Annex 18 Annual Plan of Operations (APO) *2004

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Japanese side>
 CA: Chief Advisor
 JPC: Project Coordinator
 LE: Long-term expert

– Plan

	LE: Long-term expert SE: Shurt-term evver				•
		Remonsihia			1
	TFY2004 TFY2005	T			
	JFY2004	T-T	Input (*)	Remarks	
		12 Project(*)			
Term of Technical Cooperation		_,			
					7 5
		CA, PD	JPC, LE, PM, TPC, TC		
		1.10° 1.101	TPC, TC		
				Reffer	
0-2-1 Formulate annual plans of activities for the next year				to 2-1	
		CA, PM	JPC, LE, TPC, TC		
		CA, PD	JPC, LE, PM, TPC, TC		
		۲ <i>γ</i> γ	JPC, LE, PM, TPC, TC		
0-3 Make the project budget plan by Thai side and evenute momentu		CA, PD CA, PD	JPC, LE, PM, TPC, TC JPC 1 E PM TEC TC		
. ć 11 v d					
		CA, PM	JPC, LE, TPC, TC		-
		PD Cla	JPC, LE, TPC, TC		
		CA, PM	лес, це, трс, тс		
C/P monthly meeting. Experts weekly meeting Hold (7 events - 1.16			JPC, LE, TPC, TC, C/P		
	•	CA, PD	JPC, LE, TPC, TC, C/P		_

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1/6 Annex 18

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		Kemarks											, ,			<u></u>
	(#) [1	(+) Indul					JPC, TPC			JPC, LE, TPC, TC, C/P		JPC, LE, TPC, TC, C/P	LE, TPC, TC, C/P		SE, C/P	SE, C/P
Responsible	berson	in the	Project(*)				CA, LE, PM, TC	CA IE BAA TC		CA, PM		CA, PM	PD, PM		LE, TC	LE, TC
2004	TFY2004 TFY2005	FY2003 JFY2004	2 3 4 5 6 7 8 9 10 11 12		ned properly.	- - 					, 					
Calendar Year		Fiscal Year		terri or tecnnical Cooperation	Output 1 The necessary machinery and equipment are provided, installed, operated and maintained properly	1 The necessary machinery and equipment are provided, installed, operated and maintained properly.	1-1 Make facility refurbishment plan and implement as planned. 1-1 Make facility refurbishment plan for technical training,	seminars and prototyping service, if necessary.	1-2 Provide and install necessary machinery and equipment.	1-2-2 The plants of processing interactions and equipment to be		1-2-3 Procure and transport the machinery and equipment to the Project site.	1-2-4 Make the plan of necessary machinery and equipment, then purchase as planned by Thai side, if necessary.	1-3 Operate and maintain the machinery and equipment as planned.	1-3-1 Compose operation and maintenance manual.	Operate and tradition tracements and equipment as planned.

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Fiscal Year	TFY2004 TFY2005 JFY2003 JFY2004	person in the	Input (*)	Domodo
Fiscal Year	03	in the		
	1 2 3 4 5 6 7 8 9 10 11 12	Project(*)	•	CCILIA KS
Term of Technical Cooperation	 			
Output 2 Technical capability of the counterpart personnel (hereinafter referred to as "C/P") are upgraded.	as "C/P") are upgraded.			
2 Technical capability of the counterpart personnel (hereinafter referred to as "the C/P") are upgraded.				
2-1 Make plan of technology transfer to the C/P. 2-1-1 Formulate Annual Technical Cooperation Program (ATCP)	- - - - - - - - - - - - - - - - - - -	CA, PM	JPC, LE, TPC, TC, C/P	
for the next year and review recurrical cooperation rrogram for 5 years (TCP), if necessary. 2-1-2 Approve ATCP and TCP at JCC. 2-1-3 Revise ATCP and TCP, if necessary.		ດ⁄ ມ ເງ	JPC, LE, PM, TPC, TC JPC, LE, PM, TPC, TC, CP	
 2-2 Implement technology transfer to the C/P. 2-2-1 Prepare teaching material. 2-2-2 Implement technology transfer as ATCP. 2-2-3 Compile textbooks and necessary documents. 2-2-4 Implement echo-training and self training by C/P. 2-2-4 Implement C/P training in Japan. (The plan could be subjected to change under constraints such as subdect amonitation 1) 		LE, TC LE, TC LE, TC PN, TC CA, PD	SE, CP SE, CP SE, CP CP CP IPC, LE, PM, TPC, TC, CP	
 2-3 Monitor and evaluate the result of technology transfer to the C/P. 2-3-1 Review monitoring and evaluation method, if necessary. 2-3-2 Develop the material for monitoring. 2-3-3 Monitor and evaluate the result of technology transfer to the C/P. 2-3-4 Share the results of monitoring and evaluation at JCC. 		CA, LE, SE LE, SE CA, LE, SE CA, PD	JPC JPC, TPC, TC, C/P JPC, LE, PM, TPC, TC, C/P	

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	VUUC.	Damentel		
	2004 ZUU4	Kesponsible		
Fiscal Year	JFY2004		Input (*)	Remarks
Term of Technical Cooperation Output 3 Technical training and seminars are implemented systematically.		12 Project(*)		
3 Technical training and seminars are implemented systematically.				
3-1 Grasp an appropriate perception of present situation of Thai plastic injection mold industry.				
 3-1-2 Conduct factory questionnaire survey. 3-1-3 Hold information sessions with industrial associations. 		CA, TPC CA, TPC	JPC, LE, TC, C/P JPC, LE, TC, C/P	
3-2 Complete training courses and implement them regularly.		CA, PM	JPC, LE, TPC, TC, C/P	
3-2-2 Analyze present situation of Thai plastic injection mold industry.		PM, TPC CA, TPC	TC, C/P, SP JPC, LE, TC, C/P	
3-2-3 Revise curricula and textbooks, if necessary. 3-2-4 Announce information resarction training convest		LE, TC	C/P	
3-2-5 Accept applicants for training courses.		CA, PM TPC	JPC, LE, TPC, TC, C/P, SP SP	
		PM, TPC	LE, TPC, TC, C/P, SP TC C/B	
5-2-6 Implement training courses, 3-2-9 Revise attendants questionnaire, if necessary. 3-2-10 Review constructions are set of the		CA, PM CA, PM	LE, TC, C/P, SP JPC, LE, TPC, TC, C/P	
		РМ	TPC, TC, C/P, SP	
é		CA, PM	JPC, LE, TPC, TC, C/P	
		LE, TC	C/P	
3-3-4 Amend and complete curricula.		LE, TC	JPC, LE, TPC, TC, C/P C/P	
-3-6 Make text book.		LE, TC	C/P C/P	
e		CA, PM	JPC, LE, TPC, TC	
3-4-2 Announce information regarding pilot training course.		PM, TPC CA, PM	JPC, LE, TPC, TC, C/P, SP	
		TPC	SP	
3-4-5 Conduct teaching method training and practice sessions.		PM, TPC	LE, TPC, TC, C/P, SP TC, C/P	
		CA, PM	LE, TC, C/P, SP	
5-4-8 Conduct questionnaire survey and produce analytical report.		TPC	JPC, C/P, SP	
 3-5 Implement mold technology seminar. 3-5-1 Decide objectives and themels for the seminar. 3-5-2 Select environmentation construction of the seminar. 		CA, PM	JPC. LE	
3-5-3 Send invitation card to guests.		CA, PM	JPC, LE,	
3-5-4 Implement mold technology seminar.	1	CA, PM CA, PD	IPC, TPC,	
Conduct questionnaire survey and produce analytical report.			10' 11' 11' 11' 11' 11' 11' 11' 11' 11'	

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Calendar Year				Annex 18
	2004 2004 TFY2005	Responsible		
Fiscal Year	004	in the	[uput (*)	Remarks
		Project(*)		
Term of Technical Cooperation				
Output 5 Trial prototyping service is implemented systematically.				
S Trail prototyping service is implemented systematically.				
5-1 Grasp an appropriate perception of present situation of				
 5-1-2 Conduct factory questionnaire survey. 5-1-3 Hold information sections with induction factors. 	C C	CA, TPC JPC, LE CA, TPC JPC, LE	JPC, LE, TC, C/P JPC, LE, TC, C/P	
and a second second second in the second and a second time.			JPC, LE, TPC, TC, C/P	
 5-2 Make plan of trial prototyping service. 5-2-1 Make plan of mold manufacturing service 	· · · · · · · · · · · · · · · · · · ·			
5-2-2 Make plan of machine sharing service.	Cd, PM		IPC, LE, TPC, TC	
5-2-3 Assign personnel to administrative work of trial prototyming service			TPC, TC TPC, TC, CP, SP	
5-2-4 Make plan of SIC Internal prototipe mold		-		
5-3 Implement trial prototyping service.			JPC, LE, TPC, TC, C/P	
5-3-1 Notify information of trial prototyping service.	5 		PC LE TPC TC C/P SP	
5-3-3 Design, process and assemble the SIC Internal Mold	CA, PM		C/P, SP	
5-4 Monitor and evaluate trial prototyning service				<u> </u>
5-4-1 Revise the monitoring and evaluation questionnaire,				
It necessary. 5-4-2 Conduct guestionnaire survey and produce and hiddling and		<u> </u>	PC, LE, TPC, TC, C/P	
'I loddar usia waanna da ay		TPC, TC	TPC, TC, C/P, SP	

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1/1 Annex 19

Annex 19 Annual Tentative Schedule of Implementation (ATSI) * 2004

Calendar Year					20								_		2	004	-						200	5
Japanese Fiscal Year		5	16	17	1.0		003	3 0 1]	112	11	17	1 2		15	17	17	To		200-		1 1 /		<u>.</u>	
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Term of Technical Cooperation			 							·	 			•									 	
The Japanese side		 				-		_	·-														-	
I Dispatch of Mission		 	ļ				 .					i												
(1) Management Consultation							-		_	ļ	ļ						İ		_				<u> </u>	
(2)Mid term Evaluation Team	_				1			<u> </u>	ļ	ļ	<u> </u>												ļ!	_
(3)Final Evaluation Team							.	-						+								<u> </u>		
II Dispatch of Long-term experts				+ 		+							 -											
(1) Chief Advisor		 		 		-		-										1				1		
(2) Coordinator	_	ļ	1	1	-	<u> </u>								<u>[</u>						-		-		
(3) Mold Design • 3D CAD/CAM					<u> </u>				<u> </u>									1		-				
(4) Mold Processing				 		-*									_	1	1	-		·		1		
(5) Mold Assembling and Trial Short	_				 · ·				1 		-									•				
III Dispatch of Short-term experts									 															
(1) 3D Design														<u> </u>						-				
(2) Design(Lecture)			_																					
(3) Seminar			·																					
(4) Mold Processing(EDM)						<u> </u>		=			_		·				<u> </u>			<u> </u>				
(5)Maintenance					<u> </u>							• • • •												
(6)Measurement										-+									÷			\vdash	_	
(7)Lapping												_												
			•				•														-		-	
								·																
IV Training of the C/P in Japan													-						İ	 				
(1) Mold processing									=											ļ				
(2) Mold Design(3D)																			İ	Ì		-		
(3) Mold Design(3D)				_				[.										
	- +	+	-																			·		
V Provision of Machinery and Equipment	-													}									_	
v Trovision of Wachinery and Equipment														1										
		• • • • • •								-														
The Thai side		-							•••••			-+-		+										
I Building and Facilities		-														_								
	+							1							+									
II Machinery and Equipment											<u> </u>	_		<u> </u>	_		_				····			
	-[-+	\rightarrow						+	+	-
III Allocation of the C/P														_		-	_							
and necessary staff												-+	•		-+		-+					-+		
	-			-+	-								\neg								-	-+		_
IV Allocation of Budget	-	-																_						
	1	!	1	1	- 1	1		1	1		I	1	1		-		<u>i</u>	ļ			1	1		

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— (Take over duties)
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Manager
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1/3 Annex 20 2/3 Annex 20

Remarks Mold Processing Processing Mold Processing Mold Mold Assembling Training in Japan Training Assembling Processing CAD/CAM Operation Field Operation Operation 3D Mold 3D Mold CAD/CAM CAD/CAM Design Design Mold Mold Duration (month) . က က က က က \sim ŝ ŝ က 2004 9 r----| * 2003 ≌ ۲ (Transferred.) ¥ - 01 2002 Oct. [~ -2001 <u>e</u> ~ Annex 20 Allocation of the C/P Allocation of the C/P 2000 1 ≘ ~ Ţ 1999 2 Nov. 1 Nov. F Nov. | Nov. 1 Nov. 1 💻 Yov. I Nov. 1 Nov. 1 Nov. t 🗕 Nov. 1 Nov. 1 Nov. 1 Nov. I Nov. 1 -Nov. 1 -Nov. I Nov I **~** Mr. Sompong Teeracanont (3) Assembling & Trial Shot Mr. Damlong Kratumkhetr Mr. Sahas Chumsoongnoen Mr. Tikumporn Chinnarong *1 Mr. Paiboon Chaengsanon JFΥ *1 Mr. Chairat Keawdoung *1 Mr. Virit Viseshsindh Mr. Satta Denpradith Mr. Paiboon Tekapan Mr. Sirisak Ritngan Mr. Preecha Jamtath Mr. Chanon Suktayu Taweesit Buamee *1 Mr. Paisal Lhokaew Mr. Prakob Janma . Mr. Worapong Chinchoksakulchai (2) Mold Processing 2 Technical C/P Wongprachanukul Vongrasametoeng Name of C/P (1) Mold Design (NC Programing) Mr. Pongsak Mr. Bantao Ŧ Ħ

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3/3 Annex 20

Remarks Training Field Training in Japan Duration (month) -2 2004 r--2003 r--1 01 2002 ~ 7 10 1 2001 (Transferred) Annex 20 Allocation of the C/P Allocation of the C/P 7 10 1 2000 <u>1</u>.15 -01 1999 Nov. I (Mr. Worapong Chinchoksakulchai) ~ Mr.Umnart Teerapongpipat Mr. ChanchaiUngpinitpong Mr.Kijja Chongkwanyuen JFY (5) Factory relation Name of C/P (4) Networking Note AA

*1: These C/P are given a status as the supporting staff. Training in Japan - Allocated

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Annex 21 Number	r of	participant	of	meeting
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Year No. Date	Thai side	Japanese side	Secretary	Total
999 1 Nov. 15	5	4		12
2 Nov. 22	5	4	3	12
3 Nov. 29	5	4	5	14
4 Dec. 7	6	4	4	14
5 (Dec. 20	6	4	4	14
6 Dec. 27	3	3	4	10
· · · · · · · · · · · · · · · · · · ·		- ···		10
2000 1 Jan. 10	5	2	5	12
2 Jan. 17	7	4	5	16
3 Jan. 31	5	3	4	12
4 Feb. 8	; 6	3	3	12
5 Feb. 14	4	4	2	10
6 Feb. 23	2	4	4	10
7 Feb. 28	7	4	3	14
8 Feb. 6	4	4	3	11
9 Mar. 13	3	3	2	8
10 Mar. 20	4	4	3	11
11 Mar. 27	4	4	5	13
12 Apr. 3	5	3	2	10
13 Apr. 10	6	2	2	10
14 May 1	5	4	3	12
15 May 8	2		2	7
16 May 22	2 3	3	2	10
17 May 29	2	5	3	10
18 Jun. 5	4	5	4	13
19 Jun. 12	3	5 5	3	11
20 Jun. 19	3	5	3	11
21 Jun. 26	4	5	2	11
22 Jul. 10	4	5	4	13
23 Jul. 24		5	2	12
	5	5	3	13
25 Aug. 7	4	5	5	14
26 Aug. 21	• 4	4	5	13
27 Aug. 28	4	5	5	14
28 Sep. 4	4	5	5 2	11
29 Sep. 25	2	5	3	10
30 Oct. 2	3	4	4	11
31 Oct. 9	4	4	3	11
32 Oct. 16	3	4	4	11
33 Oct. 30	3	5	2	10
34 Nov. 6	3	4	2	9
35 Nov. 17	4	3	2	.9
36 Nov. 27	3	4	4 2 2 2 2 2	9
37 Dec. 12	4	4	2	10
38 Dec. 19	4	4		9
			, _ ,	9
01 1 Jan. 8	6 ;	5	3	11
2 Jan. 29	4	5;	3	14
3 Feb. 5	4	<u>5</u> ,	<u> </u>	12
4 Feb. 12	4	<u>5</u> i		10
5 Feb. 19	2	<u>5</u>	2	
<u> </u>	4			7
7 Mar. 19	4	4	3	11

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Year	No. Date	Thai side	Japanese side	Secretary	Total
	8 Mar. 26	5	4	3	12
	9 Apr. 2	3	3	1	7
	10 Apr. 9	4	3	2	9
	11 Apr. 23	2	2	2	6
	12 Apr. 30	3	4	2	9
	13 May 14	5	5	2	12
	14 May 21	2	5	2	9
	15 May 28	2 3	4	2	9
	16 Jun. 4	2	5	1	0
	17 Jun. 11	5	5	1	
	18 Jun. 18	5	3	2	10
	19 Jun. 25	5	5	1	11
	20 Jul. 2	2	4	1	7
·····	21 Jul. 10	3	4	1	8
·	22 Jul. 23	4	4	1	9
	23 Jul. 30		. 2	1 *	6
	24 Aug. 6	3	3	2	8
	25 Aug. 13	3	5	2	
	26 Aug. 20	3	5	2	10
	27 Sep. 3	6	4	2	12
	28 Sep. 10	3	5	2	10
	29 Sep. 17	6	, 5	2	13
	30 Oct. 1	• 5	5	2	12
	31 Oct. 8	3	4	1	8
	32 Oct. 15	3	4	2	9
	33 Oct. 29	4	6	2	12
	34 Nov. 5	5	6	2	13
	35 Nov. 19	, U	6	2	13
	36 Nov. 26	3	5	2	10
	37 Dec. 3	. 8	5	2	15
	38 Dec. 17	5	5	2	12
	39 Dec. 24	3	4	2	9
	· · · · · · · · · · · · · · · · · · ·	·			
2002	1 Jan. 7	6	5	2	13
	2 Jan. 21	4	5	2	11
	<u>3</u> Jan. 28	5	4	2	11
	<u>4 Feb. 11</u>	4	4	1	9
	5 Mar. 4	5 5	4 .	1 ;	10
	6 Mar. 25	5	5	2	12
	7 Apr. 1	5	5	2	12
-	8 Apr. 22	3	5	2	10
	9 Apr. 30	5	5	1	11
	10 Jun. 24	4	4	2	10
	<u>11 Jul 1</u>	2	5	2	9
	12 Jul. 8	· ∠	5	1	8
	13 Aug. 5	3	5	2	10
	14 Aug. 19	4	6	2	12
	15 Sep. 2	5	6	1	12
	16 Oct. 21	4	2	2	8
	17 Nov. 25	3	4	1	8
	18 Dec. 2	5	4	2	11
0000					
2003	<u>1 Mar. 31</u>	4	4	4	12
	<u>2</u> Dec. 11	1	1	2	4
	3 Dec.16	3	7	10	10

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3/3 Annex 21

6	4	2	12
1	1 .	2	4
17	5	4	26
	0 1 17	0 4 1 1 17 5	0 4 2 1 1 2 17 5 4

Monthly meeting

Year	No.	Date	Thai side	Japanese side	Total
2000	1	Dec. 26	12	5	17
2001	1	Jan. 31	11	5	16
	2	Feb. 28	9	5	14
	3	Mar. 30	11	4	15
		Apr. 27	10	4	14
:	5	May 31	8	5	13
		Jun. 29	11	4	15
	7	Jul. 27	10	4	14
	8	Aug. 31	9	5	14
	9	Sep. 28	11	5	16
		Oct. 31	12	5	17
		Nov. 30	9	5	14
·	12	Dec. 26	9	5	14
2002	1	Jan. 31	12	5	17
		Feb. 28	10	5	<u> </u>
		Mar. 29	11	5	16
	4	Apr. 30	9	5	14
	5	Jul. 9	8	4 5	12
	6	Aug. 29	9	5	14
	7	Sep. 27	10	5	15
	8	Oct. 31	15	6	21
2003	1	Jan. 21	17	8	25

JCC Meeting

2000 1 Jun. 8 19 10 29 2 Nov. 23 16 9 25 2001 3 Jun. 21 19 10 29 4 Dec. 13 21 11 32 2002 5 Jul. 30 17 11 28 2003 6 Jan. 28 21 11 32 2003 7 Jul. 16 21 11 32 2003 8 Dec. 23 18 9 27	Year	No	Date	Thai side	Japanese side	Total
2001 3 Jun. 21 19 10 29 4 Dec. 13 21 11 32 2002 5 Jul. 30 17 11 28 2003 6 Jan. 28 21 11 32 2003 7 Jul. 16 21 11 32	2000	1	Jun. 8	19	10	29
4 Dec. 13 21 11 32 2002 5 Jul. 30 17 11 28 2003 6 Jan. 28 21 11 32 2003 7 Jul. 16 21 11 32		2	Nov. 23	16	9	25
2002 5 Jul. 30 17 11 28 2003 6 Jan. 28 21 11 32 2003 7 Jul. 16 21 11 32	2001	3	Jun. 21	19	10	29
2003 6 Jan. 28 21 11 32 2003 7 Jul. 16 21 11 32		4	Dec. 13	21	11	32
2003 7 Jul. 16 21 11 32	2002	5	Jul. 30	17	11 .	28
	2003	6	Jan. 28	21	11	32
2003 8 Dec. 23 18 9 27	2003	7	Jul. 16	21	11	32
	2003	8	Dec. 23	18	9	27

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Annex 22 Number of Publicity (Brochures, Periodicals, etc.)

PUBLICITY

1 Brochures 1			Total	Balance	Location
		September 2000	3,000	57	SIC Office
2 Suppliment		September 2000	3,000	49	SIC Office
<u>3</u> Brochures 2		October 2001	3,000	49	SIC Office
4 SIC homepa	age	October 2001			www.smethai.net/sicproject

EXHIBITION

	ubject	Date	Participant	Brochure	Location
	nd Die Thailand	October 26-29, 2000	20,253	2,000	BITEC Bangna
2 METALEX		October 8-11, 2001	>40,000	2,000	BITEC Bangna
	nd Die Thailand	October 24-27, 2002	12,091	500	BITEC Bangna
4 Inter Plas &	Inter Mold 2003	June 6-9, 2003	~36,000	100	BITEC Bangna
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TELEVISION, REDIO, NEWSPAPER, PUBLISH

No.	Subject	Date	Location
	nner in Industrial Clinic	November 16, 2000	Television Channel 11
	evision Broadcast	November 5, 2000	Television Channel 5, 11
<u>3</u> Rad	dio Interview Director-General of DIP and	November, 2000	FM 101
	sident of TDIA		
_4 Tec	chnology for Plastic Mold Injection	November 18, 2002	Television Channel 11
	. Prapat & Dr. Ikeuchi)		
	erview of Industry in Thailand	April-May, 2004	Newsletter of BSID
<u> </u>	Jun Ikeuchi)		the 1st year, the 1st Vol.

<u>No.</u>	Local Suppliers	Spare Parts
1	Misumi (Thailand) Co.,Ltd	Standard Part
2	Futaba JTW (Thailand) Ltd.	Mold Base
	Mitsiam international,Limited	CADCEUS Software
	PSSP Trading Co.,Ltd.	Tooling, oil equipment ect.
5	Extract Co.,Ltd.	Finishing plate (for mold)
6	Mitrakom Co.,Ltd.	Makino
7	Sodick Thailand Co.,Ltd.	Sodick
8	Factory Max Co.,Ltd.	Tooling
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Annex 23 List of Spare Parts Suppliers

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Annex 24 Monitoring and Evaluation Sheet Field:Design-Group Expert in Charge: Mr. J. Ono 2004/6/17

Subjects						11 /0 /2007
	: :		Counter	er part		
	Mr.Paiboon	Mr.Warapong	Mr.Paisal	Mr.Chanon	Mr.Sompong	Mr.Preecha
1) Fundamentals of Mold Design					0	
Forming methods of plastics	4	4	e.	V		6
Name and function of mold components	6		0	ric	t c	
Runner and Gate basin configuration		2	0	S	v	·
	S.	3	3	4	4	¢.
Action Method of under cut part	3	ო	ę	с С	с.	6
Method of Ejector	e	3	3	4	Ň	• •
Cooling system	3	67) (°		+ <	C
2) CAD/CAE Operation		>		+	+	
Solid modeling		[c			-
	t	o	S	4	4	 c
r arametric modeling	4	ç	e	6	c	6
Making of molding requirement	3	с.	C	. ~	2	. c
Mold Design function	C) c	>	2	
Mold Flow	0 0	2 0	7	4	4	
3) Education	2	~	*	3	с С	5
				-		
Basic Mold Design Course	က	3	*	7		6
Basic CAD Course	4	4	6	V	-	
Parametric CAD Course	4		×	+ 0	+ c	7
C/MoldDesign Course		-	÷ .	°.	r	
Evnerimental 3D Darian Darian J. T. V	, ,	n	*	4	4	~.
	4	3	*	4	4	6
Experimental 3D Design Course (AlarmClock)	0	0	0	0	0	C
Experimental 3D Design Course (Leephone)	4	3	*	4	4	6

Level=0: Technology transfer is not started

1: Counterpart personnel can perform the job under expert' instruction.

