

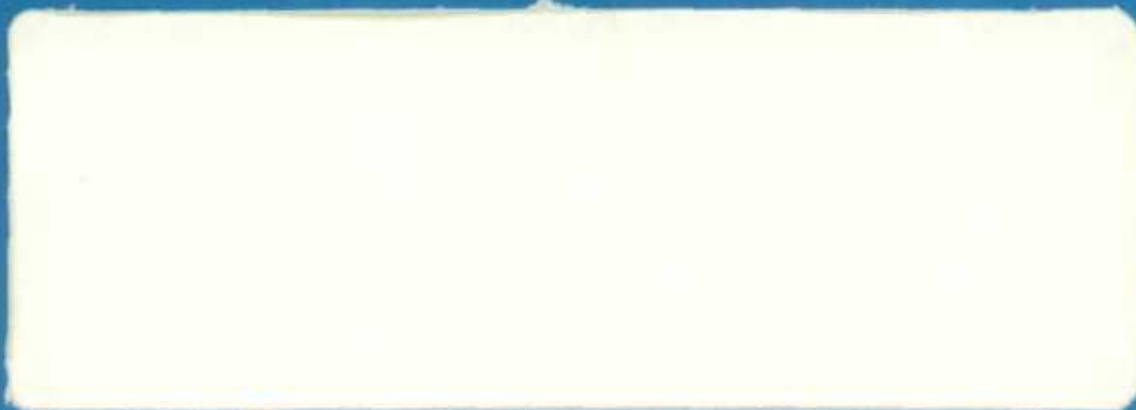


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**Science, Technology
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**Division des sciences,
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Survey of Manufacturing Technologies - 1989

Statistical Tables

Science, Technology and Capital Stock Division
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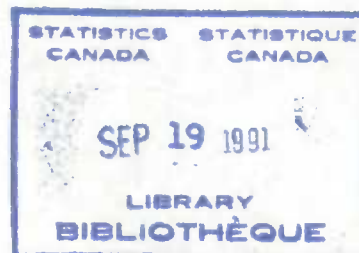




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- 40 Where is most of the formal training done for your staff in this plant? (establishment weighted)
- 41 How difficult has it been to hire skilled personnel to work with the technologies used in this plant? (establishment weighted)
- 42 For those technologies in SECTION A that are used in this plant, have any been modified to improve their output? (establishment weighted)
- 43 For goods of own manufacture, what was the percentage of the value of shipments exported from this plant in the last year? (shipment weighted)
- 44 Where is most of the research and development work done for this plant? (shipment weighted)
- 45 Where is most of the formal training done for your staff in this plant? (shipment weighted)
- 46 How difficult has it been to hire skilled personnel to work with the technologies used in this plant? (shipment weighted)
- 47 For those technologies in SECTION A that are used in this plant, have any been modified to improve their output? (shipment weighted)

ANNEXES

- A Survey of Manufacturing Technologies - Survey form
- B Definition of terms for section A of questionnaire

Table 1. The technologies
Tableau 1. Les technologies

Technology Group	Technology
Groupe technologique	Technologie
1. Design and engineering Conception et ingénierie	
1.1	Computer aided design (CAD) and/or computer aided engineering (CAE) Conception assistée par ordinateur (CAO) et/ou ingénierie assistée par ordinateur (IAO)
1.2	CAD output used to control manufacturing machines (CAD/CAM) Résultats CAO servant au contrôle des machines de fabrication (CAO/FAO)
1.3	Digital representation of CAD output used in procurement activities Représentation numérique des résultats CAO servant au service des achats
2. Fabrication and assembly Fabrication et assemblage	
2.1	Flexible manufacturing cell(s) (FMC) or systems (FMS) Cellule(s) ou système de fabrication flexible (CFF) (SFF)
2.2	NC/CNC machine(s) Machines CN/CNI
2.3	Materials working laser(s) Laser servant à la fabrication de matériel
2.4	Pick and place robot(s) Robots de mise en place
2.5	Other robots Autres robots
3. Automated material handling Manipulation automatisée du matériel	
3.1	Automated storage and retrieval system (AS/RS) Système de stockage et d'extraction automatisé (SSEA)
3.2	Automated guided vehicle systems (AGVS) Système de véhicules guidés automatiques (SVGA)

**4. Automated sensor based inspection
and/or testing equipment**

**Matériel d'inspection, de détection et de tests
informatiques**

- 4.1 Performed on incoming or in process materials
Utilisation aux étapes de l'entrée ou dans le
procédé de fabrication
- 4.2 Performed on final product
Exécution sur le produit final

**5. Communications and control
Communications et contrôle**

- 5.1 Local area network for technical data
Réseau local pour les données techniques
- 5.2 Local area network for factory use
Réseau local pour l'usine
- 5.3 Inter-company computer network linking
plant to subcontractors.
Réseau informatique entre entreprises reliant
les usines aux sous-contractants, fournisseurs
ou clients
- 5.4 Programmable controller(s)
Contrôleurs programmables
- 5.5 Computer(s) used for control on the factory floor
Ordinateurs servant au contrôle dans le procédé
de fabrication

**6. Manufacturing information systems
Système d'information relatif à la fabrication**

- 6.1 Materials Requirement Planning (MRP)
Planification des besoins matières (PBM)
- 6.2 Manufacturing Resource Planning (MRP II)
Planification des ressources en fabrication
(PBM II)

**7. Integration and control
Contrôle et intégration**

- 7.1 Computer integrated manufacturing (CIM)
Fabrication intégrée par ordinateur (FIO)
- 7.2 Supervisory control and data acquisition (SCADA)
Contrôle et acquisition des données de production
(CADP)
- 7.3 Artificial intelligence and/or expert systems
Intelligence artificielle et/ou systèmes experts

TABLE 2

THE USE OF TECHNOLOGY
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH									
	1A CAO/CAE	1B CAO/CAM	1C CAO PROC	2A FMC/S	2B NC/CNC	2C LASER	2D ROBOT PP	2E ROBOT OTH	3A AS/RS	3B AGVS
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
IND										
1. FOOD, BEVERAGE AND TOBACCO	14	3	2	11	7	1	3	3	5	2
2. RUBBER AND PLASTIC	10	3	2	10	8	0	7	3	6	3
3. LEATHER, TEXTILE AND CLOTHING	10	7	4	6	14	2	2	3	4	2
4. WOOD	13	8	7	9	7	3	4	3	4	5
5. FURNITURE AND FIXTURE	7	4	2	4	7	1	1	1	1	1
6. PAPER AND ALLIED PRODUCT	27	5	4	7	11	3	3	7	10	4
7. PRINTING, PUBLISHING AND ALLIED	14	3	2	1	12	8	0	3	6	0
8. PRIMARY METAL	28	7	4	14	20	1	10	6	4	4
9. FABRICATED METAL PRODUCT	21	11	5	7	25	0	5	1	1	4
10. MACHINERY	36	12	4	13	35	1	4	5	3	2
11. TRANSPORTATION EQUIPMENT	34	17	13	13	19	1	13	12	9	3
12. ELECTRICAL AND ELECTRONIC PRODUCTS	42	9	6	9	18	5	9	2	1	1
13. NON-METALLIC MINERAL PRODUCTS	11	7	7	12	13	1	3	1	14	7
14. PETROLEUM AND CHEMICALS	18	4	4	6	3	0	3	1	8	2
15. OTHER MANUFACTURING	7	3	1	5	9	0	1	2	1	0
TOTAL	17	7	4	7	14	2	3	3	4	2

(CONTINUED)

TABLE 2

THE USE OF TECHNOLOGY
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH									
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PROG C	5E COMP C	6A MRP	6B MRP II	7A CIM
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
IND										
1. FOOD, BEVERAGE AND TOBACCO	14	12	16	14	9	30	19	23	8	2
2. RUBBER AND PLASTIC	5	9	8	6	10	31	17	17	9	3
3. LEATHER, TEXTILE AND CLOTHING	4	3	12	6	9	6	7	17	13	4
4. WOOD	12	10	10	8	16	23	15	8	9	1
5. FURNITURE AND FIXTURE	5	5	4	7	6	12	7	25	6	2
6. PAPER AND ALLIED PRODUCT	25	30	22	22	16	44	32	24	16	12
7. PRINTING, PUBLISHING AND ALLIED	6	3	8	2	3	10	2	10	6	5
8. PRIMARY METAL	15	20	21	20	18	47	32	25	13	14
9. FABRICATED METAL PRODUCT	8	8	12	13	9	14	11	17	12	8
10. MACHINERY	3	6	17	9	5	16	9	17	13	2
11. TRANSPORTATION EQUIPMENT	23	21	21	18	45	29	26	33	13	4
12. ELECTRICAL AND ELECTRONIC PRODUCTS	15	14	18	12	15	20	19	29	20	5
13. NON-METALLIC MINERAL PRODUCTS	9	12	7	14	7	23	12	17	11	5
14. PETROLEUM AND CHEMICALS	9	8	19	16	19	33	22	32	18	10
15. OTHER MANUFACTURING	7	7	2	3	7	7	3	11	4	1
TOTAL	9	8	11	9	10	18	12	17	10	4

(CONTINUED)

TABLE 2

THE USE OF TECHNOLOGY
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH	
	7B SCADA	7C AI/ES
	PERCENT	PERCENT
	OF EST.	OF EST.
IND		
1. FOOD, BEVERAGE AND TOBACCO	9	0
2. RUBBER AND PLASTIC	6	0
3. LEATHER, TEXTILE AND CLOTHING	5	2
4. WOOD	6	0
5. FURNITURE AND FIXTURE	7	1
6. PAPER AND ALLIED PRODUCT	19	4
7. PRINTING, PUBLISHING AND ALLIED	5	0
8. PRIMARY METAL	16	3
9. FABRICATED METAL PRODUCT	5	6
10. MACHINERY	10	0
11. TRANSPORTATION EQUIPMENT	7	0
12. ELECTRICAL AND ELECTRONIC PRODUCTS	6	1
13. NON-METALLIC MINERAL PRODUCTS	9	2
14. PETROLEUM AND CHEMICALS	15	3
15. OTHER MANUFACTURING	0	0
TOTAL	6	2

