac{V}{W} \times 100 - 100$

AB Supplier Oper. Pattern above/below Customer 供应商与客户生产天数的比率 [D/Y]

93	67	879
13	193	176
189	189	189
1.8%	2.2%	-7.1%
20%	40%	40%

产能规划不足

Capacity Analysis Reporting

--常见问题



产能规划过剩

IV. Capacity Calculation 产能计算

- V Weekly Parts Available for Shipment 可交付产品
- W Daily Parts Available for Shipment 日可交付产品 [V/Y]
- Z Daily Production Volume (DPV) 每天产量
- AA Percent above/below DPV 高于或低于DPV的百分比 [(W/Z)-1]
- AB Supplier Oper. Pattern above/below Customer 供应商与客户生产天数的比率 [D/Y]

4815
963
189
409.0%
100%

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Operating pattern for the specific part 指定产品的操作模式

- Process description 过程描述
- Dedicated or Shared process 专用或共用(for shared process, show only the operating pattern for the specific part)
- A Shifts/day 班次/天
- B Total hours/shift 总小时数/班次
- C1 Personal breaks 人员休息: lunch 午饭, breaks 休息 (minutes 分钟/shift 班次)
- C2 Planned Maintenance 计划保养 (minutes 分钟/shift 班次)
- D Days/week 工作天数/周

Process 工序 1	
SHARED	▼
1	
12	
60	
30	
5	

Required Cycle time needed to cover exact customer demand (sec/件) [E*3600*K/L] 为满足客户需求所需的节拍

M Net Planned Ideal Cycle Time (sec/part) 逼真的计划节拍 (秒/件) For multiple cavities in one tool, see notes.

246.24
60

Capacity Analysis Reporting

--常见问题

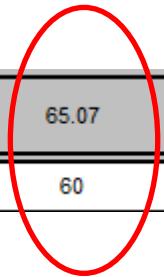


Operating pattern for the specific part 指定产品的操作模式	
Process description 过程描述	
Dedicated or Shared process 专用或共用(for shared process, show only the operating pattern for the specific part)	
A	Shifts/day 班次/天
B	Total hours/shift 总小时数/班次
C1	Personal breaks 人员休息: lunch 午饭, breaks 休息 (minutes 分钟/shift 班次)
C2	Planned Maintenance 计划保养 (minutes 分钟/shift 班次)
D	Days/week 工作天数/周

Process 工序 1	
SHARED	▼
1	
12	
60	
30	
2	

Required Cycle time needed to cover exact customer demand (sec/件/part) [E*3600*K/X*L] 为满足客户得求所得的节拍	
M	Net Planned Ideal Cycle Time (sec/part) 预想的计划节拍 (秒/件) For multiple cavities in one tool, see notes.

65.07
60



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IV. Capacity Calculation 产能计算

V	Weekly Parts Available for Shipment 可交付产品
W	Daily Parts Available for Shipment 日可交付产品 [V/Y]
Z	Daily Production Volume (DPV) 每天产量
AA	Percent above/below DPV 离于或低于DPV的百分比 [(W/Z)-1]
AB	Supplier Oper. Pattern above/below Customer 供应商与客户生产天数的比率 [D/Y]

1098
220
189
16.1%
40%

16.1%

40%

Capacity Analysis Reporting

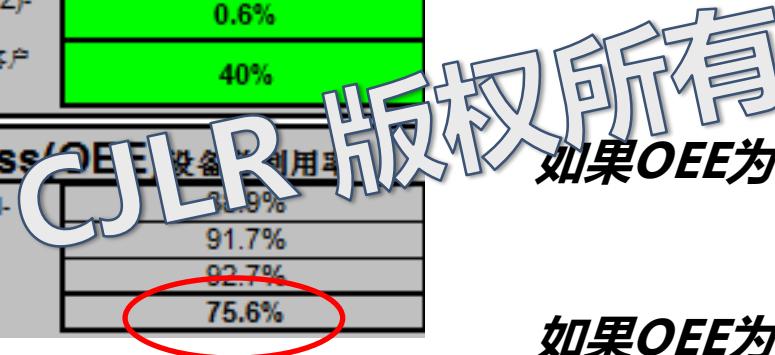
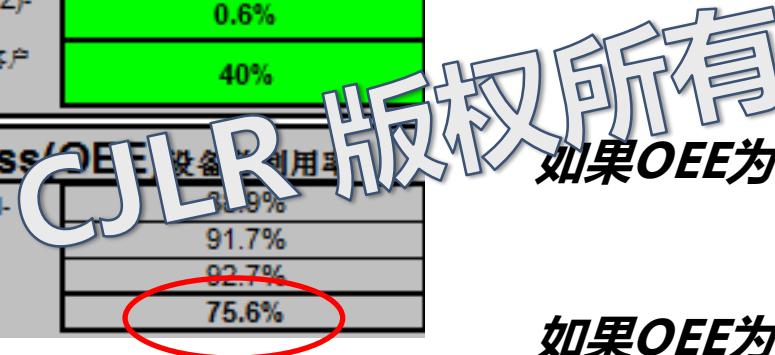
--常见问题



OEE 不合理

IV. Capacity Calculation 产能计算	
V	Weekly Parts Available for Shipment 同可交付产品
W	Daily Parts Available for Shipment 日可交付产品 [V/Y]
Z	Daily Production Volume (DPV) 每天产量
AA	Percent above/below DPV 高于或低于DPV的百分比 [(W/Z)-1]
AB	Supplier Oper. Pattern above/below Customer 供应商与客户生产天数的比率 [D/Y]

V. Overall Equipment Effectiveness/OEE 设备综合利用率	
AC	Equipment Availability 设备可用率 $[(N-O1-O2-P)/(N-O1)] \times 100\%$
AD	Performance Efficiency 运行效率 $[(M*Q)/(N-O1-O2)] \times 100\%$
AE	Quality Rate 质量合格率 $[T/Q] \times 100\%$
AF	OEE 设备总利用率



如果OEE为96%，你觉得有问题吗？

如果OEE为50%，你觉得有问题吗？

Capacity Analysis Reporting

--常见问题



报价阶段的产能规划调查表

Base Programme Assumptions 基本项目设想								Maximum Demand (Using Flex Formula) 最大需求量 (使用变量公式)		Installed Capacity vs Maximum Demand 产能 与 最大需求量		
Commodity Description 零件名称	P/N 零件号	前缀	中缀	后缀	Peak Weekly Volume 周高峰产量	On-Peak Weekly Volume 周高峰产量合计	Off-Peak Weekly Volume 周低谷产量	Flex Factor 零件装配率 (%)	Auto Calc Peak Weekly Volume 自动计算周高峰产量	Auto Calc Flex Factor 自动计算可变系数	Installed base capacity 基本产能	Variance Installed vs Peak 可变产能 vs 高峰需求量
燃油泵液位传感器	J9C39A299BA	J9C3	9A299	BA	700	1	700	80.0%	560	1.2	655	1,000
燃油泵总成	K8D29H307BA	K8D2	9H307	BA	700	1	700	20.0%	140	1.5	211	400

承诺的安装产能远远大于项目CPV需求

Capacity Analysis Reporting

--CJLR产能分析工作后续规划



- 优化/完善相关程序文件，统一术语
- 产能和产量信息表每年更新（或有重大变化时更新）
- 制定量产项目产能计算规则，定期发布量产项目Line Rate
- 新项目Take rate, Usage, CPV等信息直接添加到E-SQ报价包中
- 新项目签订SCPA前，供应商提交产能规划调查表，承诺 Insatalled CPV
- E-CAR系统上线

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THANKS

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