

EXPORT IMPORT ANNUAL GROWTH, TRADE BALANCE, TRADE FACTOR BY PRODUCT GROUP (1993~1996)  
 (SECTOR A:Plastic Molds)

ITEM CODE	EXPORT						IMPORT						TRADE BALANCE						TRADE FACTOR							
	VAL 93	VAL 94	VAL 95	VAL 96	EX VALSUM	VAL 93	VAL 94	VAL 95	VAL 96	EX VALSUM	VAL 93	VAL 94	VAL 95	VAL 96	EX VALSUM	VAL 93	VAL 94	VAL 95	VAL 96	EX VALSUM	VAL 93	VAL 94	VAL 95	VAL 96	EX VALSUM	
ANNUAL GROWT	ANNUAL GROWT	ANNUAL GROWT	ANNUAL GROWT	ANNUAL GROWT	ANNUAL GROWT	ANNUAL GROWT	ANNUAL GROWT	ANNUAL GROWT	ANNUAL GROWT	ANNUAL GROWT	ANNUAL GROWT	ANNUAL GROWT	ANNUAL GROWT	ANNUAL GROWT	ANNUAL GROWT	ANNUAL GROWT	ANNUAL GROWT	ANNUAL GROWT	ANNUAL GROWT	ANNUAL GROWT	ANNUAL GROWT	ANNUAL GROWT	ANNUAL GROWT	ANNUAL GROWT	ANNUAL GROWT	
8480	453162	-42.2	201809	-30.0	181727	-47.2	59037	956335	10686348	-5.3	10724289	-6.8	9438403	9.7	10348814	40585552	-10233184	-9862480	-9254676	-10289177	-39639517	-91.9	-95.0	-96.2	-98.9	-95.4
8207	4233	331.4	18247	-80.7	3532	99.8	7057	33189	1899170	-11.5	1504515	-7.0	1489126	10.7	1649167	6341978	-1684977	-1486188	-1485594	-1642110	-6308789	-99.5	-97.6	-99.5	-99.1	-99.0
TOTAL	457415	-39.8	280156	-33.8	185259	-64.0	66694	989528	12386516	-6.1	11628604	-6.0	10825529	9.8	11997881	48937830	-11928101	-11348648	-10740270	-11931287	-45948306	-92.9	-95.3	-96.7	-98.9	-95.9

UNIT:  
 VAL in TD  
 ANNUAL GROWTH in %  
 TRADE BALANCE in TD  
 TRADE FACTOR in %



ITEM CODE:

7315	Transmission Chain
7316	Anchor
7317	Nail
7318	Hook/Screw/Bolt/Pin
7319	Needle
7320	Leaf spring for cars
7323	Domestic Good in Stainless Steel
7324	Sink/Bathub
7326	Tightner
7407	Bars in Refined Copper
7410	Leaf spring for cars
7412	Piping Accessories in Refined Copper
7418	Domestic Good in Copper
7419	Tabacco Case
7612	Soft Tube
7613	Container in Aluminum
7615	Pressure Cooker in Aluminum
7616	Spikes, Piton, Pegs in Aluminum
8201	Rakes, Scraper
8202	Hand Saw, Blade
8203	Files, Hand Tools, Tongs
8204	Openend Spanner
8205	Tools for Drilling, Threading, Screw Drivers
8207	Tools for Drilling
8208	Cutter for Metal Work
8211	Kitchen Knife
8212	Shaving Razor
8213	Scissors
8214	Tools:Manicure & Pedicure, Grass Hand Cutter
8215	Spoon, Fork
8301	Locker with Key
8302	Hinges

EXPORT IMPORT ANNUAL GROWTH, TRADE BALANCE, TRADE FACTOR BY PRODUCT GROUP (1993~1996)  
 (SECTOR C: Bicycles Bikes)

ITEM CODE	EXPORT					IMPORT					TRADE BALANCE					TRADE FACTOR									
	1993	1994	1995	1996	1993~1996	1993	1994	1995	1996	1993~1996	1993	1994	1995	1996	1993~1996	1993	1994	1995	1996	1993~1996					
8512	289	-100.0	0	#DIV/0!	0	289	565490	-74.9	142729	886651	1896	106522	46.9	72510	841234	65.4	1391227	-840197	-1391227	-3654542	-50.0	-99.4	-99.8	-100.0	-86.4
8711	280215	-98.7	3759	-100.0	0	285011	529958	125.8	1166134	-27.9	841234	79490	422.7	415532	6881131	34285	459376	1198539	-7933022	-29485577	-73.3	-70.1	-74.2	-79.3	-74.2
8712	125430	56.4	196111	174.8	539666	199.5	1614070	11285	1336.5	161026	79490	422.7	415532	6881131	34285	459376	1198539	-7933022	-29485577	-73.3	-70.1	-74.2	-79.3	-74.2	
8714	1389847	6.9	1486145	-18.5	1210643	-14.7	1032409	5119044	9023842	-6.5	8443609	-3.3	8165739	9.8	8965431	34804821	-7639995	-8957464	-6955096	-7409427	-69.9	-70.9	-67.9	-67.1	
TOTAL	1795781	1686015	3.8	1750546	51.2	2646478	7878821	10127556	-2.1	9913698	-7.6	9159973	19.8	10878712	40078938	-8331774	-8227683	-7409427	-8232233	-32200117	-69.9	-70.9	-67.9	-67.1	

UNIT:

VAL in TD  
 ANNUAL GROWTH in %  
 TRADE BALANCE in TD  
 TRADE FACTOR in %

ITEM CODE:  
 8512 Electronic Parts  
 8711 Motorcycle  
 8712 Bicycle  
 8714 Engine and Frame Parts



7309	Reservoirs (Vat, Tank, Container) for Solid Materials
7310	" (Vat, Barrel, Tank, Drum, Container) for all Materials
7311	Container for compressed or liquefied gas
8402	Boiler(Tubular Type), Steam Boiler, Boiler Components
8403	Boiler for central heater
8404	Auxiliary devices for Boilers
8407	Reciprocal engine for Vehicles, other engine (gasoline fuel)
8408	Compression engine (diesel)
8409	Valve, Piston, Engine block, Carburetor, their parts, and other engine parts for spark ignition engines (gasoline fuel), Injector and injector holder
8411	Turbo-reactor, Other gas-turbine
8412	Hydraulic engine, Other pneumatic engine
8413	Pump for fuel distribution, Liquid pump, Pump with lever, Pump for liquid cooling, Other fuel or oil pumps for spark/compression ignition engines, Pump for concrete, Reciprocal volumetric pump, Centrifugal Pump, Pump Components/Parts
8414	Vacuum Pump, Air Pump, Other compressor, Generator with free piston, Pump Components/parts, Compressor components
8421	Oil Filter for engines, Air filter for engine
8425	Hoist, Other winch, Hydraulic jack
8426	Overhead Traveling Crane
8427	Autopropelled carrier
8428	Elevation/loading/unloading machines
8429	Tracked Bulldozer and Angledozer
8430	//
8431	Components/Parts for hoists/screw jacks and Elevation/loading unloading machines
8511	Dumpster, Shovel, Grappling Iron, Pliers, Spark Plug, Distribution of electric current, Ignition coil, Hot Plug, Alternator, Electric generator, Breaker
8512	Optical block, Head lamp, Electrical signaling device, Acoustic signaling device, Wiper
8513	Safety lamp, Other portable lamp
8516	Heating resistance, Components for solar water-heater
8609	Frame and Container
8701	Tractor
8702	Bus
8707	Vehicle bodies
8708	Bumper components, Assembled chassis frame, Door and door elements, Engine hood, Glass for Passenger cars, Fender, Brake elements, Brake-shoe, Brake-Drum, Gear-box, Gear-box Parts, Differential, Wheel axle, Wheel cover
8709	Other vehicle without lifting devices
8715	Baby seat and baby car.
8716	Trailer or semi-trailer for camping, Cistern

EXPORT IMPORT ANNUAL GROWTH, TRADE BALANCE, TRADE FACTOR BY PRODUCT GROUP (1993~1996)  
(SECTOR E: Home appliances)

ITEM CODE	EXPORT					IMPORT					TRADE BALANCE					TRADE FACTOR											
	VAL 93	ANNUAL GROWTH	VAL 94	ANNUAL GROWTH	VAL 95	ANNUAL GROWTH	VAL 96	ANNUAL GROWTH	VAL 97	ANNUAL GROWTH	VAL 98	ANNUAL GROWTH	VAL 99	ANNUAL GROWTH	VAL 00	ANNUAL GROWTH	VAL 01	ANNUAL GROWTH	VAL 02	VAL 03	VAL 04	VAL 05	VAL 06	VAL 07	VAL 08	VAL 09	VAL 10
7321	264314	-69.6	86775	113.7	211089	-30.2	147354	-11.0	462359	96.2	906979	22.3	110882	297549	-256015	-303544	-691528	-227601	-32.5	-427601	-97.3	-64.8	-62.2	-76.5	-61.2	-61.2	-61.2
7322	29517	-97.0	881	866.9	8093	421.3	45325	84418	2136349	-3.1	1791827	-19.0	140489	7065468	-2108632	-1790941	-1358764	-4981050	-97.3	-99.9	-99.9	-99.9	-99.9	-99.9	-99.9	-99.9	-99.9
7417	874	-100.0	0	874	546	309.4	0	0	2593	-100.0	0	RDIV/0	186	3295	3281	-2583	0	-168	23.1	-100.0	RDIV/0	-100.0	RDIV/0	-100.0	RDIV/0	-100.0	RDIV/0
8414	313793	-23.7	239447	169.2	644518	-65.8	917581	1269518	15111285	7.9	16301911	32.3	21564153	1.1	21800652	74785401	-14797492	-16082464	-20919435	-21716794	-73492885	-95.9	-97.1	-94.2	-96.2	-98.6	-98.6
8415	980429	0	392908	63.5	825423	184.2	1777421	3771922	9045553	14.0	10312860	51.5	15262673	46793738	-6039124	-9930272	-15001490	-10039970	-45021816	-60.3	-92.8	-92.8	-92.8	-92.8	-92.8	-92.8	-92.8
8416	7059	-100.0	0	7118	-100.0	0	0	14177	434423	-24.0	330190	-47.2	174375	274.3	652741	-427998	-187257	-63247	-1577560	-96.8	-100.0	-92.2	-100.0	-92.2	-100.0	-92.2	-92.2
8417	100123	-53.0	47091	-1.0	48540	-100.0	0	193072	688522	33.3	811082	-28.0	583743	-100.0	2003347	-506399	-764073	0	-1698875	-71.7	-69.0	-65.2	RDIV/0	RDIV/0	RDIV/0	RDIV/0	RDIV/0
8418	15115817	-17.6	12458181	-34.1	8207320	-63.5	1357154	3719472	2327508	21.1	30805200	19.9	36492492	-10.7	32776398	12531588	-10161691	-18147049	-28485172	-7014125	-23206789	-96.5	-98.2	-99.1	-92.5	-92.5	
8419	102467	-73.6	27042	-1.8	26551	2768.3	745632	901692	5812245	-14.1	4980835	12.3	5605844	38.4	7759737	24168481	-6709778	-4963793	-5779931	-7014125	-23206789	-96.5	-98.2	-99.1	-92.5	-92.5	
8422	18798	995.3	186540	-89.7	12279	664.3	132063	334680	3194711	32.2	4284110	-35.6	2721305	25.7	5439928	13951114	-3177973	-4055370	-2704028	-3288868	-13226434	-99.0	-92.3	-98.7	-92.8	-92.8	
8450	89132	-44.2	46337	350.0	212684	-67.0	70217	415390	3663118	21.9	4500716	-16.4	3781797	-26.6	2748370	14718001	-3609966	-4454379	-3549113	-2692153	-14502611	-95.4	-98.0	-89.3	-92.9	-91.6	
8451	331441	-78.4	71561	319.8	300429	-98.8	189971	893402	5306826	-4.5	504733	-1.5	4991140	-1.4	4923574	20280273	-4969385	-4993172	-42259676	-19386871	-98.2	-97.2	-98.6	-92.9	-91.6		
8452	1816780	-22.7	1404398	64.3	2307847	-6.8	2147645	7076658	41864874	4.9	43901037	1.5	44567523	6.0	47812489	177514843	-40048094	-3496851	-42259676	-19386871	-98.2	-97.2	-98.6	-92.9	-91.6		
8516	281026	28.4	383584	52.5	554453	43.0	798042	1992105	2963046	13.9	3729994	9.9	3709481	-18.9	3007748	13054299	-2482020	-3010410	-3159008	-2214726	-1062164	-82.7	-80.5	-74.0	-54.3	-73.5	
TOTAL	1942360	-21.3	1508351	-14.0	1316948	-43.1	749763	5542810	11594237	9.2	129673467	12.6	142638688	-2.8	138674393	52394845	-66509071	-11365118	-129468742	-131176770	-49850435	-71.3	-78.4	-83.1	-69.7	-60.9	

UNIT: VAL in TD

ANNUAL GROWTH in %

TRADE BALANCE in TD

TRADE FACTOR in %

ITEM CODE:  
7321 Gas Hot Plate, Gas Cooker, Other Gas Cooking device  
7322 Non-electric Central Heating system (including air Conditioner)  
7417 Non-electric Cooking device

8414 Refrigerator use Compressor, Fan, Fan Parts

8415 Air Conditioner, Air Conditioner Parts

8416 Liquid Fuel (Kerosene) Heater (Stove)

8417 Non-electric Oven for bakeries

8418 Refrigerator, Freezer, Compressor, Cold Chamber, Chilled drinking fountain, Evaporator, Condenser, Other refrigerator Parts

8419 Gas Water-heater, Dryer, Heat-exchanger

8422 Dish washer, Bottle washing machine, Dish washer Parts

8450 Washing machine, Washing machine Parts

8451 Dry cleaning machine, Dryer, Press and Iron for clothing, Dry cleaning machine Parts, Press Iron Parts, Cloth Cutter, Cloth Cutter Parts

8452 Sewing machine, Head for Sewing machine, Needle for Sewing machine, Sewing machine Parts

8516 Electric Water-heater, Dish washer, Electric Room heating unit, Microwave Oven, Electric Oven, Electric Cooker, Electric Tea and Coffee Maker

Toaster, Other electric heater, Solar-Water-heater Parts

**IMPORT TREND BY PRODUCT (SECTOR E:Home appliances)**  
**- GAS COOKING DEVICES - (1993~1996)**

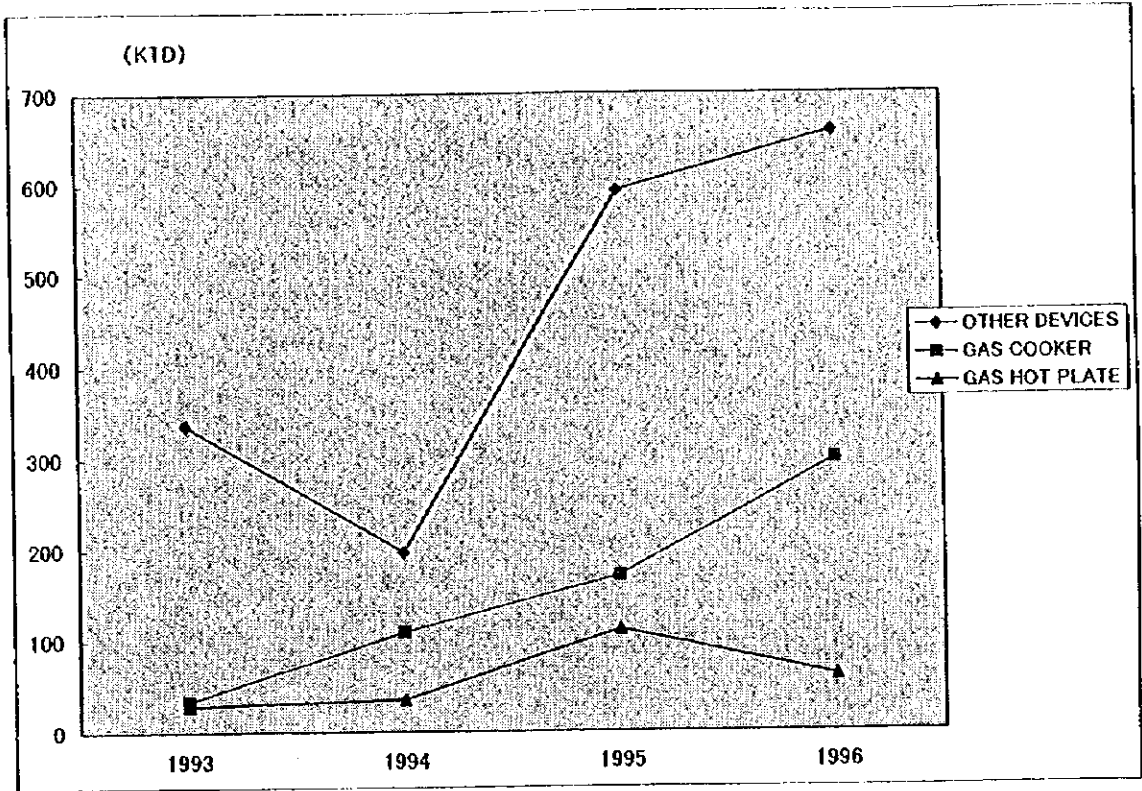
ITEM CODE	1993		1994		1995		1996		1993~1996	
	VAL 93	RATIO	VAL 94	RATIO	VAL 95	RATIO	VAL 96	RATIO	IM.VALSUM	RATIO
OTHER DEVICES	336	84.3%	197	57.8%	592	67.8%	658	64.6%	1784	67.8%
GAS COOKER	34	8.5%	109	31.9%	171	19.5%	299	29.4%	613	23.3%
GAS HOT PLATE	29	7.2%	35	10.3%	111	12.7%	61	6.0%	236	8.9%
TOTAL	399	100%	341	100%	874	100%	1017	100%	2632	100%

**EXPORT TREND BY PRODUCT (SECTOR E:Home appliances)**  
**- GAS COOKING DEVICES - (1993~1996)**

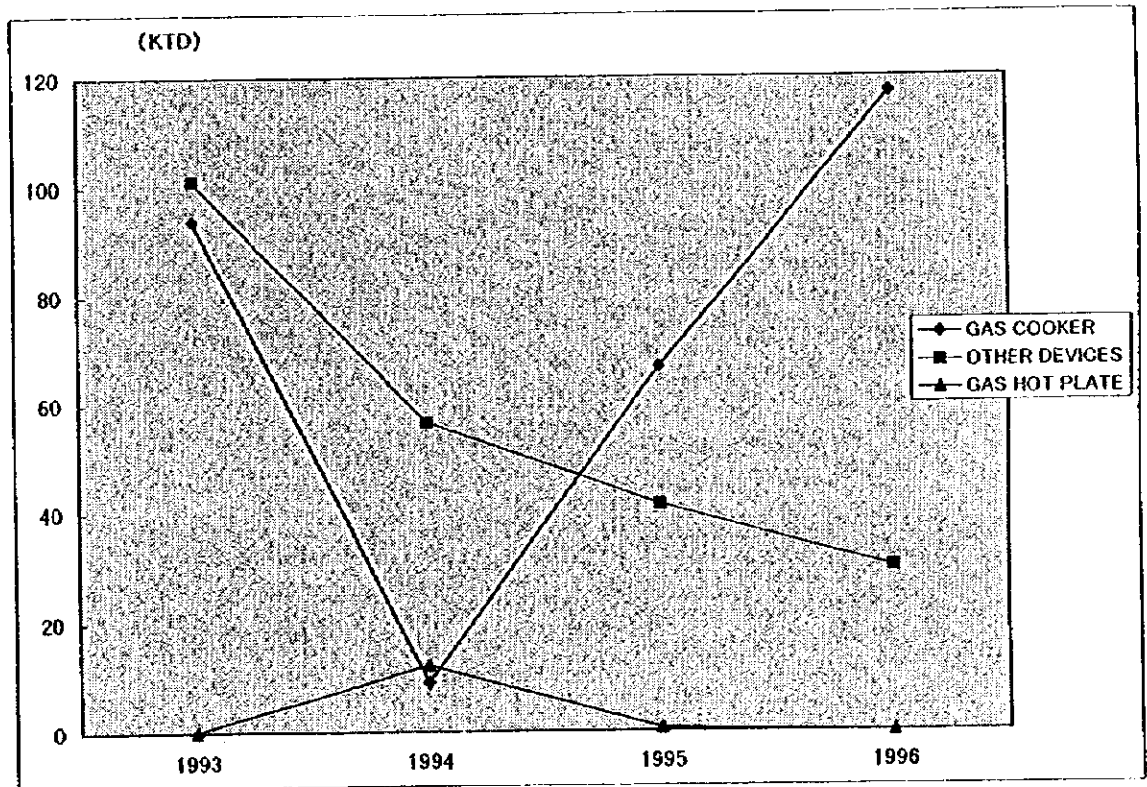
ITEM CODE	1993		1994		1995		1996		1993~1996	
	VAL 93	RATIO	VAL 94	RATIO	VAL 95	RATIO	VAL 96	RATIO	IM.VALSUM	RATIO
GAS COOKER	94	48.1%	9	11.5%	67	61.4%	117	79.5%	287	54.2%
OTHER DEVICES	101	51.8%	57	72.8%	41	38.1%	30	20.5%	229	43.4%
GAS HOT PLATE	0	0.1%	12	15.7%	1	0.5%	0	0.0%	13	2.4%
TOTAL	195	100%	78	100%	109	100%	147	100%	529	100%