TABLE 3

THE USE OF AT LEAST ONE OF THE TECHNOLOGIES IN THE
TECHNOLOGY GROUPS, BY INDUSTRY
(ESTABLISHMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
IND							
1. FOOD, BEVERAGE AND TOBACCO	15	15	7	15	40	24	10
2. RUBBER AND PLASTIC	12	17	8	12	36	18	8
3. LEATHER, TEXTILE AND CLOTHING	13	20	4	5	19	18	6
4. WOOD	20	15	8	13	35	11	6
5. FURNITURE AND FIXTURE	8	11	2	5	15	25	8
6. PAPER AND ALLIED PRODUCT	28	19	12	33	52	25	21
7. PRINTING, PUBLISHING AND ALLIED	16	18	7	8	19	10	9
8. PRIMARY METAL	30	36	8	22	59	27	23
9. FABRICATED METAL PRODUCT	23	28	4	8	30	17	13
10. MACHINERY	37	42	5	6	28	19	11
11. TRANSPORTATION EQUIPMENT	37	46	12	31	58	34	9
12. ELECTRICAL AND ELECTRONIC PRODUCTS	42	23	1	18	42	30	11
13. NON-METALLIC MINERAL PRODUCTS	16	20	16	14	31	19	11
14. PETROLEUM AND CHEMICALS	20	10	9	13	45	33	18
15. OTHER MANUFACTURING	9	14	1	10	16	11	1
TOTAL	19	21	6	11	30	18	9

TABLE 4
THE PLAN TO USE TECHNOLOGY WITHIN THE NEXT 2 YEARS
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH									
	1A CAD/CAE	1B CAD/CAM	1C CAD PROC	2A FMC/S	2B NC/CNC	2C LASER	2D ROBOT PP	2E ROBOT OTH	3A AS/RS	3B AGVS
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
IND										
1. FOOD, BEVERAGE AND TOBACCO	1	3	4	1	1	0	1	.	2	0
2. RUBBER AND PLASTIC	9	1	5	1	0	1	4	4	1	0
3. LEATHER, TEXTILE AND CLOTHING	7	6	6	1	1	0	2	1	1	0
4. WOOD	5	3	2	1	1	0	1	2	3	0
5. FURNITURE AND FIXTURE	9	6	3	6	5	4	4	8	0	4
6. PAPER AND ALLIED PRODUCT	8	3	3	1	3	1	2	1	5	2
7. PRINTING, PUBLISHING AND ALLIED	1	0	0	0	0	1	0	0	0	0
8. PRIMARY METAL	4	3	3	.	3	1	2	2	7	1
9. FABRICATED METAL PRODUCT	11	11	8	1	1	6	0	4	0	0
10. MACHINERY	7	5	3	1	6	2	1	2	2	0
11. TRANSPORTATION EQUIPMENT	9	11	10	7	7	9	16	3	2	8
12. ELECTRICAL AND ELECTRONIC PRODUCTS	16	6	4	1	1	1	2	5	4	0
13. NON-METALLIC MINERAL PRODUCTS	3	2	1	1	1	1	1	0	1	1
14. PETROLEUM AND CHEMICALS	3	1	2	1	5	1	1	2	1	4
15. OTHER MANUFACTURING	3	1	1	1	0	0	0	1	.	.
TOTAL	6	5	4	1	2	2	2	2	1	1

(CONTINUED)

TABLE 4

THE PLAN TO USE TECHNOLOGY WITHIN THE NEXT 2 YEARS
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH									
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PROG C	5E COMP C	6A MRP	6B MRP II	7A CIM
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
IND										
1. FOOD, BEVERAGE AND TOBACCO	5	5	7	9	6	2	9	11	14	10
2. RUBBER AND PLASTIC	2	2	5	8	4	3	10	13	9	2
3. LEATHER, TEXTILE AND CLOTHING	6	6	7	9	2	1	5	8	8	2
4. WOOD	2	3	4	4	4	1	4	13	7	1
5. FURNITURE AND FIXTURE	5	1	6	8	2	2	7	9	16	5
6. PAPER AND ALLIED PRODUCT	8	8	15	11	6	9	10	28	22	8
7. PRINTING, PUBLISHING AND ALLIED	0	0	2	2	8	0	2	14	3	1
8. PRIMARY METAL	2	2	5	7	10	2	7	16	21	3
9. FABRICATED METAL PRODUCT	1	2	4	5	2	3	7	6	5	2
10. MACHINERY	3	2	3	6	3	1	8	22	15	2
11. TRANSPORTATION EQUIPMENT	17	4	17	24	2	7	15	20	25	14
12. ELECTRICAL AND ELECTRONIC PRODUCTS	1	4	11	16	11	8	13	20	21	2
13. NON-METALLIC MINERAL PRODUCTS	4	1	4	5	4	2	5	7	7	2
14. PETROLEUM AND CHEMICALS	4	4	6	6	9	5	9	8	5	2
15. OTHER MANUFACTURING	1	1	2	1	1	1	2	8	7	1
TOTAL	3	3	5	6	4	2	6	12	9	3

(CONTINUED)

TABLE 4
THE PLAN TO USE TECHNOLOGY WITHIN THE NEXT 2 YEARS
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH	
	7B SCADA	7C AI/ES
	PERCENT	PERCENT
	OF EST.	OF EST.
IND		
1. FOOD, BEVERAGE AND TOBACCO	7	3
2. RUBBER AND PLASTIC	4	1
3. LEATHER, TEXTILE AND CLOTHING	4	2
4. WOOD	2	0
5. FURNITURE AND FIXTURE	7	0
6. PAPER AND ALLIED PRODUCT	7	5
7. PRINTING, PUBLISHING AND ALLIED	0	0
8. PRIMARY METAL	2	1
9. FABRICATED METAL PRODUCT	9	1
10. MACHINERY	2	0
11. TRANSPORTATION EQUIPMENT	16	8
12. ELECTRICAL AND ELECTRONIC PRODUCTS	5	1
13. NON-METALLIC MINERAL PRODUCTS	4	2
14. PETROLEUM AND CHEMICALS	4	2
15. OTHER MANUFACTURING	1	0
TOTAL	5	1

TABLE 5

THE PLAN TO USE AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP WITHIN THE NEXT 2 YEARS.
BY INDUSTRY
(ESTABLISHMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
IND							
1. FOOD, BEVERAGE AND TOBACCO	6	2	2	6	17	15	16
2. RUBBER AND PLASTIC	14	9	1	3	18	17	5
3. LEATHER, TEXTILE AND CLOTHING	8	4	1	6	13	9	6
4. WOOD	8	4	3	4	9	14	3
5. FURNITURE AND FIXTURE	10	15	4	6	10	22	11
6. PAPER AND ALLIED PRODUCT	9	7	7	9	30	31	13
7. PRINTING, PUBLISHING AND ALLIED	2	2	0	0	11	15	1
8. PRIMARY METAL	6	8	7	3	22	25	4
9. FABRICATED METAL PRODUCT	16	12	1	2	14	8	10
10. MACHINERY	13	9	2	3	16	26	3
11. TRANSPORTATION EQUIPMENT	20	24	8	18	29	29	17
12. ELECTRICAL AND ELECTRONIC PRODUCTS	20	8	4	5	30	26	7
13. NON-METALLIC MINERAL PRODUCTS	6	4	1	4	12	9	6
14. PETROLEUM AND CHEMICALS	4	8	4	4	24	12	7
15. OTHER MANUFACTURING	4	2	.	1	4	10	1
TOTAL	9	7	2	4	14	15	7

TABLE 6

THE PLAN TO USE TECHNOLOGY WITHIN THE NEXT 2-5 YEARS
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH									
	1A CAO/CAE	1B CAD/CAM	1C CAD PROC	2A FMC/S	2B NC/CNC	2C LASER	2O ROBOT PP	2E ROBOT OTH	3A AS/RS	3B AGVS
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
IND										
1. FOOD, BEVERAGE AND TOBACCO	1	1	1	1	1	0	2	4	7	5
2. RUBBER AND PLASTIC	8	6	8	3	1	1	4	4	8	2
3. LEATHER, TEXTILE AND CLOTHING	4	3	3	3	2	1	2	1	1	2
4. WOOD	6	2	3	1	1	1	1	1	5	1
5. FURNITURE AND FIXTURE	2	4	7	3	2	2	2	3	1	1
6. PAPER AND ALLIED PRODUCT	5	8	4	6	3	2	7	7	12	9
7. PRINTING, PUBLISHING AND ALLIED	5	0	0	1	1	1	0	0	1	0
8. PRIMARY METAL	6	8	3	4	5	3	4	3	4	3
9. FABRICATED METAL PRODUCT	8	7	3	1	6	3	2	3	2	1
10. MACHINERY	14	16	12	6	2	2	3	2	1	0
11. TRANSPORTATION EQUIPMENT	14	10	10	2	9	8	3	11	3	2
12. ELECTRICAL AND ELECTRONIC PRODUCTS	7	14	15	4	1	5	11	5	3	5
13. NON-METALLIC MINERAL PRODUCTS	10	2	1	4	3	1	3	2	4	4
14. PETROLEUM AND CHEMICALS	3	4	5	3	1	1	3	4	4	3
15. OTHER MANUFACTURING	6	6	5	2	5	1	1	2	1	0
TOTAL	6	5	4	2	3	2	2	3	3	2

(CONTINUED)

TABLE 6

THE PLAN TO USE TECHNOLOGY WITHIN THE NEXT 2-5 YEARS
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH									
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PROG C	5E COMP C	6A MRP	6B MRP II	7A CIM
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
IND										
1. FOOD, BEVERAGE AND TOBACCO	8	9	6	6	7	3	6	8	8	8
2. RUBBER AND PLASTIC	5	7	7	7	6	2	9	12	12	13
3. LEATHER, TEXTILE AND CLOTHING	2	2	2	3	4	2	3	8	8	7
4. WOOD	6	2	6	6	3	2	5	9	11	2
5. FURNITURE AND FIXTURE	2	1	1	1	6	6	2	8	12	7
6. PAPER AND ALLIED PRODUCT	9	5	2	6	9	1	6	10	11	5
7. PRINTING, PUBLISHING AND ALLIED	1	1	1	1	6	2	6	4	7	1
8. PRIMARY METAL	1	2	6	8	6	.	3	4	6	3
9. FABRICATED METAL PRODUCT	5	5	17	10	12	6	8	10	10	8
10. MACHINERY	0	1	11	8	5	3	6	9	12	8
11. TRANSPORTATION EQUIPMENT	10	9	11	3	7	4	5	9	10	14
12. ELECTRICAL AND ELECTRONIC PRODUCTS	8	5	13	15	15	10	15	18	16	17
13. NON-METALLIC MINERAL PRODUCTS	6	7	4	2	3	3	4	5	5	4
14. PETROLEUM AND CHEMICALS	7	4	7	8	9	4	10	12	15	3
15. OTHER MANUFACTURING	1	1	4	2	4	4	11	6	4	1
TOTAL	4	4	7	5	7	4	7	8	9	5

