

# SCHEDULING SYSTEM FOR SEMICONDUCTOR MANUFACTURING

Casio Micronics Co., Ltd.

February 15, 2007

- **Company Overview**
- **Characteristics of the system**
- **Background of and effects brought by introduction of the system**
  1. **Outline of implementation**
    - System overview**
    - Implementation schedule**
    - Introduction cost**
  2. **Explanation of scheduling system**
  3. **About periphery systems**
  4. **System issues**
  5. **Wrap up**

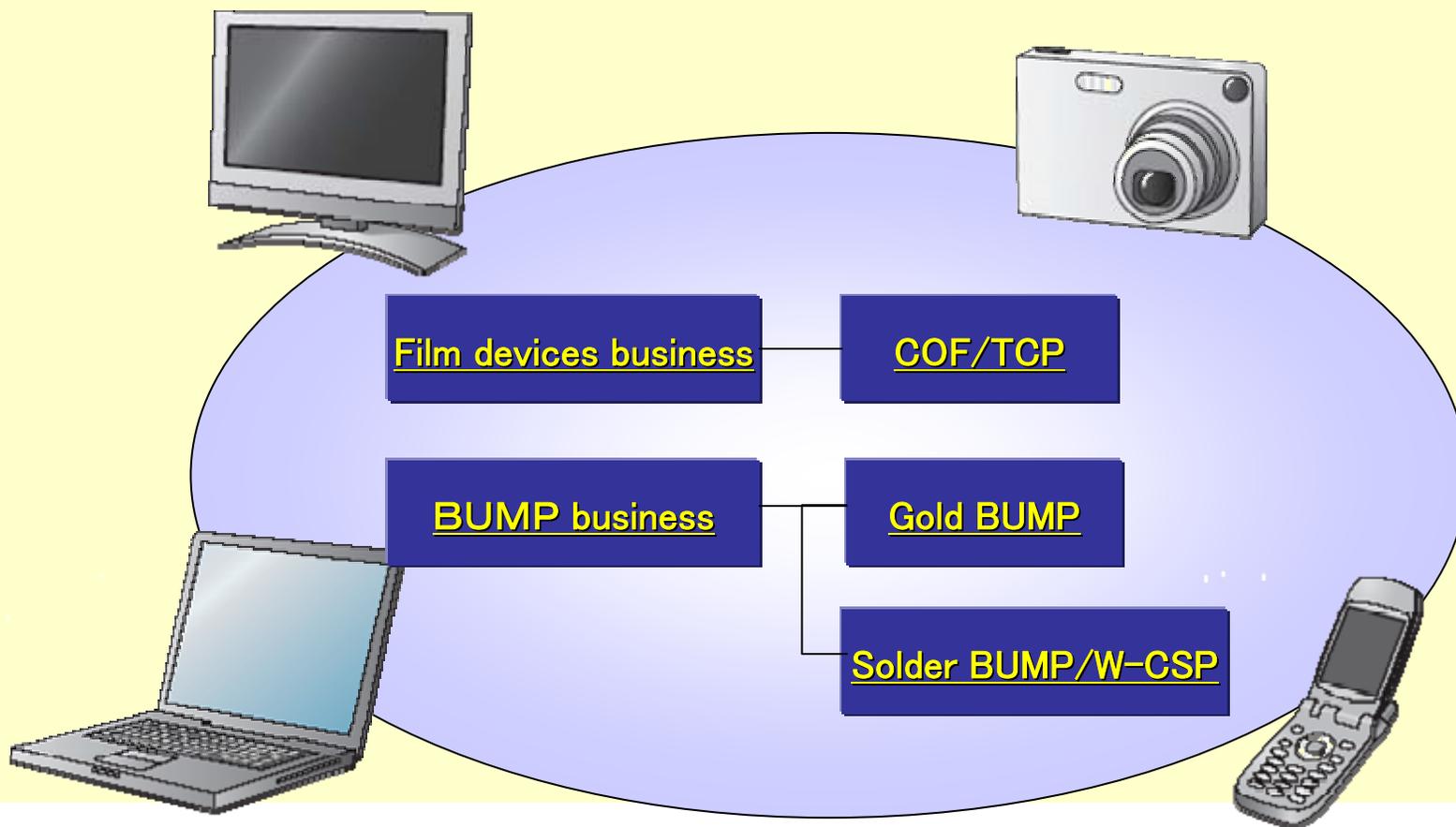
# OUTLINE OF COMPANY

<b>Founded:</b>	<b>July 25, 1987</b>
<b>Lines of business:</b>	<b>BUMP Business Film Devices Business</b>
<b>Production base:</b>	<b>Ohme Works (No. 1 &amp; No. 2 plants) Yamanashi Works (No. 1 &amp; No. 2 plants)</b>
<b>Capital:</b>	<b>2,992 Million yen (as of March 31, 2006)</b>
<b>Turnover:</b>	<b>25.1 billion yen (March 2006)</b>
<b>No. of employees:</b>	<b>630 (March 2006)</b>
<b>Stock exchange:</b>	<b>JASDAQ</b>
<b>Securities code:</b>	<b>6760</b>
<b>Newspaper listing name:</b>	<b>C Micro</b>
<b>Newspaper listing column:</b>	<b>J stock</b>



# OUTLINES OF BUSINESS

CONSTANTLY UPHOLDS THE INNOVATION OF  
DIGITAL EQUIPMENT WITH MICRO METER BASED UNIQUE  
AND REVOLUTIONARY TECHNOLOGIES

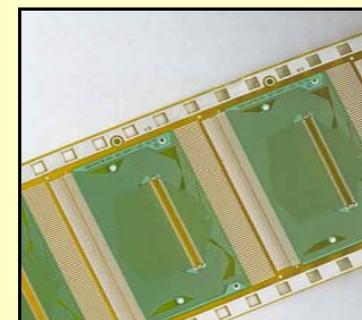
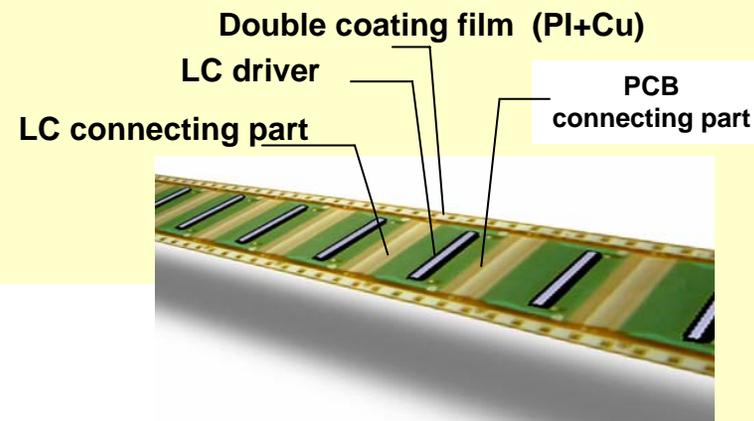


# FILM DEVICES BUSINESS

Used in large screen  
thin type PCs/LCD  
televisions for low cost



## < COF structure >



PI : polyimide  
Cu : copper

# BUMP BUSINESS

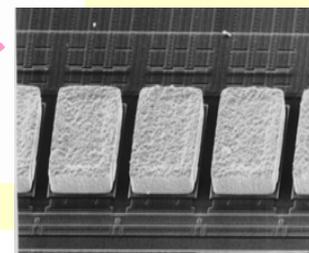
《 SOLDER BUMP/W-CSP 》

《 GOLD BUMP 》



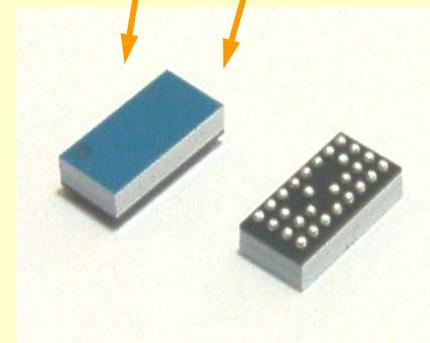
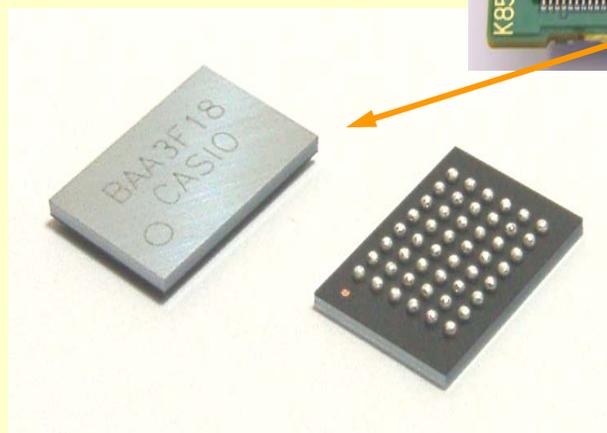
**Weight saving for  
multifunction mobile information  
terminal equipment**