**IMPORT TREND BY PRODUCT (SECTOR E:Home appliances)  
- GAS COOKING DEVICES - (1993~1996)**



**EXPORT TREND BY PRODUCT (SECTOR E:Home appliances)  
- GAS COOKING DEVICES - (1993~1996)**



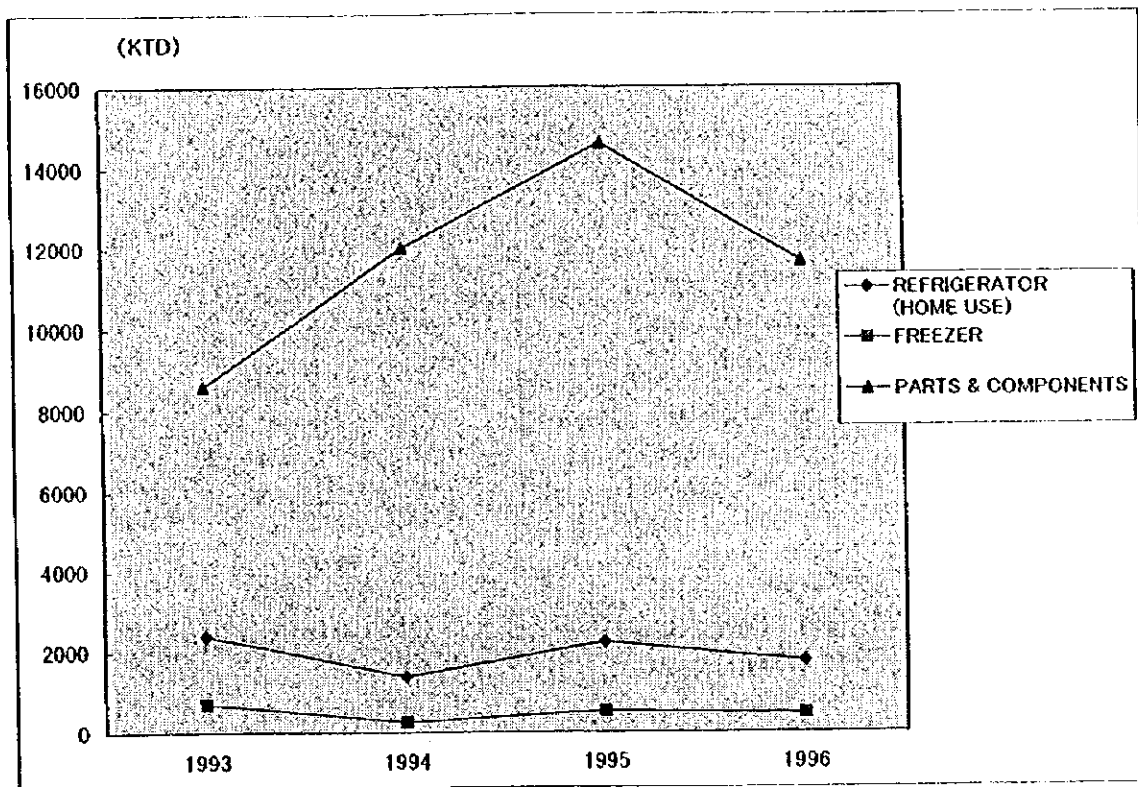
**IMPORT TREND BY PRODUCT (SECTOR E:Home appliances)**  
**- REFRIGERATORS & FREEZERS - (1993~1996)**

ITEM CODE	1993		1994		1995		1996		1993~1996	
	VAL 93	RATIO	VAL 94	RATIO	VAL 95	RATIO	VAL 96	RATIO	IM.VALSUM	RATIO
PARTS & COMPONENTS	8609	73.6%	12013	88.0%	14609	84.2%	11675	84.0%	46906	82.9%
REFRIGERATOR (HOME USE)	2386	20.4%	1379	10.1%	2220	12.8%	1763	12.7%	7748	13.7%
FREEZER	705	6.0%	254	1.9%	518	3.0%	464	3.3%	1942	3.4%
TOTAL	11700	100%	13646	100%	17348	100%	13903	100%	56596	100%

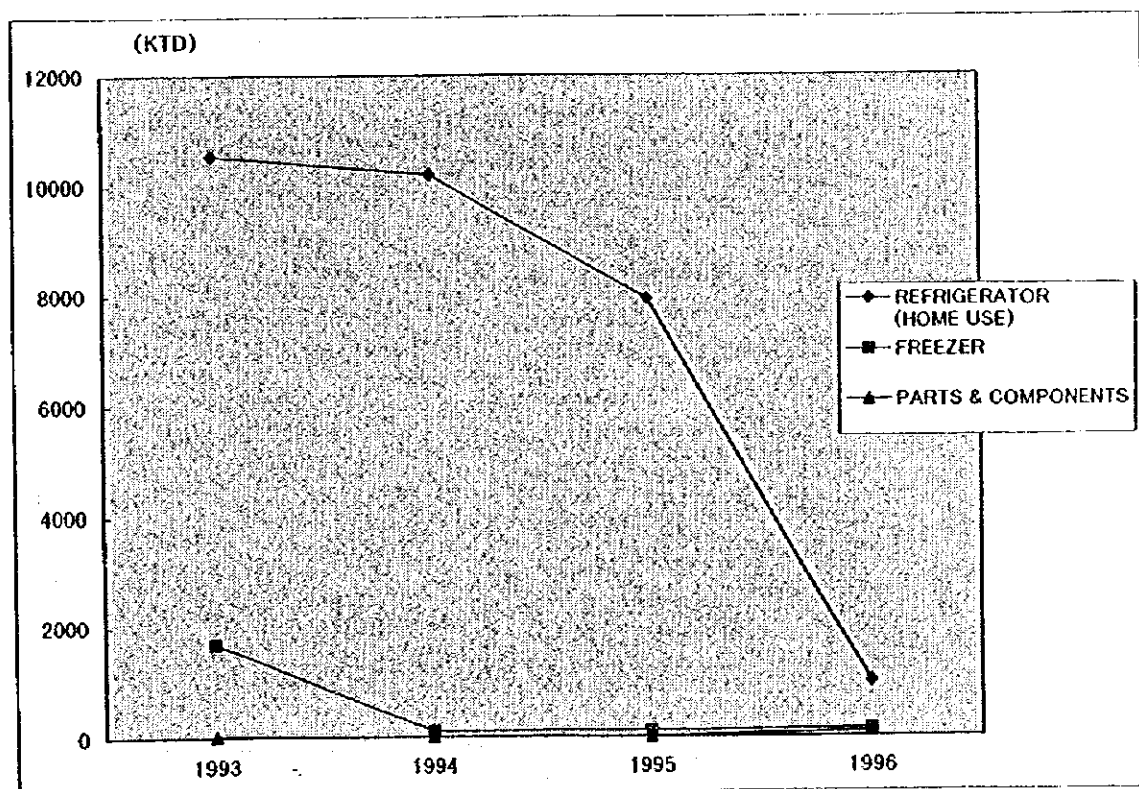
**EXPORT TREND BY PRODUCT (SECTOR E:Home appliances)**  
**- REFRIGERATORS & FREEZERS - (1993~1996)**

ITEM CODE	1993		1994		1995		1996		1993~1996	
	VAL 93	RATIO	VAL 94	RATIO	VAL 95	RATIO	VAL 96	RATIO	IM.VALSUM	RATIO
REFRIGERATOR (HOME USE)	10534	86.1%	10208	98.9%	7941	98.6%	1006	80.6%	29689	93.2%
FREEZER	1679	13.7%	111	1.1%	114	1.4%	144	11.6%	2049	6.4%
PARTS & COMPONENTS	18	0.1%	8	0.1%	0	0.0%	98	7.8%	123	0.4%
TOTAL	12231	100%	10327	100%	8055	100%	1248	100%	31861	100%

**IMPORT TREND BY PRODUCT (SECTOR E:Home appliances)  
- REFRIGERATORS & FREEZERS - (1993~1996)**



**EXPORT TREND BY PRODUCT (SECTOR E:Home appliances)  
- REFRIGERATORS & FREEZERS - (1993~1996)**



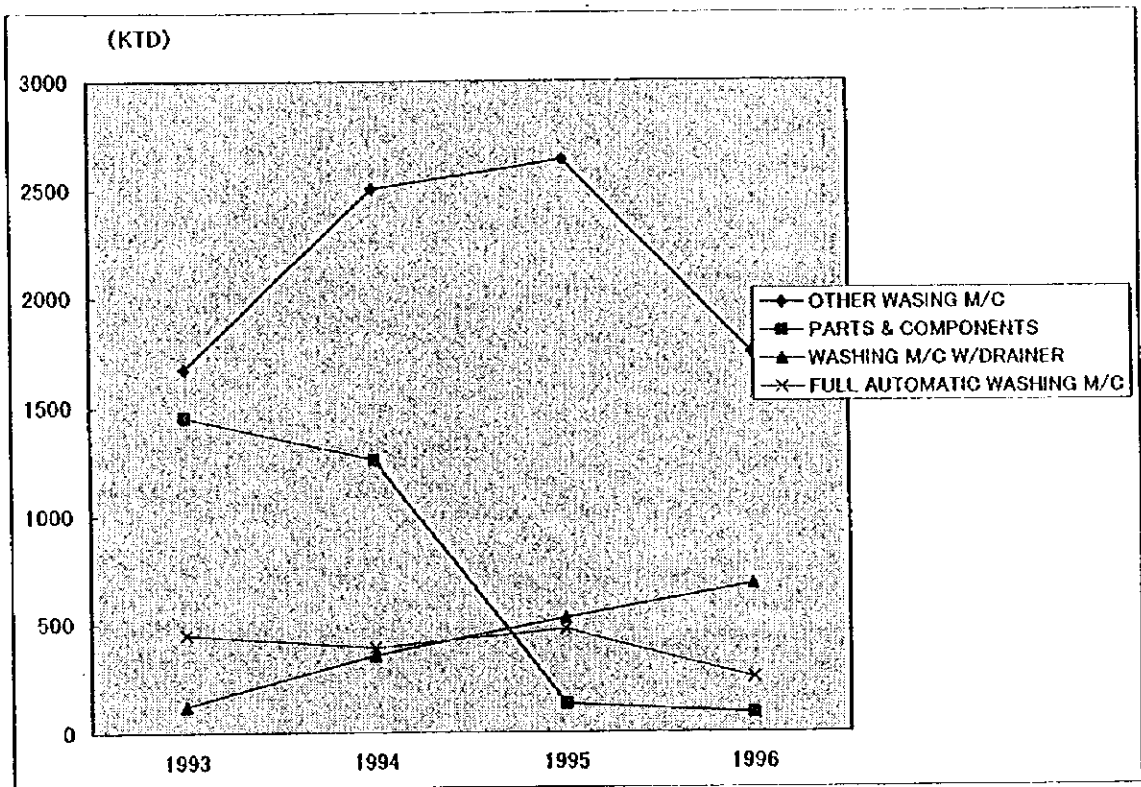
**IMPORT TREND BY PRODUCT (SECTOR E:Home appliances)**  
**- WASHING MACHINES - (1993~1996)**

ITEM CODE	1993		1994		1995		1996		1993~1996	
	VAL 93	RATIO	VAL 94	RATIO	VAL 95	RATIO	VAL 96	RATIO	IM.VALSUM	RATIO
OTHER WASING M/C	1672	45.3%	2503	55.6%	2639	70.1%	1748	63.3%	8562	58.2%
PARTS & COMPONENTS	1454	39.4%	1260	28.0%	128	3.4%	86	3.1%	2927	19.9%
WASHING M/C W/DRAINER	121	3.3%	352	7.8%	524	13.9%	682	24.7%	1678	11.4%
FULL AUTOMATIC WASHING M/C	447	12.1%	386	8.6%	472	12.5%	246	8.9%	1551	10.5%
TOTAL	3693	100%	4501	100%	3762	100%	2762	100%	14718	100%

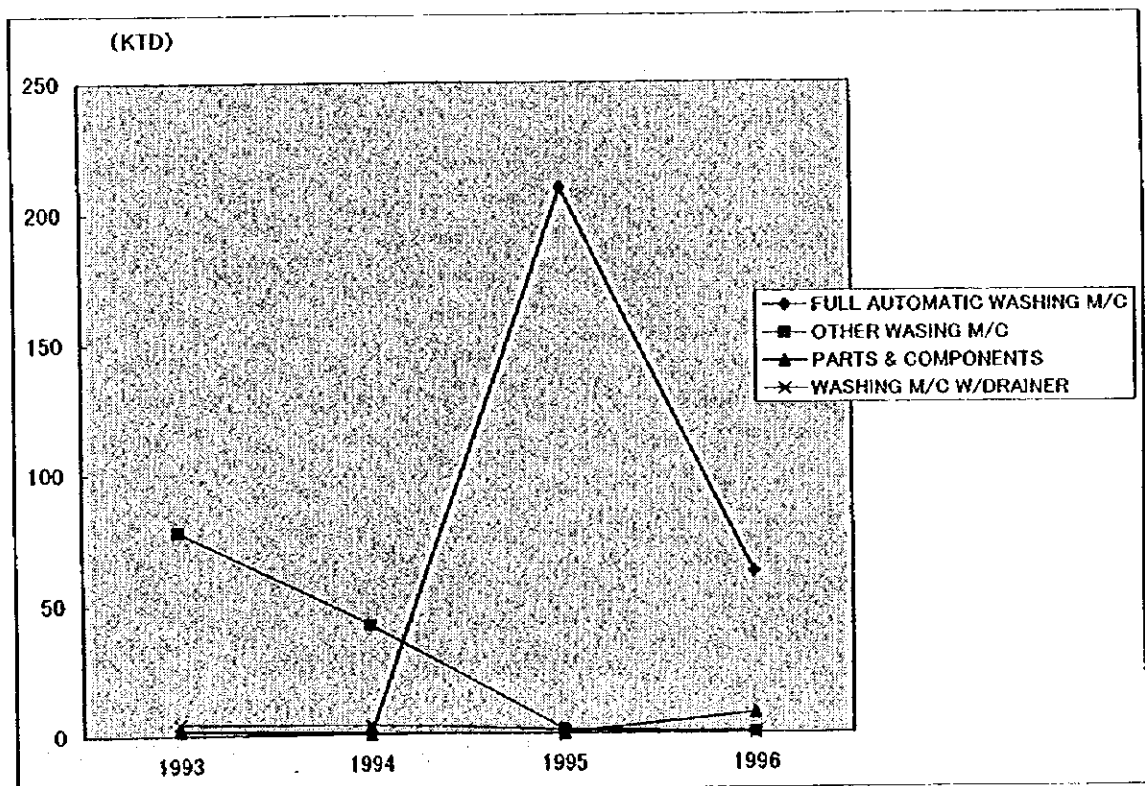
**EXPORT TREND BY PRODUCT (SECTOR E:Home appliances)**  
**- WASHING MACHINES - (1993~1996)**

ITEM CODE	1993		1994		1995		1996		1993~1996	
	VAL 93	RATIO	VAL 94	RATIO	VAL 95	RATIO	VAL 96	RATIO	IM.VALSUM	RATIO
FULL AUTOMATIC WASHING M/C	2	2.5%	0	0.9%	210	98.7%	62	88.4%	275	66.1%
OTHER WASING M/C	78	90.5%	42	91.4%	1	0.7%	0	0.6%	122	29.4%
PARTS & COMPONENTS	2	2.2%	0	0.0%	0	0.0%	8	11.0%	10	2.3%
WASHING M/C W/DRAINER	4.195	4.9%	4	7.7%	1	0.6%	0	0.0%	9	2.2%
TOTAL	86.152	100%	46	100%	213	100%	70	100%	415	100%

**IMPORT TREND BY PRODUCT (SECTOR E:Home appliances)  
- WASHING MACHINES - (1993~1996)**



**EXPORT TREND BY PRODUCT (SECTOR E:Home appliances)  
- WASHING MACHINES - (1993~1996)**





## 2. 企業アンケート調査データ分析結果

本資料はローカルコンサルタントから入手した回答結果とそれを集計した結果であり下記内容からなる。概要コメントのみ参考に記載するが詳細なコメント記載されていない。コメントについては報告書(DFR)を参照されたい。

### 目次

1. 分析結果概要
2. グラフ化された概要
3. モデル企業および代表企業アンケート結果対比表

1998年3月

デュニジア 国機械電気生産性向上調査団

## 1. 分析結果概要

ローカルコンサルタントに委託して 76 (金型メーカー及びユーザーは 92) の質問からなる質問状を発送し回収した。

### 1. アンケート集計結果

質問状は 388 社に対し発送したが、

ダブリ	13社	
住所不明	47社	
無関心	31社	
合計	91社	を除くと
対象会社は	297社	これに対し
回答は	151社	

回収率 51.0% 目標50%達成

### 2. アンケート結果から読みとれる事

#### (1) 企業規模と会社数

売上 10MDT(10 億円)未満の会社が 80%を占める。従業員数 30 人未満の企業が 1/3 を占める。

#### (2) 輸出高

1MDT(1 億円)未満の会社が 70%で、輸出先の 40%がヨーロッパ、36%がマグレブ諸国である。

#### (3) 資本金

金型、家電および生産財は資本金 3,000 万円~1 億円(300~1,000KDT)以上の企業が 60~80%占めているのに対し自転車バイク及び金物は 30%で 3,000 万円(300KDT)以下の小企業が 70%を占める。

#### (4) 売上高

セクターにより若干の差があるが、10 億円(10MDT)未満の企業が 60~90%を占める。

#### (5) 従業員数

家電は 100 人以上の企業が半数以上をしめるが、他セクターは 30 人未満が半数近くを占める。



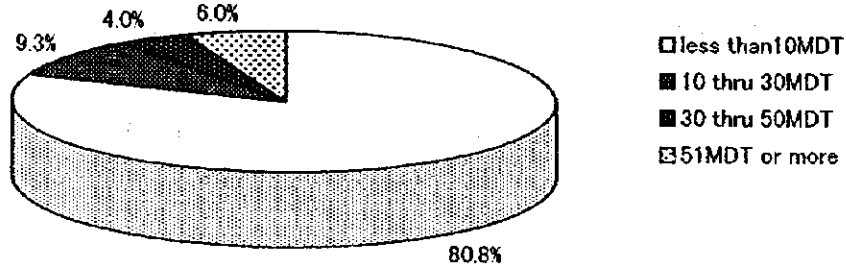
- (6) 経常利益  
金物セクターは500万円(50KDT)以下の企業がほぼ60%、他セクターは40%。
- (7) 直間比率  
間接比率 15%未満の会社がほぼ半数以上を占めている。その中で開発要員は殆どの企業で2名以下である。
- (8) 平均給与  
5万円(0.5KDT)未満が65%以上。
- (9) 提案制度  
制度のない企業が30~67%計画度が20~30%と低調だが自転車バイクセクターでは40%(5社)が実施中。
- (10) 海外品に対する競争優位性  
対等に競争できる企業が60~80%。
- (11) OEM 出荷比率  
各セクター共に0%が半数をしめるが生産財セクターには51%以上をOEM出荷している企業が3社ある。
- (12) 設備稼働率  
家電セクターには71%以上の企業が65%(9社)もあるが、他セクターは40~71%の間散在する。  
保全体制に関して65%が故障の都度修理。予防保全は低調。
- (13) 作業標準の使用  
ときどき使用が60~78%、標準がない企業が25%。
- (14) 不良率  
生産財、金物セクターの40%、家電、自転車バイクセクターの60~70%。金型セクターの80%が不良率5%以下。
- (15) 仕掛かり  
各セクターとも1ヶ月の長期製品在庫を抱えている。  
工程間仕掛かりについては家電、自転車バイクは1週間以内の短期のものが多い。
- (16) ISO 9000 に対する姿勢  
関心あり、勉強中、および計画中でほぼ80%を占める。関心なしの回答5社。
- (17) CETIME への期待  
セクター共通に技術支援、企業診断および教育に対する期待が大きい。しかし金型に関する支援期待度は低い。