(CONTINUED)

TABLE 6
THE PLAN TO USE TECHNOLOGY WITHIN THE NEXT 2-5 YEARS
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH	
	7B SCADA	7C AI/ES
	PERCENT	PERCENT
	OF EST.	OF EST.
IND		
1. FOOD, BEVERAGE AND TOBACCO	3	3
2. RUBBER AND PLASTIC	11	3
3. LEATHER, TEXTILE AND CLOTHING	8	6
4. WOOD	4	1
5. FURNITURE AND FIXTURE	3	1
6. PAPER AND ALLIED PRODUCT	13	7
7. PRINTING, PUBLISHING AND ALLIED	2	5
8. PRIMARY METAL	10	8
9. FABRICATED METAL PRODUCT	6	2
10. MACHINERY	5	3
11. TRANSPORTATION EQUIPMENT	5	3
12. ELECTRICAL AND ELECTRONIC PRODUCTS	14	6
13. NON-METALLIC MINERAL PRODUCTS	4	4
14. PETROLEUM AND CHEMICALS	11	5
15. OTHER MANUFACTURING	1	1
TOTAL	5	3

TABLE 7

THE PLAN TO USE AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP WITHIN THE NEXT 2-5 YEARS.
BY INDUSTRY
(ESTABLISHMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
IND							
1. FOOD, BEVERAGE AND TOBACCO	2	6	10	9	16	11	8
2. RUBBER AND PLASTIC	13	9	6	8	15	18	18
3. LEATHER, TEXTILE AND CLOTHING	6	5	2	3	7	9	9
4. WOOD	7	3	5	7	12	13	8
5. FURNITURE AND FIXTURE	9	7	2	2	8	13	7
6. PAPER AND ALLIED PRODUCT	12	14	14	9	16	15	15
7. PRINTING, PUBLISHING AND ALLIED	6	2	1	1	12	8	6
8. PRIMARY METAL	13	15	5	2	13	8	18
9. FABRICATED METAL PRODUCT	14	12	2	5	24	14	11
10. MACHINERY	30	12	1	2	19	13	15
11. TRANSPORTATION EQUIPMENT	18	29	4	12	19	11	15
12. ELECTRICAL AND ELECTRONIC PRODUCTS	29	14	7	11	30	23	24
13. NON-METALLIC MINERAL PRODUCTS	11	8	5	8	12	7	9
14. PETROLEUM AND CHEMICALS	6	6	5	8	18	17	15
15. OTHER MANUFACTURING	9	7	1	2	15	7	2
TOTAL	10	8	4	5	16	12	10

TABLE 8
THE PLANNED USE OF TECHNOLOGY (2 YEARS OR 2-5 YEARS)
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH									
	1A CAD/CAE	1B CAD/CAM	1C CAD PROC	2A FMC/S	2B NC/CNC	2C LASER	2D ROBOT PP	2E ROBOT DTH	3A AS/RS	3B AGVS
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
IND										
1. FOOD, BEVERAGE AND TOBACCO	3	5	5	2	2	1	3	4	9	6
2. RUBBER AND PLASTIC	17	7	12	4	2	2	7	8	6	2
3. LEATHER, TEXTILE AND CLOTHING	11	8	9	3	3	1	4	3	2	2
4. WOOD	11	5	5	1	1	1	2	3	7	1
5. FURNITURE AND FIXTURE	11	10	9	8	7	6	7	11	2	5
6. PAPER AND ALLIED PRODUCT	12	11	7	8	6	3	9	8	18	11
7. PRINTING, PUBLISHING AND ALLIED	7	1	1	1	1	2	1	1	1	1
8. PRIMARY METAL	10	10	6	4	9	4	6	5	11	4
9. FABRICATED METAL PRODUCT	19	19	11	2	8	9	3	7	2	2
10. MACHINERY	22	21	15	7	8	4	4	4	3	1
11. TRANSPORTATION EQUIPMENT	23	21	20	9	16	17	18	13	5	10
12. ELECTRICAL AND ELECTRONIC PRODUCTS	23	20	19	5	1	6	13	10	7	5
13. NON-METALLIC MINERAL PRODUCTS	13	4	2	5	4	1	4	3	5	5
14. PETROLEUM AND CHEMICALS	6	5	6	4	6	2	4	5	4	6
15. OTHER MANUFACTURING	10	8	6	2	5	1	2	2	1	0
TOTAL	12	10	8	3	4	4	4	5	4	3

(CONTINUED)

TABLE 8

THE PLANNED USE OF TECHNOLOGY (2 YEARS OR 2-5 YEARS)
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH									
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PROG C	5E COMP C	6A MRP	6B MRP II	7A CIM
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
IND										
1. FOOD, BEVERAGE AND TOBACCO	14	14	14	15	12	5	15	18	22	18
2. RUBBER AND PLASTIC	7	9	12	18	9	5	19	25	21	14
3. LEATHER, TEXTILE AND CLOTHING	8	8	9	12	6	4	9	16	18	9
4. WOOD	8	4	10	11	7	3	9	23	18	3
5. FURNITURE AND FIXTURE	7	3	8	9	8	8	9	16	28	12
6. PAPER AND ALLIED PRODUCT	16	13	17	17	15	10	18	38	33	11
7. PRINTING, PUBLISHING AND ALLIED	1	1	3	3	14	2	7	18	9	1
8. PRIMARY METAL	3	4	11	15	16	2	10	20	27	8
9. FABRICATED METAL PRODUCT	6	7	21	15	14	8	15	16	15	8
10. MACHINERY	3	3	14	14	8	5	14	31	27	10
11. TRANSPORTATION EQUIPMENT	26	14	28	28	9	11	20	29	34	28
12. ELECTRICAL AND ELECTRONIC PRODUCTS	9	9	23	31	26	17	28	36	37	19
13. NON-METALLIC MINERAL PRODUCTS	9	8	8	8	7	5	9	11	12	6
14. PETROLEUM AND CHEMICALS	12	8	13	15	18	8	19	20	20	5
15. OTHER MANUFACTURING	2	2	8	4	5	6	13	14	11	2
TOTAL	7	8	12	12	11	8	13	20	18	8

(CONTINUED)

TABLE 8
THE PLANNED USE OF TECHNOLOGY (2 YEARS OR 2-5 YEARS)
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH	
	7B SCADA	7C AI/ES
	PERCENT	PERCENT
	OF EST.	OF EST.
IND		
1. FOOD, BEVERAGE AND TOBACCO	10	5
2. RUBBER AND PLASTIC	15	4
3. LEATHER, TEXTILE AND CLOTHING	12	9
4. WOOD	6	1
5. FURNITURE AND FIXTURE	9	1
6. PAPER AND ALLIED PRODUCT	19	12
7. PRINTING, PUBLISHING AND ALLIED	3	5
8. PRIMARY METAL	12	9
9. FABRICATED METAL PRODUCT	15	3
10. MACHINERY	8	3
11. TRANSPORTATION EQUIPMENT	21	12
12. ELECTRICAL AND ELECTRONIC PRODUCTS	19	7
13. NON-METALLIC MINERAL PRODUCTS	9	5
14. PETROLEUM AND CHEMICALS	15	7
15. OTHER MANUFACTURING	2	1
TOTAL	10	5

TABLE 9

THE PLANNED USE OF AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP (2 YEARS OR 2-5 YEARS)
(ESTABLISHMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
IND							
1. FOOD, BEVERAGE AND TOBACCO	8	7	12	15	27	26	23
2. RUBBER AND PLASTIC	24	16	7	10	28	30	21
3. LEATHER, TEXTILE AND CLOTHING	13	9	3	9	19	18	14
4. WOOD	15	6	7	10	18	26	8
5. FURNITURE AND FIXTURE	14	20	6	8	12	30	14
6. PAPER AND ALLIED PRODUCT	20	19	21	18	39	43	26
7. PRINTING, PUBLISHING AND ALLIED	8	3	1	1	22	19	7
8. PRIMARY METAL	19	20	11	5	29	32	21
9. FABRICATED METAL PRODUCT	28	23	3	7	35	19	17
10. MACHINERY	39	20	3	4	32	35	17
11. TRANSPORTATION EQUIPMENT	37	39	12	29	46	39	31
12. ELECTRICAL AND ELECTRONIC PRODUCTS	42	20	11	16	53	44	26
13. NON-METALLIC MINERAL PRODUCTS	17	10	7	12	18	14	12
14. PETROLEUM AND CHEMICALS	10	12	8	13	32	25	20
15. OTHER MANUFACTURING	12	9	1	3	19	16	3
TOTAL	18	13	5	9	26	24	15

TABLE 10
NO PLAN TO USE TECHNOLOGY BECAUSE IT DOES NOT APPLY
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH									
	1A CAD/CAE	1B CAD/CAM	1C CAD PROC	2A FMC/S	2B NC/CNC	2C LASER	2D ROBOT PP	2E ROBOT OTH	3A AS/RS	3B AGVS
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
IND										
1. FOOD, BEVERAGE AND TOBACCO	68	73	76	74	78	86	75	73	60	66
2. RUBBER AND PLASTIC	58	76	70	67	73	86	67	74	61	68
3. LEATHER, TEXTILE AND CLOTHING	55	67	66	64	61	65	72	68	73	67
4. WOOD	58	65	68	68	71	84	74	72	67	74
5. FURNITURE AND FIXTURE	68	72	77	78	76	82	84	81	84	81
6. PAPER AND ALLIED PRODUCT	55	75	76	73	71	82	75	70	51	63
7. PRINTING, PUBLISHING AND ALLIED	73	90	90	90	80	85	90	86	83	69
8. PRIMARY METAL	51	67	71	68	56	84	68	69	60	69
9. FABRICATED METAL PRODUCT	54	59	68	75	58	71	74	68	76	75
10. MACHINERY	29	47	61	52	36	64	60	60	63	63
11. TRANSPORTATION EQUIPMENT	36	50	54	59	48	62	50	57	65	61
12. ELECTRICAL AND ELECTRONIC PRODUCTS	25	49	46	53	53	64	45	50	52	54
13. NON-METALLIC MINERAL PRODUCTS	70	81	77	69	70	83	76	78	62	69
14. PETROLEUM AND CHEMICALS	66	82	80	84	83	90	80	83	71	80
15. OTHER MANUFACTURING	73	75	82	86	80	90	89	87	81	84
TOTAL	59	70	73	73	68	79	75	74	72	74