**Constantly evolving  
high definition  
color LC display**



# W-CSP APPLICATION EXAMPLES

Example of use (digital camera)



# PRODUCT CHARACTERISTICS

W-CSP: items handled by the scheduling system

(1) **Wafer inch size**  
**5Φ、6Φ、8Φ、(12Φ)**

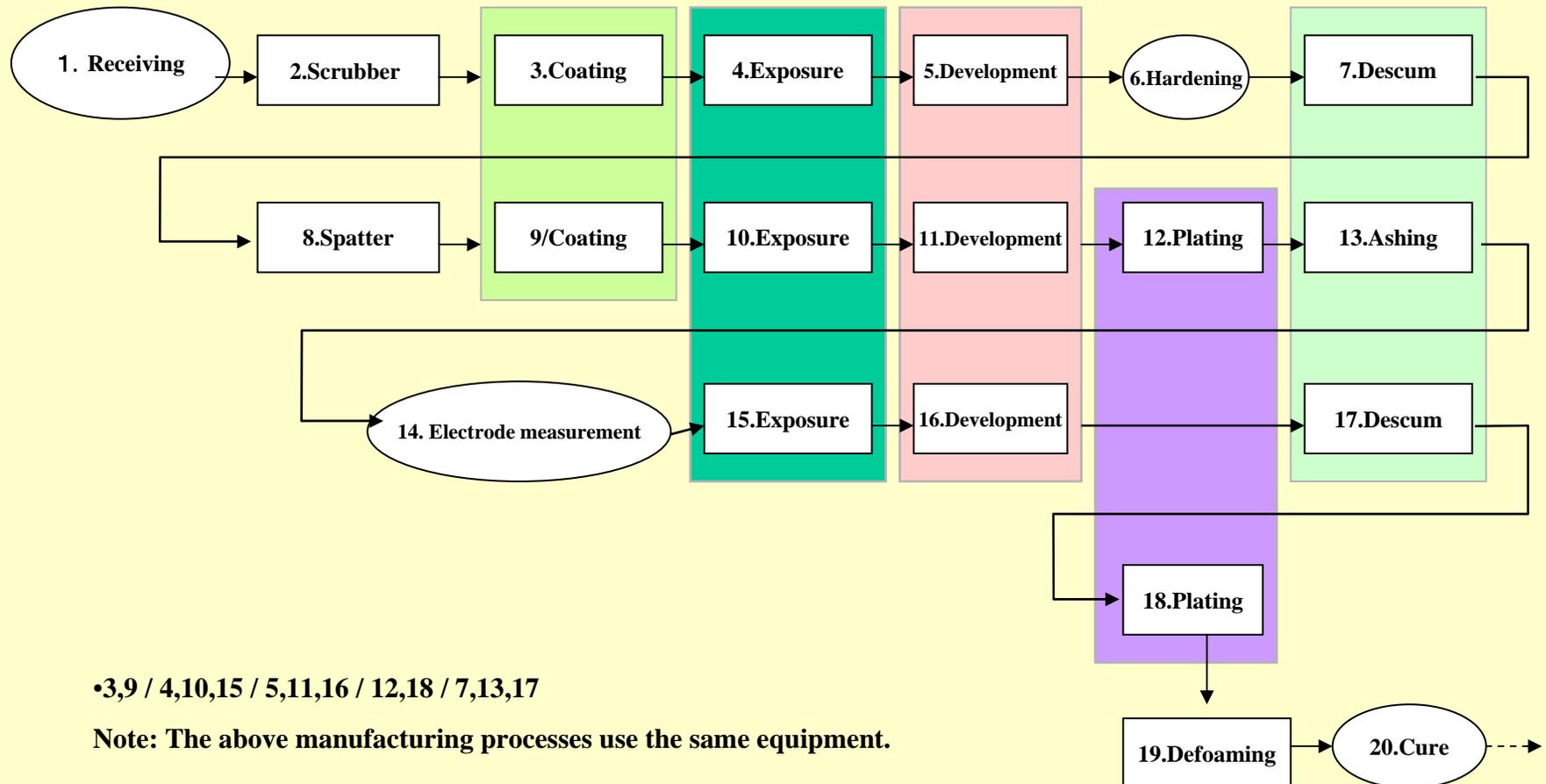
(2) **No. of models**            **About 100/month**

(3) **Lot size**  
**Mass production**    **25 sheets (1~25 sheets)**  
**Proto type**            **1 sheet ~ 10 sheets**

(4) **No. of processes**            **Min. 9 ~ Max. 67**

(5) **Lead time**            **Prototype 4 days ~ 14 days**  
**Mass production 7 days ~ 10 days**

# CHARACTERISTICS OF MANUFACTURING PROCESSES



# BACKGROUND INTRODUCTION

- 1. Intends to bring W-CSP business to our 3<sup>rd</sup> pillar of operation, which started full-scale mass production in 2004, and to attain the number one share in the world.**
- 2. As this was a new package, it generated a number of sales order alterations in proportion to the increases in sales orders. Also, the percentage of its prototype was high. It was thus predicted that the definite scheduling adjustments would not be carried out manually.**
- 3. This didn't mean that we had to depend on an expensive package specially designed for semi-conductor processing. Nonetheless, we didn't have enough time to prepare in-house developed scheduling software.**
- 4. Our group company has introduced SMT based scheduler in the past. We were thus not worried about its validity.**