2: Counterpart personnel can perform the job with experts' advice.

3: Counterpart personnel can perform the job by themselves.

4: Counterpart personnel can instruct others.

*: It is not possible to evaluate because he hardly comes. Mr.Paisal became the supporting staff in October, 2003. ?: Mr.Preecha just came to the design group in April, 2004, and does not evaluate.

Evalution Comments

1) Mr. Paiboon

He acted as a group leader including teaching to other people when Japanese expert was not in CAD room.

CAD knowledge and his modeling ability are also very high.

His help as the interpreter at the technology transfer and to translate of the training materials is very useful for the project.

2) Mr. Warapong

He explains very well in the training course. Character as the instructor is best.

Recently, he seems to be busy for the meeting of management. However, I want him to use more time to operate CAD.

3) Mr. Paisal

He has been to Japan for the CAD training . He has hardly come to the project after he had appointed the member of welding group. Therefore, the project made him to be supporting staff.

4) Mr. Chanon

He had hardly used CAD for three years.

However, he could undersdand 3D design and CAD operation fastest in the design group.

5) Mr. Sompong

He had hardly used CAD for three years. He is a man who makes efforts. Always, he is training by himself.

6) Mr. Preecha

Sanch

He has just transfered from the assembly group in April. He is studying Basic CAD, Modeling by using various drawings. I want him to continue the current effort to catch up another C/P ahead.

Monitoring and Evaluation Sheet Field : Processing Group Expert in Charge: Mr.T.Yoshio Annex 24

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17-May-2004

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	Mr.Damronø		EUM		4	4	3 5	2.5	3.5			4	4	4	3	, ,	ל 2 ת	200	35			4	<u> </u>	+	 	Unfinished
er part	Mr.Sirisak	W.EDM		**** - - - - - - - - - - - -	4	4	3.5	3.5	3.5		********	4	4	4	3	2	3.5	3	3.5			4	4		l Infinishad	Unfinished
Counter part	Mr.Bantao	CNC·M/C		***************************************	4	4	3.5	3.5	3.5			4	4	4	4	3.5	3.5	3	3.5			4	4	3.5	Unfinished	Unfinished
	Mr.Satta	CNC-M/C				± C	C.S	3.5	3.5		; 	÷	4	4	co.	2	3.5	3	3.5		Y	*	4		Unfinished	Unfinished
		Specialty		*********				sing.		g machinery	entional Machinery				8.11711						ē				ique on 3D CADCAM)	es with 3U CAD/CAM)
Subject	Carolect		1) Fundamentals of Processing	Cutting theory	Fundamentals of Machinery	Inspection and measurement	Planning and scheduling access	Quality control		2) Operation and function of processing machinery	Operation and function of conv	Operation of NC Machinery	Operation of CNC Machinery	CAM/CNC operation and programming	CAD operation for processing	Machine maintennance	Tooling management	Measuring tool management		3) Education	Fundamental processing lecture	Fundamental CNC programing lecture	Basic 3D CAM (Evnerion of 9D	Advanced CAM (ESC T T	Flectrode CAM (Molice - 1, 1, 1, 1, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2,	CAU/CAM)

Level=

0: Technology transfer is not startid 1: Counterpart personnel can perform the job under expert' instruction. 2: Counterpart personnel can perform the job with experts' advice. 3: Counterpart personnel can perform the job by themselves.

4: Counterpart personnel can instruct others.

Sareh

Evalution Comments

1) Mr.Satta

He is the best lecturer in our counter part. He can manage the mood of his lecture well.

His technique of using M/C is also excellent. He knows how he manage the accuracy by making full use of CNC functions.

2) Mr.Damrong

He takes in charge of EDM machine. His specialty is not only EDM but also good at using all conventional machines(Grinding/Lathe/Milling) very well. Especially he can do spontaneous experiment to find the best condition and solve some problem by himself. I hope him to continue that investigation.

3) Mr.Sirisak

He takes in charge of Wire-EDM machine and uses its control software well. But we don't have CNC Lathe, so he can't exercise his abilitiy. He also has knowledge about CNC programing for CNC lathe.

4) Mr.Bantao

He is the key person of processing group.

His skill and knowledge about processing are the best in processing group, especially using CAD/CAM system. Recently, almost every processing works in our project depend on his performance, so he always very busy... He want to study about CAD/CAM more detail but he have no time study. I hope him to teach the other counter part about CAD/CAM system.

Sanch

Annex 24 Monitoring and Evaluation Sheet Fi Assembling and Trial shot Expert in charge <u>N.Ishizaki</u> Subject

17-Jun.-2004

Subject		ľ		
Specialty		Counter part	er part	
ntals of Mold assembling and Trial shot	INIT-Prakob	<u>IMr.Preecha</u>	Mr.Sahas	Mr Tikumorn
T T T T T T T				
Ľ <u>.</u>				
Assembling T asset ule order to polish mold smoothly		+	4	4
		4	4	P
		4	4	
1/J molding To understand kinds and charactering of inolu		4		+ +
			- +	4
in the structure and the various functions of		┛	4	4
T injection molaing machine and to master how to use it		4	4	4
Maintenance to understand the maintenance and the maintenance and the		4	T	
To put ability of the characterization will use management of mold				4
2) Application skill of Mold comp of the citeching mold and the repairing mold			4	4
Poliching of more assembling and Irial shot		4	4	4
1 UNINING FLOW to polich the corner (R-part) and edge				
		4		
Assembling To master the constitute			- + 	4
		╪╢╺	4	4
1/1 molution 1.0 understand and to master the order of assembling mold		4	4	4
10 understand the content of injecting trouble ar		4	4	
To master how to use the grane and how to use		с С		# c
To experience the mersting the instanting to the mold		4		m.
attached acritic are used to machine and the			- t	4
Maintenance To be allo to the principal and the Way of the trial molding		2	4	m
<u>-I</u>				
3) Education		4	4	4
ſ		2	4	
r viisning Lecture and Exercise				2
į		4		
I/J molding entrine and Evening			4	4
Γ		4	4	4
- 		e S	4	35
inctaination 0		Unfinished	Unfinished	Infinite
N •	U/P personnel can perform the job with experts' advice	he job with expert	s' advice	nalisiiiin
. 4	Dersonnel can instruct other	+ hours	י מתאוכט.	

4 C/P personnel can instruct others . . Jou by themselves .

Sanch

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Evalution Comment

:He mainly manages the project in work-shop A . Heis too busy to come doing operation . Mr.Prakob

: He has mastered the fundarmental skill but not experience so much with the application skill . Mr.Preecha

:He tranferred to the design group from this work . Mr.Sahas

: He is a leader in this group and has mastered whole skill and technology in mold assembling and trial shot field . : What he should do is to experiencl plastic injection molding .

Mr.Tikumpori : He has transferred to this group since January in 2003 .

Sanch

. He is a quick learner and already mastered the fundamental skill . All he has to do is just to experience .

6/6 Annex 24

Name of Mold - 1 Pen tray - Cr Purpose - Sr					
Pen tray - 0	Design	Processing	ing	Acc'v &	Ace'y & Trial chaf
Pen tray	Important Points to Learn	Problem	Countermeasure	Problem	Cointernocours
	 Create ejector pin, sleeve 	- Ejecter hole is big so that	- Did not renair	- Blirb	
	- Cooling pipe, System	flash after Injection			- chiarge gas vent
	- Sprue bush	- Ejecter plate cannot move	- Machine to enlarge	- Bari was occurred near	- Repaire the elliptic part
	- Locate ring	becarrese ejecter milde	the hele		
-plate	- Runner	and electer hush to filted	Change and a L-	gate	by welding and finishing
1	Guide bushes, guide pins	- The hold of elector pin	Stronder		
SSS		was ellipse	ou ou get		
and the basic shapes					
of rib and boss					
To understand the					
Importance of polishing					
the mold surface					
Mold Evaluation	ais mold was simple one that o				
	le condition of polishing was at	- The condition of polishing was about same level that was molded by using mold made in Japan.	d there was no big proble d by using mold made ir	sm . Japan.	

Sanch

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1/12 Annex 25

		Progess Record of Completed 1 arget Mold	l arget wold j		
	Design	Processing	ing	Ass'y	Ass'y & Trial shot
Name of Mold	Important Points to Learn	Problem	Countermeasure	Problem	Countermeasure
Front Case for	- Under Cut, Draft Angle	- Accuracy of processing		- Flash at slide	- Welded and machined
Alarm Clock	- Parting surface	the slide was bad		- Weld line was	
				occurred	again
	- Mold base			at the hold of the	- Make ditches at gas
				product	
Purpose	- Core pin				vent of Oshikiri - pin
 To master the applicable 	- Slide				
structure of a two-plate	- Runner gate				
vertical split mold and	 Positiming ejector pin, ejector 				
partial undercutting	sleeve, ejector guid pinejector				
To learn fabrication	guide base				
of simple curve shapes	- Cooling pipe				
and cutting	- Holding part				
	screw				
	- Mold weight				
	- 2D Drawing				
Mold Evaluation	- This mold was side - gate type and was not s	and was not special problem for shaping	r shaping.		
	- The side of this mold was under - cut by slide system that the core slided with an angular pin.	- cut by slide system that the c	core slided with an ang	ular pin.	
	- The work to put together the slide was not good	ide was not good.			

2/12 Annex 25

Sanch

Name of Mold Important Points to Learn 3 Front Panel for - Model test Personal Computer - Splirt skin test Purpose - Insert , Splirt 1 To master the basic of	arn Problem - Ejecter hole is too big so that made flash after Injection njection - Shape of ejector pin was partially elliptic	Countermeasure - Did not repair	Problem - Contact surface (Parting line) was not good and made flash	Countermeasure Changed Insert Is not
Front Panel for Personal Computer Purpose	 Ejecter hole is too big so that made flash after Injection Shape of ejector pin was partially elliptic 	- Did not repair	- Contact surface (Parting line) was not good and made flash	- Changed Insert
	that made flash after Injection - Shape of ejector pin was partially elliptic		(Parting line) was not good and made flash	
	e of		good and made flash	
	njection - Shape of ejector pin was partially elliptic		good and made flash	
Purpose 1 To mastar the basic of	- Shape of ejector pin was partially elliptic			
1 To mastar the basic of	partially elliptic			
a three -plate vertical				
split mold				
2. To master insert				
thinking				
3. To learm thinking				
behind medium-sized				· · · · · · · · · · · · · · · · · · ·
moldstrength and insert				
division				
-				
Mold Evaluation - This mold was three - plate type and heavy.	te type and heavy. C/P should oper	C/P should operate corefully on safety.		
- The area to polish was w	- The area to polish was wide , which took time machining polishing	ling.		
- The mold was completed	 The mold was completed same level as good as the target mold. 	old.		

Sand

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3/12 Annex 25

Name of Mold Im Upper case for - Posi Telephone - Cool	Ilhican				
er case for - P		Processing			ASS V & I rial shot
er case for	Important Points to Learn	Problem	Countermeasure	Problem	Countermeasure
	 Positiming ejector pin, 	- Slide core mistook so that	- Weld and machine	- Slant core mistook so	- Welded and machined
- Coo	ejector sleeve	flashed after Injection	again	that flashed after	again
- C00					
	- Cooling System	- Short center pin (Standard	- Change	ark was occrred	- Changed center pin
Purpose - Ejec	- Ejector System	parts) have a problem sink	644 - 1 4 - 1 7 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 	after injection due to	acain
1. To master the fabrication		mark after injection		short center pin	- Change size O-ring
process of an exterior				- Coolling system was	- Repaired the part of
appearance oriented mold				leak	under cut by removed
2. Io learn about improving				- Runner unid not take	polishes again
				off	
core snape (which -				toppered hold of runner	- Welded the part of the
strongly core snape				was under - cut	problem and finished
affects appeaance),cavity				- Bari occurred at pate	again
insertion polishing of					
				loose core	
grossy surraces, and undercritting of core					
Mold Evaluation - It we	as the first experience foor C	- It was the first experience foor C/P to make a mold with loose - core and side ending cut system (Oshikiri)	core and side ending c	ut svstem (Oshikiri)	
- Carc	- Carcerning to the Oshikiri bari did not occur	d not occur			
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4/12 Annex 25

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Name of Mold Important Points to Learn Problem Countermeasure 5 Camera Body - Check the import model data - Some Insert to be - Enlarge insert to be Purpose - Positiming the ejector pins - Some Insert core - Enlarge insert to be 1. To Master the basic - Positiming the ejector pins opposite - Change size Insert. structure of a two-plate - Pocketing & cutter making - Tap was tilt - Change size Insert. 2. To Master the basic - Sprit core & cavity - The accuracy of position - New Tap 2. To learn about split mold - Sprit core & cavity of ejector pin is bad machining and - Sprit core & cavity of ejector pin is bad machining		
Matter important Forms to Learn Problem Camera Body - Check the import model data - Some Insert core Purpose - Positiming the ejector pins - Some Insert core 1. To Master the basic - Positiming the ejector pins opposite 1. To Master the basic - Postiming the ejector pins opposite 2. To Master the basic - Posteting & cutter making - Tap was tilt 2. To learn about split mold - Sprit core & cavity - The accuracy of position 2. To learn about split mold - Sprit core & cavity - The accuracy of position and general directional under - Couling system of ejector pin is bad and cutting - Couling system of ejector pin is bad	_	Ass'y & Trial shot
Camera Body - Check the import model data - Some Insert core Purpose - To Master the basic - Positiming the ejector pins - opposite 1. To Master the basic - Positiming the ejector pins - opposite - rap was tilt 1. To Master the basic - Slide core making - Tap was tilt - rap was tilt 2. To learn about split mold and general directional under cutting - Sprit core & cavity - The accuracy of position 2. To learn about split mold general directional under cutting - Sprit core & cavity - The accuracy of position		Countermeasure
Possitining the ejector pins opposite o Master the basic - Pocketing & cutter making - The accuracy of ucture of a two-plate - Slide core making - The accuracy of ucture of a two-plate - Cooling system - The accuracy of position ucture of a two-plate - Cooling system - The accuracy of position ucture of a two-plate - Sprit core & cavity - The accuracy of position ucture of a two-plate - Sprit core & cavity - The accuracy of position ueral directional under - Sprit core & cavity - Of ejector pin is bad ing - Elector pin is bad - Elector pin is bad	Enlarge insert to be - Piece is flash because	se - Weld and machined
pose - Pocketing & cutter making - Tap was tit o Master the basic - Slide core making - The accuracy of position ucture of a two-plate - Cooling system is low ucture of a two-plate - Cooling system is low dercutting mold - Sprit core & cavity of ejector pin is bad o learn about split mold - Sprit core & cavity of ejector pin is bad ing - Interctional under - Interctional	Incort Slido mistool	-
o Master the basic - Slide core making - The accuracy of processing ucture of a two-plate - Cooling system is low ucture of a two-plate - Cooling system is low dercutting mold - Sprit core & cavity - The accuracy of position o learn about split mold - Sprit core & cavity of ejector pin is bad neral directional under ting - The accuracy of position -	size Insert - Fiecter plate don't to	agaill - Enlarce electer nin to
ucture of a two-plate - Cooling system processing dercutting mold - Cooling system is low o learn about split mold - Sprit core & cavity of ejector pin is bad neral directional under - The accuracy of position - ing - The accuracy of position - ing - Sprit core & cavity of ejector pin is bad ing - The accuracy of position - ing - The accuracy -		
ucture of a two-plate - Cooling system is low dercutting mold - The accuracy of position - o learn about split mold - Sprit core & cavity of ejector pin is bad neral directional under - The accuracy of position - ing - The accuracy of position - o learn about split mold - Sprit core & cavity of ejector pin is bad neral directional under - The accuracy of position - ing - The accuracy of position - ing - The accuracy of position - - Inde - The accuracy of position - - Ind		
dercutting mold - The accuracy of position o learn about split mold - Sprit core & cavity neral directional under ting of ejector pin is bad	p temperature >= 60	- Change spring to he
o learn about split mold neral directional under ting	the position -	stronger
o learn about split mold Teral directional under ting	_	
general directional under cutting		- Welding and re-polishing
Mold Evaluation - This mold was a good sample for processing (M/C. EDM and W - EDM) and finishing process	and finishing process.	
- Because it in the mold that should machine procisely and put toogether carefully	arefully.	
- It was completed after the third trial.		

South

5/12 Annex 25

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		r - Did not repair	too		angle																			
	Problem	- White mark after Injection	because Embose too	rough	skin and little draft angle																	nsert.		
	countermeasure																					al C/P changed design ir		
1																					mold.	Ч. С		<u></u>
nte	,	- Uid not repair					ints to Learn					š Ejector pin									the first prototyping	ign was also designe	ich until completing	
Problem		-A little Uratt	angle because		too rough skin		Important Po	- Design	- Auto CAD 2D	- Runner Gate	- Locate Ring	- Stripper Plate 8									- This mold was	- Production des	- It took time mu	
Name of Mold	Name card case	Naille Caru case	-																		Mold Evaluation			
	Prohlem a Droklom	Name of Mold Problem e Problem Countermeasur	Countermeasur Countermeasur Problem e Problem e Se -A little Draft - Did not repair	Name of Mold Problem Countermeasur Name of Mold Problem e Name card case -A little Draft - Did not repair angle because angle because	Name of Mold Problem Countermeasur Name card case -A little Draft - Did not repair angle because -A little because - Did not repair	Name of Mold Problem Countermeasure Name of Mold Problem e Problem Name card case -A little Draft - Did not repair Countermeasure angle because angle because Embose -	Name of Mold Problem Countermeasur Name card case -A little Draft - Did not repair angle because -A little Draft - Did not repair Embose -A little Draft - Did not repair too rough skin - Did not repair	Name of Mold Problem Countermeasure Name of Mold Problem e Problem Name card case -A little Draft - Did not repair Countermeasure angle because e - Did not repair Countermeasure Embose -A little Draft - Did not repair Countermeasure Impose Embose - Did not repair Countermeasure	Name of Mold Problem Countermeasure Name of Mold Problem e Problem Countermeasure Name card case -A little Draft - Did not repair Countermeasure angle because -A little Draft - Did not repair Countermeasure Embose -A little Draft - Did not repair Countermeasure Impose Embose - Did not repair Countermeasure Lesse Lesse - Did not repair - Did not repair	Name of Mold Problem Countermeasure Name card case -A little Draft - Did not repair Countermeasure angle because -A little Draft - Did not repair Countermeasure angle because - Did not repair Countermeasure Countermeasure Embose - Did not repair - Did not repair Countermeasure Impose - Did not repair - Did not repair - Did not repair - Design - Design - Design - Did not repair	Name of Mold Problem Countermeasure Name of Mold Problem e Name card case -A little Draft - Did not repair angle because -A little Draft - Did not repair Embose - Did not repair	Name of Mold Problem Countermeasure Name card case -A little Draft - Did not repair Countermeasure Angle because -A little Draft - Did not repair Countermeasure angle because - Did not repair Countermeasure Countermeasure Embose - Did not repair - Did not repair Countermeasure Imbose - Did not repair - Did not repair - Did not repair Imbose - Did not repair - Did not repair - Did not repair Important Points to Learn - Design - Design - Did not repair - Design - Design - Design - Did not repair - Locate Ring - Docate Ring - Did not repair - Did not repair	Name of Mold Problem Countermeasure Problem Countermeasure Name card case -A little Draft - Did not repair Countermeasure Countermeasure angle because - Did not repair - Did not repair Countermeasure Countermeasure angle because - Did not repair - Did not repair Countermeasure Countermeasure Imbore - Did not repair - Did not repair Countermeasure Countermeasure Imbore - Did not repair - Did not repair Countermeasure Countermeasure Imbore - Did not repair - Did not repair Countermeasure Countermeasure - Design - Design - Design - Design - Design - Design - Locate Ring - Locate Ring - Design - Design - Design - Design - Locate Ring - Stripper Plate & Ejector pin - Design - Design - Design	Name of Mold Problem Countermeasure Name card case -A little Draft - Did not repair Countermeasure And card case -A little Draft - Did not repair Countermeasure angle because - Did not repair - Did not repair Countermeasure Embose - Did not repair - Did not repair - Did not repair Impose - Did not repair - Did not repair - Did not repair Impose - Did not repair - Did not repair - Did not repair - Disign - Design - Did not repair - Did not repair - Locate Ring - Locate Ring - Did not repair - Did not repair	Name of Mold Problem Countermeasure Problem Countermeasure Name card case -A little Draft - Did not repair Countermeasure Countermeasure angle because - Did not repair - Did not repair Countermeasure Countermeasure angle because - Did not repair - Did not repair Countermeasure Countermeasure Important because - Did not repair - Did not repair Countermeasure Countermeasure Important Points to Learn - Design - Design - Design - Design - Locate Ring - Countermeasure - Locate Ring - Stripper Plate & Ejector pin - Countermeasure - Countermeasure - Countermeasure	Name of Mold Problem Countermeasure Name card case -A little Draft - Did not repair Countermeasure Important - Did not repair - Did not repair Countermeasure Important - Did not repair - Did not repair Countermeasure Impose - Did not repair - Did not repair Countermeasure Impose - Did not repair - Did not repair - Did not repair - Embose - Did not repair - Did not repair - Did not repair - Did not repair - Did not repair - Did not repair - Did not repair - Did not repair - Did not repair - Did not repair - Did not repair - Design - Design - Design - Design - Design - Locate Ring - Design - Design - Design - Design - Stripper Plate & Ejector pin - Design - Design - Design - Design	Name of Mold Problem e Problem e Problem countermeasure Name card case -A little Draft - Did not repair e Problem Countermeasure angle because -A little Draft - Did not repair Countermeasure Countermeasure angle because - Did not repair - Did not repair Countermeasure Countermeasure Embose - Embose - Did not repair - Did not repair Countermeasure Embose - Dorough skin - Did not repair - Did not repair - Did not repair Important Points to Learn - Design - Design - Design - Did not repair - Auto CAD ZD - Autor CAD ZD - Locate Ring - Did not repair - Did not repair - Stripper Plate & Ejector pin - Did not repair - Did not repair - Did not repair	Name of Mold Problem Countermeasure Name card case A little Draft - Did not repair Countermeasure And case A little Draft - Did not repair Countermeasure angle because A little Draft - Did not repair Countermeasure angle because A little Draft - Did not repair Countermeasure Embose Embose Enbose - Did not repair Countermeasure Embose Embose Enbose - Did not repair - Countermeasure Embose Embose - Did not repair - Countermeasure - Countermeasure Auto CAD 2D - Design - Auto CAD 2D - Auto CAD 2D - Auto CAD 2D - Runner Gate - Locate Ring - Locate Ring - Auto CAD 2D - Auto CAD 2D - Stripper Plate & Ejector pin - Auto CAD - Auto CAD - Auto CAD - Auto CAD	Name of Mold Problem Countermeasure Problem Countermeasure Name card case -A little Draft - Did not repair Problem Countermeasure angle because - A little Draft - Did not repair Countermeasure Countermeasure angle because - A little Draft - Did not repair Countermeasure Countermeasure angle because - A little Draft - Did not repair Countermeasure Countermeasure And Cable - Did not repair - Did not repair Countermeasure Countermeasure - Did not repair - Did not repair - Did not repair Countermeasure Countermeasure - Did not repair - Did not repair - Did not repair Countermeasure Countermeasure - Did not repair - Did not repair - Did not repair Countermeasure Countermeasure - Runer Gate - Stripper Plate & Ejector pin - Did not repair - Did not repair - Did not repair	Name of Mold Problem Countermeasure Name of Mold Problem e Alittle Draft - Did not repair Countermeasure angle because - Did not repair Countermeasure Embose - Did not repair - Did not repair Embose - Did not repair - Did not repair - Embose - Did not repair - Did not repair - Embose - Did not repair - Did not repair - Design - Design - Did not repair - Locate Ring - Did not repair - Did not repair - Stripper Plate & Ejector pin - Did not repair - Did not repair - Did not	Name of Mold Froblem Countermeasure Name of Mold Problem Problem Countermeasure Name card case A little Draft - Did not repair Countermeasure angle because angle because Problem Countermeasure Embose Embose Embose Problem Countermeasure Embose Embose Embose Problem Problem Embose Embose Embose Problem Problem Embose Embose Problem Problem Problem Problem Problem Problem Problem Problem Problem Problem Problem Problem Problem Problem Problem Problem Problem Problem Protonough skin Proton Problem	Name of Mold Froblem Countermeasure Name of Mold Froblem Problem Countermeasure Name card case -A little Draft - Did not repair Problem Countermeasure angle because -A little Draft - Did not repair Problem Countermeasure Embose Embose - Name card case - Name card case - Name card case - Countermeasure Important Points to Learn - Natio CAD 2D - Auto CAD 2	Name of Mold Problem Countermeasure Name card case A little Draft - Did not repair Problem Countermeasure Angle because Angle because Problem Countermeasure Countermeasure Embose Embose Embose Problem Countermeasure Countermeasure Angle because Embose Embose Embose Countermeasure Countermeasure Embose Embose Embose Embose Countermeasure Countermeasure Embose Embose Embose Embose Countermeasure Countermeasure Embose Embose Embose Embose Countermeasure Countermeasure Autor CAD 2D - Autor CAD 2D - Autor CAD 2D - Autor CAD 2D Counter Cale - Counter Cale - Counter Cale - Counter Cale - Counter Cale - Counter Cale - Counter Cale - Counter Cale - Counter Cale - Counter Cale - Counter Cale - Counter Cale - Counter Cale - Counter Cale - Counter Cale - Counter Cale - Counter Cale -	Name of Mold Problem Countermeasure Name of Mold Problem e Problem Countermeasure Name card case A little Draft - Did not repair Problem Countermeasure angle because Embose Embose Embose Problem Countermeasure Important Points to Learn Important Points to Learn Problem Countermeasure Important Points to Learn - Locate Ring - Locate Ring - Locate Ring - Locate Ring - Stripper Plate & Ejector pin - Stripper Plate & Ejector pin - Locate Ring - Countermeasure - Plate & Ejector pin Mold Evaluation - This mold was the first prototyping mold. - This mold was the first prototyping mold. - Froduction design was also design

Sometr .