## 2. グラフ化された概要

### 1. Survey Results by Total (Excerpts)

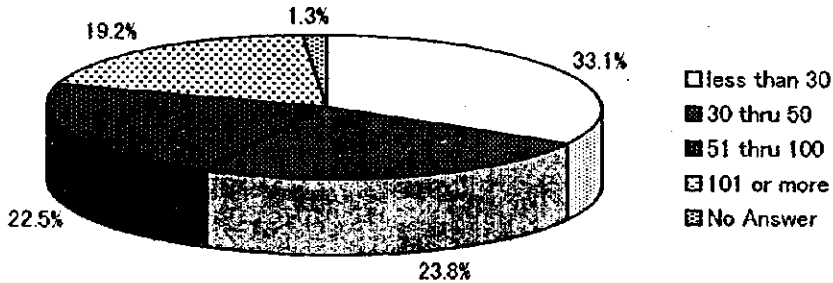
#### (1) Annual Turnover

	less than 10MDT	10 thru 30MDT	30 thru 50MDT	51MDT or more	Total
# of Enterprises	122	14	6	9	151
%	80.8%	9.3%	4.0%	6.0%	100%



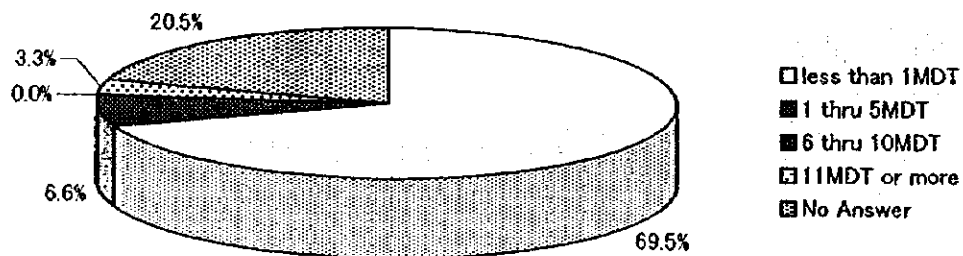
#### (2) Number of Employees

	less than 30	30 thru 50	51 thru 100	101 or more	No Answer	Total
# of Enterprises	50	36	34	29	2	151
%	33.1%	23.8%	22.5%	19.2%	1.3%	100%



#### (3) Export Sales Amount

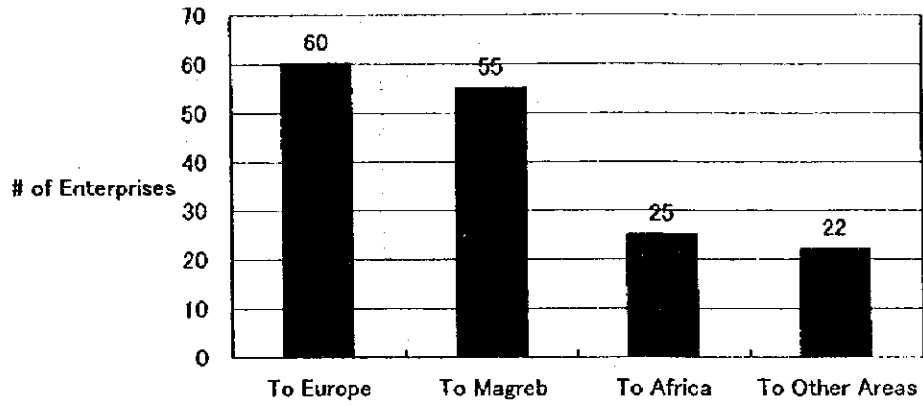
	less than 1MDT	1 thru 5MDT	6 thru 10MDT	11MDT or more	No Answer	Total
# of Enterprises	105	10	0	5	31	151
%	69.5%	6.6%	0.0%	3.3%	20.5%	100%



(4) Export Areas

	To Europe	To Magreb	To Africa	To Other Areas
# of Enterprises	60	55	25	22
% *	39.7%	36.4%	16.6%	14.6%

\*% by Total Number of Enterprises



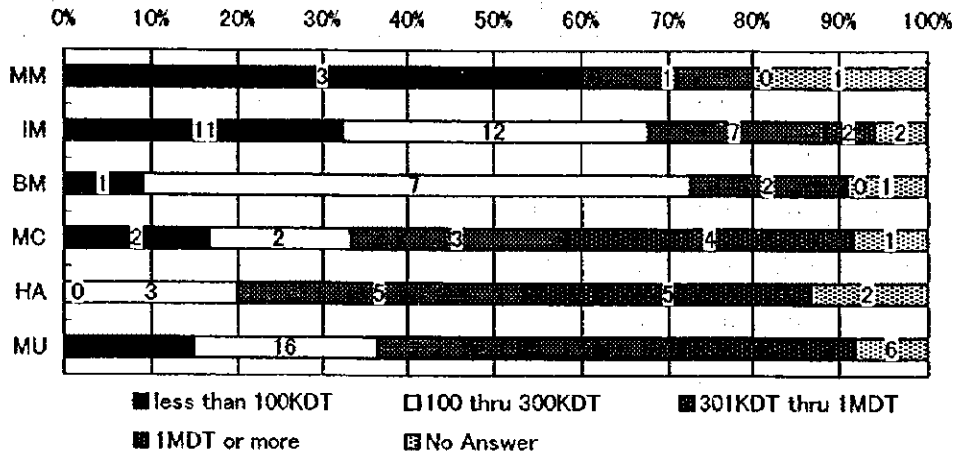
## 2. Survey Results by Sectors (Excerpts)

MM: Mold Makers  
 BM: Bicycles and Motorbikes  
 HA: Home Appliances

IM: Iron Mongery  
 MC: Machine Components  
 MU: Mold Users

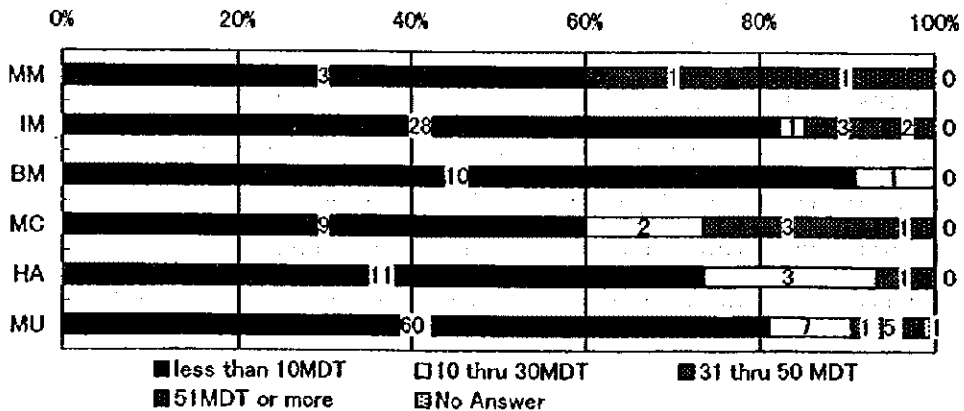
### (1) Capital Size

Sector	less than 100KDT	100 thru 300KDT	301KDT thru 1MDT	1MDT or more	No Answer	Total
MM	3	0	1	0	1	5
IM	11	12	7	2	2	34
BM	1	7	2	0	1	11
MC	2	2	3	4	1	12
HA	0	3	5	5	2	15
MU	11	16	26	15	6	74



### (2) Annual Turnover

Sector	less than 10MDT	10 thru 30MDT	31 thru 50 MDT	51MDT or more	No Answer	Total
MM	3	0	1	1	0	5
IM	28	1	3	2	0	34
BM	10	1	0	0	0	11
MC	9	2	3	1	0	12
HA	11	3	1	0	0	15
MU	60	7	1	5	1	74



## 2. Survey Results by Sectors (Excerpts)

MM: Main Memory

CM: Cache and Main Memory

EM: Embedded Memory

MI: Main Memory

MC: Machine Components

ME: Main Memory

Figure 2.1

Sector	Less than 10MDT	10-30MDT	30-50MDT	50MDT or more	No Answer	Total
MM	3	0	1	0	1	5
CM	11	12	7	2	2	34
EM	1	7	2	0	1	11
MI	2	2	3	4	1	12
MC	1	3	5	5	2	15
ME	11	16	26	15	6	74

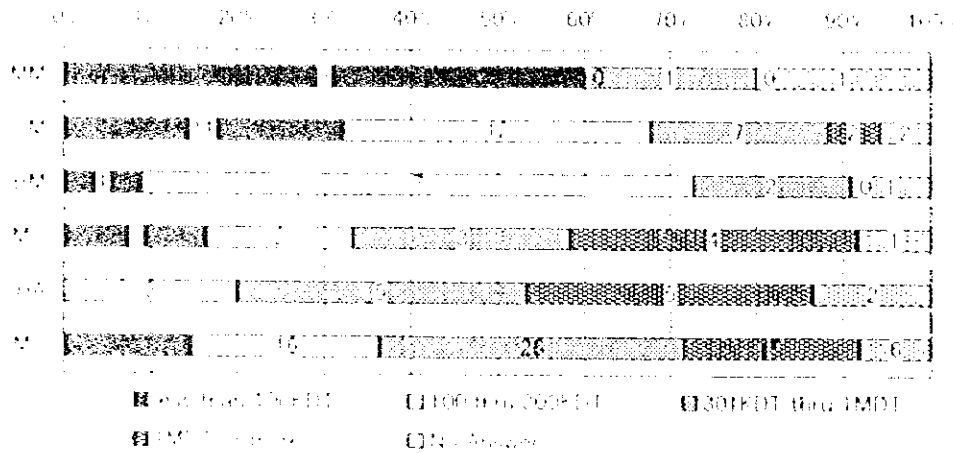
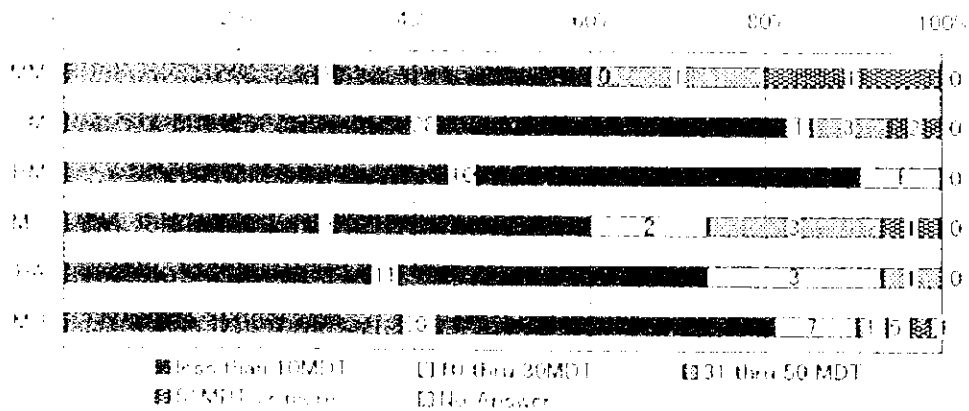


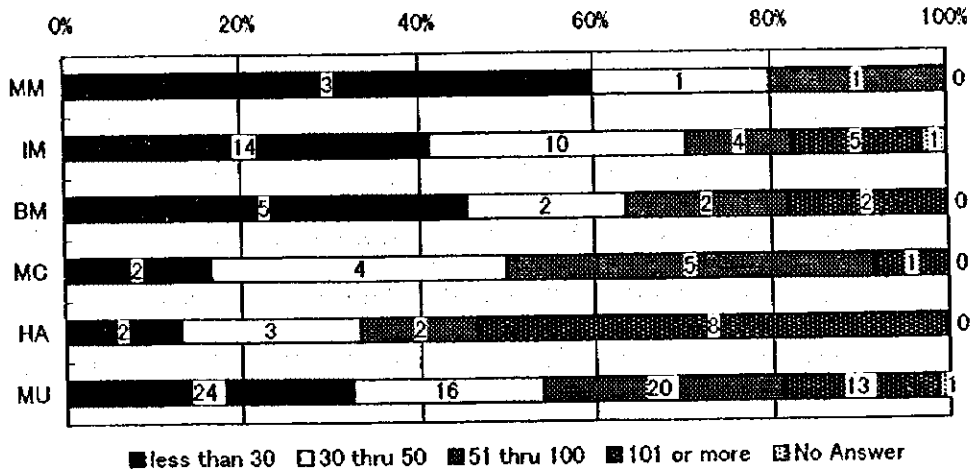
Figure 2.2 (Excerpt)

Sector	Less than 10MDT	10-30MDT	30-50MDT	50MDT or more	No Answer	Total
MM	3	0	1	1	0	5
CM	28	1	3	2	0	34
EM	10	1	0	0	0	11
MI	9	2	3	1	0	12
MC	11	3	1	0	0	15
ME	60	7	1	5	1	74



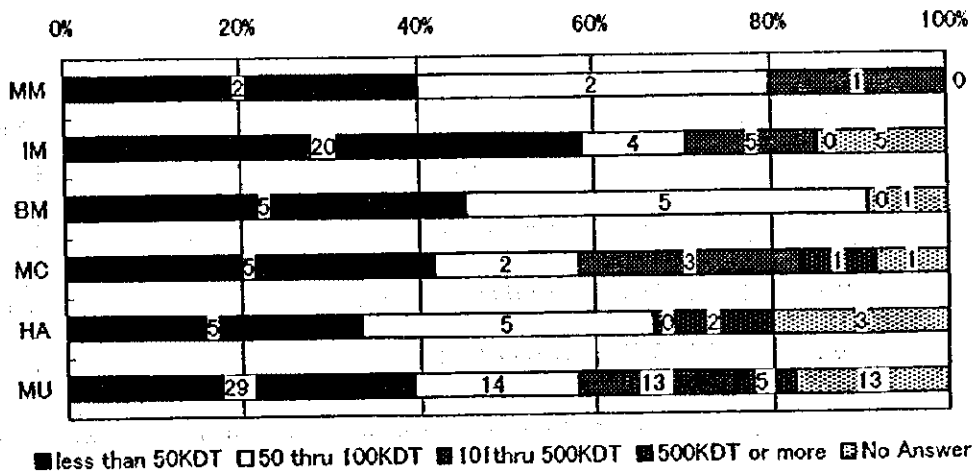
(3) Number of Employees

Sector	less than 30	30 thru 50	51 thru 100	101 or more	No Answer	Total
MM	3	1	1	0	0	5
IM	14	10	4	5	1	34
BM	5	2	2	2	0	11
MC	2	4	5	1	0	12
HA	2	3	2	8	0	15
MU	24	16	20	13	1	74



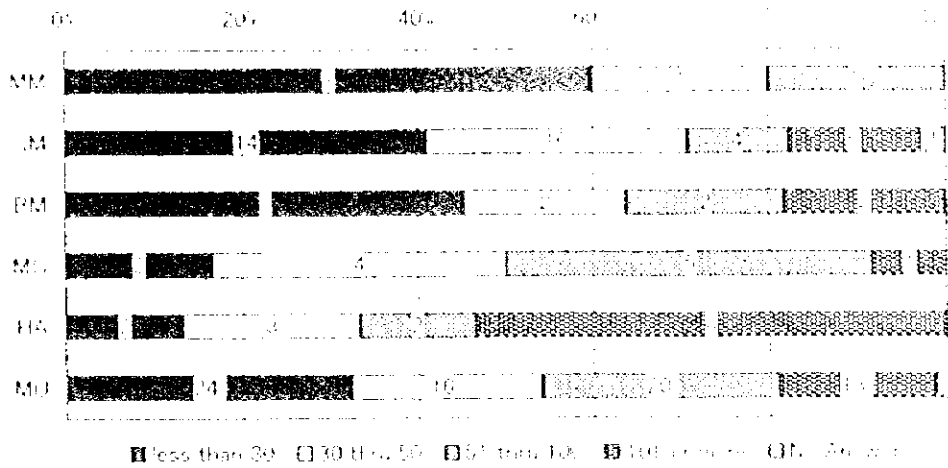
(4) Annual Recurring Profit

Sector	less than 50KDT	50 thru 100KDT	101 thru 500KDT	500KDT or more	No Answer	Total
MM	2	2	1	0	0	5
IM	20	4	5	0	5	34
BM	5	5	0	0	1	11
MC	5	2	3	1	1	12
HA	5	5	0	2	3	15
MU	29	14	13	5	13	74



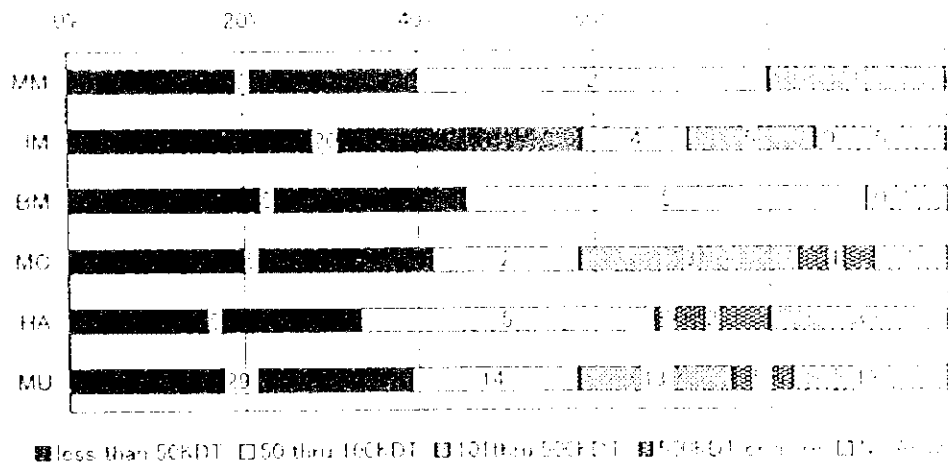
3. Number of Employees

Sector	less than 10	10 thru 50	50 thru 100	100 thru 500	500 or more	Total
MM	3	1	1	0	0	5
IM	14	10	4	5	1	34
BM	5	2	2	2	0	11
MC	2	4	5	1	0	12
HA	2	3	2	8	0	15
MU	24	16	20	13	1	74



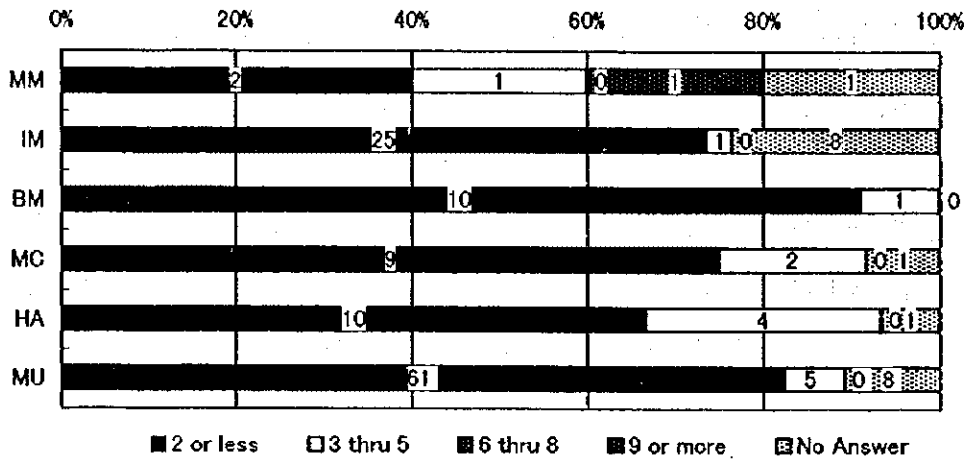
4. Annual Recurring Profit

Sector	less than 50KDT	50 thru 100KDT	100 thru 500KDT	500KDT or more	Number of Firms	Total
MM	2	2	1	0	0	5
IM	20	4	5	0	5	34
BM	5	5	0	0	1	11
MC	5	2	3	1	1	12
HA	5	5	0	2	3	15
MU	29	14	13	5	13	74



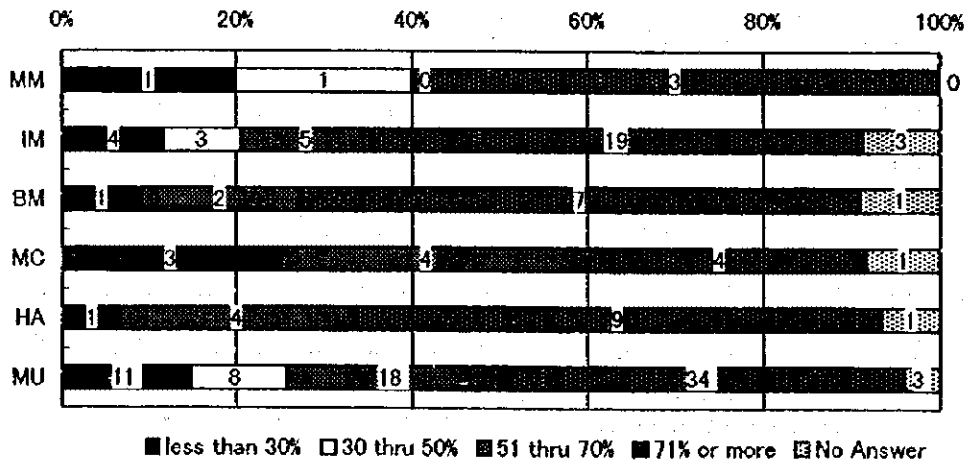
(5) Number of R&D Staff

Sector	2 or less	3 thru 5	6 thru 8	9 or more	No Answer	Total
MM	2	1	0	1	1	5
IM	25	1	0	0	8	34
BM	10	1	0	0	0	11
MC	9	2	0	0	1	12
HA	10	4	0	0	1	15
MU	61	5	0	0	8	74