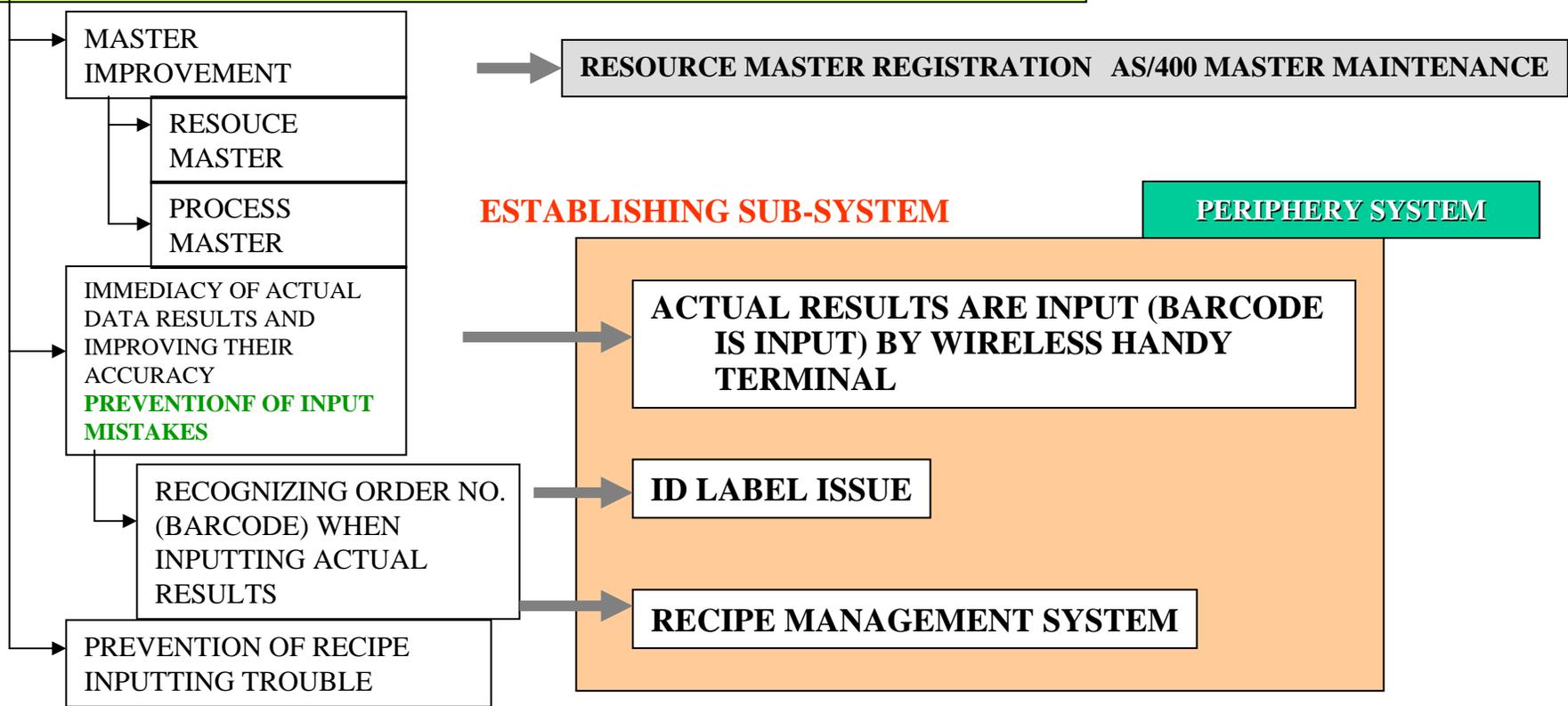


# 1.1 SYSTEM OVERVIEW

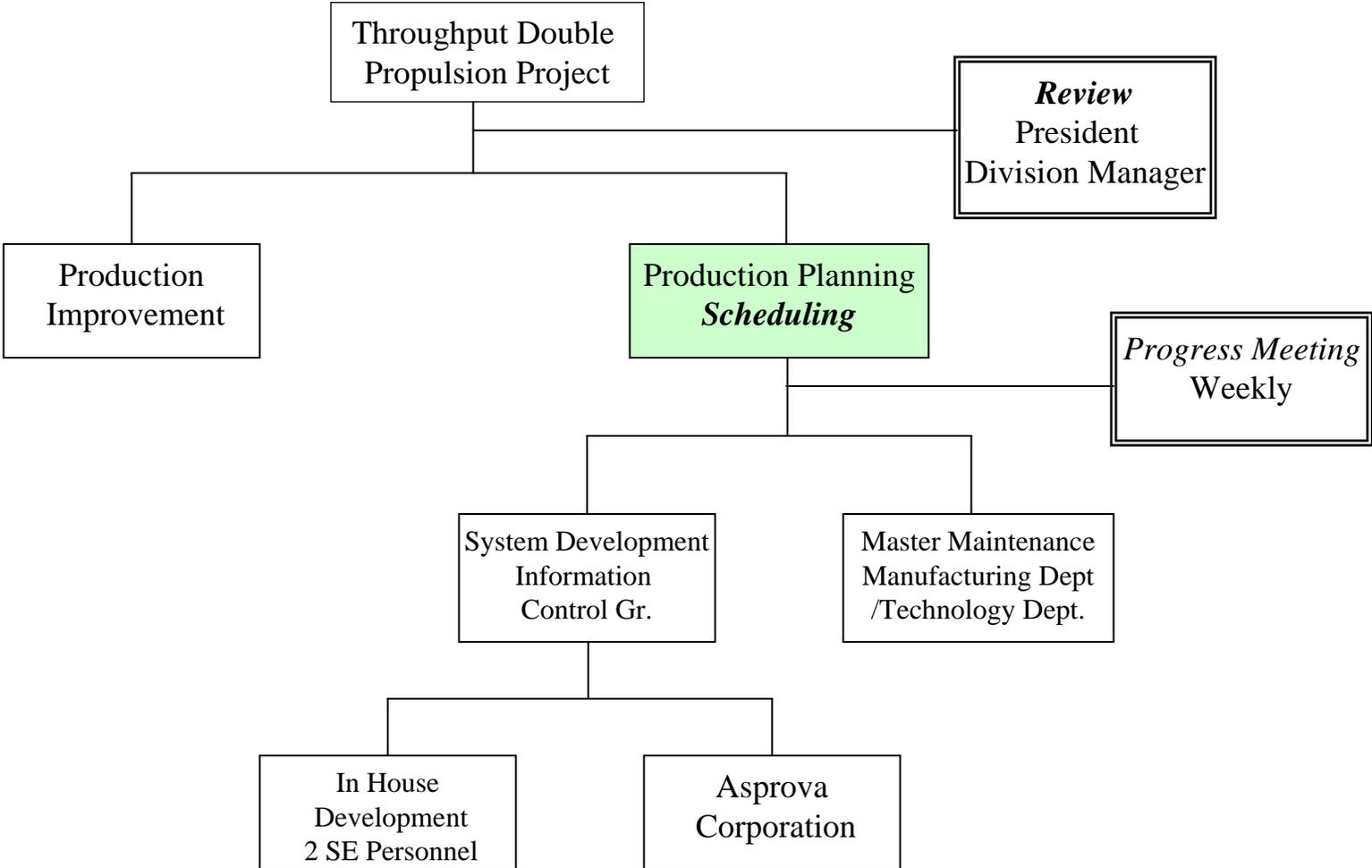
## SCHEDULING SYSTEM

HOST I/F, SCHEDULING, SETUP, WORK INSTRUCTIONS SHEET

## ENVIRONMENTAL IMPROVEMENTS FOR THE OPERATION OF SCHEDULING SYSTEM



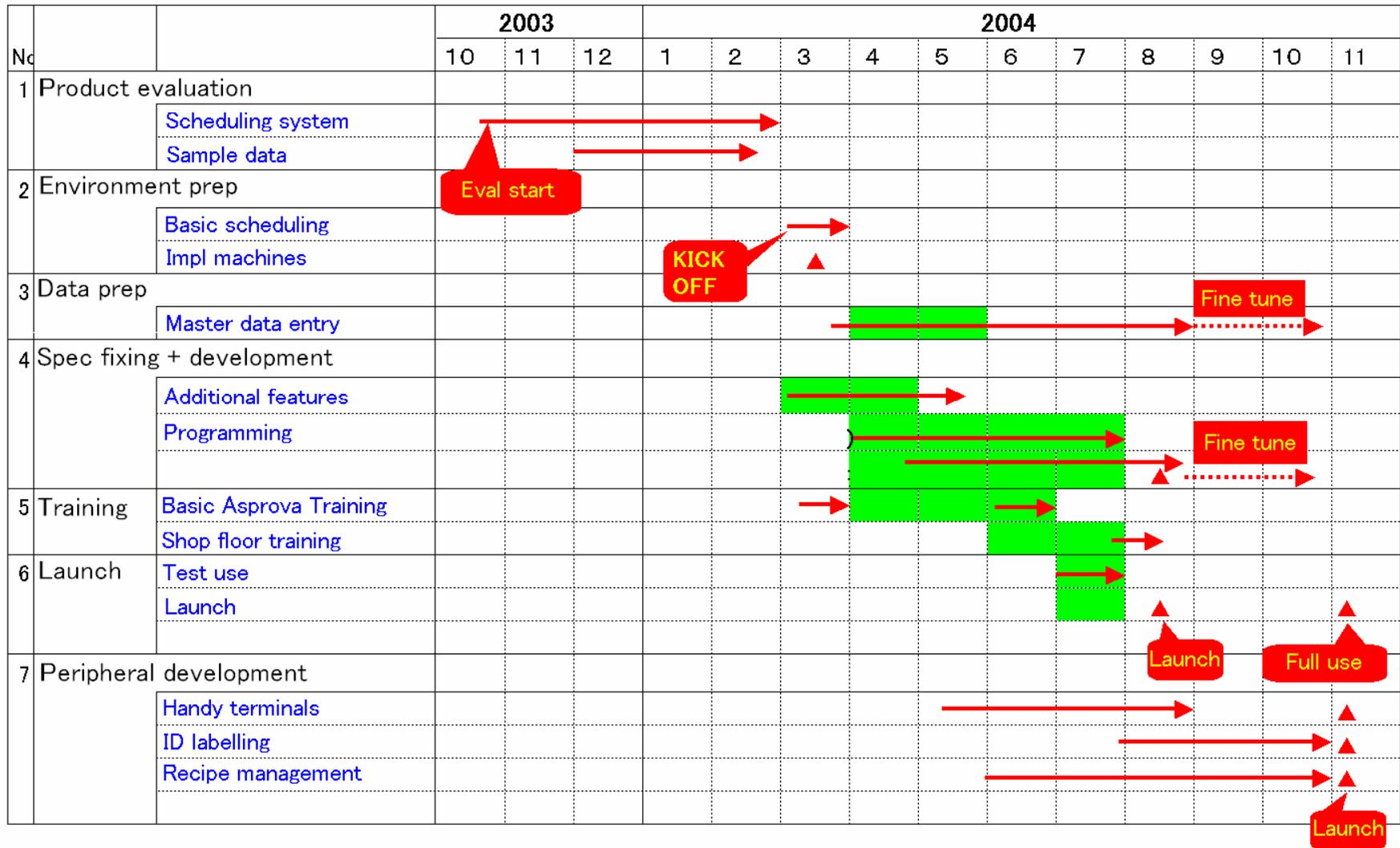
# 1.2 IMPLEMENTATION STRUCTURE



# 1.3 IMPLEMENTATION SCHEDULE

Plan

ASPROVA Implementation Plan (and results)

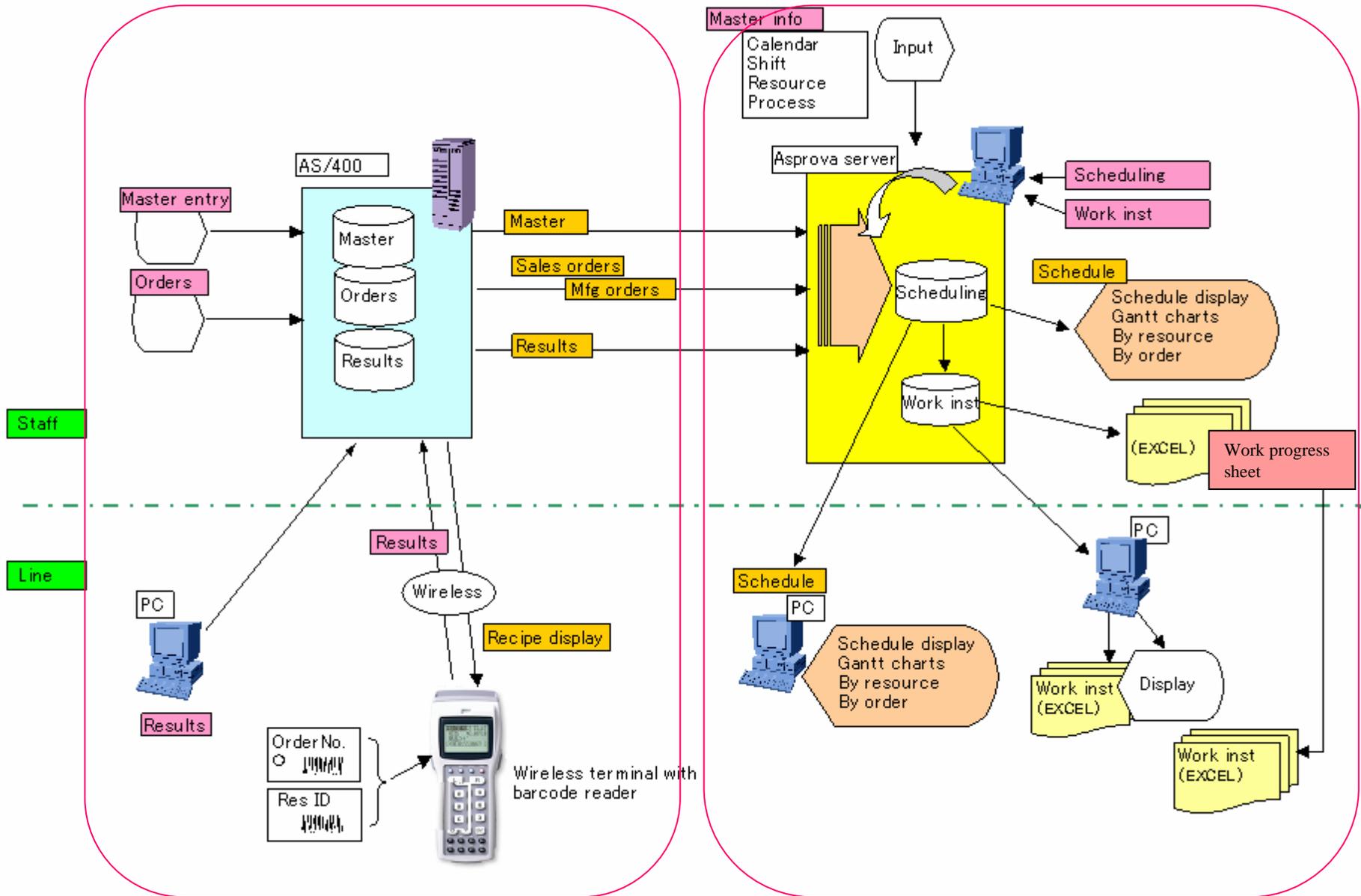




## 2. EXPLANATION OF SCHEDULING SYSTEM

- 2.1 Information Referenced Diagram
- 2.2 Master Registration
- 2.3 Order Input
- 2.4 Actual Results Input
- 2.5 Work Instructions Sheet
- 2.6 Operational Flow
- 2.7 Work Progress Table

# 2. 1 INFORMATION REFERENCED DIAGRAM



## 2.2 MASTER REGISTRATION

Outline of data: No. of manufacturing process: about 70  
No. of equipment: about 80  
Operating 24 hours, 360 days/year

Incorporating the manufacturing process/equipment information from host machine (AS400)

- \* Coinciding manufacturing processes, resource names and codes

- \* Synchronization of update information  
(synchronization of maintenance timing)

Inputting master data designed for scheduler

Master registration examples that fit our company's production characteristics