Name of Mold Progress Record of Completed flutenal Prototyping Mold. Ame of Mold Important Points Frogress Record of Completed flutenal Prototyping Mold. Ame card body Design - Thic of plece dont Problem Ame card body - Design - Thic of plece dont - Change core insert. - Small unable to put - Change Mold and insert Ame card body - Design - Thic of plece dont - Change core insert. - Small unable to put - Change Mold and insert Ame card body - Design - Equilatify to Learn - Contermessure - Contermessure Ame card body - Design - Thic of these dont - Change core insert. - Small unable to put - Change Mold and insert - Locate Fing - Locate Fing - Locate Fing - Locate Fing - Contermessure - Stripper Plete & Ejector pin - Encote Fing - Encote Fing - Contermessure - Contermessure - Stripper Plete & Ejector pin - Encote Fing - Encote Fing - Encote Fing - Encote Fing - Mold Evaluation - Distributive as a strip restore to pind - Encote Fing - Encote Fing

Sanch

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		Progress Record of		Completed [Internal Prototyping Mold]		
	De	Design	Processing	sing	Ass'v &	Ass'v & Trial shot
	Problem	Countermeasur e	Problem	Countermoseuro		
Medicine box - Alii lock	ttle parting	- Change parting lock	- Big stripper plate flash	- Machined new	aus	- Polished again
un	<u> </u>	to be bigger	after injection	material	Dau	
stri		- Supplement roller				
pla	plate	lock				
- ha	- have no roller					
	lock between					
COL	core plate and					
stri	stripper plate					
	Important Points to Learn	ints to Learn				
in - 1	- Using stripper ejector system	sjector system				
Ŭ	- Cooling system					
					· · · · · · · · · · · · · · · · · · ·	
		-				
Mold Evaluation - Th	his mold was t	- This mold was the third prototyping mold.	a mold.			
	he way of rem	oving the product	- The way of removing the product was stripper - type.			
	he structure of	- The structure of the mold was not diffcult ,	diffcult , but it spent much tin	but it spent much time to polish whole sunface of the hox and rihs	ce of the hox and rihe	

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A							9/12 Annex 25	
枘	Λ_{μ}		Progress Record of		Completed [Internal Prototyping Mold]			
		De	Design	Processing	ing	Ass'y 8	Ass'y & Trial shot	_
	 Name of Mold 	Problem	Countermeasur e	Problem	Countermeasure	Prohlem	Countermoseuro	
I	9 Multi -Usage	- Screw postion	- Change point	- Miss the position of ejector	-	- None	- None	
		at core side		hold	(enlarge ejector hold)			
		diagonally						
		opposite						
		(off-set)1mm						
		Important Po	Important Points to Learn					
		- Using ejector pin system	pin system					
<u> </u>		- Cooling system	F					
••								
<u></u>								
-								
			-					
	Mold Evaluation	- This mold was	- This mold was one for polishing technical tr	echnical training course.				
		- Mold - base is	set in the 20 ton in	- Mold - base is set in the 20 ton injection machine and then cavity and core part could remove and change independenly.	/ity and core part could r	emove and change indepe	andenly.	
		- Ineretore, the There was no	various type of sar	- I nererore, the various type of sample to polish can use by changing the carity and core.	nging the carity and core			
		DI COM CONTO						

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AR			Progress Record of Completed 『Internal Prototyping Mold』	al Prototyping Mold∦		10/12 Annex 25
-		Design	Processing	ing	Ass'y 8	Ass'y & Trial shot
	Name of Mold	Important Points to Learn	Problem	Countermeasure	Problem	Countermeasure
0	CD Case 1 (Case)	- Under Cut, Draft Angle	- Interference tool holder	- Welding and		
	_		and			
· .		- Parting Surrface	broke the part (Core insert)	re-machining		
	_	- Mold Base Insert		ŀ		AND AND A THE AND AND AND AND AND AND AND AND AND AND
	_	- Loose Core, Core Insert				*******
	_	- Working Rail & Support Plate			a da ana ang ang ang ang ang ang ang ang an	
	_	- Runner Gate				
	_	- Positiming Sleeve				
	_	- Positiming the Ejector pin				
	_	- Cooling Pipe				
	_	- Holding Part Screw				
	_	- Mold Woinst				
	_					
	_	- ZU Par List				
	Mold Evaluation					
_						

Important Points to Learn Problem - Under Cut, Draft Angle - Parting Surrface - Parting Surrface - Mold Base Insert - Mold Base Insert - Coore Joset - Working Rail & Support Plate - Working Rail & Support Plate - Positiming Steeve - Positiming Steeve - Positiming Beeve - Positiming The Ejector pin - Mold Weight - Oling Pipe - Mold Weight - 2D Part List	Namo of Mold	Design	Processing	Acc'u &	Trial chat
Import - Under Cut, Draft Angle - Parting Surface - Parting Surface - Mold Sase Insert - Mold Sase Insert - Working Rait & Support Plate - Working Rait & Support Plate - Working Rait & Support Plate - Positiming Sleeve - Positiming Sleeve - Positiming Lee Ejector pin - Holding Part Screw - Mold Weight - ZD Part List		Important Points to Learn	Countermeasure		
	ise2 (Holder)	- Under Cut, Draft Angle		1000	countermeasure
		- Parting Surrface			
		- Mold Base Insert			
		- Loose Core , Core Insert			
		- Working Rail & Support Plate			
		- Runner Gate			
		- Positiming Sleeve			
		- Positiming the Ejector pin			
		- Cooling Pipe			
		- Holding Part Screw			
		- Mold Weight			
		- OD Dart Liet			
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aluation					
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aluation					
	Mold Evaluation				
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12/12 Annex 25 Ace'u & Trial chat		Countermeasure																	
Δcc ¹	Ducklow						······································												
al Prototyping Mold∬ ng	Countermeasure																		
Progress Record of Completed 『Internal Prototyping Mold』 Processing	Problem																		
	Problem	- Under Cut, Draft Angle	- Parting Surrface	- Iviola base Insert	- Loose Core ,Core Insert	- Working Rail & Support Plate	- Runner Gate	- Positiming Sleeve	- Positiming the Ejector pin	- Cooling Pipe	- Holding Part Screw	- Mold Weight	- 2D Part List						
	Name of Mold	CD Case 3 (Opener)														Mold Evaluation			

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Annex 26 List of Mannuals, Textbooks and Materials Prepare by Japanese Experts

No.	Subject	Qty.	Remark	Place
1 (7) Under o		1 Lecture	for C/P, Pilot training course	Design Room
2 B Forming		<u> </u>	for C/P, Pilot training course	Design Room
3 Calculation	of vending	1 Lecture	for C/P, Pilot training course	Design Room
4 Content 5 Design Sta	ndordo		for C/P, Pilot training course	Design Room
	al of steel for mold		for C/P, Pilot training course	Design Room
7 Mold specif			for C/P, Pilot training course	Design Room
	ication sheet 2		for C/P, Pilot training course	Design Room
	funtion of components		or C/P, Pilot training course or C/P, Pilot training course	Design Room
	funtion of molded products	1 Lecture	or C/P, Pilot training course	Design Room Design Room
11 Oiwa 0-0.1-	(5)-A-(B) revised	1 Lecture	or C/P, Pilot training course	Design Room
12 Oiwa 0-0.1-	(5)-A-(A) revised	1 Lecture 1	or C/P, Pilot training course	Design Room
	change system	1 Lecture	or C/P, Pilot training course	Design Room
	injection mold & what is a mold	1 Lecture i	or C/P, Pilot training course	Design Room
15 A types and		1 Lecture f	or C/P, Pilot training course	Design Room
	ormula for mold	1 Lecture f	or C/P, Pilot training course	Design Room
17 Design of m		1 Lecture f	or C/P, Pilot training course	Design Room
18 Dimensiona		1 Lecture f	or C/P, Pilot training course	Design Room
	old design format	1 Lecture f	or C/P, Pilot training course	Design Room
21 Plastic Inject	uction of mold elements	<u> </u>	or C/P, Pilot training course	Design Room
22 EGG		1 Lecture f	or C/P, Pilot training course	Design Room
	ressing Forming	1 Lecture f	or C/P, Pilot training course or C/P, Pilot training course	Design Room
24 FIG2 Transf		1 Lecture f	or C/P, Pilot training course	Design Room
25 FIG3 Injecti		1 Lecture f	or C/P, Pilot training course	Design Room Design Room
26 FIG4 Hollow	/ Molding	1 Lecture fe	or C/P, Pilot training course	Design Room
	on Hollow Molding	1 Lecture for	or C/P, Pilot training course	Design Room
28 FIG6 Extrus		1 Lecture for	or C/P, Pilot training course	Design Room
9 FIG6 Therm	o Forming	1 Lecture for	or C/P, Pilot training course	Design Room
0 Chocolate	· · · · · · · · · · · · · · · · · · ·	1 Lecture for	or C/P, Pilot training course	Design Room
Animation				
31 2 Plate Indir		Lecture for	or C/P, Pilot training course	Design Room
32 2 Plate Type 33 2 Plate Type		1 Lecture fo	r C/P, Pilot training course	Design Room
34 2 Plate Subr			r.C/P, Pilot training course	Design Room
5 2 Plate type	EP sleeve	1 Lecture fo	r C/P, Pilot training course r C/P, Pilot training course	Design Room
6 2 Plate Type		Lecture to	r C/P, Pilot training course	Design Room
7 3 Plate Type		1 Lecture fo	r C/P, Pilot training course	Design Room Design Room
8 Movable side		1 Lecture for	r C/P, Pilot training course	Design Room
9 Hot runner		1 Lecture fo	r C/P, Pilot training course	Design Room
0 Stationary si	de slide black	1 Lecture fo	r C/P, Pilot training course	Design Room
	and Trail shot			
Fudamental	s of Plastic injection molding			
1 0-0.1-(5)-a-(a	a) (1) Outline of Plastic injection molding	1 Lecture fo	r C/P for A & T, Pilot training c	Assembling Room
20.01.6	(2) Outline of Injection molding machine (3) Outline of Injection molding machine			
2 0-0.1-(5)-a-(1 3 0-0 4-(2)-a-(1	a)(b)((4) Main factors of Plastic injectin molding	1 Lecture fo	r C/P for A & T, Pilot training o	o Assembling Room
	a)(b)((5) Main factors of Plastic injectin moloning a)(b)((5) Mainly imprtant principles of Plastic injectin	moldi 1 Lecture to	r C/P for A & T, Pilot training c	CASSEMbling Room
	Alex ter meany angulant principles of Plastic injection		r C/P for A & T, Pilot training c	Assembling Room
Fundamenta	al of Polishing, Finishing, Assembling			
5 3-3.1-(1)(2)(3		1 Lecture fo	C/P for A & T, Pilot training c	Assembling Poor
6 3-3.1-(1)(2)(3		1 Lecture fo	C/P for A & T, Pilot training c	d Assembling Room
7 3-3.1-(1)(2)(3		1 Lecture fo	C/P for A & T, Pilot training c	d Assembling Room
8 3-3.2-(1)	Mold assembling - Assembling of Pen tray mole	1 Lecture for	C/P for A & T, Pilot training c	Assembling Room
9 3-3.2-(1)	Mold assembling - Disassemble of Pen tray mo		C/P for A & T, Pilot training c	c Assembling Room
0 3-3.2-(1)	Mold assembling - Finishng of Pen tray mold		C/P for A & T, Pilot training c	Assembling Room
13-3.2-(1)	Mold assembling - Polishing of Pen tray mold	1 Lecture for	C/P for A & T, Pilot training c	Assembling Room
23-3.2-(1)-a.b	Mold assembling 1. General	1 Lecture for	C/P for A & T, Pilot training c	Assembling Room
3 3-3.2-(1)-a.b	Mold assembling 2. Each mold parts	1 Lecture for	C/P for A & T, Pilot training c	Assembling Room
13-3.2-(1)-a.b	Mold assembling 3. Contacting of Parting surface	e 1 Lecture for	C/P for A & T, Pilot training co	Assembling Room
	edge for Plastic injection molding			·····
5 3-3.2-(2)-a-(a		1 Lecture for	C/P for A & T, Pilot training co	Assembling Room
	Function of Mold clamping unit			
	Function of Ejection unit			
110 0 0 /01 L	(2) Function of Injection molding machine	1 Lecture for	C/P for A & T, Pilot training co	Assembling Room
<u>5-3-3.2-(2)-D</u>			the real rate of the rate of the real rate of the real rate of the	streaden bling Room
5 3-3.2-(2)-b	Function of Injection unit How to clean Plasticizing cylinder			

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		Subject	Qty		Place
57	3-3.2-(2)-c	(3) Preparation of Plastic material resin for Molding	1	Lecture for C/P for A & T, Pilot training	
		Kinds of Material dryer			<u>, , , , , , , , , , , , , , , , , , , </u>
	0.0.0.1	General of Material drying conditon			
58	3-3.2-(2)-d	(4) Calculating and Setting parameters of each Mole Conditions	1	Lecture for C/P for A & T, Pilot training	cc Assembling Ro
		Kinds of necessary parameters			
	-	Calculation of each parameters			
		Setting of each parameters		······	
59	3-3.2-(2)-e-2	(6) Mold temperature device	' 1	Lecture for C/P for A & T, Pilot training	cc Assembling Ro
		Kinds of Mold temperature devices			<u></u>
		Function and meaning of Mold temperature	<u> </u>		
60	3-3.3-(1)	(7) Preparation of Injection molding	1	Lecture for C/P for A & T, Pilot training	cd Assembling Ro
		Confirm about Mold Confirm about Molding product		/	
		Confirm about Molding machine			
-	· ··· · · · ·	(8) Confirm about Molding conditions	1	Lecture for C/P for A & T, Pilot training	cd Assembling Ro
		Confirm about each molding condition parameter	:	in the second seco	correctioning rec
		Setteing fo the other Molding machine conditions			
61	3-3.3-(8)	Mold evaluation		·	
		General 1 Processing evolution	4		
		1 Processing evaluation 2 Function evaluation	1	Lecture for C/P for A & T, Pilot training	co Assembling Roo
		3 Final evaluation	1	Lecture for C/P for A & T, Pilot training of Lecture for C/P for A & T, Pilot training of the comparison of the compari	co Assembling Roo
62	3-3.3-(8)-2	Confirmation of Mold specification	1	Lecture for C/P for A & T, Pilot training (cd Assembling Roc
	<u></u>	The chart of Mold specification			
63	3-3.3-(9)-1-a.b.c	Moling products evaluation	1	Lecture for C/P for A & T, Pilot training of	co Assembling Roo
64	3-3.3-(9)-2	(10) Molding defects & Trouble shooting	1	Lecture for C/P for A & T, Pilot training of	cc Assembling Roc
		The chart of Molding product defect			
65	3-3.3-(9)-3	(11) Counterplan for Molding product defect	1	Lecture for C/P for A & T, Pilot training of	cc Assembling Roc
66	3-3.6-(1)(2)(3)-1	The chart of Counterplan for Molding product defect Molding machine - Maintenance & Inspection	1	Lecture for C/P for A & T, Pilot training of	
		Molding machine	1	Lecture for C/P for A & T, Pilot training c	Assembling Roc
		Table for Maintenance & Instruction procedure		about of of the for Au 1, 1 not usuning t	Jornasembling Roo
<u>co</u>	Application Know	vledge for Plastic injection molding	1	Locitize for O/D for A 9 T Dilations	
601. 601	Kind of material fo	ng Filling process in the injection molding	1	Lecture for C/P for A & T, Pilot training c Lecture for C/P for A & T, Pilot training c	Assembling Roo
					I
	List of Text by Sh	ort term expert (Asahi selki Kougyou Co.,Ltd)			
<u>70</u>	Polishing basic ma			Lecture for C/P for A & T, Pilot training c	c Assembling Roo
	Manual for Equip				
.		ment	_		
	NISSEI, Molding m	nachine	1	Instruction manual for A & T	Assembling Roo
72	MATSUI, Mold terr	nachine nperature control system	1	Operation instruction for A & T	Assembling Roo
72 73	MATSUI, Mold tem KANNETSU, Wate	nachine nperature control system er less system	1 1 1	Operation instruction for A & T Instruction manual for A & T	Assembling Roo Assembling Roo
72 73 74	MATSUI, Mold tem KANNETSU, Wate Japan techo indus	nachine nperature control system er less system try, YOZO Welding system	1 1 1 1	Operation instruction for A & T Instruction manual for A & T Operation instruction for A & T	Assembling Roo Assembling Roo Assembling Roo
72 73 74	MATSUI, Mold tem KANNETSU, Wate	nachine nperature control system er less system try, YOZO Welding system	1 1 1 1	Operation instruction for A & T Instruction manual for A & T	Assembling Roo Assembling Roo
72 73 74 75	MATSUI, Mold tem KANNETSU, Wate Japan techo Indus MINITOR, Polishin Processing	nachine nperature control system er less system try, YOZO Welding system g equipment	1 1 1 1	Operation instruction for A & T Instruction manual for A & T Operation instruction for A & T Instruction manual for A & T	Assembling Roo Assembling Roo Assembling Roo
72 73 74 75 75	MATSUI, Mold tem KANNETSU, Wate Japan techo Indus: MINITOR, Polishin Processing Text (11/99-5/00) M	nachine nperature control system er less system try, YOZO Welding system g equipment	1	Operation instruction for A & T Instruction manual for A & T Operation instruction for A & T Instruction manual for A & T Lecture for C/P for Processing	Assembling Roo Assembling Roo Assembling Roo Assembling Roo Processing Roor
72 73 74 75 75	MATSUI, Mold tem KANNETSU, Wate Japan techo Indus: MINITOR, Polishin Processing Text (11/99-5/00) M Reference Process	nachine perature control system priless system try, YOZO Welding system g equipment Machining sing	1 1 1 1 1 1	Operation instruction for A & T Instruction manual for A & T Operation instruction for A & T Instruction manual for A & T Lecture for C/P for Processing References for Text	Assembling Roo Assembling Roo Assembling Roo Assembling Roo Processing Roo Processing Roor
72 73 74 75 75 75 75 75 75 75 77 78	MATSUI, Mold tem KANNETSU, Wate Japan techo Indus MINITOR, Polishin Processing Text (11/99-5/00) M Reference Process Reference Lathe M	nachine perature control system priless system try, YOZO Welding system g equipment Machining sing	1 1 1 1 1 1 1	Operation instruction for A & T Instruction manual for A & T Operation instruction for A & T Instruction manual for A & T Lecture for C/P for Processing References for Text References for Text & First Lecture for C	Assembling Roo Assembling Roo Assembling Roo Assembling Roo Processing Roor Processing Roor A Processing Roor
72 73 74 75 75 1 76	MATSUI, Mold tem KANNETSU, Wate Japan techo Indus: MINITOR, Polishin Processing Text (11/99-5/00) N Reference Process Reference Lathe M Reference	nachine perature control system priless system try, YOZO Welding system g equipment Machining sing	1 1 1 1 1 1 1	Operation instruction for A & T Instruction manual for A & T Operation instruction for A & T Instruction manual for A & T Lecture for C/P for Processing References for Text	Assembling Roo Assembling Roo Assembling Roo Assembling Roo Processing Roo Processing Roor
72 73 74 75 75 75 75 75 75 75 77 78	MATSUI, Mold tem KANNETSU, Wate Japan techo Indus MINITOR, Polishin Processing Text (11/99-5/00) M Reference Process Reference Lathe M Reference NC Processing	nachine perature control system er less system try, YOZO Welding system g equipment Machining ling lachine	1 1 1 1 1 1 1	Operation instruction for A & T Instruction manual for A & T Operation instruction for A & T Instruction manual for A & T Lecture for C/P for Processing References for Text References for Text & First Lecture for C	Assembling Roo Assembling Roo Assembling Roo Assembling Roo Processing Roor Processing Roor A Processing Roor
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72 73 74 75 75 77 76 77 78 79 79 79 79 79 70 70 70 70 70 70 70 70 70 70 70 70 70	MATSUI, Mold tem KANNETSU, Wate Japan techo Indust MINITOR, Polishin Processing Text (11/99-5/00) N Reference Process Reference Lathe M Reference NC Processing Flipping Curricul TGI Curriculum Die Casting (Voc Reference Process	nachine perature control system er less system try, YOZO Welding system g equipment Machining lachine um cabulary)		Operation instruction for A & T Instruction manual for A & T Operation instruction for A & T Instruction manual for A & T Lecture for C/P for Processing References for Text References for Text & First Lecture for C References for Text Machine Team Manual	Assembling Roo Assembling Roo Assembling Roo Assembling Roo Processing Roor Processing Roor Processing Roor Processing Roor Processing Roor
72 73 74 75 75 77 76 77 78 79 79 79 79 79 70 70 70 70 70 70 70 70 70 70 70 70 70	MATSUI, Mold tem KANNETSU, Wate Japan techo indust MINITOR, Polishin Processing Text (11/99-5/00) N Reference Process Reference Lathe W Reference NC Processing Flipping Curricul TGI Curriculum Die Casting (Voo Reference Process References	nachine perature control system pr less system g equipment Machining sing lachine um cabulary) sing		Operation instruction for A & T Instruction manual for A & T Operation instruction for A & T Instruction manual for A & T Lecture for C/P for Processing References for Text References for Text & First Lecture for C References for Text	Assembling Roo Assembling Roo Assembling Roo Assembling Roo Processing Roor Processing Roor Processing Roor
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72 73 74 75 75 77 76 77 78 79 79 79 79 79 70 70 70 70 70 70 70 70 70 70 70 70 70	MATSUI, Mold tem KANNETSU, Wate Japan techo Indus: MINITOR, Polishin Processing Text (11/99-5/00) N Reference Process Reference Lathe W Reference NC Processing Filipping Curricul TGI Curriculum Die Casting (Voo References Production Cont Daido Steel	nachine perature control system pr less system g equipment Machining sing lachine um cabulary) sing		Operation instruction for A & T Instruction manual for A & T Operation instruction for A & T Instruction manual for A & T Lecture for C/P for Processing References for Text References for Text & First Lecture for C References for Text Machine Team Manual	Assembling Roo Assembling Roo Assembling Roo Assembling Roo Processing Roor Processing Roor Processing Roor Processing Roor Processing Roor
72 73 74 75 75 77 76 77 78 77 78 77 79 79 79 79 70 79 70 70 70 70 70 70 70 70 70 70 70 70 70	MATSUI, Mold tem KANNETSU, Wate Japan techo Indus: MINITOR, Polishin Processing Text (11/99-5/00) N Reference Process Reference Lathe W Reference Lathe W Reference Lathe W Reference Lathe W Reference S Filipping Curricul TGI Curriculum Die Casting (Voo Reference Process References Production Cont Daido Steel 5S	nachine perature control system per less system try, YOZO Welding system g equipment Machining lachine um cabulary) sing rol		Operation instruction for A & T Instruction manual for A & T Operation instruction for A & T Instruction manual for A & T Lecture for C/P for Processing References for Text References for Text & First Lecture for C References for Text Machine Team Manual References for Text	Assembling Roo Assembling Roo Assembling Roo Assembling Roo Processing Roor Processing Roor Processing Roor Processing Roor Processing Roor Processing Roor
72 73 74 75 75 77 77 77 77 77 77 77 77 77 77 77	MATSUI, Mold tem KANNETSU, Wate Japan techo Indus: MINITOR, Polishin Processing Text (11/99-5/00) N Reference Process Reference Lathe M Reference Lathe M Reference Lathe M Reference Sing Filipping Curricul TGI Curriculum Die Casting (Voo Reference Process References Production Cont Daido Steel 5S Reference Process	nachine perature control system priess system g equipment Machining lachine um cabulary) sing rol		Operation instruction for A & T Instruction manual for A & T Operation instruction for A & T Instruction manual for A & T Lecture for C/P for Processing References for Text References for Text & First Lecture for C References for Text Machine Team Manual References for Text References for Text	Assembling Roo Assembling Roo Assembling Roo Assembling Roo Processing Roor Processing Roor Processing Roor Processing Roor Processing Roor Processing Roor Processing Roor
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Annex 26 List of Mannuals, Textbooks and Materials Prepare by Japanese Experts

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Annex 26 List of Mannuals, Textbooks and Materials Prepare by Japanese Experts