(6) Percentage of Employees Who Engage in Direct Labor

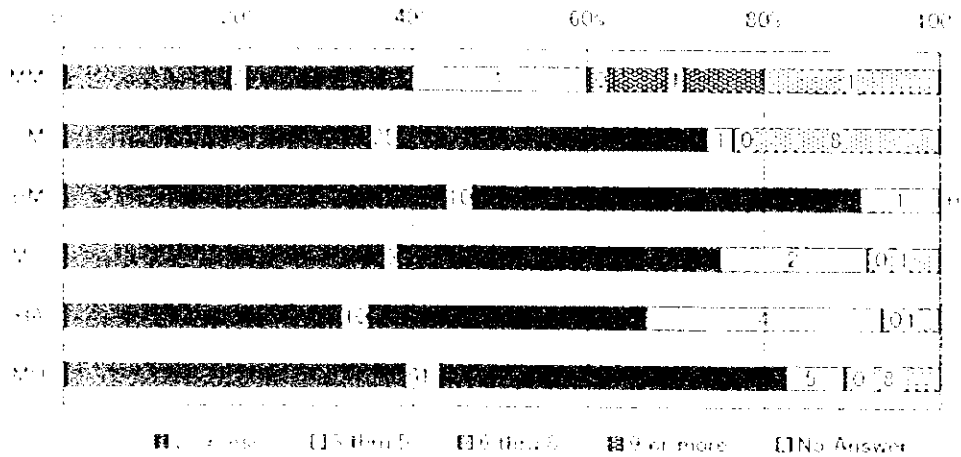
Sector	less than 30%	30 thru 50%	51 thru 70%	71% or more	No Answer	Total
MM	1	1	0	3	0	5
IM	4	3	5	19	3	34
BM	1	0	2	7	1	11
MC	3	0	4	4	1	12
HA	1	0	4	9	1	15
MU	11	8	18	34	3	74





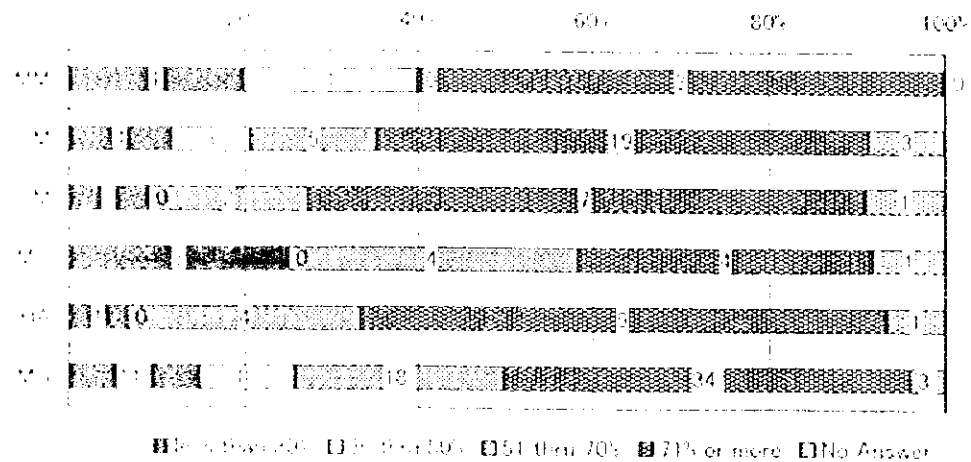
Case 1: Half Staff

Sector	Less than 20%	20% to 40%	40% to 60%	60% or more	No Answer	Total
AA	2	1	0	1	1	5
M	25	1	0	0	8	34
AAZ	10	1	0	0	0	11
MZ	9	2	0	0	1	12
AAZ	10	4	0	0	1	15
MZ	61	5	0	0	8	74



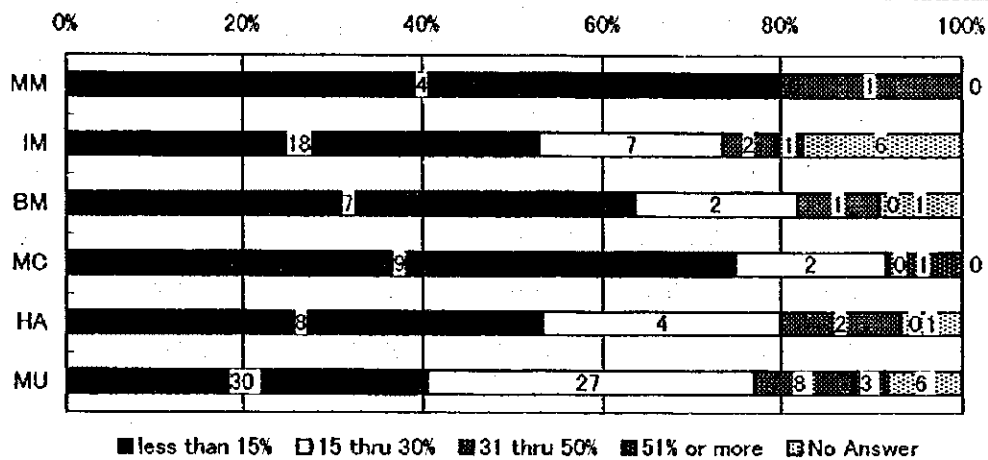
Case 2: Full Staff - All Employees Less Than 10%

Sector	Less than 10%	10% to 50%	50% to 70%	70% or more	No Answer	Total
AA	1	1	0	3	0	5
M	1	3	5	19	3	34
AAZ	1	0	2	7	1	11
MZ	3	0	4	4	1	12
AAZ	1	0	4	9	1	15
MZ	11	8	18	34	3	74



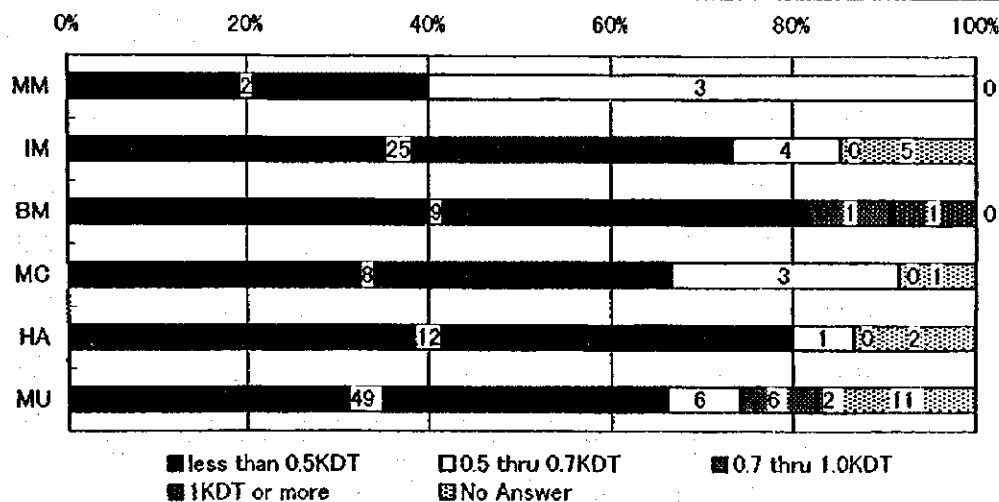
(7) Percentage of Employees Who Engage in Indirect Labor

Sector	less than 15%	15 thru 30%	31 thru 50%	51% or more	No Answer	Total
MM	4	0	1	0	0	5
IM	18	7	2	1	6	34
BM	7	2	1	0	1	11
MC	9	2	0	1	0	12
HA	8	4	2	0	1	15
MU	30	27	8	3	6	74



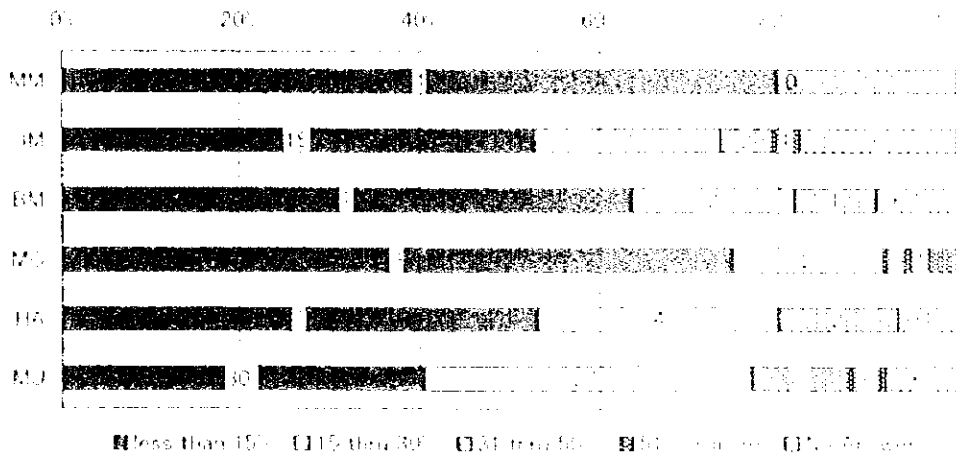
(8) Average Amount of Salary Per Employee

Sector	less than 0.5KDT	0.5 thru 0.7KDT	0.7 thru 1.0KDT	1KDT or more	No Answer	Total
MM	2	3	0	0	0	5
IM	25	4	0	0	5	34
BM	9	0	1	1	0	11
MC	8	3	0	0	1	12
HA	12	1	0	0	2	15
MU	49	6	6	2	11	74



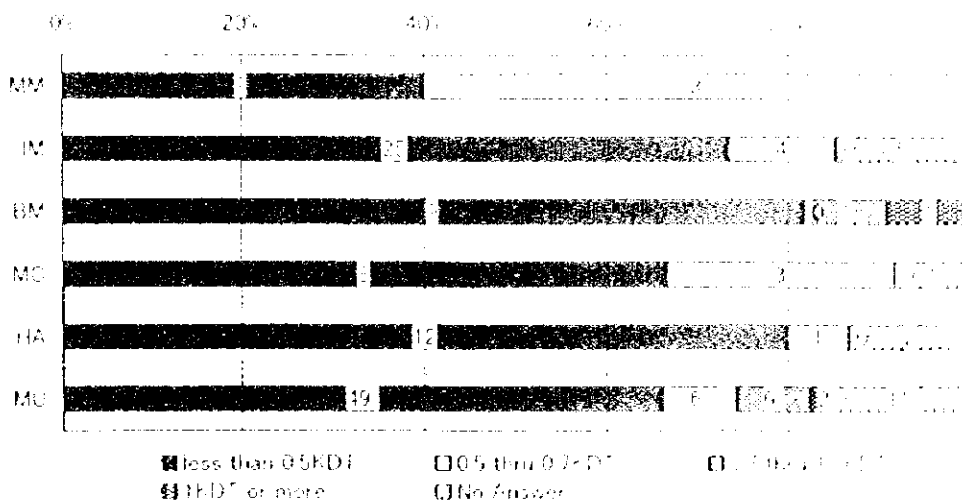
27. Percentage of employees who designate themselves as:

Sector	less than 15%	15% thru 30%	31% thru 50%	51% thru 70%	71% thru 90%	No Answer	Total
MM	4	0	1	0	0	0	5
IM	18	7	2	1	6	0	34
BM	7	2	1	0	1	0	11
MC	9	2	0	1	0	0	12
HA	8	1	2	0	1	0	12
MU	30	27	8	3	6	0	74



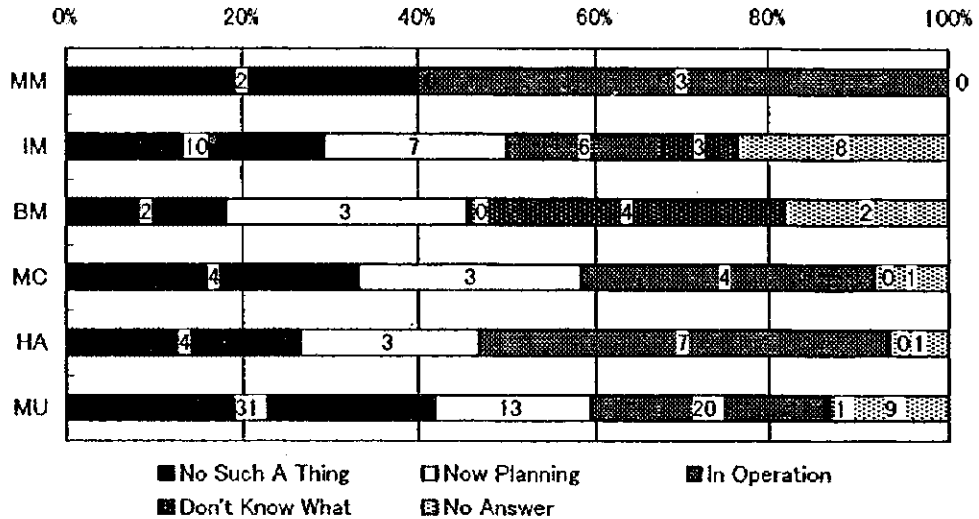
28. Average Amount of Salary Per Employee

Sector	less than 0.5KDT	0.5 thru 0.7KDT	0.7 thru 1.0KDT	1.0KDT or more	No Answer	Total
MM	2	3	0	0	0	5
IM	25	4	0	0	5	34
BM	9	0	1	1	0	11
MC	8	3	0	0	1	12
HA	12	1	0	0	2	15
MU	49	6	6	2	11	74



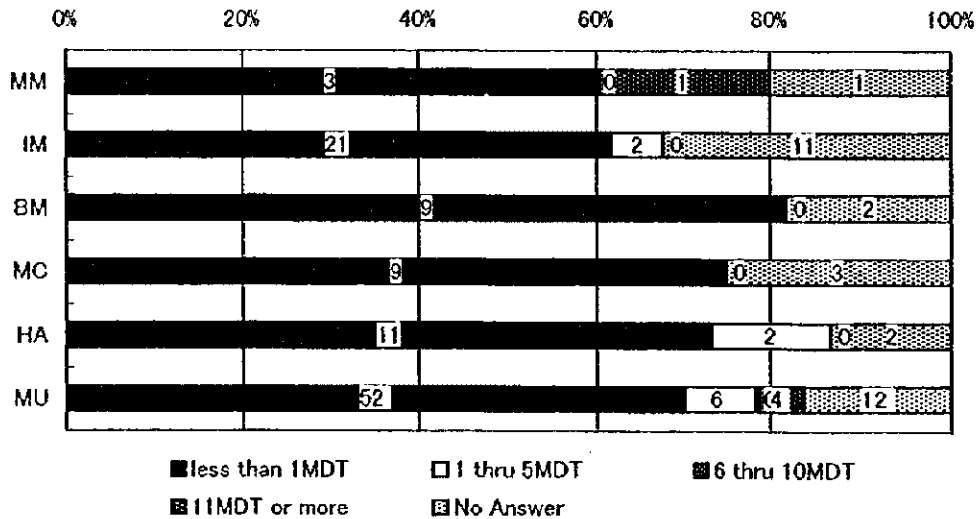
(9) Enforcement of Incentives for Operational Improvement Proposition

Sector	No Such A Thing	Now Planning	In Operation	Don't Know What	No Answer	Total
MM	2	0	3	0	0	5
IM	10	7	6	3	8	34
BM	2	3	0	4	2	11
MC	4	3	4	0	1	12
HA	4	3	7	0	1	15
MU	31	13	20	1	9	74



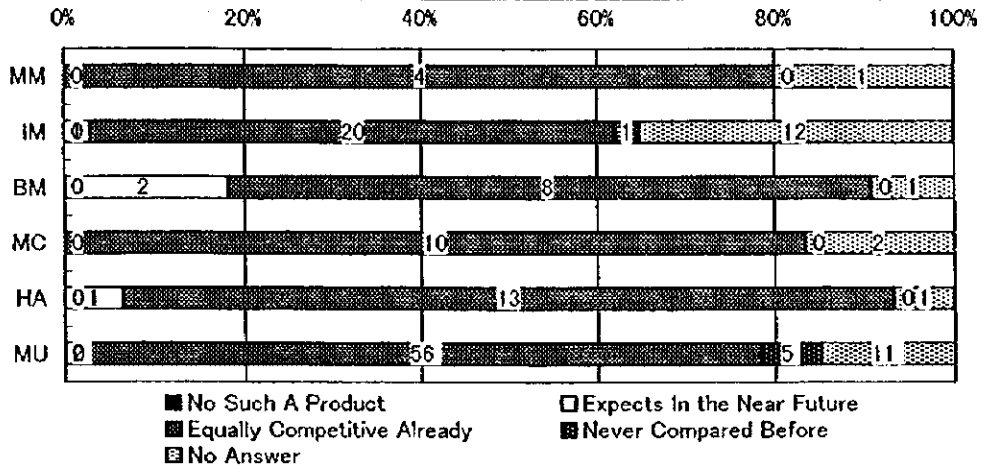
(10) Export Sales Amount

Sector	less than 1MDT	1 thru 5MDT	6 thru 10MDT	11MDT or more	No Answer	Total
MM	3	0	0	1	1	5
IM	21	2	0	0	11	34
BM	9	0	0	0	2	11
MC	9	0	0	0	3	12
HA	11	2	0	0	2	15
MU	52	6	0	4	12	74



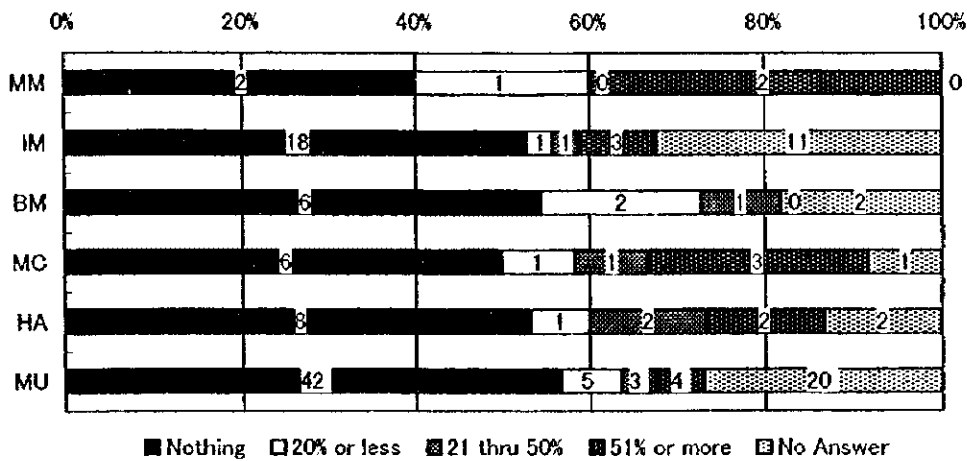
(11) Production of Superiorly Competitive Products Compared with Foreign Ones

Sector	No Such A Product	Expects In the Near Future	Equally Competitive Already	Never Compared Before	No Answer	Total
MM	0	0	4	0	1	5
IM	0	1	20	1	12	34
BM	0	2	8	0	1	11
MC	0	0	10	0	2	12
HA	0	1	13	0	1	15
MU	0	2	56	5	11	74



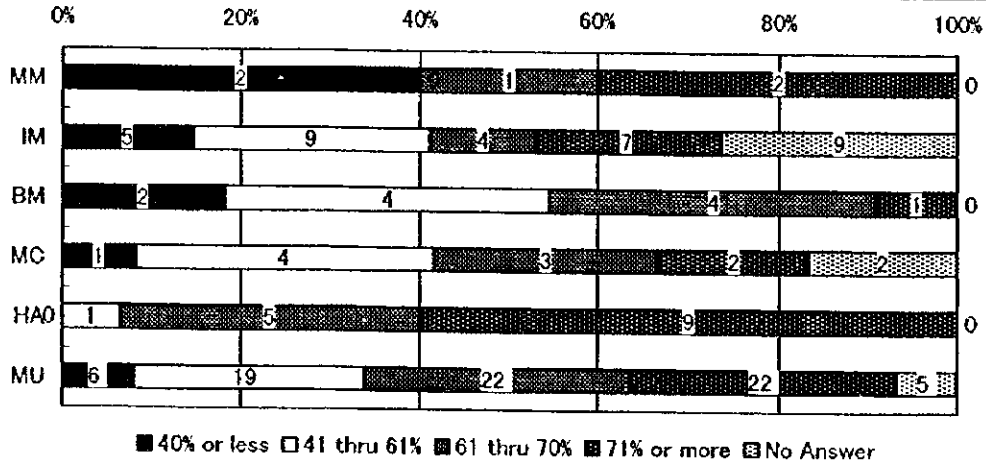
(12) Percentage of OEM Sales

Sector	Nothing	20% or less	21 thru 50%	51% or more	No Answer	Total
MM	2	1	0	2	0	5
IM	18	1	1	3	11	34
BM	6	2	1	0	2	11
MC	6	1	1	3	1	12
HA	8	1	2	2	2	15
MU	42	5	3	4	20	74