- \* Calendar (maintenance time registration for equipment)
- \* Shift table (24 hours 4 groups 2 shifts structure)
- \* Overlapping, lot wrap up (furnace resource) operation

# ASPROVA INTEGRATED MASTER SETUP EXAMPLE

	品目	工程番号	工程コード	指図種別	指図コード	品目/資源	先前提取り	製造	後段取り	重なり方法	重なりM
722				使用指図	M	wf確認作業_000		10m		ES	
722	QCAB	10	受入検査_C100	使用指図	M	受入作業_000		1m		ES	
722				出力指図	Out	QCAB-10		1			
723		20	スクラバー洗浄_C120	入力指図	In	QCAB-10		1		ES	
723				使用指図	M	スクラバーT2#2_004		1.1mp+(4.3m-1.1m)		ES	
723				出力指図	Out	QCAB-20		1			
723		30	PI塗布_C140	入力指図	In	QCAB-20		1		ES	
723				使用指図	M	塗布WLP#2_002		2.3mp+(19.2m-2.3m)	12	ES	
723				使用指図	M	塗布WLP#3_003		2.3mp+(19.2m-2.3m)	12	ES	
723				出力指図	Out	QCAB-30		1			
723		40	PI露光_C150	入力指図	In	QCAB-30		1		ES	
723				使用指図	M	ステップ#8_008		1.6mp+(2.1m-1.6m)		ES	
723				使用指図	M	ステップ#9_009		1.6mp+(2.1m-1.6m)		ES	
724				出力指図	Out	QCAB-40		1			
724		50	PI現像_C160	入力指図	In	QCAB-40		1		ES	
724				使用指図	M	現像WLP#2_002		2.3mp+(2.9m-2.3m)		ES	
724				使用指図	M	現像WLP#3_003		2.3mp+(2.9m-2.3m)		ES	
724				出力指図	Out	QCAB-50		1			
724		60	PI現像検査_C170	入力指図	In	QCAB-50		1		ES	
724				使用指図	M	OSTWLP#1_001		1.0mp+(1.5m-1.0m)		ES	
724				出力指図	Out	QCAB-60		1			
724		70	硬化_C180	入力指図	In	QCAB-60		1		ES	
724				使用指図	M	硬化炉WLP#1_001		440m		ES	
725				出力指図	Out	QCAB-70		1			