No.	Subject	Qty.	Remark	Place
	: 1-7, 2001 - August 23, 2001			1 1000
90 Trend	of High-speed-processing in the world	1	Lecture text for Pilot Training course	Processing Room
	ive Seminar November 6, 2001			1
91 Plastic	Mold Quality Standard and Global Market	1	Lecture text for Seminar	SIC Office
Mr.	Tetsuo Sasaki (November 30, 2000)			
	of High-speed-processing in the World	1_	Lecture text for Seminar	SIC Office
	ng. Toshitaka Matsuoka (November 1, 2001)			
	of Die Technology in Asia	1	Lecture text for Seminar	SIC Office
	Etsujiro Yokota (November 5, 2002)			
	nd Die Industry in Thailand			
	Tadashi Shimizu	·	Total facilities	
	g Condition		Text for lecture	Assembling Roon
	Noboru Ishizaki (February 6, 2003)		Tout for lost	
95 Moldin		1	Text for lecture	Assembling Room
	Noboru Ishizaki (February 6, 2003)	1	Total Conclusion	
	ic Defect and Thai Counter Measure	1	Text for lecture	Assembling Room
Mr. (Noboru Ishizaki (April 30, 2003)		I a church faith fair OD BALLA Direction	010 015
	ence 3D Mold Design (Pen Tray)	1	Lecture text for 3D Mold Desing experien	SIC Office
IVI <u>F. s</u>	Junzo Ono logy Transfer Manual for Plastic Injection Molding		Course	010 01
	1 Industrial Basics	I	Text for lecture	SIC Office
	2 Theory of Mold Design		······································	
Part 1	3 Theory or Injection Molding		· · · · · · · · · · · · · · · · · · ·	
	4 Theory of Mold Processing			· · · · ·
	5 Practical Application			
Mr	ruichi Fukushima (July 2-11, 2003)			
	f Plastic Injection	1	Text for lecture	SIC Office
	Noboru Ishizaki (November 4-7, 2003)			
00 Basic c	f 3D CAM	1	Text for lecture	SIC Office
Mr.	Fakahito Yoshio (November 6-7, 2003)			010 01100
01 Latest	Trends of Shinkage Fit Holding Tool and Related Technologie	es 1	Text for lecture	SIC Office
(Mol	d Processing C/P Training, Dr. Toshitaka Matsuoka, Novemb	er 11-19,	2003)	
(Nov	ember 11-19, 2003)			
02 Text fo	r Executive Seminar November 20, 2003			
1. lr	troduction of 3D Mold Design (Mr. Junzo Ono)		Text for lecture	SIC Office
	urrent Situation, Applications and Future Trends of High Spee	ed 1	Text for lecture	SIC Office
M	illing Technologies (Dr. Toshitaka Matsuoka)			
03 Experie	nce 3D Mold Design (Alarm Clock) (Jan. 20, 2004)		Text for lecture	SIC Office
04 Experie	nce 3D Mold Design (Telephone) (Jan. 20, 2004)		Text for lecture	SIC Office
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Annex 27 List of Mannuals, Textbooks and Materials Developed by Thai C/Ps

1	Subject	Qty.	Remark	Place
2 nd training course				
Mold design				
Process Plastic Industrial Pro	ocess	1	Lecture for C/P. Pilot training course	Design Room
Plastic Materials Type of Mold and Parts	· · · · · · · · · · · · · · · · · · ·	1	Lecture for C/P. Pilot training course	Design Room
Insert Materials		i i	Lecture for C/P, Pilot training course	Design Room
Product Design		1	Lecture for C/P, Pilot training course	Design Room
Runner and Gate		1 1	Lecture for C/P. Pilot training course	Design Room
Ejector System			Lecture for C/P, Pilot training course	Design Room
Cooling System Defect and Resolution	<u> </u>	<u> </u>	Lecture for C/P, Pilot training course Lecture for C/P, Pilot training course	Design Room Design Room
Derect and Resolution		_ <u></u>	Lectore for G/P, Plibt training course	Design Room
Mold Processing				
Planning for Mold and Die		1	Lecture for C/P , Pilot training course	Processing Room
Processing Machines		1	Lecture for C/P , Pilot training course	Processing Room
Cutting Condition		1	Lecture for C/P , Pilot training course	Processing Room
Cutting Condition Formula		1	Lecture for C/P , Pilot training course	Processing Room
Measurement		1	Lecture for C/P , Pilot training course	Processing Room
NC Program CNC Milling Operation			Lecture for C/P , Pilot training course Operation for C/P , Pilot training course	Processing Room Processing Room
EDM Sinking Operation		1 1	Operation for C/P , Pilot training course	Processing Room
W/EDM Cutting Operation		1 1	Operation for C/P , Pilot training course	Processing Room
	·····			
Assembly & Trail Shot				
				A
Fundamentals of Finishing	·····	1	Lecture for C/P . Pilot training course Lecture for C/P . Pilot training course	Assembling Room Assembling Room
Finishing Application		1	Lecture for C/P , Pilot training course	Assembling Room
Mold Assemble, Assembling of	Pen Tray Mold	1	Lecture for C/P , Pilot training course	Assembling Room
Mold Assemble, Finishing of Pe	en Tray Mold	1	Lecture for C/P , Pilot training course	Assembling Room
Mold Assemble, Polishing of Po		1	Lecture for C/P , Pilot training course	Assembling Room
Mold Assembling, Pen Tray Dis		1 1	Lecture for C/P , Pilot training course	Assembling Room
Assembling and Polishing Oper	ration	1.	Operation for C/P , Pilot training course	Assembling Room
Injection Molding		<u> </u>	Operation for C/P , Pilot training course	Assembling Room
3 rd training course				
Basic of CADCUES		1 1	Lecture for C/P , Pilot training course	Design Room
Drafting		1 1	Lecture for C/P , Pilot training course	Design Room
Surface modeling		<u> </u>	Lecture for C/P , Pilot training course	Design Room
Solid modeling	· · · · · · · · · · · · · · · · · · ·	1	Lecture for C/P , Pilot training course	Design Room
4 th training course Mold Processing Die making Process in the age	of CNG Machining	1	Lecture for C/P . Pilot training course	Processing Room
		1	Lecture for C/P , Pilot training course	Processing Room
Electro Processing		1	Lecture for C/P , Pilot training course	Processing Room
				Processing Room
Metal Material Measurement		1	Lecture for C/P , Pilot training course	
Metal Material Measurement Face Milling Cutter	· · · · · · · · · · · · · · · · · · ·	1	Lecture for C/P , Pilot training course	Processing Room
	em	1	Lecture for C/P , Pilot training course Lecture for C/P , Pilot training course	Processing Room Processing Room
Metal Material Measurement Face Milling Cutter Machine controll by CNC syste Machining center	em	1 1 1	Lecture for C/P , Pilot training course Lecture for C/P , Pilot training course Operation for C/P , Pilot training course	Processing Room Processing Room Processing Room
Metal Material Measurement Face Milling Cutter Machine controll by CNC syste Maching center EDM	em	1 1 1 1	Lecture for C/P , Pilot training course Lecture for C/P , Pilot training course Operation for C/P , Pilot training course Operation for C/P , Pilot training course	Processing Room Processing Room Processing Room Processing Room
Metal Material Measurement Face Milling Cutter Machine controll by CNC syste Machining center	em	1 1 1	Lecture for C/P , Pilot training course Lecture for C/P , Pilot training course Operation for C/P , Pilot training course	Processing Room Processing Room Processing Room
Metal Material Measurement Face Milling Cutter Machine controll by CNC syste Machining center EDM Wire cut EDM	em	1 1 1 1	Lecture for C/P , Pilot training course Lecture for C/P , Pilot training course Operation for C/P , Pilot training course Operation for C/P , Pilot training course	Processing Room Processing Room Processing Room Processing Room
Metal Material Measurement Face Milling Cutter Machine controll by CNC syste Machining center EDM Wire cut EDM			Lecture for C/P , Pilot training course Lecture for C/P , Pilot training course Operation for C/P , Pilot training course Operation for C/P , Pilot training course	Processing Room Processing Room Processing Room Processing Room
Metal Material Measurement Face Milling Cutter Machine controll by ONC syste Machining center EDM Wire cut EDM Mold Assembly Fundamentals of Plastic inject injection Molding system	iọn Molding		Lecture for C/P , Pilot training course Lecture for C/P , Pilot training course Operation for C/P , Pilot training course Operation for C/P , Pilot training course Operation for C/P , Pilot training course Lecture for C/P , Pilot training course Lecture for C/P , Pilot training course	Processing Room Processing Room Processing Room Processing Room Processing Room Assembling Room Assembling Room
Metal Material Measurement Face Milling Cutter Machining centroll by CNC syste Machining center EDM Wire cut EDM Mold Assembly Fundamentals of Plastic inject Injection Molding system Basic Knowledge for Plastic inject	ion Molding		Lecture for C/P , Pilot training course Lecture for C/P , Pilot training course Operation for C/P , Pilot training course Operation for C/P , Pilot training course Operation for C/P , Pilot training course Lecture for C/P , Pilot training course Lecture for C/P , Pilot training course Lecture for C/P , Pilot training course	Processing Room Processing Room Processing Room Processing Room Processing Room Assembling Room Assembling Room
Metal Material Measurement Face Milling Cutter Machine controll by CNC syste Machining center EDM Wire cut EDM Mold Assembly Fundamentals of Plastic inject Injection Molding system Basic Knowledge for Plastic injectio	ion Molding jection Molding on		Lecture for C/P , Pilot training course Lecture for C/P , Pilot training course Operation for C/P , Pilot training course Operation for C/P , Pilot training course Operation for C/P , Pilot training course Lecture for C/P , Pilot training course Lecture for C/P , Pilot training course Lecture for C/P , Pilot training course Lecture for C/P , Pilot training course Lecture for C/P , Pilot training course	Processing Room Processing Room Processing Room Processing Room Processing Room Assembling Room Assembling Room Assembling Room
Metal Material Measurement Face Milling Cutter Machine controll by CNC syste Machining center EDM Wire cut EDM Mold Assembly Fundamentals of Plastic inject injection Molding system Basic Knowledge for Plastic injection Principles for Plastic injection	ion Molding jection Molding on		Lecture for C/P , Pilot training course Lecture for C/P , Pilot training course Operation for C/P , Pilot training course Operation for C/P , Pilot training course Operation for C/P , Pilot training course Lecture for C/P , Pilot training course Lecture for C/P , Pilot training course Lecture for C/P , Pilot training course Lecture for C/P , Pilot training course Lecture for C/P , Pilot training course Lecture for C/P , Pilot training course Lecture for C/P , Pilot training course	Processing Room Processing Room Processing Room Processing Room Processing Room Assembling Room Assembling Room Assembling Room Assembling Room
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Annex 28-1 Record of Technical Trainings and Seminars Conducted by the Project

Technical Training Course

Training and seminar are considered as the major activities of the project. At first, BSID's staff or counterparts have been divided into 3 groups based on technological areas namely Mold Design, Mold Processing, and Assembly & Trial Shot. Each group has then obtained technology transfer from both long-term and short-term dispatched experts, and also joined the OJT courses in Japan, each of which lasted for an average of 3 months (see Annex 28-2 for more details). After gaining a great deal of knowledge and experiences, the counterparts have attempted to deliver these 3 fields of technology mentioned earlier to the personnel working in mold and die industry, with an assistance of dispatched experts. The pilot training courses comprising of Basic Knowledge of Mold Design, Basic Mold Processing, and Basic Mold Assembling & Trial Shot were established since June 2001. However, these three courses emphasized mostly on theories, and therefore two more practical courses including Mold Processing and Assembly & Trial Shot were added in early 2002. The Basic CAD course, using CADCEUS V6.2F to support computerized mold design and drawing, and the Basic Mold Polishing course were also introduced later on. Thus, by the end of 2002, there were totally 7 courses. In 2003, the basic curricula were additionally developed, and so some other courses employing more advance equipment were created. These include Basic 3D CAM and how to use Machining Center, EDM and Wirecut EDM for Mold Processing. As for Mold Design group, there were Parametric CAD and 3D Mold Design, while Assembly & Trial Shot group introduced Plastic Injection course. At least 15 courses in total were targeted.

The pilot training courses established in 2001 were arranged 4 times with 50 trainees in total. In addition, the counterparts conducted the training totally 13 times with 226 trainees in 2002, and totally 12 times with 90 trainees in 2003.

For the second half of the year 2003 (July to December), 7 training curriculum were provided to the industry, as shown in the table below. They were intended for technicians and engineers who worked in factories less than 2 years of experience in respective skills.

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Course	Duration	Participants
1. 3 D Mold design	July 28 - August 1, 2003	13 persons
2. Parametric CAD	September 1 – 4, 2003	10 persons
3. Basic CAD	October 13 - 16, 2003	5 persons
4. Plastic injection	November 4 – 7, 2003	10 persons
5. Basic CAM	November 6 – 7, 2003	2 persons
6. Basic CAM	December 2 – 4, 2003	4 persons
7. Mold processing	December 15 – 19, 2003	12 persons

For 3D Mold Design course, 76.92% of the participants have had experiences in mold designing and most of them (11 out of 13) got bachelor degree or above. They agree that the course subject is suitable and up to date (score 4.08/5.00, 5 = exceptionally good). The instructors teach fairly well (score ranged from 3.85 - 3.97/5.00). However, they suggest that the instructors should explain more in details on hard topics. They said they could use the knowledge and techniques learned in class to transfer to their colleagues at their companies.

For Parametric CAD, the score of the course subject is 3.83/5.00 and the score for the instructors range from 4.17 to 4.22 out of 5.00. Some of the comment are:

- These should be a manual or hand out for the trainees in order to understand the subject better.
- The technique learned in class can be adapted to my work and very useful for both 2D and 3D designing.
- The techniques can reduce the design time.

For Basic CAD, the score of the course subject is quite high (4.50), as well as the score for the instructors, ranged from 4.27 to 4.63. The trainees agree that the course is good and the knowledge can be adapted to their works.

For plastic injection course, 66.67% of the trainees have had experiences on plastic injection. The score of the course subject is 4.44/5.00 and the score for the instructors ranges from 3.85 to 4.42. Some of the comments are:

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- In theory part, there should be video or pictures as examples to make the section more interesting.
- Comparing the time spent and the knowledge received, this course is very useful.
 This (plastic injection) is one of the best choices to start up a company.

For Basic CAM, the score of the course subject is 4.16/5.00 and the score for the instructors ranges from 4.11 - 4.33. As we can see from the scores, people like this course. However, they think that the time is too short to comprehend the use of the machine.

In 2004, the final year of the project, two more courses were developed, and therefore there were totally 17 courses. Nine courses have already been carried out during January -May 2004, and there were totally 157 trainees. The remaining ones are Basic 3D CAM, Advance CAM, Electrode CAM and Maintenance. Please see Annex 28-2 for more details.

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Vo.	Course	Duration	Participant
	Pilot Training Course		
	2001	· · · · · · · · · · · · · · · · · · ·	
1	Basic of Mold Design	June 10 -July 1, 2001	15 persons
2	Basic of Mold Processing	June 11 -July 2, 2001	10 persons
3	Basic of Mold Assembling and Trial Shot	June 13 -July 5, 2001	15 persons
	2002		
4	Basic of Mold Design	June 10 -July 1, 2002	28 persons
5	Basic of Mold Processing	June 11 -July 3, 2002	24 persons
6	Basic of Mold Assembling and Trial Shot	June 13 -July 5, 2002	26 persons
7	Basic CAD	October 15 - 18, 2002	10 persons
		October 21-22, 2002	
8	Basic of Mold Design	December 11-13, 2002	14 persons
9	Basic CAD	December 16-20, 2002	14 persons
10	Basic of Mold Processing	December 11-20, 2002	9 persons
11	Basic of Mold Polishing	December 11-20, 2002	10 persons
ļ	2003	· · · · · · · · · · · · · · · · · · ·	
12	Basic CAD	March 18-21, 2003	7 persons, C/P 4
13	Basic CAD	April 1-4, 2003	4 persons
14	Basic of Mold Assembling	May 27-30, 2003	5 persons
15	Basic of Mold Processing	June 16-20, 2003	9 persons
	3 D Mold design	July 28 - August 1, 2003	13 persons
7	Parametric CAD	September 1-4, 2003	10 persons
8	Basic CAD	October 13 - 16, 2003	5 persons
	Plastic Injection	November 4-7, 2003	10 persons
20	Basic CAM	November 6-7, 2003	2 persons
	Basic CAM	December 2-4, 2003	4 persons
	Mold Processing	December 15-19, 2003	12 persons
	2004		
	Parametric	February 3-6, 2004	8 persons
	Mold Design	February 23-27, 2004	11 persons
	Experiment 3D	March 15-19, 2004	5 persons
	Mold Processing	March 25-31, 2004	7 persons
	Trial Shot/NISSEI 700 FN(360ton)	March 25-31, 2004	60 persons
	Basic Knowledge of Mold Design	April 27-30, 2004	11 persons
	Polishing	April 26-30, 2004	11 persons
	Fundamental CNC Seminar	May 11-14, 2004	30 persons
1	Plastic Injection	May 20-28, 2004	14 persons
	Executive Seminar Plastic Mold Quality Standard and Golbal Market	November 30, 2000	
2	- What it takes to become a leading	November 1, 2001	130 persons
1	Mold manufacturing company		
-	- Current situation of Plastic Injection Mold		
	manufacturing in China		
3	- Recent Situation of Mold Industry and	November 5, 2002	116 persons
	Technical Trends from the Standpoint of	······································	
	the Global View		· · · · · · · · · · · · · · · · · · ·
	Problems Expectation of Thai Mold Industry		
	from the View of Automotive Industry		
	- Introduction of 3D Mold Design	November 20, 2003	110 persons
	- Current Situation, Applications and Future		
	Trends of High Speed Milling Technologies		·····
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- 11-2			Some

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Annex 29-1 Progress of Technical Information and Advisory Services Conducted by the Project

In 2002, SIC Project aimed at providing advisory services to 19 firms, 10 firms applied for services through Thai Die and Mold Industries Association (TDIA) and 9 firms applied directly to BSID. Most of them were plastic injection mold makers for electrical/electronics parts, auto-part makers, cosmetic-container manufacturers. From January to May, 12 firms had been visited. From June to December, 2002, Japanese experts and Thai staff had already accomplished the mission as requested from 14 firms and had visited academic institutions as well as governmental office, totally 26 firms which is more than expected.

The tasks that had already done can be concluded as follows

- 1. Improvement in manufacturing management to reduce delivery time
- 2. Selections of materials making mold parts such as core, cavity, etc. and method to use insert materials
- 3. Polishing techniques and mold maintenance
- 4. Injection Techniques with various kinds of plastic such as ABS, PS, etc.
- 5. Defects analysis and elimination occurring in manufacturing process such as flashing, scratching, bending, weld line, etc.

6. Consultancy and advisory services in operating CNC, CNC profile grinding machine, etc. Japanese experts have visited Vocational Institution and industry in Nakorn- Ratchasrima to evaluate the possibility of expanding project's activities and building up technical networks in this area, utilizing existing equipment and facilities efficiently.

Since July 2003, the SIC advisory unit has served the industry for 26 times. Examples of the companies and academic institutes that obtained the advisory services are:

- Institute of Skill Development
- Sarayuth Machine Work Co.,Ltd.
- Triumph Engineering Co.,Ltd.
- MCI Mold Co.,Ltd.
- Microtek Products Co.,Ltd.
- Rajamangala Institute of Technology

- Daisin Co.,Ltd.
- Surin Technical College
- Siam Nissan Karnchanaburi Co., Ltd.
- and many more.

The services emphasize on giving advises on plastic injection techniques, mold and part machining, mold and die maintenance which can be summarized as follows:

- 1. To improve and modify the plastic injection conditions to get consistent quality products.
- 2. To maintain and fix mold and die.
- 3. To improve and fix equipment and machinery producing molds and dies.
- 4. To solve the problems encountered in making gears to remedy abnormal sound and non alignment of gears after using them.
- 5. To give advice a how to operate CNC machines, grinding machines and how to do programming and G-code writing.
- 6. To control mold and die manufacturing process and machining process of machinery parts to make high quality products.

The next page is the complete example of our advisory service.

Date: August 1, 2003

Time: 10.45 – 12.30 AM.

Company: Wuttiwan Co.,Ltd.

Address: 225 M.1 Mitrtaphab rd., Banphai, Khonkan 40110

Tel: 0-4327-4227-8

Type of Business: producing plastic injection mold

Machines: Injection molding machine (50 tons, 80 tons), Milling machine, Lathe machine,

Grinding machine, Injection machine, Drilling machine

Overview of the problems:

All the machines are quite old and small. None of them use CNC in controlling linear scale. The technicians have a small amount of knowledge in using the machines.

Problem and Solve:

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- In manufacturing multiple core cavity in one piece, the parts are not identical Solve : Reference point is not exact, must fix to 1 point
- 2. Air bent is incorrect and not enough

Solve : The air bent must be in linear shape with 10 μ m deep and use cutter in making it

- The iron made core cavity is strong enough, corroded after a long use.
 Solve : Use Iron stainless grade M 300 or other kind of Iron (grade M 238, M 202)
- Spinning rate and cutting speed are not suitable to the work.
 Solve : Use formulas in calculating feeding rate, cutting speed, and so on.

5. Machines give high allowance, not in linear scale.

Solve : Must check the setting of the machine and use the machine with low allowance when producing high precision parts.

So far, the advisory service has been provided to 87 clients which are the mould-making manufacturer and academic institutes - 17 clients have been served this year from January 2004 to May 2004. As the target point of the service is 20-client a year, the output of this year, therefore, could be possible to achieve the target by the end of October 2004 which is the last year of SIC-project.

The most of our clients this year would be categorized into 4 industries which are 1) automotive-part 2) electronic component 3) mould-making for plastic product and 4) plastic injection such as plastic bottle and cosmetic container etc. The mroe information could be found in the enclosed annex 30. Hereunder are examples of our clients this year.

- Top Trend manufacturing Co.,Ltd.
- PVS Plastic Co.,Ltd.
- Automative Mold Technology Co., Ltd.
- SIM Electric Group Co.,Ltd.
- Decha Panich Finishing Net Factory Ltd.
- Thai-Australian Technical College
- Rachamongkol Institute of Technology, Khonkean

- Surin Skill Development Centre

- and many more

The services carried on this year are focused on the problem solving technique of production process, mould and part machining, mould polishing, mould assembling, plastic injection process, and process improvement which could be summarized as following topics :

- The machining technique for < 10 μm tolerance production. The using of cutting tools in according with the machine specification and the alignment technique had been advised.
- The operating technique of Machining Centre, EDM, Wire cut M/C, and grinding M/C.
- The G-code programming.
- The applying of jig and fixture in order of higher production rate.
- The maintenance technique of machines and equipments.
- The mould design technique particularly on gating design which may results on the defects inside the product.
- The parameter conditioning and monitoring technique of plastic injection machine in order of higher production efficiency such as pressure adjusting, and cooling system monitoring.