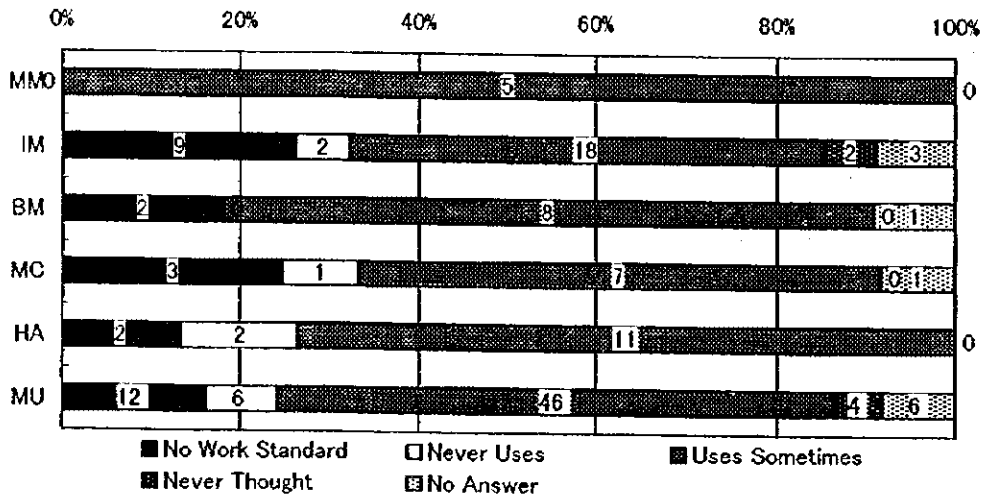
(13) Actual Operation Percentage of Main Production Line

Sector	40% or less	41 thru 61%	61 thru 70%	71% or more	No Answer	Total
MM	2	0	1	2	0	5
IM	5	9	4	7	9	34
BM	2	4	4	1	0	11
MC	1	4	3	2	2	12
HA	0	1	5	9	0	15
MU	6	19	22	22	5	74



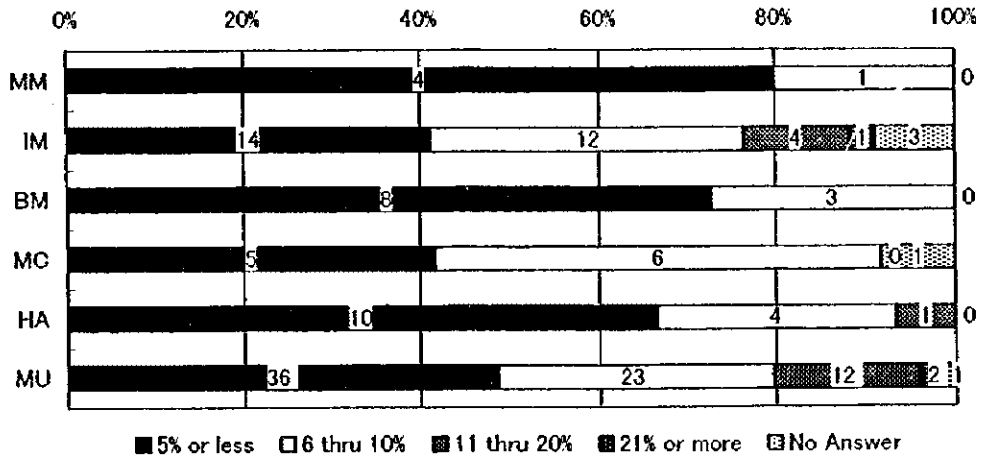
(14) Implementation of Work Standard

Sector	No Work Standard	Never Uses	Uses Sometimes	Never Thought	No Answer	Total
MM	0	0	5	0	0	5
IM	9	2	18	2	3	34
BM	2	0	8	0	1	11
MC	3	1	7	0	1	12
HA	2	2	11	0	0	15
MU	12	6	46	4	6	74



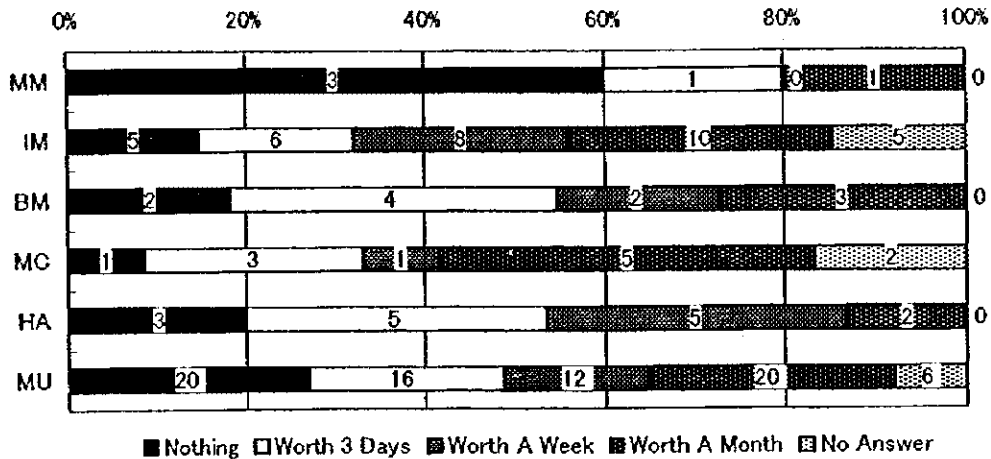
(15) Defect Percentage on Main Production Line

Sector	5% or less	6 thru 10%	11 thru 20%	21% or more	No Answer	Total
MM	4	1	0	0	0	5
IM	14	12	4	1	3	34
BM	8	3	0	0	0	11
MC	5	6	0	0	1	12
HA	10	4	1	0	0	15
MU	36	23	12	2	1	74



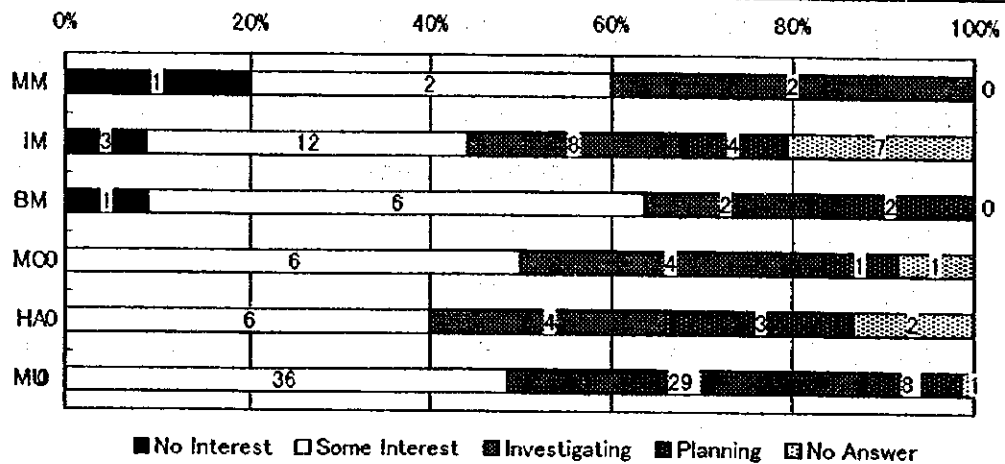
(16) Regular Amount of Products in Process

Sector	Nothing	Worth 3 Days	Worth A Week	Worth A Month	No Answer	Total
MM	3	1	0	1	0	5
IM	5	6	8	10	5	34
BM	2	4	2	3	0	11
MC	1	3	1	5	2	12
HA	3	5	5	2	0	15
MU	20	16	12	20	6	74



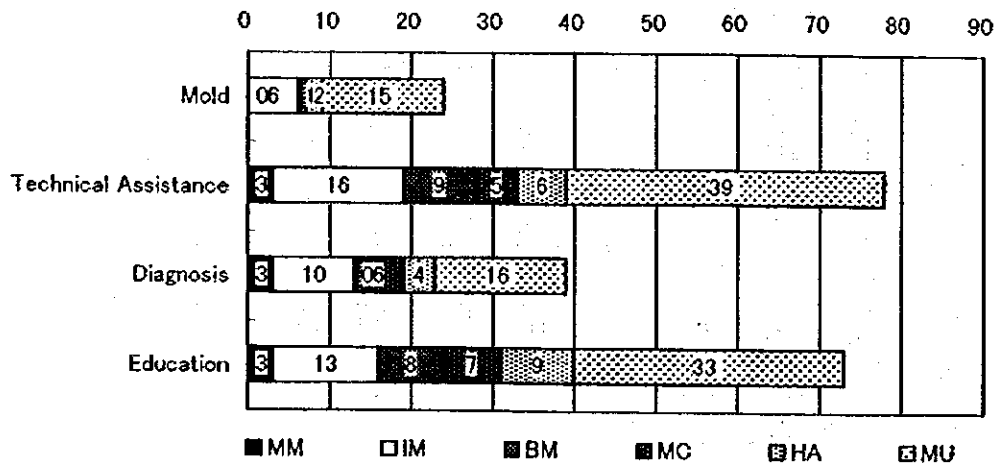
(17) Attitude Toward ISO9000 Verification

Sector	No Interest	Some Interest	Investigating	Planning	No Answer	Total
MM	1	2	2	0	0	5
IM	3	12	8	4	7	34
BM	1	6	2	2	0	11
MC	0	6	4	1	1	12
HA	0	6	4	3	2	15
MU	0	36	29	8	1	74



(18) Expectation Toward CETIME

Sector	Mold	Technical Assistance	Diagnosis	Education	# of Enterprises
MM	0	3	3	3	5
IM	6	16	10	13	34
BM	0	9	0	8	11
MC	1	5	6	7	12
HA	2	6	4	9	15
MU	15	39	16	33	74





### 3. モデル企業および代表企業アンケート結果対比表

#### 3-1 金型 セクター

RECAPITULATIF DES PRINCIPALES RESULTATS DE L'ENQUETE (BRANCHE MOULES)

Catégorie	ENTREPRISE	CETIME SOUSSE	TUNIMOULDS	A2FO	OREGON	PLASTIC TUNISIE
	DONNEES					
GESTION	Chiffre d'affaires annuel (KDT)	382	154	420	3000	3000
RESSOURCES HUMAINES	Nombre du personnel employé	87	20	23	120	120
	Nombre du personnel employé dans la production (%)	< 71%	< 71%	< 71%	< 71%	< 71%
	Nombre du personnel employé dans l'administration (%)	15% - 30%	< 15%	< 15%	< 15%	< 15%
	Nombre du personnel employé dans la commercialisation (%)	4% - 6%	< 3%	< 3%	4% - 6%	7% - 10%
	Nombre du personnel employé dans la recherche et développement	< 9	3 - 5	< 2	< 2	< 2
	Nombre du personnel spécialisé dans la technologie de production	< 11	< 11	< 3	< 11	4 - 6
	Nombre du personnel spécialisé dans la maintenance	< 5	< 5	3 - 4	< 5	1 - 2
PRODUITS	Proportion de la vente directe en % (marque propre à l'entreprise)	< 31%	< 31%	< 31%	< 31%	0
	Nombre de produits nouveaux conçus et commercialisés par l'entreprise	0	3 - 5	< 6	< 6	< 6
	Produisez vous des articles concurrentiels avec les produits étrangers	Oui	Oui	Oui	Oui	Oui
COMPTABILITE FINANCES	Résultat brut d'exploitation en KDT(1995)	101 - 500	< 50	50 - 100	< 500	50 - 100
	Valeur du stock mesuré en % du chiffre d'affaires mensuel	0.5% - 1%	0.5% - 1%	< 0.5%	< 2%	< 2%
	Valeur des achats de fournitures en % du chiffre d'affaires	< 20%	< 20%	< 20%	< 60%	41% - 60%
PRODUCTION	Mesures correctives pour limiter les retards dans les commandes	Quotidiennement	Mensuellement	Quotidiennement	Quotidiennement	Hebdomadairement
	Respecter vous les standards de production	Quelque fois	<--	<--	<--	<--
	Taux de charge des équipements	< 40%	< 71%	61% - 70%	< 71%	61% - 70%
	% des produits défectueux	< 5%	6% - 10%	< 5%	< 5%	11% - 20%
	Volume des produits sur la chaîne en % de la production journalière	-	3%	0%	3%	0%

RECAPITULATIF DES PRINCIPALES RESULTATS DE L'ENQUETE (BRANCHE MOULES)

Catégorie	ENTREPRISE DONNEES	CETIME SOUSSE	TUNIMOULDS	A2FO	OREGON	PLASTIC TUNISIE
PRODUCTION	Pourcentage des produits nécessitant des relouches	.	.	0% - 5%	.	5% - 10%
	Age des équipements (années)	15	< 25	5 - 10	< 5	5 - 15
	Fréquence de la maintenance des équipements	En cas de panne	En cas de panne / Hebdomadaire	En cas de panne / Hebdomadaire	Hebdomadaire	En cas de panne
	Avez vous des employés qualifiés en maintenance	Personnel interne	Personnel interne et externe	Personnel interne	Personnel interne	Personnel interne + fournisseurs
	Votre source d'information concernant les techniques de production (en Tunisie)	CETIME	Autres	.	Autres	CETIME / Université / Autres
	Votre source d'information concernant les techniques de production (à l'étranger)	.	Europe / Amérique	Europe	Europe / Amérique / Autres	Europe
	Conformité aux normes ISO 9000 (en années)	En cours	En cours	Intéressé	Indéressé	En cours
	Objectif de l'automatisation des techniques de production	Non prévu	.	Non prévu	Qualité / coût / main d'oeuvre	Qualité / coût / main d'oeuvre
EDUCATION	Formation continue du personnel	Interne	Externe	Interne	Interne	Interne
	Activités des cercles de travail dans l'entreprise	Cercle de qualité	Non	Autres	Cercle de qualité	Non
CETIME	Assistance technique du CETIME	.	Non	←	←	←
	Diagnostic de l'entreprise par le CETIME	.	< 5 fois	Non	←	←
	Ce que vous attendez du CETIME dans l'avenir	.	Assistance technique / formation et diagnostic	.	Moules	Assistance technique / formation
QUALITE	Inspection entre les différentes étapes de production	Oui	←	←	←	←
	Méthodes adaptées par le contrôle de qualité	Analyse des données de production	Non	Analyse des rebuts / formation du personnel	Analyse des données de production	Analyse des données de production, des réclamations et formation du personnel
RESULTATS RECENTS	Tendance dans l'évolution du Chiffre d'affaires	Constant	Légère croissance	←	←	←
	Evolution de l'investissement dans les équipements	Décroissant	Légère croissance	Légère croissance	Plus que le double	Plus que le double
	Evolution du nombre de personnel	Constant	.	Légère croissance	Constant	Légère croissance
	Tendance du résultat brut d'exploitation de l'entreprise	Constant	.	Légère croissance	Constant	Légère croissance

### 3-2 金物 セクター

Answers of enquete for model and representative enterprise(iron hardware)

		FOUNDERJF (M)	STIQUAH (R)	IMEN (R)	SIG (R)	AMI (R)	SOPAL (R)
	Annual Turnover	<10MDT	10~30MDT	<10MDT	<10MDT	<10MDT	<10MDT
Human resources	Nbr of Employees	100<	100<	100<	100<	51~100	51~100
	Pct of direct workers	71<	71<	71<	71<	—	51~70
	Pct of Indirect workers	<15	15~30	<15	31~50	—	<15
	Nbr of Sales stuff	<3	4~6	4~6	4~6	—	<3
	Nbr of R & D stuffs	<2	<2	<2	—	<2	3~5
	Nbr of Production Engineers	4~6	4~6	7~10	4~6	4~6	4~6
	Nbr of Maintenance stuff	5< Person	5<	1~2	1~2	1~2	3~4
Product	Pct of OEM Sales	0	—	0	—	—	0
	Nbr of New Product since Establishment	6<	6<	6<	3~5	3~5	6<
	Competitiveness with overseas product	Yes	—	Non but Infuture	—	—	Yes
Finance	Annual recurring profit	<100KDT	301~1MDT	301~1MDT	—	—	301~1MDT
	Inventory per Annual Turnover	1~2 Month	<0.5	<0.5	0.5~1	—	1~2
	Purchase per Annual Turnover	21~40	21~40	21~40	21~40	—	41~60
Production	Analysis of discrepancy between plan and result	Daily	Daily	Daily	Daily	Weekly	Weekly
	Implementation of work standard	Sometimes	Sometimes	Sometimes	Sometimes	0	0
	Operation rate of Facilities	71<	41~60	61~70	41~60	—	41~60
	Defect pct of main product	6~10	6~10	6~10	<5	6~10	<5
	Inventory between processes	7 Days	3	3	0	3	<7
	Reprocessing	5~10	<5	<5	<5	5~10	<5

		FOUNDERJF (M)	STIQAM (R)	INEN (R)	SIG (R)	AMI (R)	SOPAL (R)
	Age of Facilities	15 Yrs	5~15	15~20	10	25	15
	Frequency of Maintenance	On breakdown Weekly	On breakdown Monthly	On breakdown Weekly	On breakdown Weekly	On breakdown Weekly	On breakdown
	Who Improves maintenance	In house	In house	In house & outside	In house & outside	In house & outside	In house
	Source of Local Production Engineering Information	Government CETINE	Government CETINE & Others	Others	Government	Others	Others
	Source of overseas Production Engineering Information	Europe	Europe & Others	Europe & Others	—	Europe & Others	Europe
	Attitude toward ISO9000	—	Planning	—	Planning	Planning	Introduced
	Purpose of Automation			Quality Costdown Labor saving	Cost reduction Labor Saving	Quality Labor saving	Labor saving
	Training of Employees	Outside	in house	in house & Outside	Non	—	Outside
Motivation	Activity of QC circle	Yes	For safety Yes	Yes	Non	Non	Non
CETINE	Technical Support by CETINE	<5 times	<5 times	<5 times	Don't know about the support	<5 times	<5 times
	Diagnosis by CETINE	<5 times	<5 times	<5 times	Never	<5 times	
	Expectation toward CETINE	Die	Diagnosis	Technical support Diagnosis Training	—	Die	Die
Quality	Inspection between processes	Yes	Partly	Yes	Yes	Yes	Yes
	Activity of Quality control	Data analysis Handling claim Training	Data analysis Handling claim	Data analysis Handling claim Training	Data analysis	Data analysis Training	Data analysis Training
Recent Tendency	Tendency of Annual Turnover	Slowly increasing	Slowly increasing	No change	Slowly increasing	Slowly increasing	Slowly increasing
	Tendency of Facilities Investment	Slowly increasing	No change	Slowly increasing	Slowly increasing	Slowly increasing	Slowly increasing
	Tendency of Nbr. of Employees	Slowly increasing	Slowly increasing	No change	Slowly increasing	Slowly increasing	Slowly increasing
	Tendency of profit per Annual turnover	—	No change	Slowly increasing	Decreasing	—	Slowly increasing

### 3-3 自転車バイク セクター

Answers of enquete for model and representative enterprise(Bicycle and Motor bic)

		SAHI (M)	CYCLD - PIECES(R)	HTPC (R)	SIMBY SID(R)	SACHO (R)
	Annual Turnover	<10MDT	<10MDT	<10MDT	10~30MDT	<10MDT
Human resources	Nbr of Employees	101<	<30	<30	<30	<30
	Pct of direct workers	71<	71<	71<	—	71<
	Pct of Indirect workers	15~30	15~30	15~30	—	15~30
	Nbr of Sales stuff	7~10	<3	<3	—	<3
	Nbr of R & D stuffs	<2	<2	<2	<2	<2
	Nbr of Production Engineers	7~10	<3	<3	—	<3
	Nbr of Maintenance stuff	3~4	0	1~2	1~2	1~2
Product	Pct of OEM Sales	11~30	31<	11~30	—	31<
	Nbr of New Product since Establishment	6<	6<	6<	6<	6<
	Competitiveness with overseas product	Yes	Yes In future	Yes	Yes In future	Yes In future
Finance	Annual recurring profit	50~100	<50	<50	50~100	<50
	Inventory per Annual Turnover	1~2	<0.5~1	<0.5~1	2<	0.5~1
	Purchase per Annual Turnover	60<	60<	60<	21~40	21~40
Production	Analysis of discrepancy between plan and result	3	7	3	7	Daily
	Implementation of work standard	Sometimes	Sometimes	Sometimes	—	—
	Operation rate of Facilities	61~70	61~70	61~70	<40	61~70
	Defect pct of main product	<5	6~10	<5	<5	<5
	Inventory between processes	7	0	3	3	0
	Reprocessing	5~10	5	5	0	5