- **Manufacturing process, resource code: Combined manufacturing process name and code**  
(simple display, combined when master is synchronized)
- **Manufacturing process number (order) : Handles manufacturing processes adding simulation by skipping every 10 digits**
- **Manufacturing ability: time saved when registering new items by preparing the master separately**  
Default equipment prepared for each wafer size

## 2.3 ORDER INPUT

Receiving Order Production, Approximately 200 Orders Per Month,  
100 models (Asprova in Place)

\* Sales order:

- Input when the order is placed from a client

\* Manufacturing order:

- Prepared when a manufacturing process is input
- Prepared by host machine's manufacturing process control system

**Sales orders and manufacturing orders loaded from host machine.**

Scheduling method:

- \* **Appointing “FORWARD” based on the input date**
- \* Sales orders (based on the scheduled warehousing date)
- \* Manufacturing order (based on the manufacturing process input date)
- \* Priority given based on the needs of urgency etc.

## 2.4 INPUTTING ACTUAL RESULTS

Imported from host machine (AS400) manufacturing process control system

- \* Actual operational results input automatically (completed time, number of finished item) for each model, each manufacturing lot, and each manufacturing process
- \* Automatically deletes manufacturing orders, using actual data results

Timing:

- \*At time of scheduling (once a day, around 17:00)

# ASPROVA ◆ PROCESSING MENU BETWEEN HOST MACHINES

Prepared a menu for handling the interface data, using EXCEL with which the shop floor staff are familiar.

20050414\_001

WLP 工程スケジューラー  
インターフェースメニュー

2005/2/22 10:52

2005 2月 2月 2005

カレンダー

日	月	火	水	木	金	土
30	31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	1	2	3	4	5
6	7	8	9	10	11	12

自動処理1

Master関連

品目マスタ

工程マスタ

装置資源

オーダー関連

製造オーダー

抽出対象納期

2005/2/15

0:00:00 ~

進捗実績関連

作業実績

抽出対象日時

2005/2/15

0:00:00 ~

ASPROVA変換

IFツール起動\_2

設定メニュー

各種設定

作業指示

自動作業指示

作業指示

作業指示書(オーダー順)前

終了

## 2.5 WORK INSTRUCTIONS SHEET

**This sheet is like a ledger sheet which makes it easy to give instructions to production site using ASPROVA scheduling results.**

### **Details of ledger sheet:**

- \*Outputs each manufacturing process's scheduled production time, which is assigned by the scheduler. This is done for **each manufacturing process** as well as **each equipment**.
- \*Times are continually upgraded with **hourly imported actual data results**.
- \*Contains **comments** such as urgency, etc. if special instructions are required for some operations.

### **Operation of ledger sheet:**

- \*The output work instructions sheets are **distributed to shop floor staff at each manufacturing process**, and the work is carried out.
- \***Defects or delayed input** that occurred when the manufacturing processes were input are reflected to the next day's production planning using the actual results, and work instructions are reviewed **on a daily basis**.

## 2.5 WORK INSTRUCTIONS SHEET

### WLP 作業指示書(工程順)

後工程

最終更新時間

計画範囲: 11月14日 9:00 - 11月16日 9:00 04/11/15 : 12:03 現在

NO	Wf径	工程名	資源名	ロットNo	オーダーNO	品目名	数量	開始時間	終了時間			
1	8φ	C500	PIアッシング	001	アッシャー-WLP#1_001	QG1604L002	0	M118 9615	ES-AMKOR	3	14/ 18:14	14/ 18:20
	6φ					QCAJ04L002	0	M119 4557	LC99809	20	14/ 20:34	14/ 21:01
	8φ					QG1004K003	0	M117 3242	ES8-YOUSOKEN	6	14/ 22:28	14/ 22:38
						QG0304L001	0	M119 2880	ES8-YOUSOKEN-P	5	15/ 04:38	15/ 04:47
	5φ					QAAA04L004	0	M119 3621	TB154	25	15/ 07:38	15/ 08:11
	8φ					QGAG04L015	0	M119 3615	ZT4103BDS-Z	25	15/ 10:38	15/ 11:11
						QGAG04L016	0	M119 3616	ZT4103BDS-Z	25	15 / 05:13	15 / 05:41
						QGAG04L017	0	M119 3617	ZT4103BDS-Z	25	15/ 16:38	15/ 17:11
						QGAG04L018	0	M119 3618	ZT4103BDS-Z	25	15/ 19:38	15/ 20:11
						QGAG04L019	0	M119 3619	ZT4103BDS-Z	25	15/ 22:38	15/ 23:11
						QGAG04L020	0	M119 3620	ZT4103BDS-Z	25	16/ 01:38	16/ 02:11
	5φ					QAAA04L006	0	M119 4555	TB154	23	16/ 04:24	16/ 04:54
	6φ					QCAJ04L001	0	M119 4556	LC99809	25	16/ 07:24	16/ 07:57
									5φ	48		
									6φ	45		
									8φ	164		

Manufacturing process retaining status (Indicated in grey)

Reflects the input results on an hourly basis  
 Work in progress: Updates in red letter  
 Completed work: Half transparent letter

# 2.6 OPERATIONAL FLOW

## 8:50 CHANGING SHIFTS

- \* Administrative staff accepts sales orders.
- \* Schedule forecast to customers
- \* Master maintenance



\*Operator inputs actual results.

Automatically updates the actual results on an hourly basis

## 17:00 SCHEDULING PROCESSING & PREPARING WORK INSTRUCTIONS SHEET

- \* Rescheduling & preparing work instructions sheet based on new sales orders and actual operational results

## 17:30 DISTRIBUTING WORK INSTRUCTIONS SHEET

Referring work instructions sheet (sharing)

WLP 作業指示書(工程順)		前工程								
計画範囲: 4月21日 19:00 - 4月22日 19:00		最終更新時間: 05/04/22 : 11:03 現在								
NO	WIP	工程名	資源名	ロットNo	オーダ-No	品目名	数量	開始時間	終了時間	
10	8φ	C335 DF現像検査	001	C6TWLP#1_001	QGAG05D029	01m38 5871	ZT4103BCS-Z	25	22 / 01:25	22 / 01:58
					QGAG05D028	01m38 5870	ZT4103BCS-Z	25	22 / 02:58	22 / 03:21
					QGAG05D030	01m38 5872	ZT4103BCS-Z	25	22 / 08:11	22 / 08:34
	6φ				QCAN05D025	01m37 3432	LC98807-00HA	9	22 / 08:01	22 / 08:01
	8φ				QGAG05D031	01m36 7002	ZT4103BCS-Z	25	22 / 12:34	22 / 13:07
					QGAG05D032	01m36 7003	ZT4103BCS-Z	25	22 / 15:16	22 / 15:49
					QGAG05D033	01m36 7004	ZT4103BCS-Z	25	22 / 17:42	22 / 18:15
								5φ	0	
								6φ	9	
								8φ	150	
11	5φ	C220 スリット	014	スリット#14_014	QAAB05D002	01m37 4462	GM727XL	25	22 / 06:59	22 / 07:22
	6φ		019	スリット#19_019	QCAN05D023	01m37 3430	LC98807-00HA	22	21 / 20:30	21 / 21:03
					QCAN05D024	01m37 3431	LC98807-00HA	24	21 / 23:28	22 / 00:01

## 20:50 CHANGING SHIFTS

- \*Operator inputs actual results.



## 2.7 WORK PROGRESS TABLE

Since the work instruction sheet doesn't provide all the information, the work progress status (from input to completion) is displayed in the form of a list where the comparison is made between the planning and the actual result for each manufacturing order.