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Annex 29-2 Record of Technical Information Conducted

by the Project and Advisory Services Conduted by the Project

Date		Services Conduced by the Project		
Jun, 13, 01	Name of factory	Content of the work	Problem	Researchers
		Electronic, Toys)	-Basic of design	1. Mr. Otsuka 2. Mr. Oiwa
		(Plastic Molding)	-Analysis and solve of problem	3. Mr. Sirichai
				4. Mr. Prakob
	i			5. Mr. Chairat 6. Mr. Umnart
Jun. 27. 01	Precision Interolas Co.,Ltd.	Injection molding, mold making	-Organization Chart	1. Dr. Ikeuchi
		(Electronic part, Automotive part, souvenir)	-Lay-out of Machine -Design	2. Mr.Otsuka
		(Plastic Molding)	-Old Machinery	3. Mr. Seki 4. Mr. Chairat
· · · · ·				5. Mr. Satta
Jul. 8, 01	NIPPO Co.,Ltd.	Injection molding, mold making		6. Miss Kun
		I Plastic Molding)	<u>i -Know-how of processing and</u> polishing	1, Mr. Otsuka 2. Mr. Seki
			ponsing	3. Mr. Oiwa
				4. Mr. Chairat
				5. Mr. Virit 6. Mr. Bantao
<u>Jul. 18, 01</u>	BK Industrial Co.,Ltd.	Injection molding, mold making	-Determine Parting Line	0. Mr. Dantao
		(Plastic Molding)	Determine shrink	2. Mr. Seki
			-Kind of Gate	3. Mr. Chanon 4. Mr. Sirisak
			-Cooling system	4. Wr. Strisak
			Size of insert	•
Jul. 25, 01	Jiem Cosmetic Co.,Ltd.	Injection molding, mold making	-Size of Mold Base -Handle Tool Material	
		(Plastic Molding)	-Injection condition	2. Mr. Otsuka
				3. Mr. Oiwa
				4. Mr. Prakob
				5. Mr. Worapong 6. Mr. Satta
				7, Mr. Chairat
Aug. 8, 01	Rienthal Interplas Co. Ltd.	Injection mold	-Process of Injection	18. Mr. Chandei
		(Plastic Mold)	-Way to set the machine	2. Mr. Otsuka
				3. Mr. Seki
·				4. Mr. Damrong
				5. Mr. Chanon 6. Mr. Ampart
Aug. 22, 01	GD Plas and Mold CoLtd.	Injection molding	-Injection condition	1. Dr. Ikeuchi
-		(Plastic Molding)		2. Mr. Otsuka
				3. Mr. Oiwa 4. Mr. Paiboon
				5. Mr. Chairat
Aug. 24, 01	Farsight Sahakid Co.,Ltd.	Injection molding, mold making	Televalue Pit	Mr. Sompong
Aug. 24, 01 Farsight S		i(Plastic_Molding)	-Injection_condition	1. Mr. Otsuka 2. Mr. Oiwa
				3. Mr. Sahas
				4. Mr. Bantao
Nov. 10, 01	Leartkul Plastic Co.,Ltd.	Injection molding	-Lack of knowledge in plastic	5. Mr. Chairat 1. Dr. Ikeuchi
		(Plastic Molding)	injection and maintenance	2 Mr. Seki
			machinery	3. Mr. Oiwa
				4. Mr. Preecha 5. Mr. Damrong
F.L. C 00	F			6. Mr. Chairat
Feb. 6, 02	Farsight Sahakid Co.,Ltd.	Plug (Plastic Molding)	Connecting Wire	1. Mr. Oiwa
				2. Mr. Prakob 3. Mr. Preecha
				4. Mr. Sahas
Feb. 20, 02	Choke Namchai Co.,Ltd.	Press die for automobile parts	- Machining Dresses of Streets	5. Mr. Virit
	oneno ribino do de la	I (Pless Mold)	-Machining Process of Stamping Die of Automobile	1. Mr. Seki 2. Mr. Thanate
eb. 27, 02	LP Plast Co.,Ltd.			[3, Mr. Amnart
60. 21, 02	CP Plast Go., Ltd.	Electric parts for automobile and electric appliances	-How to manage for QC	1. Mr. Oiwa
		(Plastic Molding)		2. Mr. Sirichai 3. Mr. Prakob
				4. Mr. Preecha
				5. Mr. Sahas 6. Mr. Amnart
Mar. 13. 02	Yeoheng Co.,Ltd.	Medicine press machine	-How to use machine for make	1. Mr. Amnart
		(Machinaly)	good parts of Press M/C of	2, Mr. Prakob
	1		medicine	3. Mr. Satta
				4. Mr. Charnchai [5. Mr. Amnart
Aar, 13, 02	Jiem Cosmetic Co.,Ltd.	Mold for cosmetic packing	-How to make cavity of mold by	1. Mr. Seki
		(Plastic Mold)	EDM or by Milling and other	2. Mr. Prakob
			equipment	3. Mr. Satta 4. Mr. Charnchai
or. 10, 02	SCG-Thailand Co.,Ltd.	Valve	-Forging Process	1. Mr. Seki
		(Forging Mold)	-Make letter on mold by EDM	2. Mr. Satta
			-Cooling of Die Forging	3. Mr. Damrong 4. Mr. Bantao
				5. Miss Kun
or. 24, 02	Precise Engineering	Mold for make Jig & Fixture	-How to make insert part	1. Mr. Seki
	···-	and Forging parts of machine	-Assembly of mold -How to make Electrode for EDM	2. Mr. Prakob
		is to got more the	- now to make Electrode for EUM	3. Mr. Satta 4. Mr. Damrong
				5. Mr. Bantao
	l			6, Mr. Sirisak
		t	·····	7. Mr. Anuwat
lay 8, 02	Krungthai Plaspac Co. Ltd.	Bicycle Part	-Mold design	1 Mr. Obaulia
lav 8, 02	Krungthai Plaspac Co.,Ltd.	Bicycle Part (Plastic Molding)	-Mold design	1. Mr. Otsuke 2. Mr. Prakob
1av 8, 02	Krungthai Plaspac Co.,Ltd.			2. Mr. Prakob 3. Mr. Chanon
lay 8, 02	Krungthai Piespec Co.,Ltd.			2. Mr. Prakob

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Date	Name of factory	Content of the work	Problem	Researchers
May 15, 02	A.K.P. Technology Ltd.	Electrical Part	-Mold design	1. Mr. Otsuka
		(Plastic Mold)		2. Mr. Prakob 3. Mr. Chairat
		· · · · · · · · · · · · · · · · · · ·		4. Mr. Chanon
				5. Mr. Sompong
Mav 22. 02	G.L. Pack Co.,Ltd.	Cosmetic Packing Part	-Injection problem	6. Mr. Panuwat
Way 22. V2	G.C. Pack Co., Cto.	I(Plastic Molding)	-Mold design for cosmetic	2. Mr. Prakob
			packaging	13. Mr. Preecha
				4. Mr. Sahas
May 29, 02	S.C.N. Metal Works Co.,Ltd.	Lamp of Motorcycle	I -Defect of Weldline	i 1. Mr. Oiwa
· · · · · · · · · · · · · · · · · · ·		(Plastic Molding)		2. Mr. Prakob 13. Mr. Preecha
			· · · · · · · · · · · · · · · ·	4. Mr. Sahas
				5. Mr. Amnart
Jul. 12, 02	Thai Alloy Association Co.,Ltd.	Foundry (Foundry Mold)	-Heat Treatment of the Mold	1. Dr. Ikeuchi 2. Mr. Seki
·	· · · · · · · · · · · · · · · · · · ·			3. Mr. Piboon
Aug. 14, 02	Chalam Industry	Plastic Injection Molding	How to control the shchedule	11. Mr. Seki
		(Plastic Molding)	of machine	2. Mr. Oiwa 3. Mr. Sirichai
			of drawing	4. Mr. Satta
			-How to operate the new	6. Mr. Bantao
			-How to adjust the molding	7. Mr. Sirisak
			product defect	8, Mr. Virit
			L United to be back and marking	9. Mr.Amnart
Aug. 28, 02 Sep. 4, 02	Thai Yanagawa_Co.,Ltd.	Die cast & forging plastic mold Printer housing and structure parts	I -How to use high speed machine I -The warp in the molding	1. Mr. Seki
		etc.	products	2. Mr. Seki
		(Plastic Molding)		3. <u>Mr. Oiwa</u> 4. Mr. Ono
	· <u> </u>	····		5. Mr. Uchida
				6. Mr. Sirichai
		· · · · · · · · · · · · · · · · · · ·		7, Mr. Prakob 8, Mr. Worapong
	····			9, Mr. Bantao
Sep. 4, 02	Shonan Gosei (Thailand)Co.,Ltd.	Automotive parts	-Maintenance of Mold	2. Mr. Seki
				12. Mr. Sexi
				4. Mr. Ono
				5. Mr. Uchida 6. Mr. Sirichai
				7. Mr. Prakob
				8. Mr. Worapong
Sep. 5, 02	Nakornratchasima Rachamongkol	Technical Training	-Develop to Technical Training	9. Mr. Bantao
36p. 0, 02	Institute	(University Institute)	Course	2. Mr. Seki
				3. Mr. Oiwa 4. Mr. Ono
				5. Mr. Uchida
				6. Mr. Sirichai
				7. Mr. Prakob 8. Mr. Worapong
				9. Mr. Bantao
Sep. 5, 02	Chockchai Kamchang	Parts of Trackter	-How to make the universal	1. Dr. Ikeuchi
		(Machinaly)	joint	2. Mr. Seki 3. Mr. Oiwa
				4. Mr. Ono
				5. Mr. Uchida
				7. Mr. Prakob
				8. Mr. Worapong
Oct. 3, 02	Thai Inoac Mold Co. Ltd.	Automotive parts (plastic Mold)	-Survey of the Present Situation	9. Mr. Bantao
Oct. 4, 02	Reangwa Standard Industry Co.,	Plastic Injection Molding & Design	-Molding Condition Management	1. Mr. Otsuka
	Ltd.	(Plastic Molding)	of the factory	2. Mr. Oiwa
Oct. 8, 02	Thai Stanley Electric Public Co., Ltd.	Injection Molding (Plastic Molding)	-Survey of the Present Situation	
Oct. 10, 02	Reangwa Standard Industry Co.,	Plastic Injection Molding & Design	-Molding Condition Management	1. Mr. Otsuka
	Ltd. Surin Technical College	(Plastic Molding) Technical Training Center	of the factory -Discussion about the skill	2. Mr. Oiwa 1. Mr. Oiwa
Oct. 31, 02		(University Institute)	development	2. Mr. Prakob
				3. Mr. Sahas 4. Mr. Virit
Oct. 31, 02	Kitpinan Products Co.,Ltd.	Plastic Injection Molding	-Advice for the molding condition	14. Mr. Vint
0001.01.02		(Plastic Molding)		2. Mr. Prakob
				3. Mr. Sahas 4. Mr. Virit
Nov. 11, 02	Takao (Thailand) Co.,Ltd.	Press Mold (Press Mold)	-Managing	1. Dr. Ikeuchi
Nov. 11, 02	Thai Stanley Electric Public Co.,Ltd.	Injection Molding	-Managing	1. Dr. Ikeuchi
Nov. 11, 02	ARRK Corporation (Thailand) Ltd.	Injection Mold	-Managing	1. Dr. Ikeuchi 1. Dr. Ikeuchi
Feb. 19, 03	Hitachi Consumer Products,Ltd.	Plastic Injection Molding		2. Mr.Ishizaki
				3. Mr. Prakob
				4.Mr. Sahas 5. Mr. Preecha
		<u> </u>		6. Mr. Tikumporn
Feb. 25, 03	National Metal and Materials	R&D and Technical Training Center		1. Dr. Ikeuchi
	Technology Center	(University Institute)		i 2. Mr. Uchida 3. Mr. Sirichai
				4. Mr. Wanrop
Mar. 13, 03	Gear Industry Co.Ltd.	Gear Production for Agno-	-Gear Weel noisy	il, Mr.Seki
		Imachinaries and Tractors		2. Mr. Sirichai 3. Mr. Prakop
		(Machinaly)		4. Mr. Satta
				5. Mr. Dumrong
				6. Mr. Banteo 7. Mr.Sirisak
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Mar, 19, 03	PAN Group	Content of the work	Problem -Modification of Injection	Researchers 1. Dr. Ikeuchi
mar. 10, 00	(1) PF Intertech CO.,LTD	(Shoe base)	Machine	2. Mr.Ishizaki
	(2) EDC (3) PONTEX	(Plastic Molding)		3. Mr.Sirichal 4. Mr. Prakob
				5.Mr. Sahas
				6. Mr. Preecha 7. Mr. Tikumporn
Apr. 29, 03	Siam paining Stt Industry	Mold Check , Water Supply Fan (Machinaly)		1. Mr.Seki
				2. Mr. Sirichai 3. Mr. Prakop
May 12, 03	Rachamangela Technology	Visit Facility and Discussion	-Find to co-operate the institute	4. Mr. Bantao 1. Dr. Ikeuchi
<u>may 12, 05</u>	Institute, Nakornrachasima	(University Institute)	to makepublic-relation and	i2. Mr.Seki
			activities for SME in North-East Region	3. Mr.Sirichai 4. Mr. Prakob
			hegion	15. Mr. Satta
May 13, 03	Dalichi Alloy Co.,Ltd.	Machining of Motorcycle weel	Checking machining	6. Mr. Bantao 1. Dr. Ikeuchi
		after die casting	operatio for reducing	2. Mr.Seki
		(Machinaly)	production time	3. Mr.Sirichai 4. Mr. Prakob
				5, Mr. Satta
May 13, 03	SK Mold Ltd.	Plastic Injection by orders for toy,	-Mold repairing and maintenance	6. Mr. Bantao
		electric appliance parts		2, Mr.Seki
		(Plastic Molding)		3. Mr.Sirichai 4. Mr. Prakob
				5. Mr. Satta
May 14, 03	CCI Ltd.	Produce of agromachineries parts.	-CNC operation program writhing	6. Mr. Bantao 1. Dr. Ikeuchi
		heavy machineery parts		2. Mr.Seki 3. Mr.Sirichai
		(Machinaly)		4. Mr. Prakob
				5, Mr. Satta 6, Mr. Bantao
May 29, 03	Siam Paini Co.,Ltd.	Water supply fan outs and values	-Finishing products by machining	1. Mr.Sekí
}		(Machinaly)		2. Mr.Sirichaí 3. Mr. Prakob
				4. Mr. Satta
Jun. 3, 03	PCS Co.,Ltd.	Automobile parts	-Study machining operation &	5. Mr. Bantao 11. Mr. Sirichai
		(Machinaly)	heat treatment of products	2. Dr. Pasu
				3. Mr. Prakob 4. Mr. Wallop
Jun. 3, 03 R	Rukchai Workshop	Rubber Mold and extrusion	-Machining operatiton	1. Mr. Sirichai
		machine		2. Dr. Pasu 3. Mr. Prakob
Jun, 5, 03	Korat Seicum Coled,	Study Pren Die & Die Cast Mold	-Mold making	4, Mr. Wallop 1, Mr. Sirichai
<u>Juli, J, US</u>	Norat Selcum Coles.	for Automobile parts		2. Dr. Pasu
		(Die – Cast)	/	3. Mr. Prakob 4. Mr. Wallop
Jul. 2,03	Insitute for skill Development Region			1. Mr. Ishizaki
		Course (University Institute)		2. Mr. Seki 3. Mr. Prakob
				4. Mr. Satta 5. Mr. Bantao
				6, Mr. Sirisak
Jul. 2,03	Sarayuth Machine Work Co.,Ltd.			
		Control the Tools and Safty Control	-Mind of Savety Control is low	7. Mr. Tikumporn
	Sarayutn Machine Work 50, Lto.	Control the Tools and Safty Control	-Mind of Savety Control is low	1. Mr. Ishizaki 2. Mr. Seki
			-Mind of Savety Control is low	1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob
			-Mind of Savety Control is low	1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao
			-Mind of Savety Control is low	1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn
Jul. 2,03	Finesse Flower co.Ltd.	(Machinaly)	-Mind of Savety Control is low	1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Tikumporn
Jul. 2,03		(Machinaly)	-Mind of Savety Control is low	1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Tikumporn 1. Mr. Tshizaki 2. Mr. Seki 3. Mr. Prakob
Jul. 2,03		(Machinaly)	-Mind of Savety Control is low	1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta
Jul. 2,03		(Machinaly)	-Mind of Savety Control is low	1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Tikumporn 1. Mr. Tikumporn 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak
		(Machinaly) Production of Artificail Flowers (Plastic Molding)		1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn
	Finesse Flower coLtd.	(Machinaly) Production of Artificail Flowers (Plastic Molding) Production of Machine for Agariculture	Mind of Savety Control is low	1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki
	Finesse Flower coLtd.	(Machinaly) Production of Artificail Flowers (Plastic Molding) Production of Machine for		1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Seki 3. Mr. Prakob 4. Mr. Seki 3. Mr. Seki 3. Mr. Satta
	Finesse Flower coLtd.	(Machinaly) Production of Artificail Flowers (Plastic Molding) Production of Machine for Agariculture		1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Me. Tikumporn 11. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 4. Mr. Satta 5. Mr. Bantao
Jul. 3,03	Finesse Flower co.Ltd.	(Machinaly) Production of Artificail Flowers (Plastic Molding) Production of Machine for Agariculture (Machinaly)		1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn
Jul. 3,03	Finesse Flower coLtd.	(Machinaly) Production of Artificail Flowers (Plastic Molding) Production of Machine for Agariculture (Machinaly) 4 Discussion of Technical Training		1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Me. Tikumporn 11. Mr. Ishizaki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Me. Tikumporn 1. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Shizaki 7. Mr. Tikumporn 1. Mr. Shizaki
Jul. 3,03	Finesse Flower co.Ltd.	(Machinaly) Production of Artificail Flowers (Plastic Molding) Production of Machine for Agariculture (Machinaly)		1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Sikaki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Sirisak
Jul. 3,03	Finesse Flower co.Ltd.	(Machinaly) Production of Artificall Flowers (Plastic Molding) Production of Machine for Agariculture (Machinaly) 4Discussion of Technical Training Course		1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mc. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mc. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mc. Tikumporn 1. Mr. Shizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Seki 3. Mr. Prakob 4. Mr. Satta
Jul. 3,03	Finesse Flower co.Ltd.	(Machinaly) Production of Artificall Flowers (Plastic Molding) Production of Machine for Agariculture (Machinaly) 4Discussion of Technical Training Course		1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 11. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak
Jul. 3,03 Jul. 3,03	Finesse Flower co.Ltd. Triumph Engineering Co.Ltd Insitute for skill Development Region	(Machinaly) Production of Artificail Flowers (Plastic Molding) Production of Machine for Agariculture (Machinaly) 4 Discussion of Technical Training Course (University Institute)	- Control of Mist of Milling Oil	1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Sirisak 7. Mr. Sirisak 7. Mr. Sirisak 7. Mr. Sirisak 7. Mr. Sirisak 7. Mr. Sirisak 7. Mr. Sirisak 7. Mr. Sirisak 7. Mr. Sirisak 7. Mr. Satta 5. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn
Jul. 3,03 Jul. 3,03	Finesse Flower co.Ltd.	(Machinaly) Production of Artificall Flowers (Plastic Molding) Production of Machine for Agariculture (Machinaly) 4Discussion of Technical Training Course		1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Me. Tikumporn 11. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Me. Tikumporn 1. Mr. Shizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Shizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Shizaki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Sirisak
Jul. 3,03 Jul. 3,03	Finesse Flower co.Ltd. Triumph Engineering Co.Ltd Insitute for skill Development Region	(Machinaly) Production of Artificail Flowers (Plastic Molding) Production of Machine for Agariculture (Machinaly)	- Control of Mist of Milling Oil	I. Mr. Ishizaki Z. Mr. Seki Z. Mr. Seki J. Mr. Prakob J. Mr. Prakob J. Mr. Prakob J. Mr. Sirisak T. Mr. Tikumporn Mr. Sirisak Z. Mr. Seki Z. Mr. Seki J. Mr. Sirisak J. Mr. Sirisak Mr. Sirisak J. Mr. Sirisak J. Mr. Sirisak J. Mr. Satta J. Mr. Satta J. Mr. Sirisak J. Mr. Satta J. Mr. Sirisak J. Mr. Sirisak J. Mr. Sirisak J. Mr. Sirisak J. Mr. Satta J. Mr. Wataboord J. Mr. Waraboord J. Mr. Waraboord J. Mr. Waraboord J. Mr. Waraboord J. Mr. Satta
Jul. 3,03 Jul. 3,03	Finesse Flower co.Ltd. Triumph Engineering Co.Ltd Insitute for skill Development Region	(Machinaly) Production of Artificail Flowers (Plastic Molding) Production of Machine for Agariculture (Machinaly)	- Control of Mist of Milling Oil	1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Me. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Shizaki 2. Mr. Paiboon 3. Mr. Wrapoon 1. Mr. Ono 2. Mr. Paiboon 3. Mr. Wrapoong 4. Mr.
Jul. 3.03 Jul. 3.03 Jul. 11.03	Finesse Flower coLtd. Triumph Engineering CoLtd Insitute for skill Development Region T.Krungthai Industries CoLtd.	(Machinaly) Production of Artificail Flowers (Plastic Molding) Production of Machine for Agariculture (Machinaly) 4 Discussion of Technical Training Course (University Institute) Autometric Port of Plastics (Plastic Mold)	- Control of Mist of Milling Oil	I. Mr. Ishizaki Z. Mr. Seki Z. Mr. Seki J. Mr. Prakob J. Mr. Prakob J. Mr. Prakob J. Mr. Satta S. Mr. Bantao J. Mr. Ishizaki Z. Mr. Seki J. Mr. Tikumporn Mr. Jshizaki J. Mr. Satta S. Mr. Bantao J. Mr. Sirisak J. Mr. Sirisak J. Mr. Seki J. Mr. Sirisak J. Mr. Seki J. Mr. Sek
Jul. 3.03 Jul. 3.03 Jul. 11.03	Finesse Flower co.Ltd. Triumph Engineering Co.Ltd Insitute for skill Development Region	(Machinaly) Production of Artificail Flowers (Plastic Molding) Production of Machine for Agariculture (Machinaly)	- Control of Mist of Milling Oil	I. Mr. Ishizaki Z. Mr. Seki Z. Mr. Seki J. Mr. Prakob J. Mr. Prakob J. Mr. Sirisak J. Mr. Seki J. Mr. Seki J. Mr. Seki J. Mr. Seki J. Mr. Satta J. Mr. Sa
Jul. 3.03 Jul. 3.03 Jul. 11.03	Finesse Flower coLtd. Triumph Engineering CoLtd Insitute for skill Development Region T.Krungthai Industries CoLtd.	(Machinaly) Production of Artificail Flowers (Plastic Molding) Production of Machine for Azericulture (Machinaly) Discussion of Technical Training Course (University Institute) Autometric Port of Plastics (Plastic Mold) Connector	- Control of Mist of Milling Oil	I. Mr. Ishizaki Z. Mr. Seki Z. Mr. Seki J. Mr. Prakob J. Mr. Prakob J. Mr. Prakob J. Mr. Satta S. Mr. Bantao S. Mr. Sirisak Z. Mr. Seki J. Mr. Ishizaki Z. Mr. Seki J. Mr. Seki J. Mr. Sirisak J. Mr. Sirisak J. Mr. Sirisak J. Mr. Sirisak J. Mr. Seki J. Mr. Seki J. Mr. Sirisak J. Mr. Sirisak J. Mr. Sirisak J. Mr. Seki J. Mr. Sirisak J. Mr. Sirisak J. Mr. Seki J. Mr. Sirisak J. Mr. Sirisak J. Mr. Sirisak J. Mr. Satta S. Mr. Bantao S. Mr. Satta S. Mr. Bantao S. Mr. Satta S. Mr. Satta S. Mr. Satta J. Mr. Sirisak J. Mr. Paiboon J. Mr. Chanon S. Mr. Somporg J. Mr. Paiso J. Mr. Paiboon J. Mr. Warapong
Jul. 3.03 Jul. 3.03 Jul. 11.03	Finesse Flower coLtd. Triumph Engineering CoLtd Insitute for skill Development Region T.Krungthai Industries CoLtd.	(Machinaly) Production of Artificail Flowers (Plastic Molding) Production of Machine for Azericulture (Machinaly) Discussion of Technical Training Course (University Institute) Autometric Port of Plastics (Plastic Mold) Connector	- Control of Mist of Milling Oil	1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 11. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Satta 5. Mr. Bantao 8. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ono 2. Mr. Paiboon 3. Mr. Varapong 4. Mr. Chanon 5. Mr. Paiboon 3. Mr
Jul. 3.03 Jul. 3.03 Jul. 11.03 Jul. 11.03	Finesse Flower coLtd. Triumph Engineering CoLtd Insitute for skill Development Region T.Krungthai Industries CoLtd. MCI Mouid CLtd.	(Machinaly) Production of Artificall Flowers (Plastic Molding) Production of Machine for Agariculture (Machinaly) 4 Discussion of Technical Training Course (University Institute) Autometric Port of Plastics (Plastic Mold) Connector (Plastic Mold)	- Control of Mist of Milling Oil	I. Mr. Ishizaki Z. Mr. Seki Z. Mr. Seki J. Mr. Prakob J. Mr. Prakob J. Mr. Prakob J. Mr. Satta S. Mr. Bantao J. Mr. Sirisak Z. Mr. Seki J. Mr. Ishizaki Z. Mr. Seki J. Mr. Satta J. Mr. Sat
Jul. 3.03 Jul. 3.03 Jul. 11.03 Jul. 11.03	Finesse Flower coLtd. Triumph Engineering CoLtd Insitute for skill Development Region T.Krungthai Industries CoLtd.	(Machinaly) Production of Artificail Flowers (Plastic Molding) Production of Machine for Azericulture (Machinaly) Discussion of Technical Training Course (University Institute) Autometric Port of Plastics (Plastic Mold) Connector	- Control of Mist of Milling Oil	I. Mr. Ishizaki Z. Mr. Seki Z. Mr. Seki J. Mr. Prakob J. Mr. Prakob J. Mr. Prakob J. Mr. Sirisak T. Mr. Tikumporn Mr. Sirisak Z. Mr. Seki J. Mr. Stata S. Mr. Bantao J. Mr. Sirisak J. Mr. Satta J. Mr. Sirisak J. Mr. Saki J. Mr. Sirisak J. Mr. Satta J. Mr. Sirisak J. Mr. Satta J. Mr. Sirisak J. Mr. Satta J. Mr. Seki J. Mr. Seki J. Mr. Satta J. Mr. Satta J. Mr. Sirisak J. Mr. Satta J. Mr. Prakob J. Mr. Satta J. Mr. Prakob J. Mr. Satta J. Mr. Satta J. Mr. Satta J. Mr. Prakob J. Mr. Satta J. Mr. Prakob J. Mr. Satta J. Mr. Prakob J. Mr. Paiboon J. Mr. P
Jul. 3.03 Jul. 3.03 Jul. 11.03 Jul. 11.03	Finesse Flower coLtd. Triumph Engineering CoLtd Insitute for skill Development Region T.Krungthai Industries CoLtd. MCI Mouid CLtd.	(Machinaly) Production of Artificail Flowers (Plastic Molding) Production of Machine for Azariculture (Machinaly) 4 Discussion of Technical Training Course (University Institute) 4 University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (Engineering Plastic	- Control of Mist of Milling Oil	I. Mr. Ishizaki Z. Mr. Seki Z. Mr. Seki J. Mr. Prakob J. Mr. Prakob J. Mr. Prakob J. Mr. Sirisak T. Mr. Tikumporn Mr. Sirisak Z. Mr. Seki J. Mr. Stata S. Mr. Bantao J. Mr. Sirisak J. Mr. Satta J. Mr. Sirisak J. Mr. Saki J. Mr. Sirisak J. Mr. Satta J. Mr. Sirisak J. Mr. Satta J. Mr. Sirisak J. Mr. Satta J. Mr. Seki J. Mr. Seki J. Mr. Satta J. Mr. Satta J. Mr. Sirisak J. Mr. Satta J. Mr. Prakob J. Mr. Satta J. Mr. Prakob J. Mr. Satta J. Mr. Satta J. Mr. Satta J. Mr. Prakob J. Mr. Satta J. Mr. Prakob J. Mr. Satta J. Mr. Prakob J. Mr. Paiboon J. Mr. P
Jul. 2,03 Jul. 3,03 Jul. 3,03 Jul. 11,03 Jul. 11,03	Finesse Flower coLtd. Triumph Engineering CoLtd Insitute for skill Development Region T.Krungthai Industries CoLtd. MCI Mouid CLtd.	(Machinaly) Production of Artificail Flowers (Plastic Molding) Production of Machine for Azariculture (Machinaly) 4 Discussion of Technical Training Course (University Institute) 4 University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (University Institute) 4 Discussion of Technical Training Course (Engineering Plastic	- Control of Mist of Milling Oil	1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ishizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Shizaki 2. Mr. Seki 3. Mr. Prakob 4. Mr. Satta 5. Mr. Bantao 6. Mr. Sirisak 7. Mr. Tikumporn 1. Mr. Ono 2. Mr. Paiboon 3. Mr. Varapong 4. Mr. Chanon 5. Mr. Sompong 6. Mr. Soboon 3. Mr. Warapong 1. Mr. Ono 2. Mr. Paiboon