		SAMI (M)	CYCLO - PIECES(R)	MTPC (R)	SIMBY SID(R)	SACHO (R)
	Age of Facilities	15Yrs 10Yrs 5Yrs	5Yrs	10Yrs 5Yrs	10Yrs	10Yrs
	Frequency of Maintenance	On breakdown 7days	On breakdown	On breakdown 7days	7days	On breakdown 7days
	Who Improves maintenance	In house	In house	In house & outside	In house	In house & outside
	Source of Local Production Engineering Information	Others	Others	Others	CETINE	Government Others
	Source of overseas Production Engineering Information	Europe & Others	Europe & Others	Europe	—	Europe & Others
	Attitude toward ISO9000	Interested in	Interested in	Interested in	Introducing	Interested in
	Purpose of Automation	Quality Costdown Labor saving	Quality Costdown Labor saving	Quality Costdown Labor saving	Quality	Quality Costdown
	Training of Employees	In house	In house	In house & outside	Non	In house
Motivation	Activity of QC circle	Doing	Doing	Doing	—	Non
CETINE	Technical Support by CETINE	Non	Non	<5 times	Non	Non
	Diagnosis by CETINE	Non	Non	<5 times	Non	Non
	Expectation toward CETINE	Technical support Training	Technical support Training	Technical support Training	Technical support	Technical support Training
Quality	Inspection between processes	Doing	Doing	Doing	Doing	Partly
	Activity of Quality control	Data analysis Handling claim Training	Data analysis Handling claim Training	Data analysis Training	Data analysis	Data analysis Training
Recent Tendency	Tendency of Annual Turnover	Slowly increasing	Slowly increasing	More than Doubled	Slowly increasing	Slowly increasing
	Tendency of Facilities Investment	Slowly increasing	Slowly increasing	Slowly increasing	Slowly increasing	Slowly increasing
	Tendency of Nbr. of Employees	More than Doubled	Slowly increasing	Slowly increasing	Slowly increasing	Slowly increasing
	Tendency of profit per Annual turnover	More than Doubled	Slowly increasing	Slowly increasing	Slowly increasing	Slowly increasing

### 3-4 生産財 セクター

Answers of enquete for model and representative enterprise(Machine Component)

		Hydromeca (H)	Sicame (R)	Meghreb - Moteur(R)	AM - Sud (R)	Tunicom (R)
	Annual Turnover	1,700	10,200	7,500	2,500	3,000
Human resources	Nbr of Employees	70	220	63	80	70
	Pct of direct workers	<30	71<	—	<30	51~70
	Pct of Indirect workers	<15	15~30	—	<30	15~30
	Nbr of Sales stuff	<3	4~6	4~6	<3	4~6
	Nbr of R & D stuffs	<2	<2	<2	<2	3~5
	Nbr of Production Engineers	4~6	11<	4~6	4~6	4~6
	Nbr of Maintenance stuff	1~2	5<	1~2	1~2	5<
Product	Pct of OEM Sales	<10	—	<10	31<	11~30
	Nbr of New Product since Establishment	6<	—	6<	3~5	6<
	Competitiveness with overseas product	Yes	—	Yes	—	Yes
Finance	Annual recurring profit	87	185	—	170	50
	Inventory per Annual Turnover	2< Month	2<	2<	<0.5~1	2<
	Purchase per Annual Turnover	41~60	—	21~40	41~60	—
Production	Analysis of discrepancy between plan and result	Weekly	Daily	—	Daily	Monthly
	Implementation of work standard	Exist but not used	Sometimes	Non	Non	Sometimes
	Operation rate of Facilities	40	70	55	67	70
	Defect pct of main product	0.5	0.7	2.0	8.0	7.0
	Inventory between processes	1week<	<1week	1week<	0	3days
	Reprocessing	5~10	<5	Non	Non	—

		Hydromeda (H)	Sicama (R)	Meghreb - Moteur(R)	AM - Sud (R)	Tunicom (R)
	Age of Facilities	15 Yrs	15 Yrs	15 Yrs	10 Yrs	10~5 Yrs
	Frequency of Maintenance	Weekly	On breakdown	On breakdown	On breakdown	On breakdown
	Who Improves maintenance	In house	In house	In house	In house	In house
	Source of Local Production Engineering Information	Others	Government CETIME	Others	CETIME	CETIME Others
	Source of overseas Production Engineering Information	Others	Europe	Europe	Europe	Europe
	Attitude toward ISO9000	Planning	Introduced	Interested in	Interested in	Planning
	Purpose of Automation	Quality Costdown	Quality Costdown	No idea	Quality Costdown	Quality Costdown Labor saving
	Training of Employees	In house & outside	In house & outside	Government In house	In house	In house
Motivation	Activity of QC circle	Non	For safety QC circle	Non	Non	QC circle on going
CETIME	Technical Support by CETIME	<5 times	5 times<	Non	<5 times	<5 times
	Diagnosis by CETIME	<5 times	<5 times	Non	—	Non
	Expectation toward CETIME	Technical support Diagnosis Training	Die	Technical support Diagnosis Training	Diagnosis	Technical support Diagnosis Training
Quality	Inspection between processes	On going	On going	On going	Partly	On going
	Activity of Quality control	Data analysis	Data analysis Handling claim	Data analysis Handling claim	—	Data analysis Handling claim
Recent Tendency	Tendency of Annual Turnover	Decreasing	Slowly increasing	Slowly increasing	Decreasing	Slowly increasing
	Tendency of Facilities Investment	Slowly increasing	Slowly increasing	No change	—	Slowly increasing
	Tendency of Nbr. of Employees	No change	Slowly increasing	Slowly increasing	Slowly increasing	Slowly increasing
	Tendency of profit per Annual turnover	Slowly increasing	Slowly increasing	Slowly increasing	No change	Slowly increasing



### 3-5 家電 セクター

Answers of enquete for model and representative enterprise(Home Appliance)

		FRIGAN (R)	SGE (R)	Sotufem (N)	Coala (R)	Almia (R)
	Annual Turnover	18,000	12,500	9,693	1,200	—
Human resources	Nbr of Employees	150	120	151	47	200
	Pct of direct workers	—	71<	51~70	71<	71<
	Pct of Indirect workers	<15	15~30	<15	<15	<15
	Nbr of Sales stuff	4~6	4~6	4~6	<3	7~10
	Nbr of R & D stuffs	<2	<2	3~5	<2	<2
	Nbr of Production Engineers	4~6	4~6	4~6	<3	4~6
	Nbr of Maintenance stuff	1~2	3~4	3~4	1~2	1~2
Product	Pct of OEH Sales	31<	31<	0	0	31<
	Nbr of New Product since Establishment	6<	6<	6<	6<	6<
	Competitiveness with overseas product	Competitive with overseas products	Competitive with overseas products	Competitive with overseas products	Competitive with overseas products	Competitive with overseas products
Finance	Annual recurring profit	120	50	—	43	—
	Inventory per Annual Turnover	<0.6 Month	<0.6	—	<0.6~1	<1~2
	Purchase per Annual Turnover	21~40	<20	—	41~60	41~60
Production	Analysis of discrepancy between plan and result	3days~1week	Monthly	Daily	Daily	Monthly
	Implementation of work standard	Exist but not used	Exist but not used	Sometimes	Sometimes	Sometimes
	Operation rate of Facilities	75	70	75	60	80
	Defect pct of main product	4	3	12	7	7
	Inventory between processes	0~3days	0~3days	<1week	0	1week<
	Reprocessing	<5	<5	5~10	0	<5

		FRIGAN (R)	SGE (R)	Sotufen (R)	Coala (R)	Almia (R)
	Age of Facilities	15Yrs 10Yrs	10Yrs	10Yrs	10Yrs <5Yrs	15Yrs 10Yrs 5Yrs
	Frequency of Maintenance	Weekly Monthly	On breakdown tweek	On breakdown 3Month	On breakdown	On breakdown Monthly
	Who Improves maintenance	—	In house	In house	In house & outside	In house & outside
	Source of Local Production Engineering Information	Others	Others	Government CETIME	Others	Others
	Source of overseas Production Engineering Information	Others	Europe & Others	Europe	Europe & Others	Europe & Others
	Attitude toward ISO9000	Interested in	Interested in	Planning	Interested in	Planning
	Purpose of Automation	Quality Costdown Labor saving	Quality Costdown	Quality Costdown Labor saving	Quality Costdown labor saving	Quality Costdown labor saving
	Training of Employees	In house	In house	Government In house	In house	In house & outside
Motivation	Activity of QC circle	For safety QC circle	For safety QC circle	Non	—	QC circle
CETIME	Technical Support by CETIME	Non	Non	<5 times	Did not know the help	<5 times
	Diagnosis by CETIME	Non	Non	<5 times	Did not know the help	Non
	Expectation toward CETIME	Education	Education	Technical support Diagnosis	Technical support Education	Technical support Education
Quality	Inspection between processes	Partly	Partly	Planning	On going	On going
	Activity of Quality control	Data analysis Handling claim	Data analysis Handling claim	Data analysis Handling claim Training	Data analysis Training	Data analysis Handling claim Training
Recent Tendency	Tendency of Annual Turnover	Slowly increasing	Slowly increasing	Slowly increasing	Slowly increasing	No change
	Tendency of Facilities Investment	Slowly increasing	Slowly increasing	Slowly increasing	Slowly increasing	Slowly increasing
	Tendency of Nbr. of Employees	Slowly increasing	Slowly increasing	Decreasing	Slowly increasing	No change
	Tendency of profit per Annual turnover	Slowly increasing	Slowly increasing	No change	Slowly increasing	No change

### 3(1)

## 金物セクター ミニセミナー 資料

### SEMINAR で実施した項目と内容

活動の目的、進め方についてより理解を深め徹底させるためミニセミナーを行った。

#### 1 Mental Innovation(Circle activities)

##### (a) 高い生産性を保つためのサークル活動

我々調査団が来訪した目的・実施しようとしていること。実行すればどのような良くなるか。Fonderie J.F の生産現場で発生している問題点、特に歩留向上の例を用いて説明。次いでサークル活動と方法、サークルチーム編成、チームごとのテーマと実施項目を資料で説明。

##### (b) 意識改革

作業長と作業者が日常実施している作業実態の中から実例をとりあげて問題点と改善方法を説明。双方協力し合って仕事をするよう要請した。

##### (c) 生産性・コストミニマムとはどういうことか。

鑄造作業の中で Net time と Idle time の例をあげて説明

##### (d) 金型保全グループのサークル活動

金型整備工場における金型管理方法、整備記録のとり方。3S の進め方について資料にもとづいて説明。

#### 2 鑄造作業における金型取替の時間観測および段取改善説明

金型取替作業の実態を把握するために、時間観測・ビデオによる調査を'97.9.19

(金) 実施し、その結果を金型取替作業に入る前の事前準備が不十分なために

- ・ 作業待時間が多い。
- ・ 作業者の無駄な動きが多い。

このために Loss Time がとても多い。

ということを作業長・管理者を集め説明。改善の余地があることを具体的な例をあげて

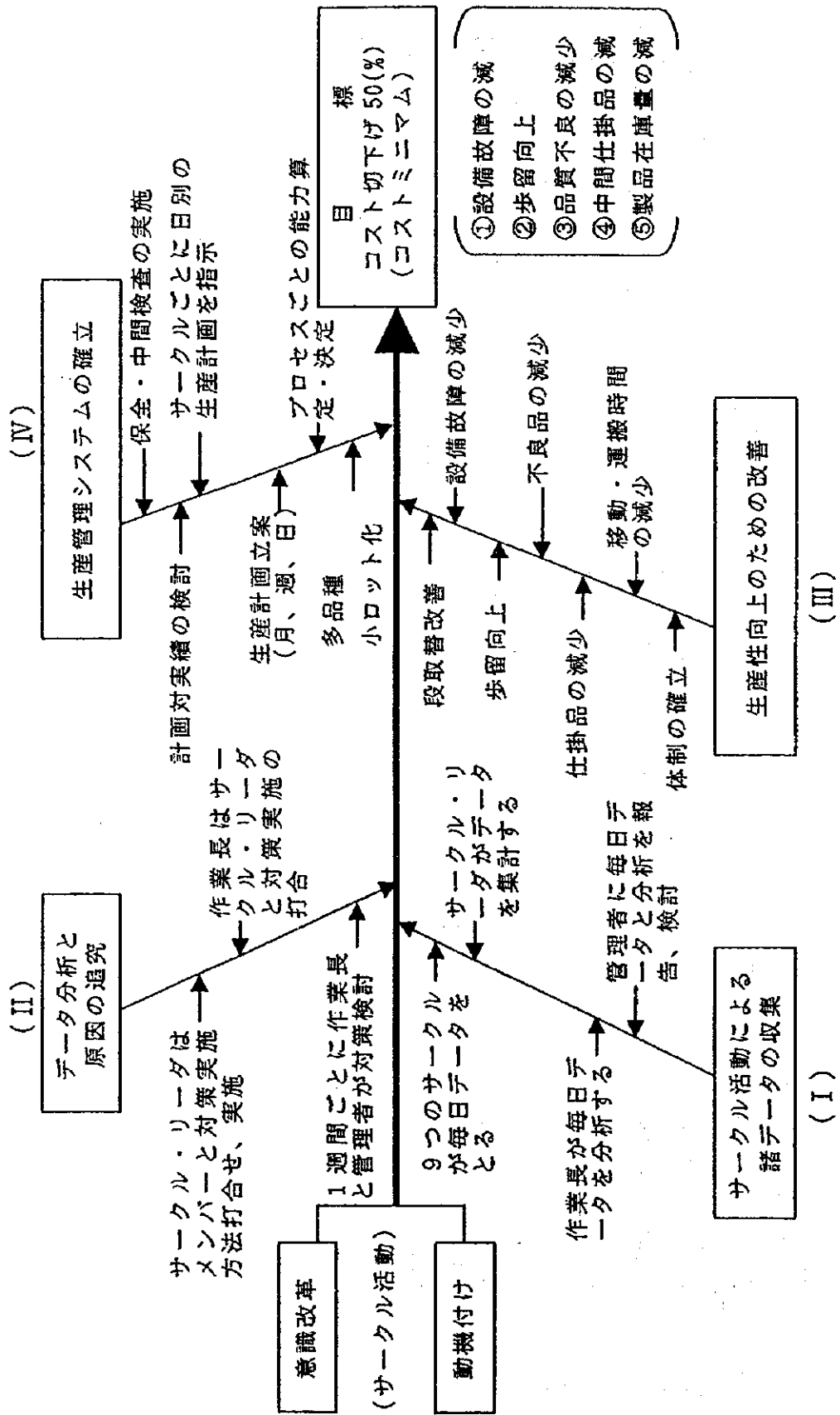
説明した。

この金型取替時間短縮により、金型取替が容易となり設備の稼働率向上が期待できる。多品種少量生産工程では生産ラインのフレキシビリティの向上が競争力向上やコスト切下げに大いに役立つことを理解させた。この改善結果は第3次調査での同作業の時間観測

の結果所要時間が半減できたことが確認できた。

さて、このようなサークル活動が会社のコスト切下げ、競争力強化にどう結びつけて行けばよいか。またマスタープランとの関連性などは次ページの図(サークル活動の応用ステップ(FONDERIE J.F))に示してあるので参照してほしい。

サークル活動の応用ステップ (FONDERIE T.F)



## 3(2)

自転車・バイクセクター

ミニセミナー 資料

〔自転車、バイクの製造品質〕

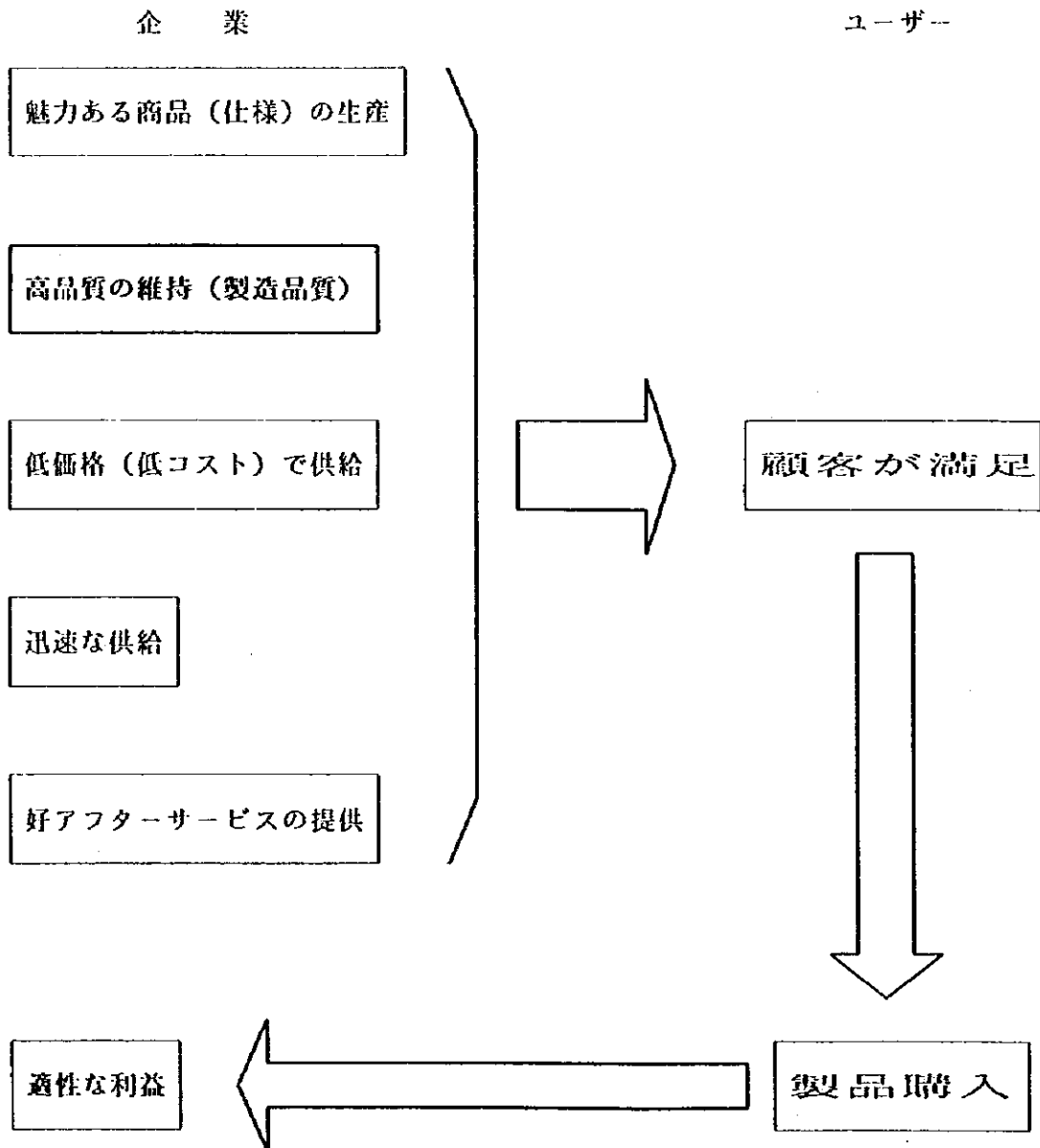
### 目 次

#### 企業継続の手段

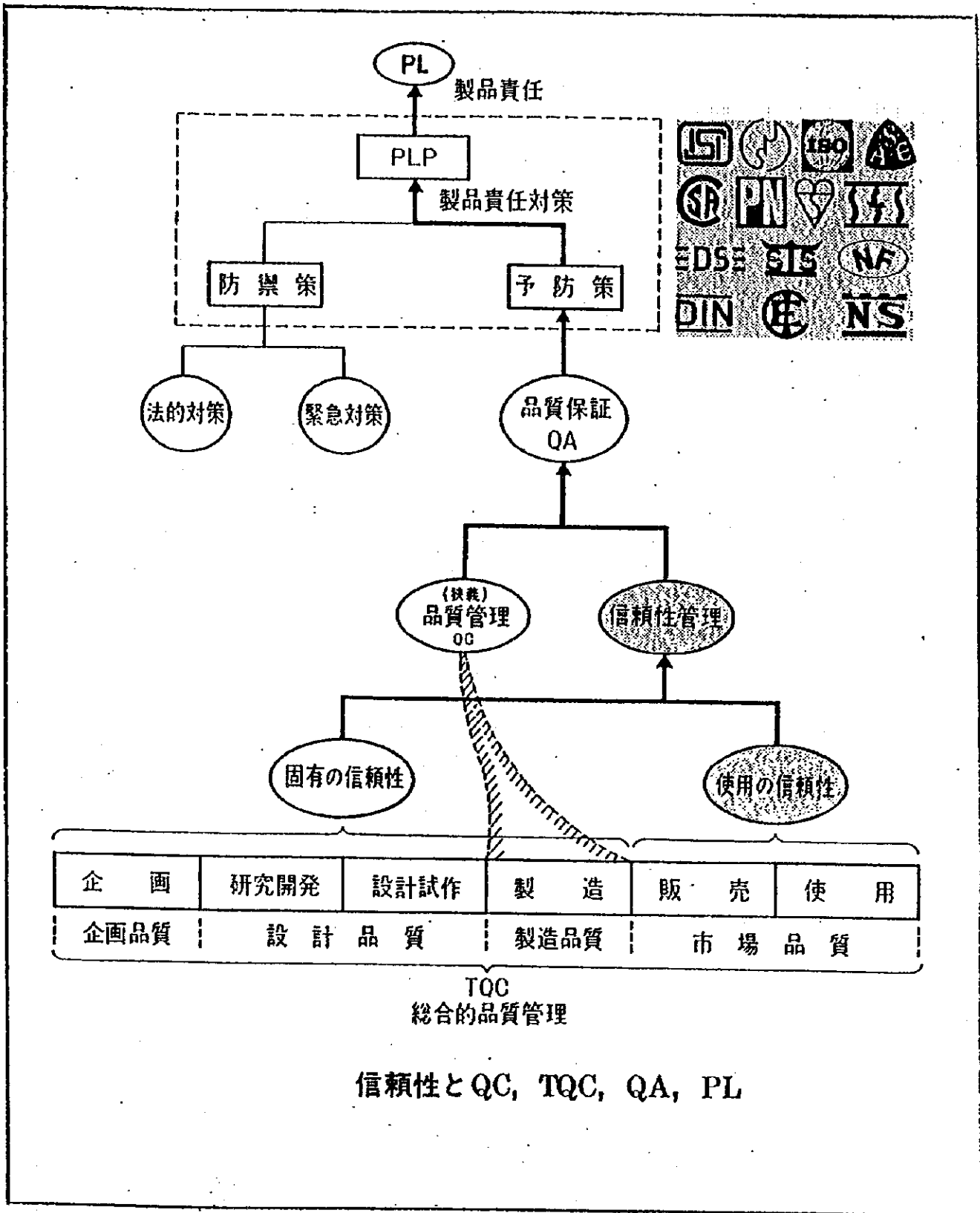
#### ・高品質の維持（製造品質）

1. 信頼性とプロダクトライアビリティ	1
・信頼性プログラムのフローチャート	2
・信頼性のPDCA	3
2. 製造の各工程で品質は作られる	4
・作業標準の必要性	
作業標準の内容	5
作業標準15の要件	6
作業標準作成のポイント	7
・工程QC表の必要性	8
3. 不良対策	
・不良原因の追及と不良対策	9
・不良対策のプロセス	10