### DETAILS OF LEDGER SHEET

- Makes a comparison between the scheduler prepared plan (from input to completion) and its actual result **for each major manufacturing process.**
- Selects the planning data, to which the comparison is to be made, from **the past ones that were planned at the arbitrary point of time.**

### OPERATION OF LEDGER SHEET

- Selects the past schedule for which the comparison needs to be made with the actual result.
- Possible to prepare a table as needed** (possible to have continual updating of the actual results on an hourly basis.)
- Makes the comparison between the planned and the actual results, and analyzes the **planning accuracy** and **the issues.**

計画範囲: 2005/04/24 - 2005/05/14

最終更新: 2005/04/26 17:04:56 現在

次回更新:

▼ 出力開始日

NO	オーダーNO	数量	予定 実績	4/23						4/24						4/25						4/26						4/27											
				9	12	15	18	21	0	3	6	9	12	15	18	21	0	3	6	9	12	15	18	21	0	3	6	9	12	15	18	21	0	3	6	9	12	15	18
17	M1376118 8 QGAG05D051 0	25	予定 実績	[Bar chart for 4/23]						[Bar chart for 4/24]						[Bar chart for 4/25]						[Bar chart for 4/26]						[Bar chart for 4/27]											
18	M1376137 8 QGAN05D005 0	25	予定 実績	[Bar chart for 4/23]						[Bar chart for 4/24]						[Bar chart for 4/25]						[Bar chart for 4/26]						[Bar chart for 4/27]											
19	M1376191 8 QGAN05D006 0	24	予定 実績	[Bar chart for 4/23]						[Bar chart for 4/24]						[Bar chart for 4/25]						[Bar chart for 4/26]						[Bar chart for 4/27]											
20	M1376192 8 QGAV05D001 0	25	予定 実績	[Bar chart for 4/23]						[Bar chart for 4/24]						[Bar chart for 4/25]						[Bar chart for 4/26]						[Bar chart for 4/27]											
21	M1376193 8 QGAV05D002 0	25	予定 実績	[Bar chart for 4/23]						[Bar chart for 4/24]						[Bar chart for 4/25]						[Bar chart for 4/26]						[Bar chart for 4/27]											
22	M1376194 8 QGAV05D003 0	25	予定 実績	[Bar chart for 4/23]						[Bar chart for 4/24]						[Bar chart for 4/25]						[Bar chart for 4/26]						[Bar chart for 4/27]											
23	M1376300 8 QG9505D003 0	2	予定 実績	[Bar chart for 4/23]						[Bar chart for 4/24]						[Bar chart for 4/25]						[Bar chart for 4/26]						[Bar chart for 4/27]											
24	M1376382 6 QC1305D001 0	2	予定 実績	[Bar chart for 4/23]						[Bar chart for 4/24]						[Bar chart for 4/25]						[Bar chart for 4/26]						[Bar chart for 4/27]											
25	M1376786 8 QGAG05E001 0	25	予定 実績	[Bar chart for 4/23]						[Bar chart for 4/24]						[Bar chart for 4/25]						[Bar chart for 4/26]						[Bar chart for 4/27]											
26	M1376787 8 QGAG05E002 0	25	予定 実績	[Bar chart for 4/23]						[Bar chart for 4/24]						[Bar chart for 4/25]						[Bar chart for 4/26]						[Bar chart for 4/27]											
27	M1378589 8 QGAG05E003 0	25	予定 実績	[Bar chart for 4/23]						[Bar chart for 4/24]						[Bar chart for 4/25]						[Bar chart for 4/26]						[Bar chart for 4/27]											
28	M1378590 8 QGAG05E004 0	25	予定 実績	[Bar chart for 4/23]						[Bar chart for 4/24]						[Bar chart for 4/25]						[Bar chart for 4/26]						[Bar chart for 4/27]											
29	M1378591 8 QGAN05E001 0	24	予定 実績	[Bar chart for 4/23]						[Bar chart for 4/24]						[Bar chart for 4/25]						[Bar chart for 4/26]						[Bar chart for 4/27]											
30	M1378592 8 QGAN05E002 0	24	予定 実績	[Bar chart for 4/23]						[Bar chart for 4/24]						[Bar chart for 4/25]						[Bar chart for 4/26]						[Bar chart for 4/27]											
31	M1378593 8 QGAN05E003 0	24	予定 実績	[Bar chart for 4/23]						[Bar chart for 4/24]						[Bar chart for 4/25]						[Bar chart for 4/26]						[Bar chart for 4/27]											

NO	工程	計画				実績				投入差	所要差					
		開始時間	終了時間	工程待	所要時間	開始時間	終了時間	工程待	所要時間							
39	C380	Tiエッチング	24	22:15	24	22:42	0:01	0:27	24	22:15	24	22:42	0:01	0:27	0:00	0:00
40	C385	Tiエッチング検査	24	22:42	24	22:44	0:00	0:02	24	22:42	24	22:44	0:00	0:02	0:00	0:00
41	C390	再配線厚測定	24	22:45	24	22:55	0:01	0:10	24	22:45	24	22:55	0:01	0:10	0:00	0:00
42	C400	ポスト厚測定	24	22:55	24	23:05	0:00	0:10	24	22:55	24	23:05	0:00	0:10	0:00	0:00
43	C410	シェア強度測定	24	23:22	24	23:32	0:17	0:10	24	23:22	24	23:32	0:17	0:10	0:00	0:00
44	C420	外観検査	25	1:01	25	2:11	1:29	1:10	25	1:01	25	2:11	1:29	1:10	0:00	0:00
45	C500	PIアッシング	25	2:36	25	3:05	0:25	0:29	25	2:36	25	3:05	0:25	0:29	0:00	0:00
46	C510	ウェハ厚測定	25	3:10	25	3:15	0:05	0:05	25	3:10	25	3:15	0:05	0:05	0:00	0:00
47	C520	樹脂印刷	25	4:21	25	5:05	1:06	0:44	25	4:21	25	5:05	1:06	0:44	0:00	0:00
48	C530	脱泡	25	5:06	25	5:08	0:01	0:02	25	5:06	25	5:08	0:01	0:02	0:00	0:00
49	C540	キュア	25	5:15	25	15:45	0:07	10:30	25	5:15	25	15:45	0:07	10:30	0:00	0:00
50	C560	樹脂研削	25	15:45	25	16:45	0:00	1:00	25	15:45	25	16:45	0:00	1:00	0:00	0:00
51	C580	端子表面処理	25	16:46	25	17:42	0:01	0:56	25	16:46	25	17:42	0:01	0:56	0:00	0:00
52	C600	保護テープ貼付	2	19:48	25	20:26	2:06	0:38	25	18:10	25	18:50	0:28	0:40	1:38	- 0:02
53	C620	Si研削	2	20:26	25	21:14	0:00	0:48	25	18:49	25	19:50	#####	1:01	1:37	- 0:13
54	C640	保護テープ剥離	2	21:18	25	21:56	0:04	0:38	25	20:10	25	20:35	0:20	0:25	1:08	0:13
55	C642	超音波洗浄1	2	2:14	26	2:44	4:18	0:30	25	20:56	25	21:23	0:21	0:27	5:18	0:03
56	C650	フラックス印刷	26	3:35	26	5:01	0:51	1:26	25	22:57	25	23:40	1:34	0:43	4:38	0:43
57	C680	半田ボール搭載	26	7:39	26	7:16	0:38	1:37	26	0:20	26	1:16	0:40	0:56	5:19	0:41
58	C700	リフロー	26	8:16	26	8:30	0:00	1:14	26	1:20	26	2:04	0:04	0:44	5:56	0:30
59	C720	フラックス洗浄	26	8:30	26	9:30	0:00	1:00	26	4:30	26	5:41	2:26	1:11	4:00	- 0:11
60	C745	端子高さ(径)測定	26	9:30	26	9:50	0:00	0:20	26	6:00	26	6:15	0:10	0:15	3:30	0:05
61	C750	端子シェア強度測定	26	9:50	26	9:57	0:00	0:07	26	6:15	26	6:22	0:05	0:05	3:35	0:02
62	C780	レーザーマーク	26	10:04	26	11:41	0:07	1:37	26	10:40	26	11:32	0:32	0:32	- 0:42	0:05
63	C782	超音波洗浄2	26	13:04	26	13:34	1:23	0:30	26	14:30	26	15:00	0:25	0:25	- 1:26	0:05
64	C790	wf外観検査	26	13:34	26	13:36	0:00	0:02	26	15:44	26	16:13	0:49	0:29	- 2:10	- 0:27
65	C900	wf確認	26	13:36	26	13:46	0:00	0:10	26	16:14	26	16:20	0:01	0:06	- 2:38	0:04