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Date	Name of factory	Content of the work	Problem	Researchers
Jul. 28, 03	Rajamanggala Insitute of Technology	Technical Training Course of Processing		1. Mr. ikeuchi (2. Mr. Seki
	· · · · · · · · · · · · · · · · · · ·	(University Institute)		3. Mr. Prakob
				4. Mr. Satta 5. Mr. Bantao
				i6. Mr. Sirisak
Jul. 29, 03	Daisin Co. Ltd.	AI -Die Cast Motorcycle I(Die - Cast)	-	1. Mr. Ikeuchi 2. Mr. Seki
				3. Mr. Yoshio
				4, Mr. Prepat
				15. Mr. Sirichai 16. Mr. Prakob
				7. Mr. Satta
	<u> </u>			8. Mr. Bantao 9. Mr. Sirisak
Jul. 30, 03	Industrial Promotion Center Region			1. Mr. Ikeuchi
		Training Course (University Institute)		2. Mr. Seki 3. Mr. Yoshio
				4. Mr. Satte
	· · · · · · · · · · · · · · · · · · ·			5, Mr. Banteo
				6. Mr. Sirisak 7. Mr. Prakob
Jul. 31, 03	Khon kaen Institute for Skill Develop	I (University Institute)	-Machine Center	1. Mr. Ikeuchi
· · · · · ·				2. Mr. Seki 3. Mr. Yoshio
				4. Mr. Satta
				5. Mr. Banteo 6. Mr. Sirisak
				7. Mr. Prakob
Jul, 31, 03	Manun Karn Chang	Gear (Machinaly)	-Mainternac of Machine	1. Mr. Ikeuchi 2. Mr. Seki
				3. Mr. Yoshio
Aug.1, 03	Permpoon Patana Industry Co., Ltd	Cotton Bar (Plastic Molding)	-Bend of the Bar	1. Mr. ikeuchi
			· · · · · · · · · · · · · · · · · · ·	2. Mr. Seki 3. Mr. Yoshio
				4. Mr. Satta
				5. Mr. Bantao 6. Mr. Sirisak
Aug.1, 03	Vuthiwan Co., Ltd.	Mold for the cotton bar	-How to set the tool	7. Mr. Prakob
Aug.1, 03	Votiniwan Co., Lto.	(Plastic Mold)		1. Mr. Ikeuchi 2. Mr. Seki
				3. Mr. Yoshio
			· · · · · · · · · · · · · · · · · · ·	4. Mr. Satta 5. Mr. Bantao
				6. Mr. Sirisak
Aug.17,03	Surin Technical Colledge	TechnicalTraining of Mold		7. Mr. Prakob 1. Mr. Ikeuchi
		(University Institute)		2. Mr. Ishizaki
• •			-	3. Mr. Prakob 4. Mr. Precha
				5. Mr. Sahat
Aug.18,03	Buochai Plastic Industrian Co.,Ltd.	Poliesther Box	-	6. Mr. Tikumporn 1. Mr. Ikeuchi
	Buothar hasta maschan ob	(Plastic Molding)		2. Mr. Ishizaki
				3. Mr. Prakob 4. Mr. Precha
				5. Mr. Sahat
Aug.19.03	Flower Associate Co. Ltd.	Plastic Flower	-Business (low teach)	6. Mr. Tikumporn 1. Mr. Ikeuchi
	Tiowar Associate Co.,Etc.	(Plastic Mold & Molding)		2. Mr. Ishizaki
				13. Mr. Prakob 14. Mr. Precha
				5. Mr. Sahat
Aug.19,03	Kitoinan Product Company	Plastic parts for sanirary Wall	-Malataman of Marking	6. Mr. Tikumporn
A02.13.03		(Plastic Molding)	-Mainternanc of Machine	1. Mr. Ikeuchi 2. Mr. Ishizaki
				3. Mr. Prakob
				4. Mr. Precha 5. Mr. Sahat
0 - 1 00				6. Mr. Tikumporn
Sep.1,03	Siam Nissan Karnchanaburi Go.,Ltd.	Fabricate of plastice blow Machine ((Machinaly))	-Searel of joint - venture	1. Mr. Yoshio 2. Mr.Satte
				3. Mr.Sirisak
Oct. 27,03	Kelang Ceramic Industry	Ceramic tile		4. Mr.Bantao 1. Mr. Seki
				2, Mr. Sirichai
			······································	3. Mr. Prakob
				4. Mr. Satta 5. Mr. Bantao
				6. Mr. Sirisak
Oct. 28,03	Nothern Industry Promotion Center	Technical Training	-Mainternanc of Machine	7. Mr. Anuwat 11. Mr. Seki
		(University Institute)		2. Mr. Sirichai
			1	13. Mr. Prakob 4. Mr. Satta
				5. Mr. Bantao
				6. Mr. Sirisak
Oct. 28,03	S. Corp Work Co.	Maice tool edge	-Layout of Machine	7. Mr. Anuwat 1. Mr. Seki
		(Machinaly)		12. Mr. Sirichai
	- [1	3. Mr. Prakob 4. Mr. Satta
				5. Mr. Bantao
				6. Mr. Sirisak
	Samveak sanambin Engineering	Machining of bar	-Old Machine	17. Mr. Anuwat 11. Mr. Seki
	Samveak sanambin Engineering	Machining of bar I(Machinaiv)	-Old Machine	17. Mr. Anuwat 11. Mr. Seki 2. Mr. Sirichai
Oct. 28,03	Samveak sanambin Engineering		-Old Machine	17. Mr. Anuwet 11. Mr. Seki 2. Mr. Sirichai 3. Mr. Prekob
	Samveak sanambin Engineering		-Old Machine	17. Mr. Anuwat 11. Mr. Seki 2. Mr. Sirichai

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Inter Mark (195) 0.0	Researchers				
Jack Discipant Model (10 %) 6.10 <t< td=""><td>1. Mr. Seki 2. Mr. Sirichai</td><td></td><td>(Blow : Mold (90%)</td><td></td><td></td></t<>	1. Mr. Seki 2. Mr. Sirichai		(Blow : Mold (90%)		
1 Lance Longhum Precision Co. Boot and Planting Mainternance of Model Mainternance of Model 202.82.03 Lance Longhum Precision Co. Description of Planting Mainternance of Model Mainternance of Model 202.82.03 Lance Longhum Precision Co. Planting Model Mainternance of Model Mainternance of Model 202.82.03 Observation of Cole Precision of Cole Precision of Cole Mainternance of Model 202.82.03 Observation of Cole Precision of Cole Precision of Cole Mainternance of Model 202.82.03 Observation of Cole Precision of Cole Precision of Cole Mainternance of Model 202.82.03 Observation of Cole Mainternance of Model Precision of Cole Mainternance of Model Mainternance of Model 202.82.03 Observation of Cole Precision of Cole Precision of Cole Mainternance of Model Mod	3. Mr. Prakob		Plastic Injection Mold (10 %)		
base Anore Luzgehan Precision Co. Electric sorts of Plantic	4. Mr. Satta				······
Data Langhun Proposition Can Diration and Ausenbun Proposition Can Plantak Median J Additateman of Model J. M. Sp. Image: State Sta	6. Mr. Bantao 6. Mr. Sirisak				
CPaster Motion 2.1 CPaster	7. Mr. Anuwat				
1 1	1. Mr. Seki			Lanna Lumphun Precision Co.	Jet 29.03
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an. 28,04 Top trend Manufacturing Co.,Ltd. Cosmetic Case or Cad – Injection 1, Mr. Ishiz an. 28,04 Top trend Manufacturing Co.,Ltd. Cosmetic Case or Cad – Injection 1, Mr. Ishiz (Plastic Molding) 2, Mr. Prak (Plastic Molding) 4, Mr. Saha an. 27,04 PVS Plastic Co., Ltd. Electric Part and Sundry Good – Mainternance 1, Mr. Ishiz (Plastic Molding) 2, Mr. Tikur an. 27,04 Nawa Plastic Industries Co.,Ltd. Plumbing Parts 1, Mr. Saha (Plastic Molding) 2, Mr. Tikur an. 27,04 Nawa Plastic Industries Co.,Ltd. Plumbing Parts 4, Mr. Saha (Plastic Molding) 2, Mr. Prak (Plastic Molding) 2, Mr. Prak (Plastic Molding) 2, Mr. Tikur an. 27,04 Nawa Plastic Industries Co.,Ltd. Plumbing Parts 4, Mr. Saha (Plastic Molding) 2, Mr. Prak (Plastic Molding) 4, Mr. Saha (Plastic Molding) 4, Mr. Saha (Plastic Molding) 5, Mr. Tikur (Plastic Mold) 5, Mr. Tikur (Plastic Mold) 5, Mr. Tikur (Plastic Mold) 5, Mr. Tikur (Plastic Mold) 5, Mr. Tikur (Plastic Mold) 5, Mr. Tikur (Plastic Mold) 5, Mr. Tikur (Plastic Mold) 5, Mr. Tikur (Plastic Mold) 5, Mr. Tikur (Plastic Mold) 5, Mr. Tikur (Plastic Mold) 5, Mr. Tikur (Plastic Mold) 6, Mr. Uchid					
an, 26,04 Too trend Manufacturing Co.,Ltd. Cosmetic Case or Cad - Injection 1. Mr. Ishiz an, 26,04 Too trend Manufacturing Co.,Ltd. Cosmetic Case or Cad - Injection 1. Mr. Ishiz an, 26,04 Too trend Manufacturing Co.,Ltd. Cosmetic Case or Cad - Injection 1. Mr. Ishiz an, 26,04 If Pastic Molding)	Mr. Tikumporn	(5.			
Image: Image:	Mr.Uchida	6,			
3. Mr. Prec 4. Mr. Saha 1. Mr. Jakiz 1. Mr. Jakiz </td <td></td> <td></td> <td></td> <td></td> <td>an. 26,04</td>					an. 26,04
indext indext <td></td> <td></td> <td></td> <td></td> <td></td>					
an. 27,04 PVS Plastic Co., Ltd. Electric Part and Sundry Good - Maintemance 1. Mr. Ishiz an. 27,04 PVS Plastic Co., Ltd. Electric Part and Sundry Good - Maintemance 1. Mr. Ishiz an. 27,04 PVS Plastic Co., Ltd. Electric Part and Sundry Good - Maintemance 1. Mr. Ishiz an. 27,04 Nawa Plastic Industries Co., Ltd. Plumbing Parts 1. Mr. Ishiz 1. Mr. Ishiz an. 27,04 Nawa Plastic Industries Co., Ltd. Plumbing Parts 1. Mr. Ishiz 1. Mr. Ishiz an. 27,04 Nawa Plastic Industries Co., Ltd. Plumbing Parts 1. Mr. Ishiz 1. Mr. Ishiz an. 27,04 Nawa Plastic Industries Co., Ltd. Plumbing Parts 1. Mr. Ishiz 1. Mr. Ishiz an. 27,04 Nawa Plastic Industries Co., Ltd. Plumbing Parts 1. Mr. Ishiz 1. Mr. Ishiz an. 27,04 Nawa Plastic Industries Co., Ltd. Plumbing Parts 1. Mr. Ishiz 1. Mr. Ishiz an. 27,04 Nawa Plastic Industries Co., Ltd. Plumbing Parts 1. Mr. Ishiz 1. Mr. Ishiz an. 28,04 Automotive Mold Technology Co., Ltd. Automotive Part 1. Mr. Ishiz 1. Mr. Ishiz an. 28,04 Autom	Mr. Sahat	14.			
an. 27,04 PVS Plastic Co., Ltd. Electric Part and Sundry Good - Mainternance 1. Mr. Jahiz. Image: Co., Ltd. (Plastic Molding.) Image: Co., Ltd. 2. Mr. Prack Image: Co., Ltd. (Plastic Molding.) Image: Co., Ltd. 1. Mr. Jahiz. Image: Co., Ltd. Plumbing Parts Image: Co., Ltd. 1. Mr. Jahiz. Image: Co., Ltd. Plumbing Parts Image: Co., Ltd. 1. Mr. Jahiz. Image: Co., Ltd. Plumbing Parts Image: Co., Ltd. 1. Mr. Jahiz. Image: Co., Ltd. Plumbing Parts Image: Co., Ltd. 1. Mr. Jahiz. Image: Co., Ltd. Plumbing Parts Image: Co., Ltd. 1. Mr. Jahiz. Image: Co., Ltd. Plumbing Parts Image: Co., Ltd. 1. Mr. Jahiz. Image: Co., Ltd. Plumbing Parts Image: Co., Ltd. 1. Mr. Jahiz. Image: Co., Ltd. Automotive Mold Technology Co., Ltd. Automotive Part Image: Co., Ltd. Image: Co., Ltd. Image: Co., Ltd. Automotive Part Image: Co., Ltd. Image: Co., Ltd. Image: Co., Ltd. Image: Co., Ltd. Image: Co., Ltd. Automotive Part Image: Co., Ltd. Image: Co., Ltd. Image: Co.	Mr. Tikumpom				
i (Plastic Molding.) 2. Mr. Praku iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii	Mr.Uchida Mr. Ishizaki	- Mainternance	Electric Part and Sundry Good	PVS Plastic Co. Ltd	an. 27.04
Image: Second					-04.4 FaM.7
an. 27.04 Nawa Plastic industries Co.,Ltd. Plumbing Parts 6. Mr. Uchid an. 27.04 Nawa Plastic industries Co.,Ltd. Plumbing Parts 6. Mr. Uchid (Plastic Molding) 1. Mr. Ishizz (Plastic Molding) 1. Mr. Preks 1. Mr. Saha 1. Mr. Saha 1. Mr. Ishizz 1. Mr. Ishiz 1. Mr. Ishiz 1. Mr. Ishiz 1. Mr. Ishiz 1. Mr. Ishiz 1	Mr. Precha	13.			
an. 27.04 Nawa Plastic industries Co.,Ltd. IPlumbing Parts 1, Mr. Ishiz (Plastic Molding) 2, Mr. Prake 3, Mr. Prake 3, Mr. Prake 4, Mr. Saha 3, Mr. Prake 4, Mr. Saha 3, Mr. Prake 5, Mr. Tikun 3, Mr. Prake 4, Mr. Saha 5, Mr. Tikun 4, Mr. Saha 1, Mr. Ishiz 1, Mr. Ishiz 1, Mr. Ishiz 1, Mr. Saha 1, Mr. Sahat Mr. Tikumpore	· 4.				
an. 27,04 Nawa Plastic industries Co.,Ltd. Plumbing Parts (Plastic Molding) 2, Mr. Prake (Plastic Molding) 2, Mr. Prake 3, Mr. Prake 4, Mr. Saha 5, Mr. Tikun 5, Mr. Tikun 5, Mr. Tikun 1, Mr. Ishiza 1, Mr. Ishiza	Mr.Uchida			· · · · · · · · · · · · · · · · · · ·	
Image: State	Mr. Ishizaki	1.1			an. 27,04
Automotive Mold Technology Co.,Ltd. Automotive Part an.28,04 Automotive Mold Technology Co.,Ltd. Automotive Part I (Plastic Mold) I (Plastic Mold) I (Mr. Prake I (Plastic Mold) I (Mr. Prake I (Mr. Sphat I (Mr. Sphat			(Plastic Molding)		
an.28,04 Automotive Mold Technology Co.Ltd. Automotive Part 1, Mr. Ushid (Plastic Mold) 2, Mr. Prake (Plastic Mold) 2, Mr. Prake (A. Mr. Shitz (A. Mr. Shitz) (A. Mr. Shitz (A. Mr. Shitz) (A. Mr. Shitz (A. Mr. Shitz) (A.	<u>wr. Precna</u> Mr. Sahət				
is, Mr.Uchidi an,28,04 Automotive Mold Technology Co.Ltd. Automotive Part (Plastic Mold) (Plastic Mold) (A. Mr. Prate (A. Mr. Sahat (S. Mr. Tikun (B. Mr.Uchidi (B. Mr.Uchidi (B. Mr.Uchidi (B. Mr.Uchidi (B. Mr.Uchidi	Mr. Tikumporn				
I(Plastic Mold) 2. Mr. Prakc I I I </td <td>Mr.Uchida</td> <td>6.1</td> <td>Automatica Data</td> <td></td> <td>- 00.04</td>	Mr.Uchida	6.1	Automatica Data		- 00.04
13. Mr. Preol 4. Mr. Sahat 5. Mr. Tikun 6. Mr. Uchjuk					an.28,04
4, Mr. Sehat 5, Mr. Tikun 6, Mr. Uchjdu	Mr. Precha				
6. Mr.Uchida	Mr. Sahat	4.1			
	Mr. Tikumporn Mr. Labida	5.1			
eb. 24.04 Rajamanggala Institute of Technology Technical Training i - Check Injection Machine 1. Mr. Ishiza	Mr.Uchida Mr. Ishizaki		Technical Training	Rajamanggala Institute of Technology	eb. 24,04
(University Institute) 2. Mr. Prake	Mr. Prakob				
3. Mr. Sahai		3. 1			

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Date	Name of factory	Content of the work	Problem	Researchers
eb. 25.04	Rajamanggala Institute of Technology	Technical Training	- Check Injection Machine	1. Mr. Ishizaki
		(University Institute)		2. Mr. Prakob
	· · · · · · · · · · · · · · · · · · ·			3. Mr. Sahat
eb.26,04	Surin Skill Development Center	Technical Training	- Check Injection Machine	1. Mr. Ishizaki
		(University Institute)		2, Mr, Prakob
				3. Mr. Sahat
Feb.27.04				4. Mr. Tikumporn
Feb.27,04	Region Center DIP In Bureerum	Technical Training (University Institute)		1. Mr. Ishizaki
	· / · · · ·			2. Mr. Prakob 3. Mr. Sahat
				4. Mr. Tikumporn
Mar.10,04	Rajamanggala Institute of Technology	Technical Training		1. Mr. Yoshio
		(University Institute)		2. Mr. Satta
				3. Mr. Bantao
				4.Mr.Sirisak
Mar.11,04	Decha Panich Fishing net Factory Ltd.	Fishing oot	- Maintenance Injection Machine	5.Mr.Prakob
101,11,04		(Plastic Molding)	- Maintenance Injection Machine	12. Mr. Satta
				13. Mr. Bantao
				4.Mr.Sirisak
				5.Mr.Prakob
Mar.11,04	Sakluwan Chang	Automotive Part	- Introduction Machine	1. Mr. Yoshio
		(Machinary)		2. Mr. Satta
				3. Mr. Bantao
				14.Mr.Sirisak I5.Mr.Prakob
Mar 11 04	Sim Electric Group Co.,Ltd.	Switch Bord	– Maintenance Machine	1. Mr. Yoshio
		(Machinary)		2. Mr. Satta
				3. Mr. Bantao
				4.Mr.Sirisak
Mar. 12,04	INK Nongkai Plastic	Datala Diau	Translate the second start is a	5.Mr.Prakoo
<u>Mar. 12,04</u>	INK Nongkar Plastic	Bottle Blow (Plastic Molding)	- Introdute the used Machine	1. Mr. Yoshio 2. Mr. Satta
		(riastic motoling)		3. Mr. Bantao
				4.Mr.Sirisak
				15.Mr.Prakob
May.11,04	Vuthiwan Company Limited	Mold and Machine for Making	CNC Milling for make Cotton bud	1. Mr. Ikeuchi
		Cotton Bud		2. Mr. Prakob
May.11.04	Perm Poon Patana Industry Company	for Cotton Bud	Injection of the Case for Cotton bud	1. Mr. ikeuchi 2. Mr. Prakob
May.13,04	CTV Dol!	Product Trailer, Repair train Box		1, Mr. Satta
		(Machine)		2. Mr. Dumrong
		· · · · · · · · · · · · · · · · · · ·		3. Mr. Bantao
				4. Mr.Sirisak
lay.13,04	E-San Plastics	Plastic Recycle Blow Mold	Lack of Plastic to be Recycle	1. Mr. Satta
		(Plastic Molding)	Need to Increase Production	2. Mr. Dumrong
				3. Mr. Bantao 4. Mr.Sirisak
lav.14,04	Sittichai Lathe	Hydroric Press	Lack of Budget to make Hydroric	i1. Mr. Satta
			Press Machine	2. Mr. Dumrong
				3. Mr. Bantao
lay. 24,04	Mold Masler Manufacturing Co., Ltd.	Decion	(May In prepage the distance from	4. Mr.Sirisak
107. 24.04	word Master Manuacturing Co., Lto.	Design	How to manage the design office	1. Mr. Ono 2. Mr. Palboon
				3. Mr. Warapong
		· · · · · · · ·		4. Mr. Chanon
				5. Mr. Sompong
ay.25,04	Top trend Manufacturing Co.,I.td.	Molding cosmellc case and	Injection of cosmelic case	1. Mr. One
		making the mold for cosmetic		2. Mr. Paiboon
		· · ·		3. Mr. Warapong
				4. Mr. Chanon 5. Mr. Sompong
lay.26,04	Reangwa Slandard Industry Co.,Ud.	Molding daily	Mainternace of mold	1. Mr. Ono
	g	······		2. Mr. Palboon
				3. Mr. Warapong
				4, Mr. Chanon
				5. Mr. Sompong
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Annex 30-1 Progress of Prototyping Services Conducted by the Project

In 2002,SIC has already provided prototyping services for 57 firm. For the first half year (January to June) ,SIC gave the service to 19 firms and the last half year (July to December) gave the service to 38 firms. Example of a company receiving prototyping services from BSID with supervision from project expert.

1. Chalam industrial Co.,Ltd.

- Mold parts include core and cavity, size 40x50mm. 1 piece.
- 2. T.R.Machine and Engineering Co.,Ltd.
 - Master model forming of shoe with size of 300x130x50 mm. by using machining center (V55)
- 3. Takai
 - Machine Core, Cavity size 450x500x60 mm. for mold parts and electrode 2 pieces, size 50x50 mm.
- 4. Kitipan Product Co., Ltd.
 - Making mold parts including making insert, core and cavity with size of 300x350x25 mm.
- 5. Chulalongkorn University
 - Making prototype for Fatigue testing machine parts with precision less than 10 micron

6. LSTP Industrial Co., Ltd.

- Making brass mold for sanitary ware, size 350x160x60 mm.
- 7. Kasetsart University
 - Making spark EDM for electrode graphite using automobile parts forming, size 30x30x30 cm.
- 8. X-Tack Co. Ltd.
 - Machine die base 650x800 on CNC milling machine with table size of 800x1250

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Annex 30-1

In 2003, SIC has already provided prototyping services for 38 times from January to June (12 firms).Example of company receiving prototyping services from BSID with supervision from project expert are :

1. Siam paini Co.,Ltd.

- Milling 1 piece
- Core 1 piece
- Mold maintenance 1 pieces
- CNC
- 2. National Science and Technology Development Agency
 - Gear bon processing
- 3. Extact Co., Ltd.
 - Graphite processing for electrode machining 8 pieces
 - Electrode machining (repair) 2 pieces
- 4. Chalam industry Co.,Ltd.
 - Wire- cut for plastic injection mold 21 pieces
 - EDM spark 4 pieces with precision 10 micron
- 5. Thaikriptech Co.,Ltd.
 - Wire-cut die zip plate 26 pieces with precision 10 micron
- 6. King's Mongkut University of Technology Thonburi
 - Machining part
- 7. Lopburi Collage
 - Clamp of injection mold
- 8. Kitipan Product Co., Ltd.
 - EDM plastic mold 2 pieces
- 9. Chulalongkorn University
 - Milling 2 pieces and hole

Since January 2004, the prototyping service has been provided 13 times in total for 2 organisations which are 1) The Iron Institute and 2) Rungreang Wire-Cut Precision Co.,Ltd. (details are stated in the enclosed document.)