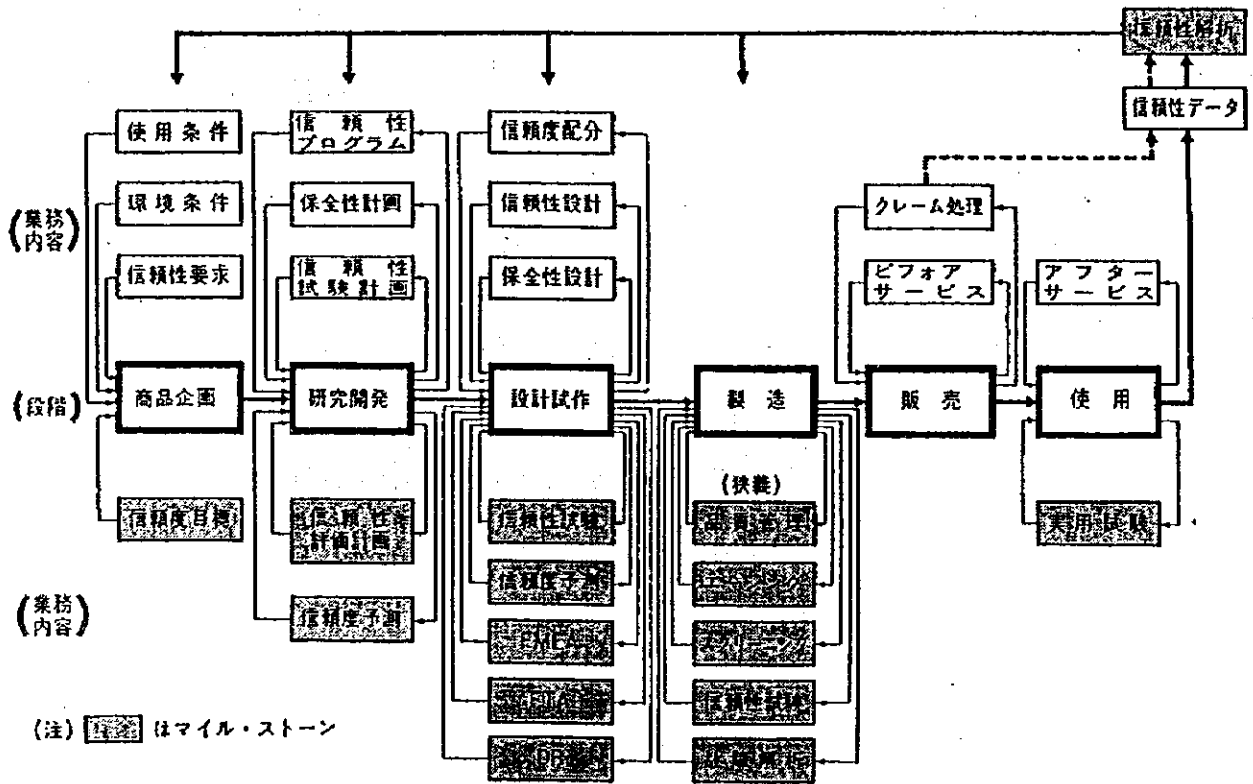
企業継続の手段



# 1 信頼性とプロダクト リライアビリティ

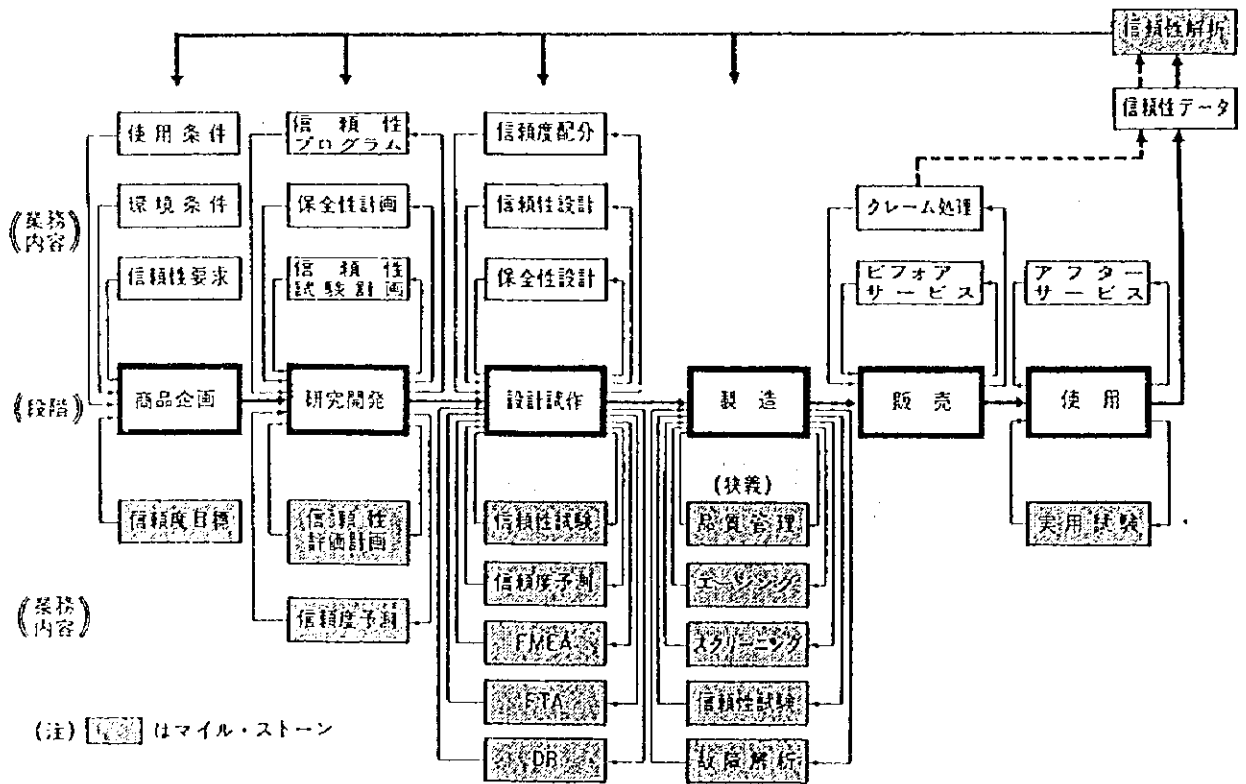


# 信頼性プログラムのフローチャート

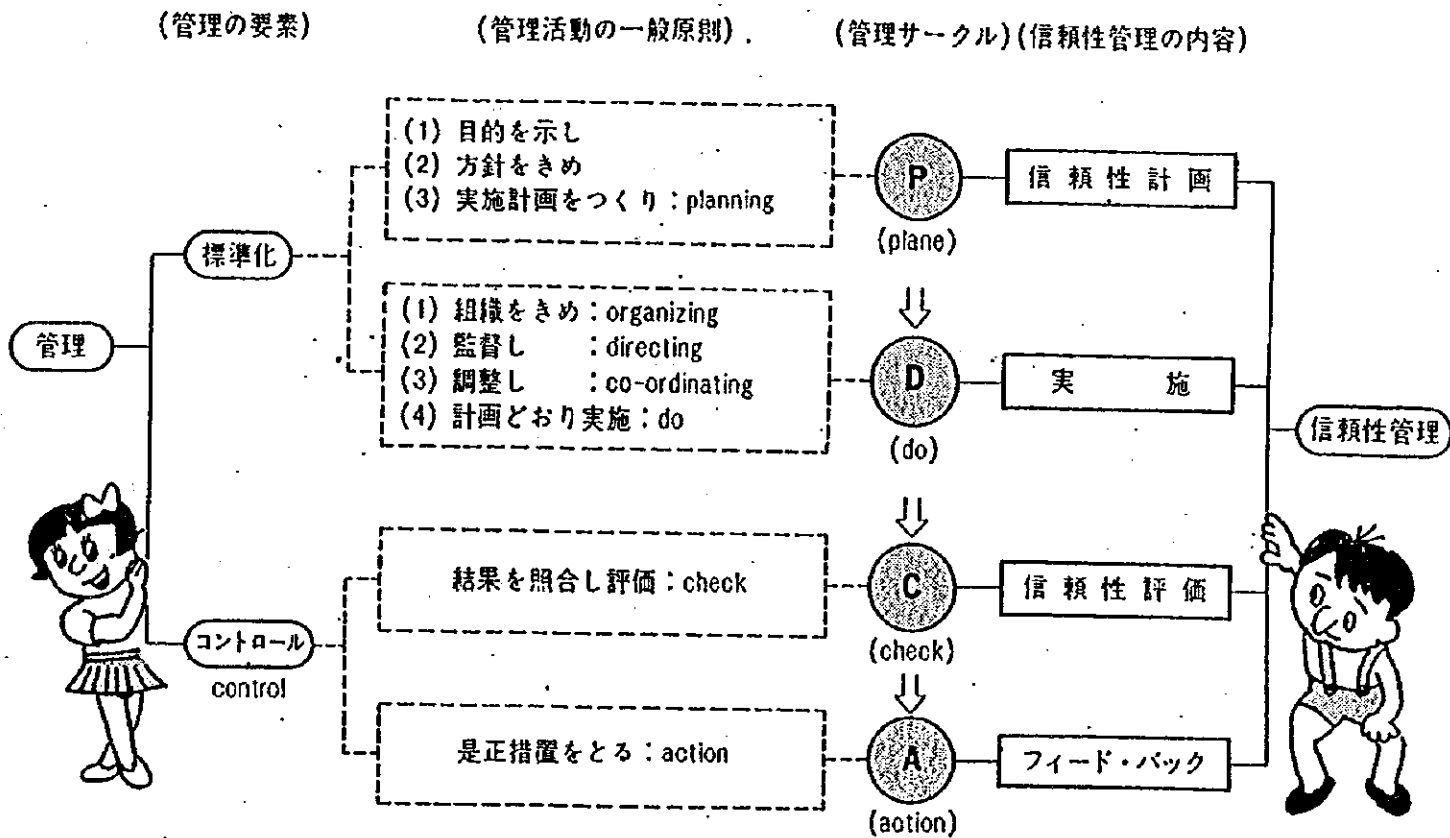




# 信頼性プログラムのフローチャート



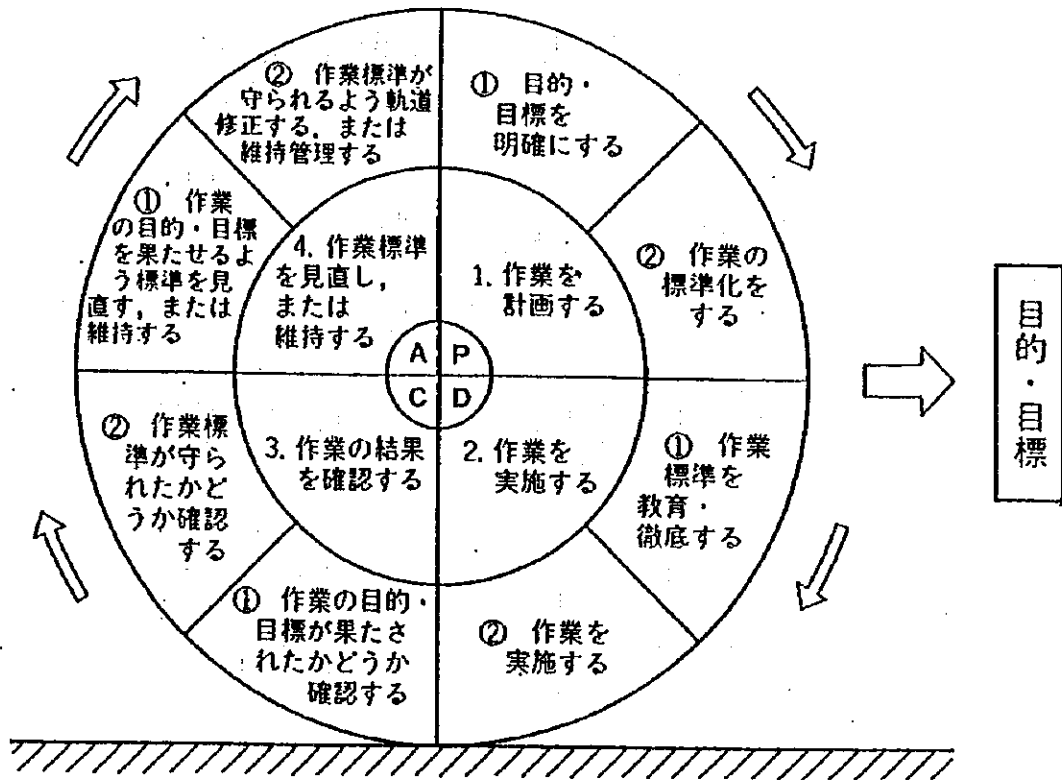
# 信頼性のPDCA



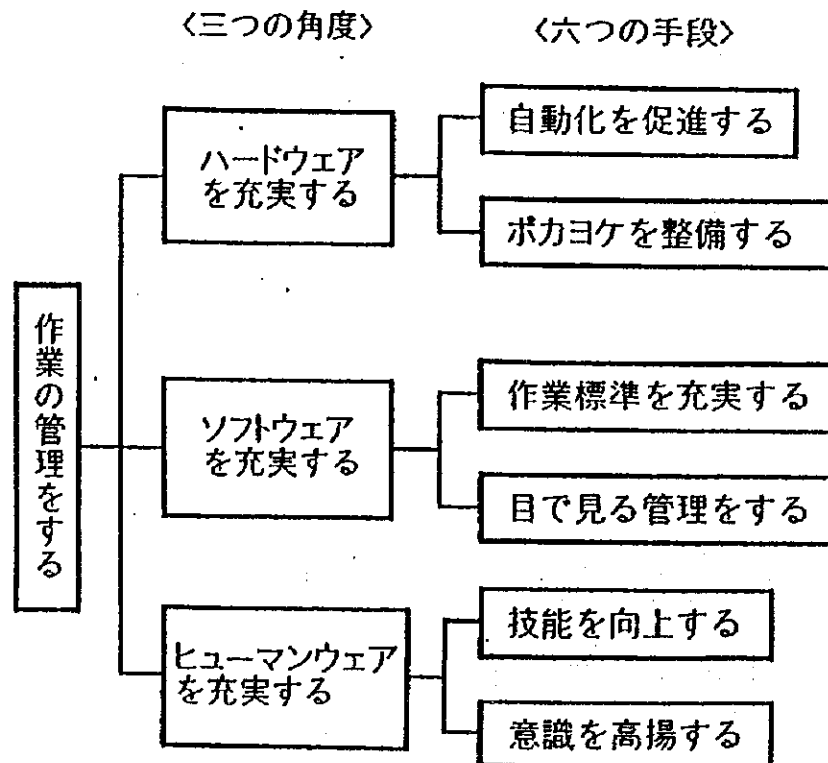
信頼性のPDCA

## 2 製造の各工程で品質は作られる

### 作業標準 と 作業管理



### 作業管理の基本型



## 作業標準の内容

作業標準の内容は、目的・用途・対象などによって異なる。目的・目標が具体的であればおのずから必要な内容は決定される。すべての目的を達成するということでは、かえって重点を失い効果が薄くなる可能性もある。いずれにしても、重要な内容を落とすことなく作成することが必要である。

一般的には以下の内容を記載している。

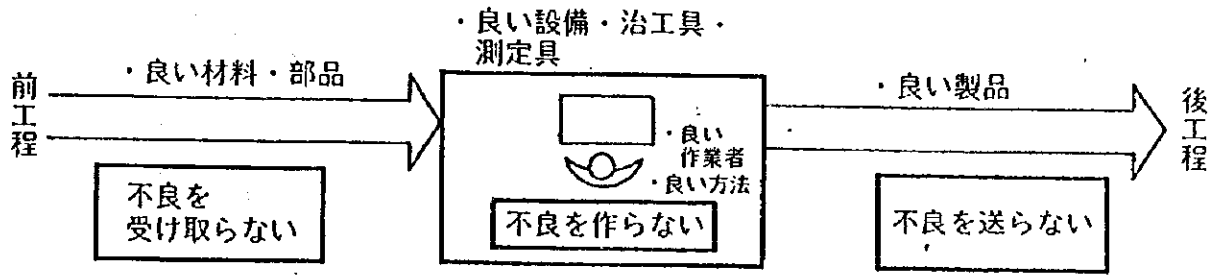
- ① 品名・品番・工程名・部課名
- ② 原材料・部品
- ③ 設備・機械・金型・治工具・計測器
- ④ 作業方法・手順とポイント [段取り・調整・保全(給油・点検・清掃・保守を含む.)]
- ⑤ 管理項目(点検項目)・管理方法(点検方法)
- ⑥ 品質特性・検査方法(不良品の処置)
- ⑦ 原単位(工数・材料・エネルギーなど)
- ⑧ 異常基準と異常時の処置
- ⑨ 作業人員と作業員の資格
- ⑩ 安全注意事項と保護具(安全原則, 事故の場合の処置を含む.)
- ⑪ 作成・決裁・改訂者の押印
- ⑫ 作成・改訂期日(改訂理由を含む.)