Slow against  
planning ST

Plan

Delayed actual  
results input  
against planning

## 3. PERIPHERY SYSTEM

### \* Establishing Sub-System in Order to Operate Scheduling System

- 3.1 Actual data input, using a wireless handy terminal
- 3.2 ID label printing
- 3.3 Recipe control system

## 3.1 INPUTTING ACTUAL DATA (INPUT BARCODE), USING A WIRELESS HANDY TERMINAL

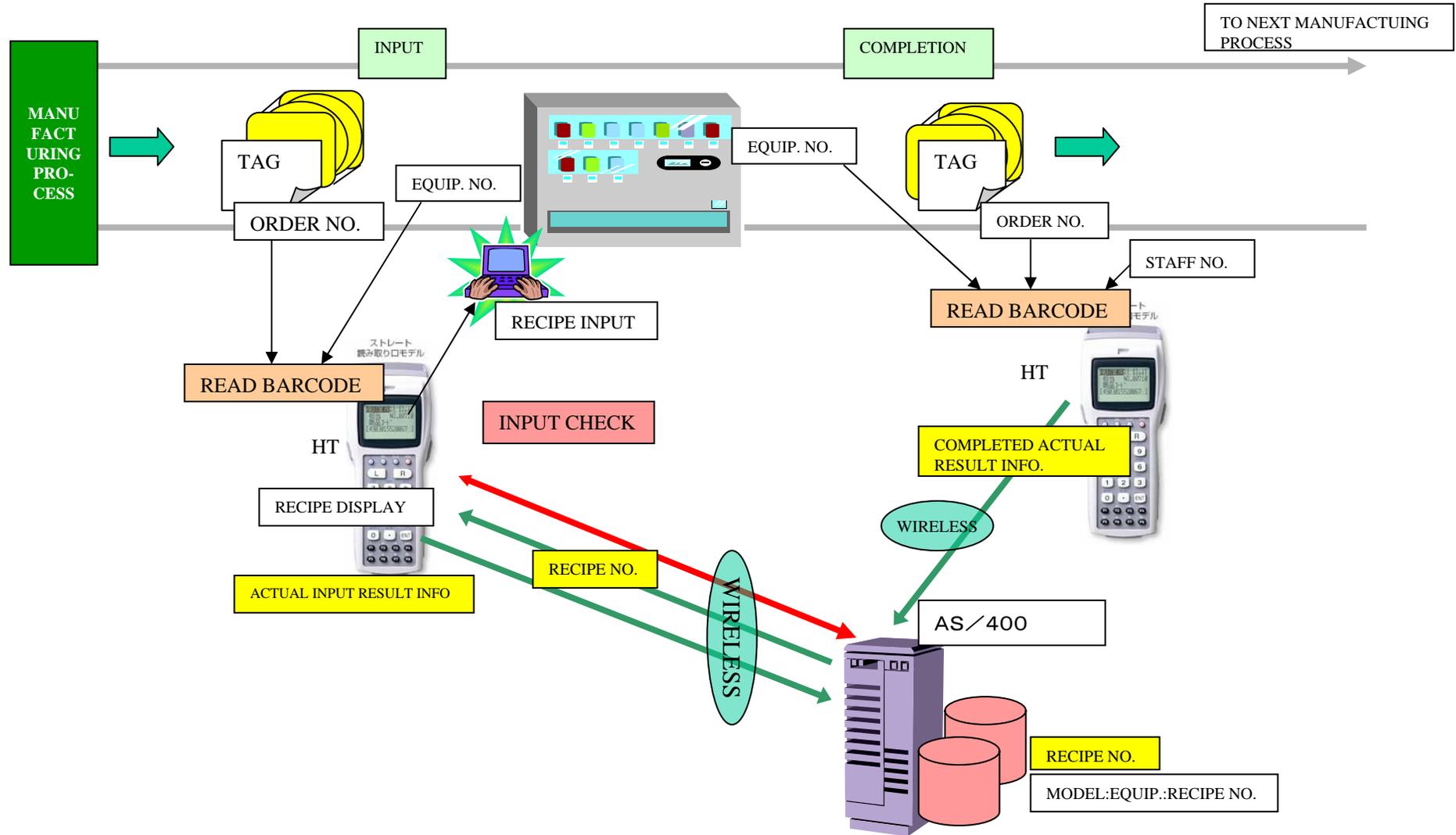
### PURPOSE:

- Improve the **accuracy of scheduling system**, by inputting the actual data into AS/400 in a timely manner.
- Implement accurate and easy input processing through the adoption of barcodes and the input of actual results in system time (promoting the input of the whole manufacturing processes)
- Provides the person in charge of operation (i.e., operator) with the operational procedures as well as the recipe information in order to prevent operational mistakes.

### OUTLINE:

- Connection is made with AS/400 online terminal, in order to synchronize with the actual results input currently in use.
- Introduces a portable type **wireless “handy terminal” equipped with a barcode reader.**

# OUTLINE FLOW DIAGRAM FOR HANDY TERMINAL (HT) INPUT SYSTEM



## 3.2 ID LABEL ISSUING SYSTEM

### Purpose

- Inputting of the actual results of manufacturing processes in a timely manner
- Prevention of mistakes such as mixing up lot cards and the actual item

### Outline

- Replaces the ID label number on carrier cases that travel between manufacturing processes with an automated output sheet, complete with bar codes
- Links the ID label with a lot card by displaying the last 4 digits of order numbers
- Simultaneously processes the ID label upon the output of a lot card

# OUTLINE OF FLOW DIAGRAM FOR ID LABEL ISSUING SYSTEM

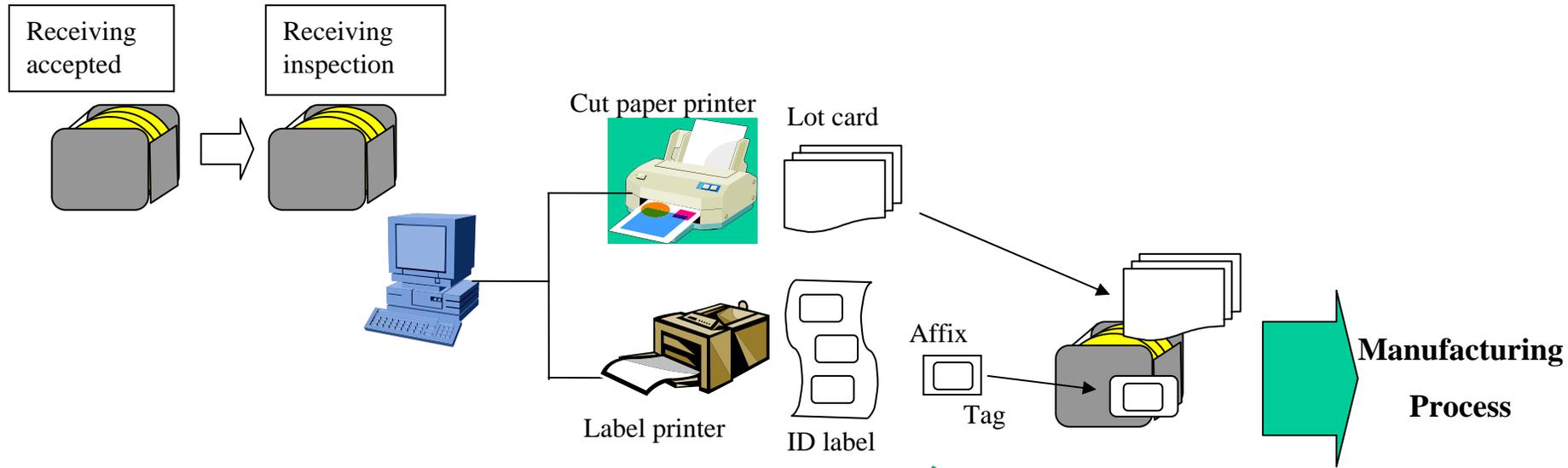
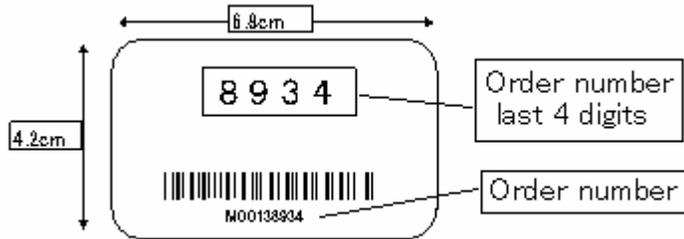