(CONTINUED)

TABLE 10

NO PLAN TO USE TECHNOLOGY BECAUSE IT DOES NOT APPLY
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH									
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PROG C	5E COMP C	6A MRP	6B MRP II	7A CIM
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
IND										
1. FOOD, BEVERAGE AND TOBACCO	47	50	57	49	53	46	43	36	47	61
2. RUBBER AND PLASTIC	69	65	63	59	59	52	48	43	51	63
3. LEATHER, TEXTILE AND CLOTHING	69	67	59	57	55	61	56	49	51	63
4. WOOD	63	65	65	66	60	60	61	47	51	68
5. FURNITURE AND FIXTURE	76	81	81	72	74	69	72	54	61	71
6. PAPER AND ALLIED PRODUCT	49	47	51	53	57	36	41	25	32	60
7. PRINTING, PUBLISHING AND ALLIED	82	87	87	91	71	80	86	64	76	87
8. PRIMARY METAL	58	53	49	47	47	41	43	43	42	53
9. FABRICATED METAL PRODUCT	69	69	55	55	57	62	58	49	51	64
10. MACHINERY	70	65	44	49	56	57	51	41	43	58
11. TRANSPORTATION EQUIPMENT	37	52	37	37	30	41	41	31	42	51
12. ELECTRICAL AND ELECTRONIC PRODUCTS	44	48	47	48	43	49	42	28	32	59
13. NON-METALLIC MINERAL PRODUCTS	65	65	66	63	67	57	61	56	57	71
14. PETROLEUM AND CHEMICALS	71	71	60	62	53	52	52	40	52	75
15. OTHER MANUFACTURING	75	75	84	82	77	76	74	71	78	84
TOTAL	67	68	64	64	60	61	60	50	55	69

(CONTINUED)

TABLE 10

NO PLAN TO USE TECHNOLOGY BECAUSE IT DOES NOT APPLY
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH	
	7B SCADA	7C AI/ES
	PERCENT	PERCENT
	OF EST.	OF EST.
IND		
1. FOOD, BEVERAGE AND TOBACCO	59	71
2. RUBBER AND PLASTIC	60	71
3. LEATHER, TEXTILE AND CLOTHING	54	66
4. WOOD	65	74
5. FURNITURE AND FIXTURE	69	80
6. PAPER AND ALLIED PRODUCT	48	62
7. PRINTING, PUBLISHING AND ALLIED	86	85
8. PRIMARY METAL	52	65
9. FABRICATED METAL PRODUCT	61	64
10. MACHINERY	59	60
11. TRANSPORTATION EQUIPMENT	54	58
12. ELECTRICAL AND ELECTRONIC PRODUCTS	55	59
13. NON-METALLIC MINERAL PRODUCTS	67	74
14. PETROLEUM AND CHEMICALS	61	78
15. OTHER MANUFACTURING	85	89
TOTAL	66	72

TABLE 11

NO PLAN TO USE AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP BECAUSE IT DOES NOT APPLY.
BY INDUSTRY
(ESTABLISHMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
IND							
1. FOOD, BEVERAGE AND TOBACCO	80	90	66	50	70	47	73
2. RUBBER AND PLASTIC	81	92	70	72	75	51	75
3. LEATHER, TEXTILE AND CLOTHING	71	79	77	72	70	52	72
4. WOOD	79	89	81	68	74	51	75
5. FURNITURE AND FIXTURE	77	92	86	83	85	81	81
6. PAPER AND ALLIED PRODUCT	81	91	66	51	68	33	68
7. PRINTING, PUBLISHING AND ALLIED	92	93	90	87	95	77	93
8. PRIMARY METAL	75	91	72	59	65	45	70
9. FABRICATED METAL PRODUCT	70	84	79	69	75	51	71
10. MACHINERY	62	76	72	71	69	44	64
11. TRANSPORTATION EQUIPMENT	55	75	70	52	57	43	61
12. ELECTRICAL AND ELECTRONIC PRODUCTS	58	74	57	52	65	33	68
13. NON-METALLIC MINERAL PRODUCTS	90	87	71	67	77	59	78
14. PETROLEUM AND CHEMICALS	86	92	84	74	74	52	82
15. OTHER MANUFACTURING	83	92	84	78	87	76	89
TOTAL	77	87	78	70	77	56	77

TABLE 12

NO PLAN TO USE TECHNOLOGY BECAUSE IT IS NOT COST EFFECTIVE
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH									
	1A CAD/CAE	1B CAD/CAM	1C CAD PROC	2A FMC/S	2B NC/CNC	2C LASER	2D ROBOT PP	2E ROBOT OTH	3A AS/RS	3B AGVS
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
IND										
1. FOOD, BEVERAGE AND TOBACCO	8	9	7	5	3	4	9	9	16	15
2. RUBBER AND PLASTIC	8	6	8	8	11	8	14	10	17	17
3. LEATHER, TEXTILE AND CLOTHING	20	12	16	20	16	25	17	15	15	24
4. WOOD	8	11	8	14	15	7	17	14	18	15
5. FURNITURE AND FIXTURE	12	12	9	7	7	8	5	4	11	10
6. PAPER AND ALLIED PRODUCT	3	7	8	10	9	7	9	10	18	18
7. PRINTING, PUBLISHING AND ALLIED	4	5	5	7	6	7	8	8	8	8
8. PRIMARY METAL	8	7	9	7	8	5	7	7	16	15
9. FABRICATED METAL PRODUCT	3	9	6	7	6	11	8	13	15	13
10. MACHINERY	10	16	13	18	14	22	24	23	25	21
11. TRANSPORTATION EQUIPMENT	4	8	8	12	13	8	11	11	14	22
12. ELECTRICAL AND ELECTRONIC PRODUCTS	8	19	15	30	22	22	31	26	36	36
13. NON-METALLIC MINERAL PRODUCTS	5	6	12	5	4	5	8	7	9	9
14. PETROLEUM AND CHEMICALS	5	5	4	4	4	4	8	8	12	8
15. OTHER MANUFACTURING	8	6	6	5	4	7	6	5	12	11
TOTAL	8	9	8	10	9	10	12	11	15	15

(CONTINUED)

TABLE 12

NO PLAN TO USE TECHNOLOGY BECAUSE IT IS NOT COST EFFECTIVE
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH									
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PRDG C	5E COMP C	6A MRP	6B MRP II	7A CIM
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
IND										
1. FOOD, BEVERAGE AND TOBACCO	11	10	3	7	11	8	9	7	6	9
2. RUBBER AND PLASTIC	11	9	8	9	13	4	8	8	8	13
3. LEATHER, TEXTILE AND CLOTHING	12	12	14	20	24	23	23	14	14	18
4. WOOD	14	14	5	5	5	5	5	9	7	16
5. FURNITURE AND FIXTURE	8	7	4	8	9	8	9	3	3	8
6. PAPER AND ALLIED PRODUCT	4	4	5	5	8	7	8	8	12	14
7. PRINTING, PUBLISHING AND ALLIED	8	6	2	2	9	2	3	5	8	5
8. PRIMARY METAL	13	14	12	12	8	5	7	5	7	14
9. FABRICATED METAL PRODUCT	10	10	5	8	9	7	9	7	7	10
10. MACHINERY	15	19	11	14	17	7	11	3	7	13
11. TRANSPORTATION EQUIPMENT	6	6	6	4	7	13	7	3	3	8
12. ELECTRICAL AND ELECTRONIC PRODUCTS	29	25	6	7	9	12	9	8	6	14
13. NON-METALLIC MINERAL PRODUCTS	7	5	3	4	5	4	6	4	5	8
14. PETROLEUM AND CHEMICALS	5	5	4	4	5	3	3	4	4	8
15. OTHER MANUFACTURING	7	7	7	7	5	6	6	4	7	11
TOTAL	10	10	6	8	10	8	9	6	7	11

(CONTINUED)

TABLE 12

NO PLAN TO USE TECHNOLOGY BECAUSE IT IS NOT COST EFFECTIVE
 BY INDUSTRY AND 22 TECHNOLOGIES
 (ESTABLISHMENT WEIGHTED)

	TECH	
	7B SCADA	7C AI/ES
	PERCENT	PERCENT
	OF EST.	OF EST.
IND		
1. FOOD, BEVERAGE AND TOBACCO	10	10
2. RUBBER AND PLASTIC	15	16
3. LEATHER, TEXTILE AND CLOTHING	24	16
4. WOOD	15	15
5. FURNITURE AND FIXTURE	8	9
6. PAPER AND ALLIED PRODUCT	11	12
7. PRINTING, PUBLISHING AND ALLIED	5	6
8. PRIMARY METAL	8	10
9. FABRICATED METAL PRODUCT	12	16
10. MACHINERY	8	15
11. TRANSPORTATION EQUIPMENT	11	22
12. ELECTRICAL AND ELECTRONIC PRODUCTS	17	19
13. NON-METALLIC MINERAL PRODUCTS	5	6
14. PETROLEUM AND CHEMICALS	5	6
15. OTHER MANUFACTURING	11	8
TOTAL	11	12

