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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: RECIPE CASCADING IN A WAFER PROCESSING SYSTEM

MODULE TYPE TYPE	PROCESS TIME	OVERHEAD TIME	PROCESS+ OVERHEAD
VP	52	10	62
VPC	60	5	65
CT	46	10	56
SB	60	7	67
SBC	45	5	50
PEB	60	5	65
PEBC	45	5	50
DEV	100	10	110
HB	25	10	35
HBC	22	10	32
EXPOSURE	10	15	25
OEBR	20	5	25
TARC	60	10	70
BARC	60	6	66
MORE?			

TRANSPORT TYPE	TRANSPORT TIME
CES	6
CAPTIVE-1	6
CAPTIVE-2	6
SI	6
IBTA	5
MORE?	

LOAD-LOCK=CASSETTE

SYSTEM THROUGHPUT (WPH) → 60
SYSTEM TAKT TIME (SEC/WAFER) → 45

500

PROCESS STEP	MODULE TYPE TRANSPORT USED USED	PROCESS + OVERHEAD TIME	TRANSPORT TIME	MODULE TAKT TIME	NUMBER OF MODULES REQUIRED	FUNDAMENTAL PERIOD
0	CASSETTE	0		0		
	CES		6			
1	VP	62		74	2	20.00
	IBTA		5			
2	VPC	65		75	2	38.00
	C-T		6			
3	CT	56		68	2	36.50
	C-1		6			
4	SB	67		79	2	38.50
	IBTA		5			
5	SBC	50		60	2	20.00
	C-1		5			
6	EXPOSURE	25		35	1	28.00
	SI		6			
7	PEB	65		77	2	34.25
	IBTA		5			
8	PEBC	50		60	2	37.50
	C-1		6			
9	DEV	110		122	3	35.00
	C-1		6			
10	HB	35		47	2	35.00
	C-1		6			
11	HBC	32		44	1	37.50
	CES		6			
12	CASSETTE	0		12	1	32.50
13	VACANT					
14	VACANT					
15	VACANT					
16	VACANT					
17	VACANT					
18	VACANT					

502

NO. OF MODULES → 22
MINIMUM SENDING RATE → 38.5
ACTUAL SENDING RATE → 45

(57) Abstract: The invention allows a cluster tool to change from a first recipe to a second recipe, while preserving periodicity and ensuring that there are no delays at critical points. This procedure is referred to as recipe cascading. Cascading involves emptying a first lot of wafers off a cluster tool and populating the cluster tool with another lot of wafers, serially and simultaneously. The procedure is performed with no delays incurred at critical process steps; and with no additional robots and process modules other than those called for by the recipe and throughput requirements of the entering and the exiting lots. The entering lot may also have different recipes and throughput requirements from the exiting lot. A program residing on a computer determines a schedule for the cluster tool which enables recipe cascading. The program may use a genetic algorithm to determine the schedule, or any other optimization technique.

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