## 作業標準 15 の要件

### 作業標準 15 の要件

- 
- ① 作業者の作成段階での参画を得る。
  - ② ポイントの絞り込みをし、だれもが実行できる標準とする。
  - ③ 現場での検証をし、守れる標準にする。
  - ④ 段取り・異常・運搬など、標準化困難な作業を改善し標準化する。
  - ⑤ 管理項目・管理方法、品質特性・検査方法を明確化する。
  - ⑥ 改善・維持・改訂を継続し、常に未完成と考える。
  - ⑦ 自動化・ポカヨケ・目で見える管理を考えた標準化をする。
  - ⑧ 過去の失敗経験・予測される問題点を事前解決した標準化をする。
  - ⑨ 目的・目標を確実に果たせる標準に作り上げる。
  - ⑩ 他の標準類と矛盾しない標準とする。
  - ⑪ 具体的・客観的で読み手に親切な標準とする。
  - ⑫ 責任と権限が明確にされていること。
  - ⑬ 関係者に認められ、権威付けがされていること。
  - ⑭ 形式主義に走らない。
  - ⑮ 改善を阻害しない。
-

## 作業標準作成のポイント



工程	不良を受け取らない	例	(原因) 工程の管理項目	(結果) 品質特性	規定値	管理方法・検査方法	異常時の処置
(前工程)	受け取らない	プレス	—	寸法 A B 外観 キズ バリ	$\bigcirc\bigcirc \pm \bigcirc \text{ mm}$ $\Delta\Delta \pm \Delta \text{ mm}$ 限度見本を超えない	作業者 1ロットにランダムに $n=5$ $c=0$	前工程で 全数選別
自工程	作らない	溶接	冷却水 溶接電流 通電時間 保持加圧時間 電極加圧 (エア圧力ゲージ目盛) チップ形状	—	2 l/分 9 300 A 16~ (タイマ目盛 67) 10~ (タイマ目盛 18) 250 kg (3.7 気圧) 先端最大径 6 mm	作業者始業時確認 タイマなどセット (監督者始業時確認) (電流・通電時間 の監視装置) スポットロン (ポカヨケ)	監督者へ報告
(後工程)	送らない	(塗装)	—	溶着状態 溶接点数	破断面 (限度見本) $\bigcirc\bigcirc$ 点	作業者・初物 定時 終物 $n=1$ $c=0$ エラーコン (ポカヨケ) (スポット点数 の監視装置)	・前回チェック までの全数 選別 ・監督者へ報告

### QC 工程表式作業標準 (例)

# 工程表の必要性

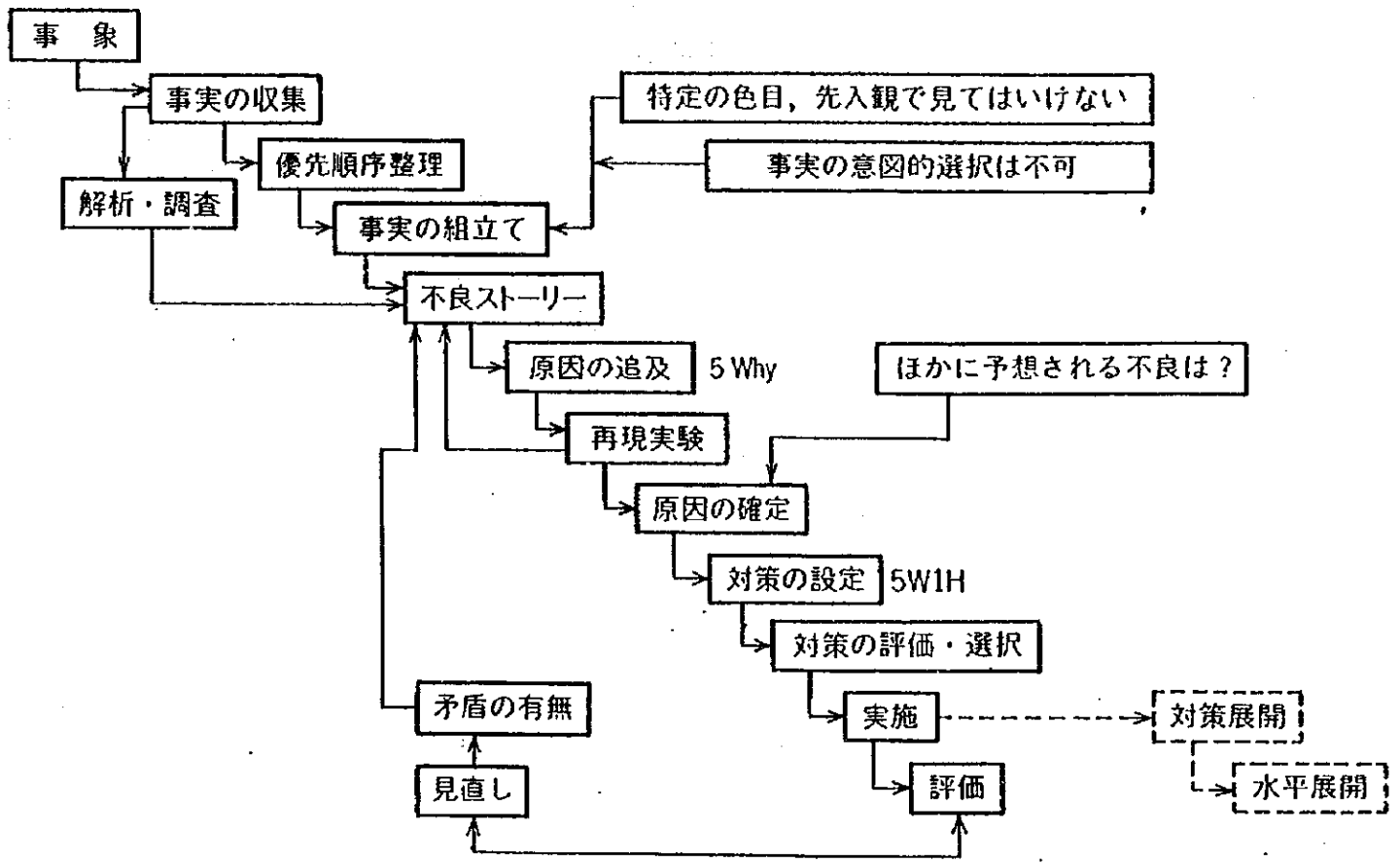
No	作成の手順	ポイント・他																																		
①	対象製品・工程を選ぶ	<ul style="list-style-type: none"> <li>●重点製品・工程に決定する</li> </ul> <p style="text-align: center;">品質特性</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>A</td> <td>B</td> <td>C</td> <td>D</td> <td>E</td> <td>F</td> <td></td> </tr> <tr> <td>工程 1</td> <td>○</td> <td>*</td> <td>○</td> <td>△</td> <td>△</td> <td>*</td> <td rowspan="3">○: 強関連 △: 弱関連 ×: 無関連</td> </tr> <tr> <td>工程 2</td> <td>*</td> <td>○</td> <td>*</td> <td>○</td> <td>○</td> <td>*</td> </tr> <tr> <td>工程 3</td> <td>△</td> <td>△</td> <td>△</td> <td>*</td> <td>*</td> <td>○</td> </tr> </table> <ul style="list-style-type: none"> <li>●</li> </ul> <p style="text-align: center;">品質特性</p> <ul style="list-style-type: none"> <li>●</li> </ul> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>管理項目</td> <td>原因となる項目 例: 温度・圧力</td> </tr> <tr> <td>品質特性</td> <td>結果となる項目 例: 寸法・強度</td> </tr> </table> <ul style="list-style-type: none"> <li>● FMEA (故障モード及び影響度解析) の考え方を 入れる</li> </ul>		A	B	C	D	E	F		工程 1	○	*	○	△	△	*	○: 強関連 △: 弱関連 ×: 無関連	工程 2	*	○	*	○	○	*	工程 3	△	△	△	*	*	○	管理項目	原因となる項目 例: 温度・圧力	品質特性	結果となる項目 例: 寸法・強度
	A		B	C	D	E	F																													
工程 1	○		*	○	△	△	*	○: 強関連 △: 弱関連 ×: 無関連																												
工程 2	*		○	*	○	○	*																													
工程 3	△		△	△	*	*	○																													
管理項目	原因となる項目 例: 温度・圧力																																			
品質特性	結果となる項目 例: 寸法・強度																																			
②	製品規格を明確にする																																			
③	どの工程でどの品質特性が作り込まれるか、確認するかを明確にする																																			
④	品質特性ごとに全工程ごとの特性要因図を作成する。③→④は2, 3回繰り返す																																			
⑤	管理項目・管理方法及び品質特性・検査方法を重点的に選択し一覧化する																																			
⑥	実際に製品を作る前, 作りながら, 作ってから問題点を見つけ解決する																																			
⑦	QC 工程表を作成する																																			

## QC 工程表作成の手順とポイント

部品名 工程名 (機械)	製品品質特性 外觀 寸法 曲げ 耐圧性 破壊強度	管理・点検方法						検査方法								備考		
		管理項目 (点検項目)	規定値	管理責任者	管理周期	計測器	異常時の処置	品質特性	検査規格	検査者	検査用具	初物	定期	終物	サンプル数	合格判定個数	資料	関連規格
材料 受入検査	○△○○							外觀 キズ	表面 OXOXO 1個以内	作業者	限度 見本	5個 ロット			115	110	○○	○○
(プレス) 絞り	○○△×	メイン エグゼク ション 金型寸法 A部	350 ± 5	作業者	1回 6か月 1回 5万個	計測器		寸法 A部	○○ ± 0.1								○○	○○
	○○△×		0.0 ± 0.1					寸法	○○ ± 0.1									○○

## QC 工程表作成例

# 不良原因の追及と不良対策



## 原因の追及・対策の一連の過程

集めた事実  
症状

- A } いずれが主体で
- B } 従属か
- C } 何が引金で
- } 何がそれに
- } 伴う付随現象か
- } .....

それで事故展開の  
ストーリーを作成  
すると矛盾があるか

特殊性—限定的—範囲を限った限定的対応  
一般性—水平展開が絶対的に必要  
再発性がある

矛盾がある場合は  
ストーリーの再組立て

必要なら再現  
テスト

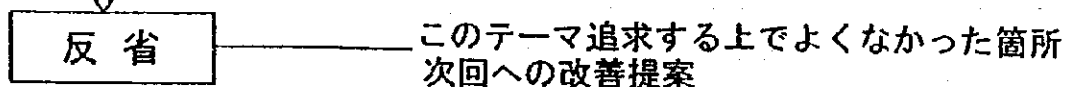
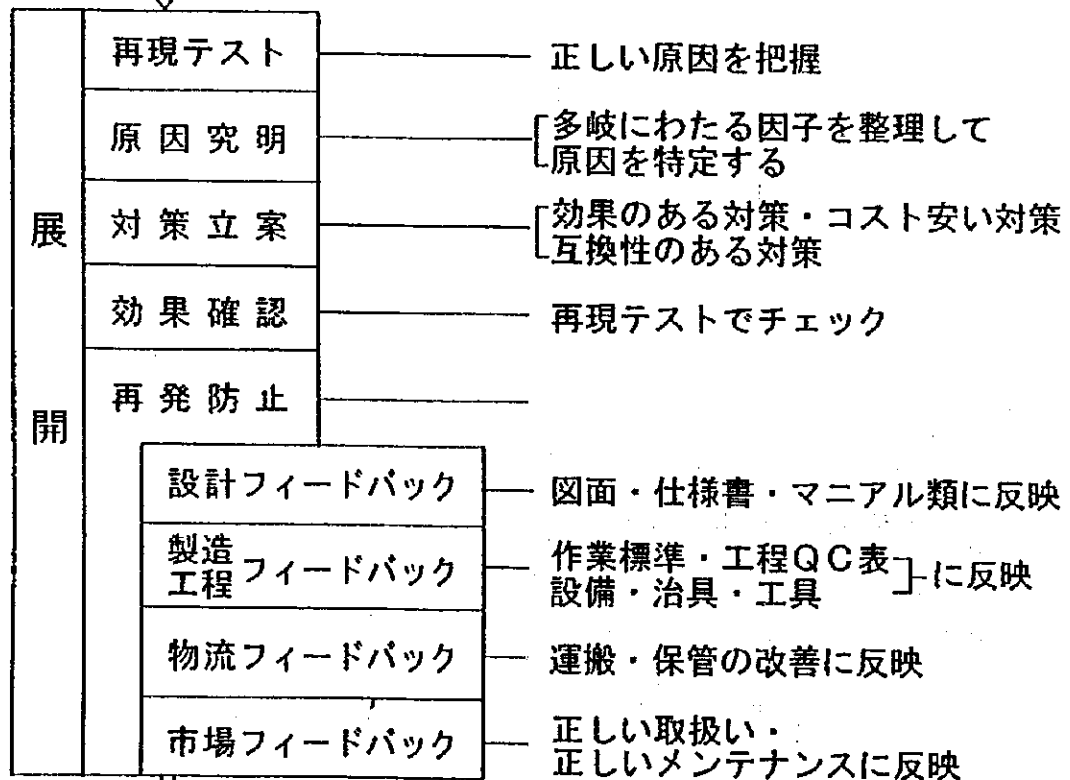
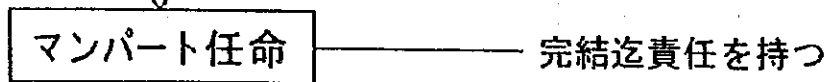
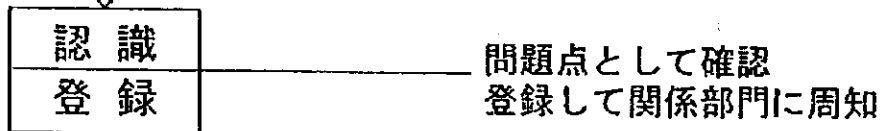
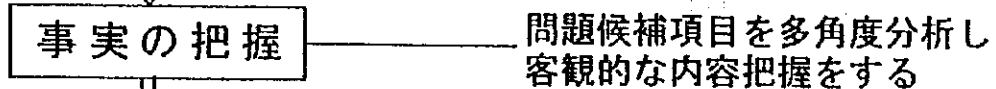
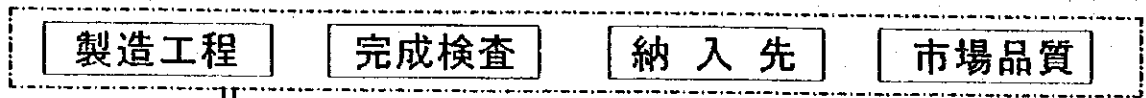
別の見落としした要因の  
追及  
(これでわかる  
こともある)

原因・メカニ  
ズムの確定

## 不良ストーリーの組立て

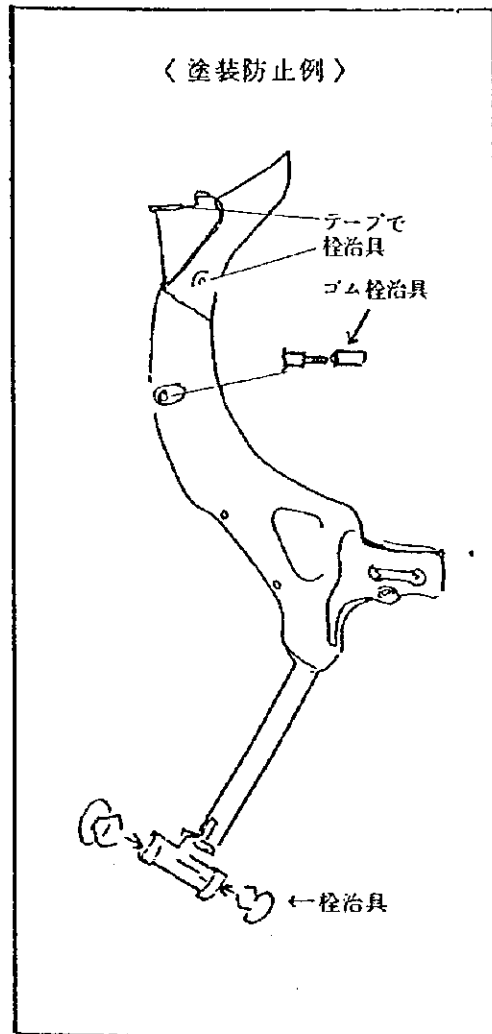
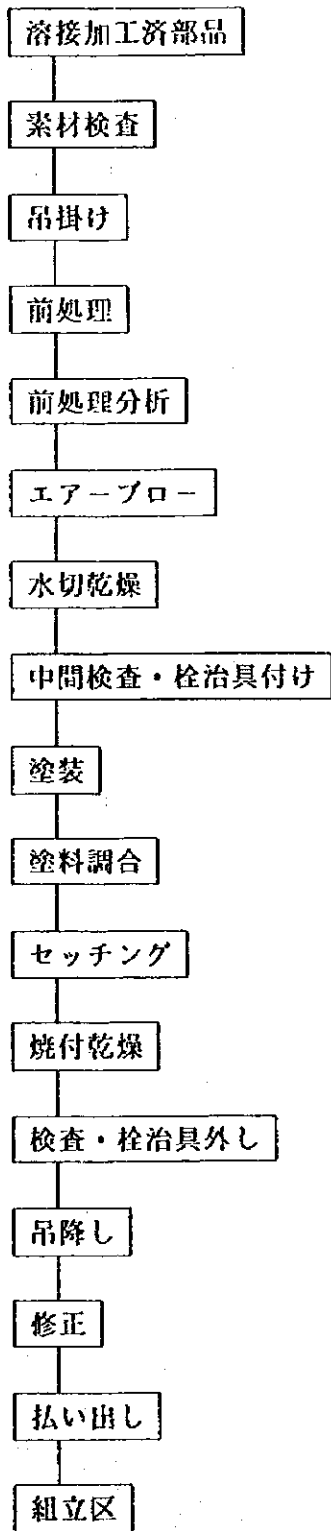


## ・不良対策のプロセス



Attached-1

FRAME BODYの塗装工程系列

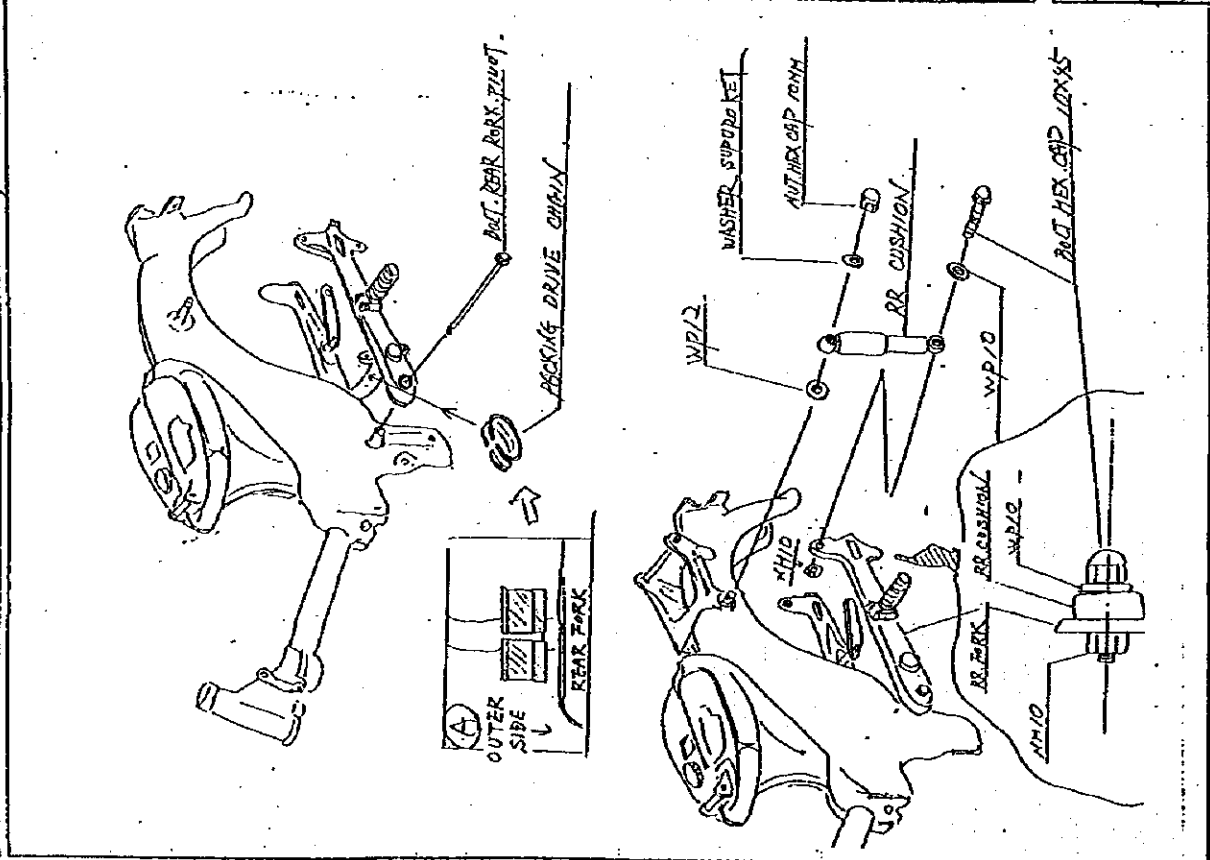


Attchd - 2

# OPERATION STANDARD FOR FRAME BODY

PROCESS: RR FORK AND RR CUSHION INSTALLATION, TIGHTENING

NO	OPERATION	PROCESS	QUALITY STANDARDS	WORKING POINTS
1	INSTALL RR FORK TO FRAME BODY		INSERT PIVOT BOLT FROM L SIDE	WEAR COTTON GLOVES
2	INSTALL CHAIN CASE PACKING		DO NOT INSTALL REVERSELY	TIRES SIDE SHOULD BE OUTSIDE (FIG. A)
3	INSTALL WP 12 TO R/L SIDES			
4	INSTALL REAR CUSHION TO R/L SIDES		DO NOT INSTALL REVERSELY	DENTED PART SHOULD BE INSIDE
5	TEMPORARILY INSTALL NUT CASES TO R/L SIDES			
6	SUB ASSEMBLE LOWER BOLTS AND WASHERS, THEN TIGHTEN TO R/L REAR FORKS			FOR L SIDE ONLY, TIGHTEN AFTER DRIVE CHAIN IS INSTALLED
7	TIGHTEN 10MM NUTS FROM R/L INSIDES		SPECIFIED TORQUE 200~300 kg-cm	
8	TIGHTEN UPPER R/L NUTS		SPECIFIED TORQUE 200~300 kg-cm	



NO	PART NAME	PART NO.	QTY	PART NAME	PART NO.	QTY

DATE	ITEMS	SIGN	DATE	ITEMS	SIGN