TABLE 13

NO PLAN TO USE AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP BECAUSE IT IS NOT COST EFFECTIVE.
BY INDUSTRY
(ESTABLISHMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATING AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
IND							
1. FOOD, BEVERAGE AND TOBACCO	10	12	17	11	17	8	12
2. RUBBER AND PLASTIC	11	19	19	12	18	8	20
3. LEATHER, TEXTILE AND CLOTHING	22	30	25	13	31	14	27
4. WOOD	15	23	21	14	6	9	18
5. FURNITURE AND FIXTURE	13	11	11	8	10	3	10
6. PAPER AND ALLIED PRODUCT	12	14	20	5	12	12	17
7. PRINTING, PUBLISHING AND ALLIED	6	10	8	8	11	6	8
8. PRIMARY METAL	11	11	16	14	16	7	17
9. FABRICATED METAL PRODUCT	10	21	15	10	11	7	18
10. MACHINERY	20	32	25	20	23	7	17
11. TRANSPORTATION EQUIPMENT	11	16	24	6	19	3	28
12. ELECTRICAL AND ELECTRONIC PRODUCTS	20	41	38	30	15	6	22
13. NON-METALLIC MINERAL PRODUCTS	14	10	10	7	8	5	7
14. PETROLEUM AND CHEMICALS	7	11	13	6	7	4	7
15. OTHER MANUFACTURING	7	9	12	8	8	7	12
TOTAL	12	18	17	11	14	8	15

TABLE 14

NO PLAN TO USE TECHNOLOGY BECAUSE OF OTHER REASONS
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH									
	1A CAO/CAE	1B CAO/CAM	1C CAO PROC	2A FMC/S	2B NC/CNC	2C LASER	2O ROBOT PP	2E ROBOT OTH	3A AS/RS	3B AGVS
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
IND										
1. FOOD, BEVERAGE AND TOBACCO	10	10	10	8	10	7	10	12	10	11
2. RUBBER AND PLASTIC	6	7	7	12	7	5	5	5	10	10
3. LEATHER, TEXTILE AND CLOTHING	4	5	5	7	7	8	5	6	6	5
4. WOOD	10	11	11	7	8	5	4	8	4	4
5. FURNITURE AND FIXTURE	3	2	3	3	2	3	4	4	3	3
6. PAPER AND ALLIED PRODUCT	2	1	4	3	4	4	4	5	4	5
7. PRINTING, PUBLISHING AND ALLIED	1	2	2	1	1	1	1	1	1	1
8. PRIMARY METAL	3	10	10	7	7	6	9	12	9	9
9. FABRICATED METAL PRODUCT	2	3	9	9	2	8	9	10	6	6
10. MACHINERY	3	4	6	10	5	8	8	7	6	6
11. TRANSPORTATION EQUIPMENT	4	4	5	7	5	6	7	7	6	6
12. ELECTRICAL AND ELECTRONIC PRODUCTS	2	3	12	3	5	3	3	11	4	4
13. NON-METALLIC MINERAL PRODUCTS	2	2	2	10	9	9	10	10	11	10
14. PETROLEUM AND CHEMICALS	5	5	5	3	4	4	4	4	4	5
15. OTHER MANUFACTURING	4	8	5	2	2	2	2	2	5	4
TOTAL	4	5	6	6	4	5	6	6	5	5

(CONTINUED)

TABLE 14

NO PLAN TO USE TECHNOLOGY BECAUSE OF OTHER REASONS
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH									
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PROG C	5E COMP C	6A MRP	6B MRP II	7A CIM
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
IND										
1. FOOD, BEVERAGE AND TOBACCO	14	14	10	13	13	11	13	15	18	9
2. RUBBER AND PLASTIC	7	7	7	10	7	7	6	8	12	7
3. LEATHER, TEXTILE AND CLOTHING	6	9	5	5	6	6	5	4	5	8
4. WOOD	3	7	11	11	11	10	9	13	15	12
5. FURNITURE AND FIXTURE	3	4	4	4	3	4	3	2	2	7
6. PAPER AND ALLIED PRODUCT	8	5	4	3	4	2	3	4	7	3
7. PRINTING, PUBLISHING AND ALLIED	3	3	1	1	2	6	1	3	2	1
8. PRIMARY METAL	10	9	6	7	11	4	8	6	9	12
9. FABRICATED METAL PRODUCT	7	7	7	10	11	9	7	10	15	10
10. MACHINERY	8	6	14	14	14	15	15	8	11	19
11. TRANSPORTATION EQUIPMENT	6	8	7	13	7	7	7	4	7	9
12. ELECTRICAL AND ELECTRONIC PRODUCTS	3	3	5	3	7	2	3	2	6	3
13. NON-METALLIC MINERAL PRODUCTS	11	10	12	12	13	10	12	11	12	12
14. PETROLEUM AND CHEMICALS	4	7	3	4	5	3	4	4	4	4
15. OTHER MANUFACTURING	7	7	1	5	6	5	5	1	2	2
TOTAL	6	7	6	8	8	8	7	7	9	7

(CONTINUED)

TABLE, 14

NO PLAN TO USE TECHNOLOGY BECAUSE OF OTHER REASONS
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH	
	7B SCADA	7C AI/ES
	PERCENT	PERCENT
	OF EST.	OF EST.
IND		
1. FOOD, BEVERAGE AND TOBACCO	12	13
2. RUBBER AND PLASTIC	5	9
3. LEATHER, TEXTILE AND CLOTHING	6	7
4. WOOD	9	10
5. FURNITURE AND FIXTURE	7	9
6. PAPER AND ALLIED PRODUCT	5	10
7. PRINTING, PUBLISHING AND ALLIED	1	5
8. PRIMARY METAL	11	13
9. FABRICATED METAL PRODUCT	7	11
10. MACHINERY	15	21
11. TRANSPORTATION EQUIPMENT	8	8
12. ELECTRICAL AND ELECTRONIC PRODUCTS	3	13
13. NON-METALLIC MINERAL PRODUCTS	10	11
14. PETROLEUM AND CHEMICALS	4	6
15. OTHER MANUFACTURING	2	2
TOTAL	6	9

TABLE 15

NO PLAN TO USE AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP BECAUSE OF OTHER REASONS.
BY INDUSTRY
(ESTABLISHMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
IND							
1. FOOD, BEVERAGE AND TOBACCO	11	12	11	14	15	18	17
2. RUBBER AND PLASTIC	8	15	10	7	13	12	10
3. LEATHER, TEXTILE AND CLOTHING	6	8	6	10	8	5	7
4. WOOD	12	9	4	7	15	17	14
5. FURNITURE AND FIXTURE	3	6	3	4	5	3	9
6. PAPER AND ALLIED PRODUCT	5	8	5	8	8	7	13
7. PRINTING, PUBLISHING AND ALLIED	2	2	1	3	6	3	5
8. PRIMARY METAL	10	16	10	10	12	10	16
9. FABRICATED METAL PRODUCT	11	16	6	7	14	15	15
10. MACHINERY	8	15	6	10	20	13	23
11. TRANSPORTATION EQUIPMENT	6	13	7	8	19	8	11
12. ELECTRICAL AND ELECTRONIC PRODUCTS	13	12	4	3	9	6	13
13. NON-METALLIC MINERAL PRODUCTS	3	13	11	11	16	13	13
14. PETROLEUM AND CHEMICALS	5	4	5	7	7	5	6
15. OTHER MANUFACTURING	8	3	5	7	9	2	2
TOTAL	7	9	6	7	11	10	11

TABLE 16
THE USE OF TECHNOLOGY
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH									
	1A CAD/CAE	1B CAD/CAM	1C CAD PROC	2A FMC/S	2B NC/CNC	2C LASER	2D ROBOT PP	2E ROBOT OTH	3A AS/RS	3B AGVS
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
IND										
1. FOOD, BEVERAGE AND TOBACCO	30	9	4	19	14	9	8	3	9	4
2. RUBBER AND PLASTIC	42	16	4	21	25	4	10	18	17	8
3. LEATHER, TEXTILE AND CLOTHING	30	16	7	16	20	4	6	9	6	6
4. WOOD	25	18	10	24	14	16	5	2	15	8
5. FURNITURE AND FIXTURE	26	17	10	15	29	3	4	8	3	4
6. PAPER AND ALLIED PRODUCT	51	13	9	21	27	6	7	2	14	7
7. PRINTING, PUBLISHING AND ALLIED	31	18	10	14	14	8	2	1	16	3
8. PRIMARY METAL	68	27	10	16	47	2	11	5	5	18
9. FABRICATED METAL PRODUCT	42	21	9	12	44	4	13	4	2	4
10. MACHINERY	69	33	13	15	71	5	5	19	2	1
11. TRANSPORTATION EQUIPMENT	64	40	30	33	48	21	39	55	22	22
12. ELECTRICAL AND ELECTRONIC PRODUCTS	73	28	22	27	55	17	27	25	21	15
13. NON-METALLIC MINERAL PRODUCTS	24	14	8	25	13	4	12	4	19	6
14. PETROLEUM AND CHEMICALS	62	10	9	14	12	3	8	6	28	3
15. OTHER MANUFACTURING	40	10	7	12	18	12	18	20	2	3
TOTAL	49	20	13	21	30	9	15	16	15	9

(CONTINUED)

TABLE 16
THE USE OF TECHNOLOGY
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH									
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PROG C	5E COMP C	6A MRP	6B MRP II	7A CIM
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
IND										
1. FOOD, BEVERAGE AND TOBACCO	23	27	30	30	22	57	42	39	17	9
2. RUBBER AND PLASTIC	19	30	37	31	34	74	48	44	35	10
3. LEATHER, TEXTILE AND CLOTHING	18	10	26	27	16	27	29	38	23	10
4. WOOD	31	24	25	24	21	63	43	30	25	7
5. FURNITURE AND FIXTURE	3	9	14	15	12	21	19	46	23	7
6. PAPER AND ALLIED PRODUCT	44	53	43	38	39	84	70	48	31	25
7. PRINTING, PUBLISHING AND ALLIED	17	10	22	18	25	39	26	33	25	8
8. PRIMARY METAL	50	62	57	68	32	85	74	38	28	58
9. FABRICATED METAL PRODUCT	5	9	14	17	17	51	29	34	26	13
10. MACHINERY	13	20	27	13	17	45	31	48	30	13
11. TRANSPORTATION EQUIPMENT	46	47	68	57	75	71	57	86	55	25
12. ELECTRICAL AND ELECTRONIC PRODUCTS	35	51	55	47	30	61	54	65	49	33
13. NON-METALLIC MINERAL PRODUCTS	21	23	20	28	21	72	53	45	24	14
14. PETROLEUM AND CHEMICALS	38	44	45	34	37	78	64	60	36	30
15. OTHER MANUFACTURING	8	19	27	22	29	38	20	46	28	17
TOTAL	31	35	41	37	35	64	50	49	33	21