1) Iron Institute :

- The Milling M/C had been used for the production of 45 pieces of the tensile testing machine part.
- The Wire-Cut M/C had been used for preparing the specimen for composition analysis.
- 2) Rungreang Wire-Cut Precision Co., Ltd.

The Wire-Cut M/C and EDM had been used for

- The part of stamping-die 30 pieces (size 30x30x40 mm)
- The die press

Annex 30-1

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Annex 30-2 Record of Prototyping Service Conducted by The Project

No.	Date	Name of Company	Supported by Expert		SIC Machine
	2000				
1	Apr. 25, 2000	Extact Co., Ltd.		Milling Machine 1 set	
		Extact Co., Ltd.		Milling Machine 2 sets	
		Extact Co., Ltd.		Machine 3 sets	
		Extact Co., Ltd.		Milling Die Forging 2 sets	
		Extact Co., Ltd.		Machine	1.
		Extact Co., Ltd.		Machine center 2 sets	1
7		Kasem Bandit University		Machining 50 Pieces	1
8		U.I. Engineering		Wire cut SCM 440 4 pieces	W
		Kasem Bandit University		Machining for trial pressure	
				80 pieces, Crashing 78 pieces	
	2001		1		
1		Extact Co., Ltd.		Machine 6 pieces	
2		Kasem Bandit University		Maching for crashing trial 25 piec	nes
		Kijpinan Products Co., Ltd.		Cutting Bar 2 pieces, Spowking	
		University of Technology Ma		Cutting 550c	
		Extact Co., Ltd.		Machine Parts 4 pieces	
		Kasem Bandit University		Wire cut 26 pieces	W
		Kasem Bandit University		Wire cut 13 pieces	W
		Kasem Bandit University		Cutting parts 11 pieces	
9		Kijpinan Products Co., Ltd.		Sparking	E
		Kasem Bandit University			<u> </u>
		Extact Co., Ltd.		Machining trial part	
		Chulalongkorn University		Machine Parts 4 pieces	w
		Extact Co., Ltd.		Compact tension 6 pieces Machine Parts 4 pieces	¥¥
		Chulalongkorn University		Dynamometer	w
		Kasem Bandit University		Machining Parts 16 parts	٧V
		Extact Co., Ltd.		Machine Parts 6 pieces	
		World Alliance Motor Ltd.		Mold	
				** ************************************	
_		Kijpinan Products Co., Ltd.	-	Fixing Mold	NC
		Extact Co., Ltd.		Machine Parts 4 pieces	
		Kijpinan Products Co., Ltd.		EDM 1 piece	E
21	Apr. 4, 2001	Extact Co., Ltd.		Machine Parts 4 pieces	
22	Apr. 23, 2001	Kasem Bandit University		Machine metal part D2 16 pieces	
23	Apr. 24, 2001	Chulalongkorn University		Machining parts 8 pieces	W
24	Apr. 24, 2001	Kijpinan Products Co., Ltd.	1	Machining Mold	NC
		Tang Sia Ping Lohakij		Manual for CNC Mazak M5	
		Extact Co., Ltd.		Machine Parts 4 pieces	
		Kitpinan Products Limited	-	EDM 1 piece	E
		Mr. Viboon Charamtaya	-	Spark Plug	E
		Precision Manufacturing Co.,I	· · · · · ·		C
				Mold Parts 6 pieces	· · · · · · · · · · · · · · · · · · ·
		Extact Co., Ltd.		Machine Parts 2 pieces	
		Extact Co., Ltd.		Machine Parts 4 pieces	
		Extact Co., Ltd.		Machine Parts 4 pieces	
		Extact Co., Ltd.		Machine Parts 2 pieces	
		Kasem Bandit University		Machining & Wire cut 51 pieces	
		Kasem Bandit University		Machining & Wire cut 51 pieces	
		Extact Co., Ltd.		Machine Parts 4 pieces	
37	Aug. 7, 2001 🕴	Extact Co., Ltd.		Machine Parts 4 pieces	

<u> XThis list is only for the partial processing service</u>



No.		Name of Company	Supporte by Expe		SIC Mach
38	Aug. 22, 2001	Kijpinan Products Co., Ltd.	1	EDM 1 piece	E
39	Aug. 22, 2001	Chulalongkorn University		Wire cut 12 pieces	W
40	Sep. 12, 2001	Advance Packaging Produc	ts 🗸	Milling	
;		Co., Ltd.			
	<u>Oct. 3, 2001</u>	Extact Co., Ltd.		Machine Parts 4 pieces	
42	Nov. 2, 2001	Extact Co., Ltd.		Machine Program 2 pieces	
	<u></u>		\[\] \[\[\] \[\[\] \[\[\] \[\[\] \[\[\[\[Die Base 1 pieces	
43	<u>Nov. 20, 2001</u>	Extact Co., Ltd.		Machine Program 2 pieces	<u>i</u>
	<u></u>		\checkmark	Die Base 1 pieces	1
<u>44 </u>	<u>Dec. 14, 2001</u>	Extact Co., Ltd.		Machine Parts 4 pieces	<u> </u>
<u>45</u>	Dec. 20, 2001	Extact Co., Ltd.		Machine Die Base 1 pieces	<u> </u>
		Extact Co., Ltd.		Machine Die Base 1 pieces	<u>.</u>
İ	2002			indefinite Die Dase T pieces	1
<u>47 i.</u>	Jan. 21, 2002	Handicraft Development Ins	titute.	Parts' erosion for assembling	<u> </u>
		Choneburi			<u> </u>
<u>48 </u>	<u>Jan. 25, 2002</u>	Chulalongkorn University		Wire cut part	W
49 🔍	Jan. 28, 2002	Extact Co., Ltd.		Machine Program 2 pieces	<u> </u>
				Die Base 2 pieces	
50 F	eb. 25, 2002	Kasem Bandit University		Trial part 22 pieces	<u> </u>
51 N	Mar. 14, 2002	Extact Co., Ltd.		Machining bronze 10 pieces	, <u> </u>
52 ¦N	Mar. 27, 2002	Faculty of Engineer Chulalon		Machining	
		University			······
53 A	Apr. 12, 2002	Chulalongkorn University		Milling & Wire cut 13 pieces	·
54 IN	lay 10, 2002	Extact Co., Ltd.	1	Machining 2 pieces	<u> </u>
		Ocean Plastic Intertrade		Eroding Alumimium Plate 1 piece	<u>,</u>
		Extact Co., Ltd.			NC
		Chulalongkorn University		Machining 1 piece	
8 N	lav 28, 2002	Chulalongkorn University		Machining & Wire cut 3 pieces	<u>M,</u> W
		JNT Industrial Co., Ltd.		Milling 3 pieces	M
				Wire cut (Training)	W
		Extact Co., Ltd.		Machine base 2 pieces	
1 J	un. 10, 2002	Chulalongkorn University		Milling 8 pieces	M
		Chulalongkorn University		Milling & Turning 8 pieces	M
		Krung Thai Plaspak Co., Ltd		Wire cut 1 piece	W
<u>4 J</u>	ul. 5, 2002	Chulalongkorn University		Wire cut 15 pieces	W
	ul. 9, 2002	Ktract Co., Ltd.		Machining Base 2 pieces	
	ul. 16, 2002	BCP Group		Machining by Lathe	
		Chulalongkorn University		Reaming 13 mm.	
<u>8 J</u> u	ul. 29, 2002 H	Kitpinan Products Limited		EDM 1 piece	E
9 Ji	ul. 30, 2002 🛛	Ktract Co., Ltd.		Machining 1 piece	E
յ յլ	ul. 31, 2002 (Chaophraya Mold & Spray		Wire cut	141
		Mark Partnership			W
		(tract Co., Ltd.		Machining 1 piece	
1 1/10		Chulalongkorn University		Wire cut 10 pieces	W
				Electrod Repair 1 piece	<u> </u>
2 Ai		(tract Co., Ltd.	- V II		
2 Αι 3 Αι	.ug. 9, 2002 X				
2 Αι 3 Αι 4 Αι	ug. 9, 2002 X ug. 9, 2002 X	tract Co., Ltd.		Machining Die Base 1 piece	
2 Αι 3 Αι 4 Αι 5 Αι	л <u>в.</u> 9, 2002 X л <u>в.</u> 9, 2002 X л <u>в</u> .19, 2002 T	tract Co., Ltd. . Krungthai Industry Co., Ltd	1 V N	Machining Die Base 1 piece Machine Insert Core, Insert Cavi	NC
2 Au 3 Au 4 Au 5 Au 8 Au	лg. 9, 2002 X лg. 9, 2002 X лg.19, 2002 T лg. 26, 2002 L	tract Co., Ltd. . Krungthai Industry Co., Ltd STP Industry Co., Ltd.		Machining Die Base 1 piece Machine Insert Core, Insert Cavi Machining	NC NC
2 Au 3 Au 4 Au 5 Au 6 Au 7 Au	Jg. 9, 2002 X Jg. 9, 2002 X Jg. 19, 2002 T Jg. 26, 2002 L Jg. 30, 2002 C	tract Co., Ltd. . Krungthai Industry Co., Ltd		Machining Die Base 1 piece Machine Insert Core, Insert Cavi	

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No.	Date	Name of Company	Support by Expe		SIC Machin
80	Sep. 12, 2002	Chalam Industry Co., Ltd.		Wire cut	W
81 3	<u>Sep. 13, 2002</u>	TR Machine & Engineering		Machine Electrode	NC NC
		Partnership	[
82	Sep. 17, 2002	TR Machine & Engineering		Machine Electrode	NC
		Partnership			
83 [Sep. 23, 2002	Xtract Co., Ltd.		Machining 2 pieces	
84 5	Sep. 27, 2002	TR Machine & Engineering		Machining Master Model	NC
85 5	Son 27 2002	Partnership	·		1
86 15	Sep. 27, 2002	Chalam Industry Co., Ltd.	<u> </u>	Mold Sparking 2 pieces	E
87 0	Det 2 2002	Chulalongkorn University		Drill 2 pieces	1
0/ 10	JCL. 2, 2002	TR Machine & Engineering Partnership		Machine Electrode 2 pieces	NC
88 C	Det 22 2002				
00 0	701. 22, 2002	TR Machine & Engineering		Machining Electrode 1 piece	NC
89 C	oct 24 2002	Partnership Chulalongkorn University			
90 0	oct 24 2002	Chalam Industry Co., Ltd.		Milling & Lathe 6 pieces	<u> </u>
91 0	$rac{1}{2}$	Siam Taimani Co., Ltd.		EDM 1 piece	<u> </u>
92 0	Oct 25 2002	Siam Painy Co., Ltd.		Milling & Lathe 1 set	NC
93 0	ot 29 2002	Takai Co., Ltd.		Slice and Milling 1set	NC
		Chulalongkorn University		Machining 4 pieces	NC
95 0	oct 31 2002	Xtract Co., Ltd.		Milling & Lathe 13 pieces	M
		Modern Technology		Machine Electrode 6 pieces	
90 IN 07 .N	01. 0, 2002	Inductrial Device T		Advisory Service for CNC	1
<u>97 IN</u>	00. 13, 2002	Industrial Product Technology	/		E
		Research and Development			ļ
98 N		Chalam Industry Co., Ltd.		14/	<u> </u>
	ov 15 2002	Kitpinan Product Co.,Ltd.	- <u>v</u>	Wire cut	W
		Xtract Co., Ltd.		Machining & Wire cut 2 pieces	W,NC
				Electrode Machine 3 pieces	NC
		Xtract Co., Ltd.	<u> </u>	Electrode Machine 2 pieces	NC
	ov. 25, 2002	Chulalongkorn University		Lathe	
		Chulalongkorn University		Wire cut 13 pieces	M,W
		Xtract Co., Ltd.		Electrode 1 piece	NC
		Xtract Co., Ltd.		Electrode Machining 3 pieces	NC
06 De		Xtract Co., Ltd.	1	Modify Electrode 1 piece	
	2003				
		Extact Co., Ltd.		Electrode 3 pieces	
		Siam Painy Co., Ltd.		CNC	NC
09 Ja	n. 22, 2003	Extact Co., Ltd.		Electrode(Repair) 2 pieces	NC NC
				Electrode(Machine) 2 pieces	NC
		Chulalongkorn University		Milling & hole	M
	n. 30, 2003			300 x 40 x 25 mm. 4 pieces	
12 Fe		Kitpinan Product Co.,Ltd.		EDM Plastic Mold 1 piece	E
1.		Chalam Industry Co.,Ltd.		EDM Spark 1 piece	E
	b. 12, 2003	Extact Co.,Ltd.		Machining Ipiece	<u></u>
14 Fe		Chulalongkorn Univesity	/	Milling & Hole	М
4 Fe 5 Fe	b. 14, 2003				141
4 Fe 5 Fe	b. 14, 2003	Thaikiptech Co.,Ltd.		Die Plate 1 piece	10/
4 Fe 5 Fe 6 Fe	b. 14, 2003 0 b. 14, 2003 ⁻			Die Plate 1 piece	W
4 Fe 5 Fe 6 Fe	b. 14, 2003 0 b. 14, 2003 ⁻	Thaikiptech Co.,Ltd.		Die Plate 1 piece Milling 1piece, Core 1 piece, Repair mold 1 piece	W NC

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No. Date	Name of Company	Supporte by Expe		SIC Machine
119 Feb. 18, 2003	Kingmongkut Technology	<u> </u>	Machining parts	W
1	Thonburi University	1		
120 Feb. 19, 2003			Machining electrode 1 piece	NC
121 Feb. 20, 2003	Kitpinan Product Co.,Ltd.	1	EDM mold 1piece	E
122 Feb. 21, 2003	Chulalongkorn University		Milling 2 pieces	<u>_</u>
123 Feb 24, 2003	Thaikriptech Co.,Ltd.		Wire cut die plate	W
124 Mar. 10, 2003	Chalam Industry Co.,Ltd.	1	Wire cut 4 pieces	Ŵ
125 Mar. 14, 2003	Thaikriptech Co.,Ltd.		Wire cut 4 pieces	W
	Thaikriptech Co.,Ltd.		Wire cut 3 pieces	
	Thaikriptech Co.,Ltd.		Wire cut 4 pieces	<u> </u>
128 Mar. 31, 2003			Advisory service	<u>W</u>
	Iron Institute	1	Wire cut 1 piece	
	Sport Technoloty Co.,Ltd.	÷	Request advisory service	W
	Thaikriptech Co.,Ltd.		Wire cut 6 pieces	1.0/
	Thaikriptech Co.,Ltd.		Wire cut 3 pieces	<u> </u>
	Chalam Industry Co.,Ltd.		Spark 3 Molds	<u></u>
	Thaikriptech Co.,Ltd.		Wire cut 2 pieces	<u> </u>
	Chalam Industry Co.,Ltd.			<u> </u>
	Mr. Sunthon Runwong	• • · · · · · · · · · · · · · · · · · ·	Spark 2 Molds	<u> </u>
137 May 9, 2003	Thaikriptech Co.,Ltd.		Reaming valve	1
	Chalam Industry Co.,Ltd.	- /	Wire cut 4 pieces	W
	Mr. Sunthon Runwong	<u> </u>	Wire cut 2 pieces	W
140 May 21, 2003			Lathe 4 pieces Clamp of injection mold	
	Chalam Industry Co.,Ltd.	 ✓ 	Wire cut 1piece	141
	Extact Co.,Ltd.		Electrode machining 2 pieces	<u>W</u>
	Chalam Industry Co.,Ltd.		Wire cut 14 pieces	NC
144 Jun. 18, 2003				<u>W</u>
	Thai Kriptech Co.,Ltd.		Electrode machining 2 pieces	NC
	Thai Kriptech Co.,Ltd.		Wire cut 8 pieces	<u>W</u>
			Wire cut 6 pieces	W
	Wire cut Precision Center Co., Ltd.		Machine center	W
	ron Institute of Thailand		Wire cut Roller 1 piece	W
149 Aug. 28, 2003	Extact Co., Ltd.	\checkmark	Electrode Machine 1 piece	M
150 Sep. 12, 2003	ron Institute		Wire cut 4 pieces	w
151 Sep. 18, 2003	Thai Kriptech Co.,Ltd.		Wire cut 2 pieces	w
152 Sep. 30, 2003	Top Hightech (Thailand)		Machining	NC
	Co., Ltd.			
	Kitpinan Product Co.,Ltd.	\checkmark	Wire cut hole	
	Mr. Wichien Aranchaiya		Wire cut 1 piece	W
	Rungreang Wire-cut Precision		Wire cut & Drill	• W
	Rungreang Wire-cut Precision			
2004			Milling & Electrode 40 pieces	
	Rungreang Wire-cut Precision	1	Wire cut	W
58 Feb. 9, 2004 F	Rungreang Wire-cut Precision		Wire cut	W
59 Feb. 26, 2004 F	Rungreang Wire-cut Precision	\	Wire cut	Ŵ
61 Feb. 27, 2004 F	Rungreang Wire-cut Precision		EDM	E
61 Feb. 27, 2004 I			Milling	M
62 Mar. 4, 2004 F	Rungreang Wire-cut Precision		Vire cut	W

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No.	Date		Supported by Expert	Kind of work	SIC Machine
163	<u>Mar. 8, 2004</u>	Rungreang Wire-cut Precisio	n Wire cut	· · · · · · · · · · · · · · · · · · ·	W
164	<u>Mar. 16, 2004</u>	Iron Institute	Wire out		Ŵ
165	<u>Mar. 21, 2004</u>	Rungreang Wire-cut Precisio	n EDM		F
166	<u>Mar.</u> 24, 2004	Rungreang Wire-cut Precisio	n Wire cut	1 piece	W
167	<u>Mar. 28, 2004</u>	Iron Institute	Milling		M
		Iron Institute	Wire cut	······································	W
169	<u>Apr. 26, 200</u> 4	Iron Institute	Milling		M
	······································				
	NC . Maakinin				

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NC : Machining Center M : Milling Machine W : Wire-cut E : EDM

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Summary of Questionnaire Survey for Technical Training Course

1. Over view

The attached paper showed the results of questionnaire of participants for each technical training course. According to the results the average point of each course is more than three. It means that participants fundamentally satisfied the course.

2. There were many suggestions and comments

Many participants wanted the longer period for most courses. Particularly they requested more time for operation. There are some difficult problem but we are going to solve them next course.

Show the representative suggestion

(1) Design group

Lecturer should have provided more example to demonstrate.

Textbook should have more example.

Question and answer of problems should have been added in appendix

The subject matter should have been provided more.

He should be improved clearness in word of speech and lecture training preparation.

BSID should make document for important part.

Should be made training documents in Thai for more knowledge and understanding.

(2) Processing group

BSID should provide the course that relate with this course in oder to understand more about the operation

The training should have been deeper and the duration should have been longer

BSID should receive the order of making plastic mold from outside and accept staff of those company joining every step of making mold

This course is not enough period in operational part and the participants should be less than this course about 3 person in each group, it's better.

They should have more suggestion of operational technics both theory and operation.

They should have modern tools & machines.

Should be more preparation.

(3) Assy/Trial Shot group

Some instructors should show more real situation as the example.

There should be more clear examples.

Instructors should explain only necessary part which can apply to the real work.

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			pnińżilo9		1	1	1	1		6.4	-	4.44	
			Mold Processing		•	•	•	r	י ט פי	B.0		4.00	
		2004	Experiment 3D		*	1			3 75	2		4.00	000
			ngised bloM		1	1	•	8	A 20	2		<u></u>	 L T
			Parametric			•	•	•	3.38	3	0000	00.0	0000
			Plastic Injection	3 78	4 22	2 20	0.00 A 20	4.56	4 33		1 67	5	4 1
	2003		Basic of Mold Processing	4 12	88	2012 RC 4	3.75	3.88	4.00		4 38	B F	4 U
rse	20		gnildmessA bloM to siss8	4 40	4 00	3 80	4 40	4.60	4.60		4 40	2	4 31
ig Cou			Basic CAD	3.79	3.36	3.36	<u>}</u>	1		1			3.48
Name of Technical Training Course			gnirial PloM to size	4.00	3.86	4 00	4.20	4.20	4.40		4.60		4.18
nical 7			Basic of Mold Processing	4.29	4.43	3.29	4.14	4.43	4.43	er (bi es es rec	4.57		4.23
f Tech			DAC cissB	4.00	3.58	3.00		1	4				3.53
ame o	2		Basic of Mold Design	3.45	3.73	3.45	3.82	4.18	4.00		4.36		3.86
z	2002		GAC cAD	3.89	3.56	3.67	,	1		**********	1		3.71
		6	pnildmseaA bloM fo oiss8 fon2 lainT bns	4.00	3.71	3.29	4.00	4.29	4.00	********	4.29		3.94
		6	Basic of Mold Processing	3.50	3.50	3.21	3.57	3.71	3.64		3.86		3.57
			Basic of Mold Design	3.27	3.50	3.09	3.64	3.68	3.59		3.91		3.53
		ß١	Basic of Mold Assemblin and Trial Shot		3.00	2.60	3.50	3.50	3.80		3.80		3.37
	2001	6	nissec of Mold Processin	•	3.10	2.40	3.60	3.60	3.90		3.60		3.37
			ngisəO bloM to oiss8		3.18	2.55	3.73	3.91	3.82	••••••	3.73		3.49
			Subject	Update and suitable of course	Quality of document	Period for training	Clearness of the matter	The matter suitable to the course	The matter useful to you and your	company	The course increase your	knowledge and ability	Average
			° Z	<u> </u>	<u>م</u>	е П	4	اغ س	<u>اً اً</u> ں	<u> </u>	<u>∔</u> ∼	<u> </u>	

5: Very good
 4: Fairly Good
 3: Good
 2: Bad
 1: Very Bad

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Summary of Questionnaire Survey Evaluation Results of the Technical Training Course

		2001.00	2002.00	00	1	2003	2003.00			200	2004.00	
Course Code	Content/Software/Machine	lul-nul]ur.fu]	Oct-Dec	Jan-Mar	Apl-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apl-Jun	Jul-Sep	Oct-Dec
Design 01	Basic Knowledge of Mold Design	3.49	3.53	3.56					xx			
D/CAD 11	Basic CAD/CADCEUS			3.71/3.53/	3.48	XX	-	XX				
D/CAD 12	Parametric CAD/CADCEUS						XX		3.38			
D/CAD 13	3D Mold Design/CADCEUS								3 88			
D/CAD 21	Experimental 3D Design/Pen Tray						XX		2010			
D/CAD 22	Experimental 3D Design/Alarm Clock											a.
D/CAD 23	Experimental 3D Design/Telephone			-					4 15			
Processing 01	Fundamental Processing Seminar	3.37	3.57	4.23		4.04			07.7			
Processing 02	Fundamental CNC Seminar	~_ *		⊥ ∕∜								
P/CAM 11	Processing/Operation/M/C/EDM	•		-		۶			2 02	vv		
P/CAM 12	Advqanced CAM/Craft Mill								0000			
P/CAM 21	Basic 3D CAM/Craft Mill							volvy				
P/CAM 22	Electrode CAM							VANA				
Assy/Shot 11	Polishing		3.94	4.18						A RO		
Assy/Shot 21	Assembly	*				4.31				00.4		
Assy/Shot 31	Trial Shot	3.37	⊥ 	 				416	vv/vv			
Assy/Shot 41	Maintenance		-							44		
~	: Implemented as one continuous course											

* : Implemented as one continuous course Remarks: 5; very good, 4: fairly good, 3; good, 2: bad, 1; very bad

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Annex 32 Monitoring and Evaluation Plan

Name of the Project	SIC-Tool and Mold Technology Developme: Thailand	nt Projec	t in	the Kingdom of
Duration of Cooperation	November 1st, 1999 to October 31st, 2004			
Study Team	Final Evaluation Team			
Period of the Study	June 2nd, 2004 to June 19th, 2004			
Division in Charge	Small and Medium Enterprise Team, Group1 (Economic Policy and Private Sector Development), Economic Development Department	Staff Charge	in	Etsuji Yoshimura

I Activities and Contents of the Project

The activities and contents of the Project are shown in the following Charts for Project Planning and Management:

1 Project Design Matrix (PDM)

2 Plan of Operations (PO)

3 Annual Plan of Operations (APO)

4 Technical Cooperation Program (TCP)

5 Annual Technical Cooperation Program (ATCP)

II Monitoring and Evaluation System

1 Monitoring

The following monitoring is scheduled to be held during the cooperation period:

(1) Periodical Monitoring

The periodical monitoring is to be implemented, the contents of which are to be discussed on the occasion of regular meetings in the Project, such as Weekly and Monthly Meeting to be implemented by Chief Advisor, Project Coordinator, other experts as well as Thai Project Director, Deputy Project Director, Project Manager, Assistant Project Coordinator and Technical C/P.