Image of ID label



# ID Label



# ID label and HT



### 3.3 RECIPE MANAGEMENT SYSTEM

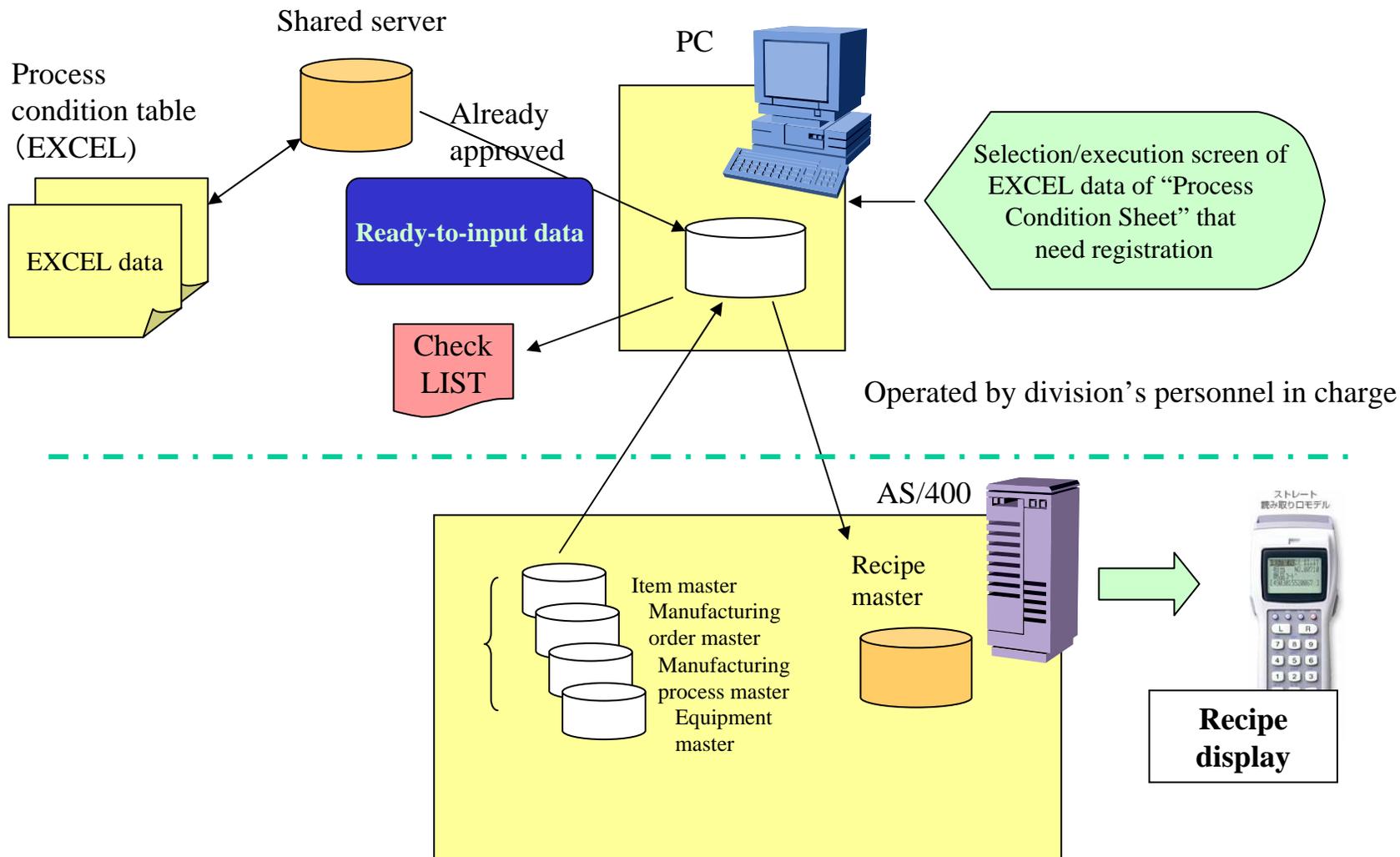
#### Purpose

- Avoids mistakes in inputting the recipe during the manufacturing processing operations and thus improves the yield ratio
- The database of recipes will be compiled and utilized for speeding up various recipe outputs (i.e., screen/ledger sheet) as well as for the recipe output system of equipment which is under planning

#### Outline

- Establishes data base on host machine (AS400)
- Utilizes the data based recipe data for recipe output screen at HT, a lot card, etc.

# OUTLINE OF BUSINESS FLOW DIAGRAM FOR RECIPE MANAGEMENT



# RECIPE SCREEN (ACTUAL EXAMPLE)

**Input: Taro Maikuro**  
**Order No.: M1193619A**  
**Laser mark**  
**Laser mark: WLP#1**  
**ZZZZ\_YYY123BC**  
**Seal spec. : 10-0-4-**  
**9869**  
**F1:UP F3:BK F4:CHG**

Manufacturing process name  
Equipment name  
Recipe  
Special instructions

## 4.SYSTEM ISSUES

- Improvement planning accuracy
  - More accurate scheduling can be obtained through the registration of human resources (i.e., operator skill)
- Expanding to other products
  - This scheduling system provides both the flexibility and speed required for sales order driven production

# 5. WRAP UP

## ■ Tips for utilization of ASPROVA

- Clearly specify the purpose of the scheduling system
- Set up scheduling to fit company's own production (in this case: sales order based production, complex manufacturing processes)
- Strike a balance between detail of master table, and accuracy of the resulting schedule

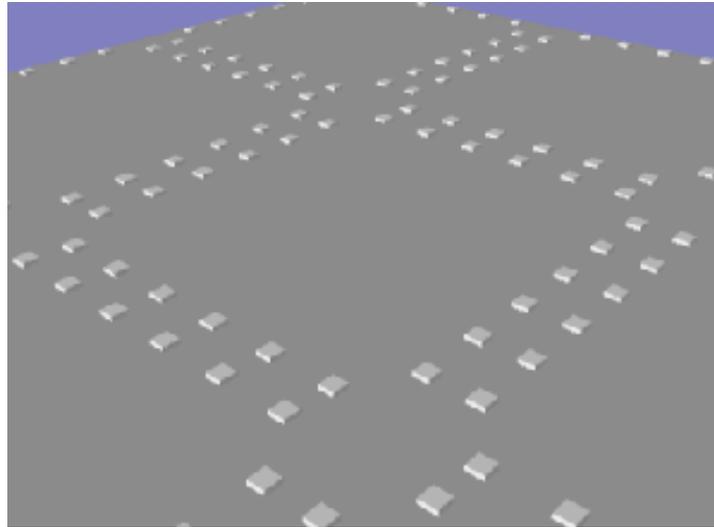
## ■ Linking to process management system

- Avoids inputting master twice
- Ensures consistency with ASPROVA by keeping information in a standard format
- Requires immediate input of all available results data

## ■ Utilizing schedule information

- Favor a work instructions sheet over a Gantt chart at the shop floor
- Narrow down what you want in order to gain effective results
- Use the scheduling system to further improve manufacturing processes

## WLP manufacturing process



Completed  
product