(CONTINUED)

TABLE 16
THE USE OF TECHNOLOGY
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH	
	7B SCADA	7C AI/ES
	PERCENT	PERCENT
	OF SHIP.	OF SHIP.
IND		
1. FOOD, BEVERAGE AND TOBACCO	21	4
2. RUBBER AND PLASTIC	19	3
3. LEATHER, TEXTILE AND CLOTHING	14	7
4. WOOD	19	2
5. FURNITURE AND FIXTURE	10	1
6. PAPER AND ALLIED PRODUCT	41	7
7. PRINTING, PUBLISHING AND ALLIED	14	2
8. PRIMARY METAL	65	3
9. FABRICATED METAL PRODUCT	10	2
10. MACHINERY	10	2
11. TRANSPORTATION EQUIPMENT	50	8
12. ELECTRICAL AND ELECTRONIC PRODUCTS	19	14
13. NON-METALLIC MINERAL PRODUCTS	39	11
14. PETROLEUM AND CHEMICALS	58	12
15. OTHER MANUFACTURING	10	12
TOTAL	34	7

TABLE 17

THE USE OF AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP, BY INDUSTRY
(SHIPMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
IND							
1. FOOD, BEVERAGE AND TOBACCO	33	35	11	30	88	42	25
2. RUBBER AND PLASTIC	45	50	25	35	78	53	29
3. LEATHER, TEXTILE AND CLOTHING	35	33	11	22	52	39	18
4. WOOD	34	36	18	34	66	34	22
5. FURNITURE AND FIXTURE	30	38	7	10	34	47	14
6. PAPER AND ALLIED PRODUCT	54	35	19	58	88	50	48
7. PRINTING, PUBLISHING AND ALLIED	41	25	17	21	56	33	16
8. PRIMARY METAL	74	83	23	66	92	40	72
9. FABRICATED METAL PRODUCT	45	51	5	10	83	42	21
10. MACHINERY	74	79	3	21	59	52	18
11. TRANSPORTATION EQUIPMENT	64	73	24	54	95	67	54
12. ELECTRICAL AND ELECTRONIC PRODUCTS	74	67	22	55	86	69	43
13. NON-METALLIC MINERAL PRODUCTS	34	38	22	31	79	47	45
14. PETROLEUM AND CHEMICALS	63	27	29	51	87	82	80
15. OTHER MANUFACTURING	42	33	5	20	47	47	20
TOTAL	52	47	18	41	77	51	40

TABLE 18
THE PLAN TO USE TECHNOLOGY WITHIN THE NEXT 2 YEARS
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH									
	1A CAD/CAE	1B CAD/CAM	1C CAD PROC	2A FMC/S	2B NC/CNC	2C LASER	2D ROBOT PP	2E ROBOT OTH	3A AS/RS	3B AGVS
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
IND										
1. FOOD, BEVERAGE AND TOBACCO	9	6	9	4	1	2	3	.	4	4
2. RUBBER AND PLASTIC	6	2	10	5	1	0	13	4	5	3
3. LEATHER, TEXTILE AND CLOTHING	7	2	4	2	1	1	4	4	5	3
4. WOOD	5	2	3	2	1	1	2	1	2	1
5. FURNITURE AND FIXTURE	23	11	11	8	4	2	4	2	2	1
6. PAPER AND ALLIED PRODUCT	17	2	5	1	4	4	5	4	8	4
7. PRINTING, PUBLISHING AND ALLIED	3	4	2	1	0	3	1	1	2	1
8. PRIMARY METAL	5	2	2	.	3	2	1	7	25	20
9. FABRICATED METAL PRODUCT	19	15	16	12	3	2	3	9	3	0
10. MACHINERY	11	15	13	7	3	6	4	6	6	0
11. TRANSPORTATION EQUIPMENT	4	6	6	7	1	22	4	6	24	24
12. ELECTRICAL AND ELECTRONIC PRODUCTS	4	11	9	6	0	4	6	4	1	1
13. NON-METALLIC MINERAL PRODUCTS	10	6	3	2	7	2	2	3	3	3
14. PETROLEUM AND CHEMICALS	11	1	10	3	3	2	1	1	1	3
15. OTHER MANUFACTURING	5	3	7	2	0	1	3	4	.	.
TOTAL	9	5	7	4	2	6	3	4	9	8

(CONTINUED)

TABLE 18

THE PLAN TO USE TECHNOLOGY WITHIN THE NEXT 2 YEARS
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH									
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PROG C	5E COMP C	6A MRP	6B MRP II	7A CIM
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
IND										
1. FOOD, BEVERAGE AND TOBACCO	12	10	8	12	8	4	10	17	24	11
2. RUBBER AND PLASTIC	3	7	9	14	8	2	13	18	22	5
3. LEATHER, TEXTILE AND CLOTHING	7	5	5	7	7	4	10	14	14	4
4. WOOD	2	2	8	5	6	2	7	14	7	5
5. FURNITURE AND FIXTURE	10	5	10	15	13	8	12	13	21	8
6. PAPER AND ALLIED PRODUCT	4	10	22	22	15	3	8	17	18	12
7. PRINTING, PUBLISHING AND ALLIED	2	2	13	14	6	2	9	14	11	3
8. PRIMARY METAL	1	3	14	3	40	0	5	3	14	3
9. FABRICATED METAL PRODUCT	12	19	26	13	18	5	19	19	13	8
10. MACHINERY	8	2	18	11	14	5	12	10	19	8
11. TRANSPORTATION EQUIPMENT	16	11	5	12	5	1	3	8	10	11
12. ELECTRICAL AND ELECTRONIC PRODUCTS	5	1	11	14	11	2	13	10	18	11
13. NON-METALLIC MINERAL PRODUCTS	2	2	24	28	14	2	14	10	18	12
14. PETROLEUM AND CHEMICALS	4	2	18	16	12	3	6	7	13	7
15. OTHER MANUFACTURING	3	1	7	6	2	3	6	6	14	1
TOTAL	8	7	12	13	12	3	9	11	15	8

(CONTINUED)

TABLE 18

THE PLAN TO USE TECHNOLOGY WITHIN THE NEXT 2 YEARS
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH	
	7B SCADA	7C AI/ES
	PERCENT	PERCENT
	OF SHIP.	OF SHIP.
IND		
1. FOOD, BEVERAGE AND TOBACCO	13	4
2. RUBBER AND PLASTIC	11	7
3. LEATHER, TEXTILE AND CLOTHING	9	3
4. WOOD	6	2
5. FURNITURE AND FIXTURE	10	1
6. PAPER AND ALLIED PRODUCT	8	3
7. PRINTING, PUBLISHING AND ALLIED	3	2
8. PRIMARY METAL	3	31
9. FABRICATED METAL PRODUCT	13	13
10. MACHINERY	9	2
11. TRANSPORTATION EQUIPMENT	10	34
12. ELECTRICAL AND ELECTRONIC PRODUCTS	15	5
13. NON-METALLIC MINERAL PRODUCTS	16	3
14. PETROLEUM AND CHEMICALS	7	20
15. OTHER MANUFACTURING	6	0
TOTAL	9	14

TABLE 19

THE PLAN TO USE AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP WITHIN THE NEXT 2 YEARS,
BY INDUSTRY
(SHIPMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
IND							
1. FOOD, BEVERAGE AND TOBACCO	13	10	8	13	27	27	20
2. RUBBER AND PLASTIC	16	16	5	8	26	27	17
3. LEATHER, TEXTILE AND CLOTHING	10	9	6	10	23	18	11
4. WOOD	7	6	2	4	18	16	10
5. FURNITURE AND FIXTURE	28	18	2	12	24	25	12
6. PAPER AND ALLIED PRODUCT	19	13	8	11	37	24	18
7. PRINTING, PUBLISHING AND ALLIED	6	7	3	3	22	15	6
8. PRIMARY METAL	6	12	25	5	48	15	35
9. FABRICATED METAL PRODUCT	27	27	3	19	46	26	25
10. MACHINERY	30	22	6	7	40	24	12
11. TRANSPORTATION EQUIPMENT	12	31	24	17	21	11	45
12. ELECTRICAL AND ELECTRONIC PRODUCTS	19	16	2	5	33	19	21
13. NON-METALLIC MINERAL PRODUCTS	17	14	4	2	46	21	22
14. PETROLEUM AND CHEMICALS	20	9	4	5	32	16	29
15. OTHER MANUFACTURING	13	9	.	3	13	17	7
TOTAL	15	16	10	10	30	19	25

TABLE 20
THE PLAN TO USE TECHNOLOGY WITHIN THE NEXT 2-5 YEARS
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH									
	1A CAD/CAE	1B CAD/CAM	1C CAD PROC	2A FMC/S	2B NC/CNC	2C LASER	2D ROBOT PP	2E ROBOT OTH	3A AS/RS	3B AGVS
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
IND										
1. FOOD, BEVERAGE AND TOBACCO	4	3	5	4	4	1	9	12	15	7
2. RUBBER AND PLASTIC	13	13	20	5	3	1	10	7	12	15
3. LEATHER, TEXTILE AND CLOTHING	8	10	10	4	4	2	5	3	3	3
4. WOOD	5	3	4	1	1	2	2	4	5	2
5. FURNITURE AND FIXTURE	5	12	9	17	13	8	9	13	8	5
6. PAPER AND ALLIED PRODUCT	7	5	6	2	1	3	8	6	8	5
7. PRINTING, PUBLISHING AND ALLIED	1	2	1	6	1	1	3	3	6	7
8. PRIMARY METAL	4	7	3	4	4	6	7	2	3	4
9. FABRICATED METAL PRODUCT	9	10	8	7	6	4	13	8	15	7
10. MACHINERY	4	13	13	10	2	9	12	10	6	7
11. TRANSPORTATION EQUIPMENT	9	6	15	14	0	6	21	4	15	13
12. ELECTRICAL AND ELECTRONIC PRODUCTS	3	20	16	9	2	3	9	6	11	7
13. NON-METALLIC MINERAL PRODUCTS	6	3	3	6	2	1	3	2	9	12
14. PETROLEUM AND CHEMICALS	5	2	8	2	1	1	3	4	11	12
15. OTHER MANUFACTURING	6	15	13	11	11	1	4	8	12	11
TOTAL	8	7	9	6	3	3	9	6	11	8