(2) Monitoring

Monitoring will be done every six (6) months by the Project. The results will be presented to the Joint Coordinating Committee (JCC) and distributed to the organizations concerned and/or personnel involved in the Project.

2 Evaluation

Final Evaluation of the Project is conducted jointly by the two Governments through JICA and Thai authorities concerned during last six(6) months of the cooperation term in order to examine the level of achievement as stipulated in the R/D. JICA dispatches the final evaluation team in Spring, 2004. In any manner, any evaluation should be jointly implemented by both sides and the outcome should be submitted and reported at the JCC in the form of Joint Evaluation Report and are to be signed by both sides, if possible.

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Annex 32 Monitoring and Evaluation Plan

Date	Monitoring or/ Evaluation and other related activities	In charge of Implementation	Reporting
July 1999	Signing of the R/D	Project Design Team The Thai side	R/D, M/M
November 1999	Commencement of the Project		
June 2000	Monitoring (1)	Japanese experts The Thai C/P	M/M at JCC Monitoring Report
		to be confirmed by JCC members	
November 2000	Monitoring (2)	Japanese experts The Thai C/P	M/M at JCC Monitoring Report
		to be confirmed by JCC members	
June 2001	Monitoring (3)	Japanese experts The Thai C/P	M/M at JCC Monitoring Report
		to be confirmed by JCC members	
December 2001	Monitoring (4)	Japanese experts The Thai C/P	M/M at JCC Monitoring Report
		to be confirmed by JCC members	100001
June 2002	Mid-term Evaluation	Mid-term Evaluation Team The Thai C/P	JER & M/M for Joint Evaluation
		to be confirmed by JCC members	team, Monitoring Report
July 2002	Monitoring (5)	Japanese experts The Thai C/P	M/M at JCC, Monitoring Report
		to be confirmed by JCC members	· * · · ·
January 2003	Monitoring (6)	Japanese experts The Thai C/P	M/M at JCC, Monitoring Report
		to be confirmed by JCC members	^
July 2003	Monitoring (7)	The Thai C/P	M/M at JCC, Monitoring Report
		to be confirmed by JCC members	• · ·
December 2003	Monitoring (8)	Japanese experts The Thai C/P	M/M at JCC, Monitoring Report
		to be confirmed by JCC members	- <u>-</u>

III Schedule for Monitoring and Evaluation



2/3 Annex 32

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Annex 32 Monitoring and Evaluation Plan

June 2004	The Final Evaluation Monitoring (9)	Joint Final Evaluation Team Japanese experts The Thai C/P	Joint Evaluation Report, M/M at JCC, Monitoring
		to be confirmed by JCC members	Report

IV Criteria and Item for Monitoring and Evaluation

1 Criteria and Item for Monitoring

(1) PDM (Project Design Matrix)

(2) PO (Plan of Operations) and APO (Annual Plan of Operations)

(3) TCP (Technical Cooperation Program) and ATCP (Annual Technical Cooperation Program)

(4) Monitoring and Evaluation Sheet

(5) Progress Report of Technical Cooperation Project

(6) Others if necessary

If technology transfer does not progress as planed, the Project will study the interior/exterior factors to hamper, take necessary countermeasures and will revise the plan.

2 Criteria and Item for Final Evaluation

Criteria and Item for Final Evaluation are prepared by the Project based on the Evaluation Grid.



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Monitoring and Evaluation(in accordance with P	
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Project Name: SIC-Tool and Mold Technology Development Project in the Kingdom of Thailand Duration: November 1, 1999 - October 31, 2004

Thai Side Implementing Agency: Bureau of Supporting Industries Development (BSID), Department of Industrial Promotion, Ministry of Industry Japanese Side Implementing Agency: Japan International Cooperation Agency (JICA) Target Group: Thai Plastic Tool and Mold Industries

nuary to June in 2004) Indicators Target in this term Achievements in this term Reasons if planned targets wouldn't been satisfied	C/Ps are allocated as planned. 24 C/P personnel are allocated to the project. Minor change was conducted; one c/p changed from assy group to design group.	a adequately allocated to the Budget is adequately allocated to the 1.4M baht was allocated at the beginning Misunderstood the Thai budget system. of the Project. local cost of the Project. of this term. The budget was too low to buy Software is classified in durable article the upgraded softwares and others to in Thailand. continue the activities of the project. Later additional 1.4 M baht was allocated in	The project holds joint weekly meeting and the ninth JCC meeting.	ber of publicity of the The project publish manuals for each The project published ten manuals for ten acreases.	 and quantity of machinery There is no plan to provide CADCEUS Version 6 software and Super At the end of the term, the project obtained pment provided are Japanese side in this term in the side side on from JICA. 	I machinery and equipment The machinery and equipment are The machinery and equipment were ted and operated kept in good conditions at BSID and generally kept in good conditions at BSID ately. and also operated appropriately.	rts are appropriately Regarding the quick response of Thai side has already had routes to contact local supplier. Iocal sources for raw materias and with local supplies. spare parts, C/P makes some ways to contact with local supplier.	 ² improves his knowledge Technical transfer from JICA expert ² improves his knowledge Technical transfer from JICA expert ² of respective technology- ⁴ to the Thai technical C/P ⁴ implements through several ⁴ measures namely lectures and ⁴ hands on training as planned in the ⁴ TCP.
June in 2004)	0-1 C/Ps are allocated as planned. C/Ps are alloca	0-2 Budget is adequately allocated to the Budget is adeq local cost of the Project.	0-3 Committees and the Project 10 management meetings are held meeting and the periodically.	0-4 The number of publicity of the The project pu Project increases.	1-1 The type and quantity of machinery There is no ple and equipment provided are Japanese side appropriate. original plan.	1.2 Provided machinery and equipment The machinery are inspected and operated kept in good cc appropriately.	1.3 Spare parts are appropriately Regarding the through local supplier. spare parts, C spare parts, C contact with lo	2-1 Each C/P improves his knowledge Technical and skill of respective technology to the Thi transfer items. implemer measures hands-on TCP. TCP.
Achievement of Outputs Outputs	0 The Project operation unit will be enhanced.				 Necessary machinery and equipment will be provided, installed, operated and maintained properly. 			2 Technical capability of the counterpart personnel (hereinafter referred to as "C/F") will be upgraded in the fields of mold design, mold processing, mold assembling

g By using multi-usage mold, CP	prototyping services increase. Another three molds for CD case-set, will design with 3DCAD. 5-2 The quality of trial prototyping By using multi-usage mold. CP	te held ten times, includingfour d t courses. They held six times in J government respects regional are vels. The total number of particit	The last target mold, mold for camera body was finished. <i>CP</i> achieved all the five target molds. The mold was also designed by using 3D mold design technology. The project developed training materials for the training course of 3D Mold Design/CADCEUD and Experimental 3D Design/CADCEUD and Experimental 3D Design/CADCEUD and Experimental 3D Design of Telephone shown in Annex 15 and 16. During this term technical training courses we two processing and four assembly and trial/sho and 16. During this term technical training courses we two processing and four assembly and trial/sho and lo. During this term technical training courses we two processing and four times in various regional areas. Thai developing industry and enhancing economic le was 165 in this term. After each advisory service was prosecuted for total 17 factories mainly in regional area like Korat, Surin, Khon Kaen, Rayoon etc. After each advisory service was conducted, <i>CP</i> or Japanese experts submitted reports to the project. Advisory reports were written in Thai, English or Japanese. CP and Experts visit factories according to the clients' request. Mainly Japanese experts reply the problem. <i>CP</i> is on the job training. It is still early to evaluate the satisfaction level of the clients benefited The mold of multi-usage was finished Another three molds for CD case-set, have been already designed with 3DCAD and the mold for CD case is fabricating in processing group.	Training manuals develop at each training manuals develop at each training course in principle. Implements training course of 3D Mold Design, Experimental 3D Design of Telephone, processing and assembly. Advisory service was regarded as on the job training, therefore the project decided in opening the gate at any time for private companies. Each time factory visits are conducted, C/P or Japanese experts submit report. The project collects and compiles them. The mold of multi-usage is finished Another three molds for CD case-set, will design with 3DCAD. By using multi-usage mold, C/P	 2-2 The number of achieved target products increases. 2-3 Original manuals, textbooks and training materials are developed. 2-3 Original manuals, textbooks and training materials are developed. 3-1 The number of implemented seminars, training courses and its partcipants increases. 3-1 The number of implemented advisory services increases. 4-3 The quantity and quality of technical information are accumulated. 4-3 The quantity and quality of technical information and advisory services satisfy the client information are accumulated. 5-1 The number of implemented trial prototyping services increase. 	and training course: ields will be in the information and vices in the said by. Ily. otyping services will ated systematically.
in the ejectoerpin system, cooling tem, the position of cavity/core			through design, processing and assembly and trial shot very well. This cavitu/cor was used for polishing technical training	learn the ejectoerpin system, cooling system, the position of cavity/core etc.	SELVICOS SALISIY LUC LUCULS INCOUS.	
prototyping services increase. Another three molds for CD case-set, will design with 3DCAD.			The mold of multi-usage was finished	The mold of multi-usage is finished	5-1 The number of implemented trial	ping services wil.
 5-1 The number of implemented trial The mold of multi-usage is finished prototyping services increase. Another three molds for CD case-set, will design with 3DCAD. 	5-1 The number of implemented trial The mold of multi-usage is finished		CP and Experts visit factories according to the clients' request. Mainly Japanese experts reply the problem. C/P is on the job training. It is still early to evaluate the satisfaction level of the clients benefited	• • •	4-3 The quantity and quality of technical information and advisory services satisfy the clients' needs.	
 4-3 The quantity and quality of technical information and advisory services satisfy the clients' needs. 5-1 The number of implemented trial prototyping services increase. Another three molds for CD case-set, will design with 3DCAD. 	 4-3 The quantity and quality of technical information and advisory services satisfy the clients' needs. 5-1 The number of implemented trial The mold of multi-usage is finished 		After each advisary service was conducted, C/P or Japanese experts submitted reports to the project. Advisory reports were written in Thai, English or Japanese.	Each time factory visits are conducted, C/P or Japanese experts submit report. The project collects and compiles them.	4-2 Related technical data including client information are accumulated.	
 4-2 Related technical data including Each time factory visits are client information are accumulated. 4-3 The quantity and quality of technical information and advisory services satisfy the clients' needs. 5-1 The number of implemented trial prototyping services increase. will design with 3DCAD. 	4-2 Related technical data including Each time factory visits are conducted. C/P or Japanese experts conducted. C/P or Japanese experts submit report. The project collects and compiles them. 4-3 The quantity and quality of technical information and advisory services satisfy the clients' needs. 5-1 The number of implemented trial		In this term advisory service was prosecuted for total 17 factories mainly in regional area like Korat, Surin, Khon Kaen, Rayoon etc.	Advisory service was regarded as on the job training, therefore the project decided in opening the gate at any time for private companies.	4-1 The number of implemented advisory services increases.	information and vices in the said implemented ly.
4:1 The number of implemented advisory Advisory service was regarded as on services increases. 4:1 The number of implemented advisory Advisory service was regarded as on services increases. 4:2 Related technical data including Each time for private companies. 4:2 Related technical data including Each time factory visits are conducted. C/P or Japanese experts submit report. The project collects and compiles them. 4:3 The quantity and quality of technical information are accumulated. A:0 on the project collects and compiles them. 4:3 The quantity and quality of technical information are accumulated. A:0 on the project collects and compiles them. 4:3 The quantity and quality of technical information are accumulated. A:1 on the redet collects and compiles them. 4:3 The quantity and quality of technical information are active statisty the clients' needs. A:1 The number of inplemented trial information and advisory services satisty the clients' needs. will 5-1 The number of implemented trial information are services increase. Another three molds for CD case-set, will design with 3DCAD.	4-1 The number of implemented advisory Advisory service was regarded as on services increases. 4-1 The number of implemented advisory Advisory service was regarded as on services increases. the job training, therefore the project any decided in opening the gate at any time for private companies. 4-2 Related technical data including conducted, C/P or Japanese experts submit report. The project collects and compiles them. 4-3 The quantity and quality of technical information are accumulated. 4-3 The quantity and quality of technical information are accumulated. and compiles them. and compiles them. and compiles them. the clients' needs. will 5-1 The number of implemented trial	ce held ten times, includingfour d t courses. They held six times in J government respects regional are vels. The total number of particir	During this term technical training courses we two processing and four assembly and trial/sho and four times in various regional areas. Thai g developing industry and enhancing economic le was 165 in this term.	Implements training course of 3D Mold Design, Experimental 3D Design of Telephone, processing and assembly.	3-1 The number of implemented seminars, training courses and its partcipants increases.	and training course lelds will be in the ill be
Implements training course of 3D Mold Design, Experimental 3D Design of Telephone, processing and assembly. Nisory Advisory service was regarded as on the job training, therefore the project decided in opening the gate at any time for private companies. g Each time factory visits are conducted, C/P or Japanese experts submit report. The project collects and compiles them. ial The mold of multi-usage is finished will design with 3DCAD.	ses 3-1 The number of implemented Implements training course of 3D seminars, training courses and its Mold Design, Experimental 3D partcipants increases. Design of Telephone, processing and assembly. assembly. Design of Telephone, processing and assembly. assembly. Design of Telephone, processing and assembly. assembly. Design of Telephone, processing and assembly. 4-1 The number of implemented advisory Advisory service was regarded as on the job training, therefore the project decided in opening the gate at any time for private companies. 4-2 Related technical data including Each time for private companies. 4-3 The quantity and quality of technical information are accumulated. C/P or Japanese experts submit report. The project collects information and advisory services satisfy the clients' needs. 1 5-1 The number of implemented trial The mold of multi-usage is finished		The project developed training materials for the training course of 3D Mold Design/CADCEUD and Experimental 3D Design of Telephone shown in Annex 15 and 16.		2-3 Original manuals, textbooks and training materials are developed.	,
2:3 Original manuals, textbooks and training materials are developed. Training manuals develop at each training materials are developed. ss 3:1 The number of implemented seminars, training courses of 3D partcipants increases. seminars, training courses and its partcipants increases. Mold Design, Experimental 3D Design of Telephone, processing and assembly. 4:1 The number of implemented advisory Advisory service was regarded as on services increases. Each time for private companies. 4:1 The number of implemented decided in opening the gate at any time for private companies. 4.3 The quantity and quality of technical information are accumulated. 4:3 The quantity and quality of technical information and advisory services satisfy the client information are accumulated. Another three molds for CD case-set, will design with 3DCAD. 16 5:1 The number of implemented trial for prototyping services increase. Another three molds for CD case-set, will design with 3DCAD.	2-3 Original manuals, textbooks and training course in principle. training materials are developed. training materials are developed. 1 The number of implemented mold Design, Bxperimental 3D partcipants increases. basign of Telephone, processing and assembly. partcipants increases. decided in opening the gate at any time for private companies. 4-1 The number of implemented advisory Advisory service was regarded as on services increases. 4-2 Related technical data including Each time for private companies. 4-3 The quantity and quality of technical in opening the project collects information are accumulated. Arisory services satisfy the client information are accumulated. for private companies. decided in opening the project collects information are accumulated. for the clients' needs. for the clients' needs. for the clients' needs.		The last target mold, mold for camera body was finished. C/P achieved all the five target molds. The mold was also designed by using 3D mold design technology.	<u> </u>	2-2 The number of achieved target products increases.	

2/5 Annex 33

	LT.	Progress of Activities	Duchlows in this town	The second and the second seco
	Plan	Action	III Jan Surn III Surariot I	l argets and Activities in next term
0-1 Alloca personnel.	ite necessary	24 C/P personnel are allocated to the project. Minor change conducted, that is one c/p changed from assy group to design group .		To keep the number of C/P as planned.
0-2 Form activities.	late plans of	Formulated the revised TCP at 7th JCC after mid- term evaluation. However, master plan of activities cour was reconstructed for remained one year based on the basic idea that was reviewed at the mid-term evaluation.	The revised plan focuses on the technical training course and on 3DCAD/CAM in place of 2D. The schedule is very tight. The managers should always check the progress.	The revised plan focuses on the technical training The important point is to execute the master plan properly. The course and on 3DCAD/CAM in place of 2D. The project are going to develop technical training courses another schedule is very tight. The managers should always fourcourses and to fabricate three internal prototyping molds until the check the progress.
0-3 Mak properly	e budget plan and execute	The budget of this year, 1.4 M baht is low compared Problem was how to cover the shortage of the plan signed by Mr. Manu in 1999 the budget to buy required articles. The project requested to increase the budget, and consequently another 1.4 M baht was added in mid-term budget.	· · · · · · · · · · · · · · · · · · ·	In order to keep these activities of the project continuously after the project finishes, Thai side should buy version upped 3D software of CAD/CAM (CADCEUS, Craft Mill) and milling tools for precise and high speed milling.
0-4 Er manag	0-4 Establish and operate management system.	The director of BSID and some director became so busy that the regular meeting between Thai side a Japanese side changed to hold once a month. However, the project usually solved the important or th urgent items in informal meetings with acting director and other directors. The project should check the progress at any time.	nd e	The activity schedule will become so tight that C/Ps become very busy. Therefore, the directors and project manager should manage C/Ps tight schedules well. Otherwise above mentioned activities might not finish by this October.
I-I M and in	1-1 Make facility refurbishment plan and implement.	1-1 Make facility refurbishment plan Made the plan and implemented. and implement.		Implementing as planned.
I-2 P neces equip	I-2 Provide and install necessary machinery and equipment.	There was no plan to provide machinery originaly. However, two equipments, CADCEUS Ver.6, Super GI (high speed feeder) and Streo Zoom Microscope have been provisioned to Thai side.	It took more time than expected for CADCEUS Ver.6 and Super GI (high speed feeder) to be installed at BSID due to a various procedure.	Operating them properly.
1-3 Oper machine properly.	 1-3 Operate and maintain the machinery and equipment properly. 	Most of the machinery and the equipment were operated and maintained properly.	NC machine were not operated utilizing the advanced functions fully due to the lack of drill, tools and raw materials.	Super GI (high speed feeder) will be set in V55 and then M/C will be operated with high speed milling in making molds for CD Case.

Progress of Activities for each Outputs (Output No. in the PDM and its description : 0~5)

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Progress of Activities for each Outputs (Output No. in the PDM and its description : 0~5)

	Pr	Progress of Activities		
A	Plan	Action	Froblems in this term	Targets and Activities in next term
T	2-1 Make Technical Cooperation Program.	Made TCP at mid-term evaluation term. Formulated the revised TCP at 5th JCC after mid-term evaluation. The project has been carried out through the new plan and the progress in this term (from January to June in 2004) is in general on schedule.		Executing as planned.
	2-2 Implement technology transfer to the C/P.	In the design group, 3D mold design technology was transferred to C/P through long-term and short- term experts at BSID. Three molds for CD case-set were designed with using 3 DCAD software as the internal prototype molds. In the processing group, mold for multi-usage was fabricated. The problems that came out after the trial shot for a camera body were re-fabricated. The basic 3D CAM and high speed milling technology were transferred. In the assembly and trial/shot group, molds for camera body and multi-usage that had gone through the processing section were finished, and trial shot was done afterwards.		Implementing as planned.
	2-3 Monitor and evaluate the result of technology transfer to the C/P.	Monitored and evaluated the result of technology transfer to the C/P. (See attached results of monitering, the Annex 21)	•	Implementing as planned.
	3-1 Make plan of technical training and seminars.	Made plan of technical training courses of design, processing and assembly/trial.shot and seminars. See the Annex 2	The project is in general carried out on schedule excluding to some postponed courses.	Make plan of technical training courses after the end of the project.
	3-2 Implement technical training and seminars	During this term technical training courses were held ten times, including four design, two pro- and four assembly and trial/shot courses. They held six times in BSID and four times in various regional areas Phrii, Surin, Korad, Khon KaenBaanlike . Thai government respects regional are developing industry and enhancing economic levels.	eld ten times, including four design, two processing six times in BSID and four times in various like. Thai government respects regional areas for	During this term technical training courses were held ten times, including four design, two processing Implementing as planned. The final seminar will be held October and four assembly and trial/shot courses. They held six times in BSID and four times in various 13th, 2004. egional areas Phrif, Surin, Korad, Khon KaenBaanlike . Thai government respects regional areas for leveloping industry and enhancing economic levels.
	3-3 Monitor and evaluate technical training and seminars.	In order to monitor and evaluate technical training and seminars, questionaires were conducted at the end of each technical training course. Latest one is being analysed. See the Annex 17.		Implementing as planned.

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4/5 Annex 33

out No. in the PDM and its description : $0{\sim}5)$
(Outr
Outputs
Progress of Activities for each (

Plan e plan of trial technical ion and advisory ect and compile l information and ement trial technical ion and advisory	Action The project decides to conduct the advisory service in any time through a year according to request of companies. So did not make advisory services.	r todiems in this term	Targets and Activities in next term
 I. Make plan of trial technical The project de in any time thr formation and advisory in any time thr companies. So services. I. Collect and compile Visited not on universities, R	cides to conduct the advisory service ough a year according to request of did not make advisory services.		
Visi univ info info info for t			Implementing advisory servises at any time through a year according to request of companies.
for t	Visited not only private companies but universities, R&DCollect and compile technical information and material.		Implementing as planned.
services. Korad, Surin,	In this term advisory service was prosecuted for total 27 factories mainly in regional area like Korad, Surin, Rachaburi, Lampang etc	Visited not only private companies but also universities, R&D centers, skill development centers and so on and collected and compiled technical information and material.	Implementing advisory services according to request of companies.
4-4 Monitor and evaluate trial SinceC/P does technical Information and of specific sut advisory services.	SinceC/P does not have enough practical experience in spite of having gained fundament of specific subjects, and advisry service are mainly taken by Japanese experts and regard job training. C/Pcollected questionaire from factories C/P implemented advisary service.	SinceC/P does not have enough practical experience in spite of having gained fundamental knowledge of specific subjects, and advisry service are mainly taken by Japanese experts and regarded as on-the job training. C/Pcollected questionaire from factories C/P implemented advisary service.	
5-1 Make plan of trial It is still difficlut prototyping services. to Trial Shot. He of producing inte See the Annex 2.	that for C/P to produce commercial module for C/P $_{\rm B}$ However the project should let C/P $_{\rm B}$ internal prototyping molds instead of ϵ 2.	It is still difficlut for C/P to produce commercial molds through a consistent process from Mold Design Implement as planned. to Trial Shot. However the project should let C/P gain practical experiences. So the project made plan of producing internal prototyping molds instead of external protopyping service. Made the master plan. See the Annex 2.	mplement as planned.
5-2 Implement trial prototyping The mold of multi-usage was injected on trial, inconvenient part was cleared and the part was service. CD case is fabricated in processing group.	The mold of multi-usage was injected on trial, incor modified. Another three molds for CD case-set har CD case is fabricated in processing group.	ld for	Implement as planned. See the Annex 2
5-3 Monitor and evaluate trial See tne Annex 21. prototyping service.		SinceC/P does not have enough practical skills to produce commercial molds through consistent process, and rototyping service is regarded as on- the job training, it is early to evaluate the the satisfactory level of the clients.	Implement as planned.

5/5 Annex 33

Annex34

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Annex34 List of Attendance of the Discussions

Japanese side

Evaluation team

1. Mr. Masayoshi Juro Team Leader, Senior Assistant to the Director General, Economic Development Department, JICA 2. Dr. Toshitaka Matsuoka **Technical Evaluation** Member of Technical Support Committee in Japan, President, Matsuoka Engineering Consultants Office 3. Mr. Etsuji Yoshimura **Evaluation Management** Staff, Small and Medium Enterprise Team, Economic Development Department, JICA 4. Mr. Izumi Sakaya **Evaluation Analysis** Consultant, Global Group 21 Japan Inc.

SIC-Tool and Mold Technology Development Project

1. Dr. Jun Ikeuchi	Chief Advisor
2. Mr. Yasuo Uchida	Coordinator
3. Mr. Junzo Ohno	CAD/CAM & 3D Mold Design
4. Mr. Takahito Yoshio	Mold Processing
5. Mr. Noboru Ishizaki	Mold Assembling and Trial Shot

<u>Thai side</u>

(*The member of Thai Evaluation Team)

1. Mr. Supat Limpaporn	Director General
	Department of Industrial Promotion (DIP)
	Ministry of Industry
2. Mr. Prapat Vanapitaksa	Deputy Director General
	DIP
3. Mr. Saneh Niyomthai*	Director
. •	Bureau of Supporting Industries Development (BSID)

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4. Mr. Sirichai Pothitapana*	Director of
	Metal Working and Machinery Industries Division,
	BSID
5. Dr. Pasu Loharjun*	Director
	Industrial Parts Manufacturing Development Division, BSID
6. Mr. Prakob Janma*	Head of Product, Mold & Die Technical Design
	Development, BSID
7. Mr. Kittiphat Panitakom*	Senior Expert, BSID
8. Mr. Viroj Sirithanasart*	President
	Thai Tool and Die Industry Association (TDIA)
9. Mr. Sombat Wudhanasrap*	Assistant Secretary, TDIA
10. Mr. Parinya Chuenmeechow*	President
	Thai Plastic Industries Association (TPIA)
11. Mr. Kowate Limtrakul*	Managing Director
	T.Krungthai Industries Public Co.,Ltd.

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