(CONTINUED)

TABLE 20

THE PLAN TO USE TECHNOLOGY WITHIN THE NEXT 2-5 YEARS
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH									
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PROG C	5E COMP C	6A MRP	6B MRP II	7A CIM
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
IND										
1. FOOD, BEVERAGE AND TOBACCO	9	10	9	14	12	4	9	9	13	17
2. RUBBER AND PLASTIC	10	7	16	14	16	2	13	9	12	26
3. LEATHER, TEXTILE AND CLOTHING	3	5	7	11	9	5	8	7	11	11
4. WOOD	9	9	3	7	11	3	6	9	14	6
5. FURNITURE AND FIXTURE	8	7	5	4	9	11	10	8	15	13
6. PAPER AND ALLIED PRODUCT	11	8	7	15	13	1	3	11	15	13
7. PRINTING, PUBLISHING AND ALLIED	2	3	5	5	7	4	5	9	10	5
8. PRIMARY METAL	0	1	6	4	7	.	0	3	3	6
9. FABRICATED METAL PRODUCT	11	7	16	21	9	5	8	19	23	11
10. MACHINERY	6	2	9	16	11	2	10	10	14	9
11. TRANSPORTATION EQUIPMENT	6	2	20	3	11	1	11	3	5	28
12. ELECTRICAL AND ELECTRONIC PRODUCTS	19	5	12	15	28	8	11	4	11	14
13. NON-METALLIC MINERAL PRODUCTS	6	13	6	6	4	3	6	11	12	11
14. PETROLEUM AND CHEMICALS	4	5	4	9	16	0	6	12	9	10
15. OTHER MANUFACTURING	15	6	6	12	4	2	7	6	7	5
TOTAL	7	6	10	10	12	3	8	8	11	14

(CONTINUED)

TABLE 20

THE PLAN TO USE TECHNOLOGY WITHIN THE NEXT 2-5 YEARS
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH	
	7B SCADA	7C AI/ES
	PERCENT	PERCENT
	OF SHIP.	OF SHIP.
IND		
1. FOOD, BEVERAGE AND TOBACCO	12	11
2. RUBBER AND PLASTIC	25	13
3. LEATHER, TEXTILE AND CLOTHING	8	6
4. WOOD	8	1
5. FURNITURE AND FIXTURE	12	2
6. PAPER AND ALLIED PRODUCT	13	19
7. PRINTING, PUBLISHING AND ALLIED	6	2
8. PRIMARY METAL	10	12
9. FABRICATED METAL PRODUCT	12	7
10. MACHINERY	11	3
11. TRANSPORTATION EQUIPMENT	7	10
12. ELECTRICAL AND ELECTRONIC PRODUCTS	15	14
13. NON-METALLIC MINERAL PRODUCTS	11	14
14. PETROLEUM AND CHEMICALS	8	16
15. OTHER MANUFACTURING	6	3
TOTAL	10	11

TABLE 21

THE PLAN TO USE OF AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP WITHIN THE NEXT 2-5 YEARS.
BY INDUSTRY
(SHIPMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
IND			.				
1. FOOD, BEVERAGE AND TOBACCO	8	19	20	11	28	15	26
2. RUBBER AND PLASTIC	28	18	22	14	31	14	46
3. LEATHER, TEXTILE AND CLOTHING	16	13	4	5	20	12	17
4. WOOD	8	6	6	12	21	15	11
5. FURNITURE AND FIXTURE	16	31	11	10	19	16	15
6. PAPER AND ALLIED PRODUCT	12	11	9	13	26	17	27
7. PRINTING, PUBLISHING AND ALLIED	3	9	10	3	14	12	9
8. PRIMARY METAL	13	17	7	1	12	5	26
9. FABRICATED METAL PRODUCT	18	29	16	11	33	26	22
10. MACHINERY	24	28	10	8	30	17	18
11. TRANSPORTATION EQUIPMENT	19	32	19	6	24	5	32
12. ELECTRICAL AND ELECTRONIC PRODUCTS	26	19	14	19	37	11	31
13. NON-METALLIC MINERAL PRODUCTS	9	10	13	14	17	18	23
14. PETROLEUM AND CHEMICALS	12	6	15	6	28	14	28
15. OTHER MANUFACTURING	21	23	13	17	17	9	10
TOTAL	15	18	14	9	25	13	25

TABLE 22

THE PLANNED USE OF TECHNOLOGY (2 YEARS OR 2-5 YEARS)
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH									
	1A CAD/CAE	1B CAD/CAM	1C CAD PROC	2A FMC/S	2B NC/CNC	2C LASER	2D ROBOT PP	2E ROBOT OTH	3A AS/RS	3B AGVS
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
IND										
1. FOOD, BEVERAGE AND TOBACCO	13	9	13	8	4	4	12	12	20	11
2. RUBBER AND PLASTIC	19	15	29	9	4	1	22	11	17	18
3. LEATHER, TEXTILE AND CLOTHING	15	12	15	7	5	3	9	6	8	6
4. WOOD	10	5	7	4	3	3	5	5	7	3
5. FURNITURE AND FIXTURE	28	24	20	25	17	10	13	15	9	6
6. PAPER AND ALLIED PRODUCT	24	7	12	3	5	7	11	9	15	9
7. PRINTING, PUBLISHING AND ALLIED	4	6	3	7	1	4	4	4	8	8
8. PRIMARY METAL	9	9	5	4	6	8	8	9	28	24
9. FABRICATED METAL PRODUCT	28	24	24	18	9	6	18	18	18	7
10. MACHINERY	15	28	26	17	5	15	16	17	12	7
11. TRANSPORTATION EQUIPMENT	13	12	21	21	2	28	25	11	39	37
12. ELECTRICAL AND ELECTRONIC PRODUCTS	7	31	25	15	2	7	15	10	12	8
13. NON-METALLIC MINERAL PRODUCTS	16	9	6	8	9	3	5	5	12	15
14. PETROLEUM AND CHEMICALS	17	3	17	6	3	2	5	4	12	15
15. OTHER MANUFACTURING	12	18	21	14	12	2	7	11	12	11
TOTAL	15	12	16	11	4	9	13	10	19	18

(CONTINUED)

TABLE 22

THE PLANNED USE OF TECHNOLOGY (2 YEARS OR 2-5 YEARS)
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH									
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PROG C	5E COMP C	6A MRP	6B MRP II	7A CIM
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
IMO										
1. FOOD, BEVERAGE AND TOBACCO	22	20	17	26	20	7	20	26	37	28
2. RUBBER AND PLASTIC	14	14	25	28	23	4	25	25	35	31
3. LEATHER, TEXTILE AND CLOTHING	10	10	12	18	17	10	18	21	25	15
4. WOOD	11	11	11	12	16	5	13	23	21	12
5. FURNITURE AND FIXTURE	17	11	16	19	22	19	22	21	36	19
6. PAPER AND ALLIED PRODUCT	15	18	29	36	28	4	11	29	33	24
7. PRINTING, PUBLISHING AND ALLIED	4	5	19	19	13	6	15	22	21	7
8. PRIMARY METAL	2	4	21	7	47	0	6	6	16	9
9. FABRICATED METAL PRODUCT	22	25	42	34	27	10	27	38	37	20
10. MACHINERY	12	4	26	27	25	6	22	20	34	15
11. TRANSPORTATION EQUIPMENT	22	13	25	15	16	2	14	9	15	37
12. ELECTRICAL AND ELECTRONIC PRODUCTS	23	6	23	29	40	9	23	14	29	25
13. NON-METALLIC MINERAL PRODUCTS	8	15	30	34	18	5	19	20	30	22
14. PETROLEUM AND CHEMICALS	8	7	22	25	28	3	12	19	23	17
15. OTHER MANUFACTURING	18	8	13	17	6	5	13	12	21	6
TOTAL	15	13	22	23	24	5	16	20	26	23

(CONTINUED)

TABLE 22

THE PLANNED USE OF TECHNOLOGY (2 YEARS OR 2-5 YEARS)
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH	
	7B SCADA	7C AI/ES
	PERCENT	PERCENT
	OF SHIP.	OF SHIP.
IND		
1. FOOD, BEVERAGE AND TOBACCO	25	15
2. RUBBER AND PLASTIC	36	20
3. LEATHER, TEXTILE AND CLOTHING	18	9
4. WOOD	13	3
5. FURNITURE AND FIXTURE	22	3
6. PAPER AND ALLIED PRODUCT	21	22
7. PRINTING, PUBLISHING AND ALLIED	8	4
8. PRIMARY METAL	13	43
9. FABRICATED METAL PRODUCT	25	21
10. MACHINERY	20	5
11. TRANSPORTATION EQUIPMENT	17	44
12. ELECTRICAL AND ELECTRONIC PRODUCTS	30	20
13. NON-METALLIC MINERAL PRODUCTS	27	17
14. PETROLEUM AND CHEMICALS	15	36
15. OTHER MANUFACTURING	12	3
TOTAL	20	24

TABLE 23

THE PLAN TO USE OF AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP WITHIN 2 YEARS OR 2-5 YEARS, BY INDUSTRY
(SHIPMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
IND							
1. FOOD, BEVERAGE AND TOBACCO	8	7	12	15	27	26	23
2. RUBBER AND PLASTIC	24	16	7	10	28	30	21
3. LEATHER, TEXTILE AND CLOTHING	13	9	3	9	19	16	14
4. WOOD	15	6	7	10	18	26	8
5. FURNITURE AND FIXTURE	14	20	6	8	12	30	14
6. PAPER AND ALLIED PRODUCT	20	19	21	18	39	43	26
7. PRINTING, PUBLISHING AND ALLIED	8	3	1	1	22	19	7
8. PRIMARY METAL	19	20	11	5	29	32	21
9. FABRICATED METAL PRODUCT	28	23	3	7	35	19	17
10. MACHINERY	39	20	3	4	32	35	17
11. TRANSPORTATION EQUIPMENT	37	39	12	29	46	39	31
12. ELECTRICAL AND ELECTRONIC PRODUCTS	42	20	11	16	53	44	26
13. NON-METALLIC MINERAL PRODUCTS	17	10	7	12	18	14	12
14. PETROLEUM AND CHEMICALS	10	12	8	13	32	25	20
15. OTHER MANUFACTURING	12	9	1	3	19	16	3
TOTAL	18	13	5	9	26	24	15

TABLE 24

NO PLAN TO USE TECHNOLOGY BECAUSE IT DOES NOT APPLY
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH									
	1A CAD/CAE	1B CAD/CAM	1C CAD PROC	2A FMC/S	2B NC/CNC	2C LASER	2D ROBOT PP	2E ROBOT DTH	3A AS/RS	3B AGVS
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
IND										
1. FOOD, BEVERAGE AND TOBACCO	46	67	67	59	68	73	59	61	40	54
2. RUBBER AND PLASTIC	28	55	50	49	54	76	43	45	36	43
3. LEATHER, TEXTILE AND CLOTHING	41	53	59	56	57	71	63	63	55	59
4. WOOD	47	60	63	59	68	65	73	75	56	69
5. FURNITURE AND FIXTURE	35	45	54	45	42	68	60	57	65	68
6. PAPER AND ALLIED PRODUCT	22	72	66	68	60	76	69	72	49	61
7. PRINTING, PUBLISHING AND ALLIED	62	63	72	71	71	79	84	83	62	66
8. PRIMARY METAL	18	53	65	72	39	74	60	63	38	32
9. FABRICATED METAL PRODUCT	19	38	48	47	37	56	53	53	50	57
10. MACHINERY	12	26	40	46	19	55	51	45	52	62
11. TRANSPORTATION EQUIPMENT	20	43	45	44	47	43	28	29	11	18
12. ELECTRICAL AND ELECTRONIC PRODUCTS	14	28	35	38	36	52	24	28	31	40
13. NON-METALLIC MINERAL PRODUCTS	56	66	77	61	73	86	60	65	47	58
14. PETROLEUM AND CHEMICALS	18	83	65	73	76	86	79	80	41	60
15. OTHER MANUFACTURING	39	59	59	59	60	67	57	54	60	72
TOTAL	29	57	58	57	56	67	56	57	39	49

(CONTINUED)

TABLE 24

NO PLAN TO USE TECHNOLOGY BECAUSE IT DOES NOT APPLY
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH									
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PROG C	5E COMP C	6A MRP	6B MRP II	7A CIM
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
IND										
1. FOOD, BEVERAGE AND TOBACCO	39	37	42	32	40	26	25	21	30	45
2. RUBBER AND PLASTIC	46	38	27	27	27	15	17	22	16	37
3. LEATHER, TEXTILE AND CLOTHING	52	58	48	41	46	49	39	29	36	51
4. WOOD	46	49	50	51	45	28	30	32	42	84
5. FURNITURE AND FIXTURE	64	65	58	50	51	44	43	27	33	56
6. PAPER AND ALLIED PRODUCT	32	23	22	22	23	10	16	11	18	33
7. PRINTING, PUBLISHING AND ALLIED	70	88	53	53	45	47	54	38	42	87
8. PRIMARY METAL	25	21	19	17	13	11	14	36	31	18
9. FABRICATED METAL PRODUCT	47	44	29	33	32	30	29	15	19	44
10. MACHINERY	48	49	30	39	39	35	32	19	21	39
11. TRANSPORTATION EQUIPMENT	28	35	4	12	3	23	24	20	23	32
12. ELECTRICAL AND ELECTRONIC PRODUCTS	22	24	13	15	17	20	17	5	7	24
13. NON-METALLIC MINERAL PRODUCTS	57	59	39	33	47	20	21	26	37	54
14. PETROLEUM AND CHEMICALS	43	43	27	35	27	17	21	17	28	43
15. OTHER MANUFACTURING	55	57	50	51	49	46	54	38	40	59
TOTAL	40	40	29	29	28	25	25	21	27	41

(CONTINUED)

TABLE 24

NO PLAN TO USE TECHNOLOGY BECAUSE IT DOES NOT APPLY
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH	
	7B SCADA	7C AI/ES
	PERCENT	PERCENT
	OF SHIP.	OF SHIP.
IND		
1. FOOD, BEVERAGE AND TOBACCO	38	54
2. RUBBER AND PLASTIC	27	42
3. LEATHER, TEXTILE AND CLOTHING	49	58
4. WOOD	52	74
5. FURNITURE AND FIXTURE	49	71
6. PAPER AND ALLIED PRODUCT	25	44
7. PRINTING, PUBLISHING AND ALLIED	62	70
8. PRIMARY METAL	14	33
9. FABRICATED METAL PRODUCT	44	45
10. MACHINERY	40	51
11. TRANSPORTATION EQUIPMENT	28	36
12. ELECTRICAL AND ELECTRONIC PRODUCTS	30	34
13. NON-METALLIC MINERAL PRODUCTS	29	61
14. PETROLEUM AND CHEMICALS	22	42
15. OTHER MANUFACTURING	58	65
TOTAL	34	47

TABLE 25

NO PLAN TO USE OF AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP BECAUSE IT DOES NOT APPLY.
BY INDUSTRY
(SHIPMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
IND							
1. FOOD, BEVERAGE AND TOBACCO	74	86	54	41	55	31	61
2. RUBBER AND PLASTIC	60	88	48	48	40	26	49
3. LEATHER, TEXTILE AND CLOTHING	62	79	62	60	62	37	62
4. WOOD	70	85	74	53	66	42	77
5. FURNITURE AND FIXTURE	56	79	74	71	68	34	73
6. PAPER AND ALLIED PRODUCT	76	89	66	35	38	21	51
7. PRINTING, PUBLISHING AND ALLIED	79	89	69	73	68	42	77
8. PRIMARY METAL	69	92	42	26	25	36	35
9. FABRICATED METAL PRODUCT	54	84	60	48	49	21	60
10. MACHINERY	44	77	64	54	54	26	58
11. TRANSPORTATION EQUIPMENT	54	67	19	36	30	27	42
12. ELECTRICAL AND ELECTRONIC PRODUCTS	37	64	43	26	38	8	40
13. NON-METALLIC MINERAL PRODUCTS	81	92	61	62	54	39	65
14. PETROLEUM AND CHEMICALS	91	92	62	49	47	29	51
15. OTHER MANUFACTURING	64	73	73	57	68	41	72
TOTAL	67	82	52	44	46	29	54

TABLE 26

NO PLAN TO USE TECHNOLOGY BECAUSE IT IS NOT COST EFFECTIVE
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH									
	1A CAD/CAE	1B CAO/CAM	1C CAD PROC	2A FMC/S	2B NC/CNC	2C LASER	2D ROBOT PP	2E ROBOT OTH	3A AS/RS	3B AGVS
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
IND										
1. FOOD, BEVERAGE AND TOBACCO	5	6	7	6	6	6	11	10	22	20
2. RUBBER AND PLASTIC	6	8	10	12	8	8	12	14	22	24
3. LEATHER, TEXTILE AND CLOTHING	7	7	8	9	9	11	13	9	19	17
4. WOOD	10	8	10	5	7	9	9	9	13	9
5. FURNITURE AND FIXTURE	8	8	8	7	10	10	15	11	18	14
6. PAPER AND ALLIED PRODUCT	2	6	8	4	4	7	8	10	14	14
7. PRINTING, PUBLISHING AND ALLIED	1	2	4	3	5	5	6	7	10	13
8. PRIMARY METAL	1	0	2	0	0	0	0	0	5	5
9. FABRICATED METAL PRODUCT	5	9	9	15	5	14	9	13	20	18
10. MACHINERY	1	9	7	14	4	17	18	13	28	23
11. TRANSPORTATION EQUIPMENT	2	4	2	1	2	4	4	2	19	17
12. ELECTRICAL AND ELECTRONIC PRODUCTS	1	4	4	12	3	7	23	22	25	24
13. NON-METALLIC MINERAL PRODUCTS	2	5	3	2	1	3	14	14	17	16
14. PETROLEUM AND CHEMICALS	3	3	7	4	4	5	5	6	18	16
15. OTHER MANUFACTURING	6	7	7	10	5	13	12	10	19	9
TOTAL	4	5	6	6	4	7	9	8	18	16

(CONTINUED)

TABLE 26

NO PLAN TO USE TECHNOLOGY BECAUSE IT IS NOT COST EFFECTIVE
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH									
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PROG C	5E COMP C	6A MRP	6B MRP II	7A CIM
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
IND										
1. FOOD, BEVERAGE AND TOBACCO	9	9	5	5	8	3	5	4	6	11
2. RUBBER AND PLASTIC	13	9	5	7	7	1	4	4	5	11
3. LEATHER, TEXTILE AND CLOTHING	10	11	5	6	8	6	7	5	7	11
4. WOOD	6	6	4	3	6	3	5	5	3	5
5. FURNITURE AND FIXTURE	6	6	6	7	6	6	7	3	4	9
6. PAPER AND ALLIED PRODUCT	3	2	1	1	3	1	1	5	6	12
7. PRINTING, PUBLISHING AND ALLIED	4	3	2	6	7	3	2	2	4	4
8. PRIMARY METAL	6	6	2	3	1	0	0	0	1	4
9. FABRICATED METAL PRODUCT	13	12	6	9	8	5	10	4	5	14
10. MACHINERY	19	20	9	10	9	5	7	4	5	14
11. TRANSPORTATION EQUIPMENT	3	2	1	1	3	2	2	1	1	2
12. ELECTRICAL AND ELECTRONIC PRODUCTS	12	9	3	4	6	4	1	4	2	8
13. NON-METALLIC MINERAL PRODUCTS	12	3	1	1	5	1	4	4	4	5
14. PETROLEUM AND CHEMICALS	9	4	3	2	4	1	2	2	7	7
15. OTHER MANUFACTURING	14	10	5	5	9	4	4	2	7	13
TOTAL	8	6	3	4	5	3	4	3	4	8

(CONTINUED)

TABLE 26

NO PLAN TO USE TECHNOLOGY BECAUSE IT IS NOT COST EFFECTIVE
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH	
	7B SCADA	7C AI/ES
	PERCENT	PERCENT
	OF SHIP.	OF SHIP.
IND		
1. FOOD, BEVERAGE AND TOBACCO	10	16
2. RUBBER AND PLASTIC	10	18
3. LEATHER, TEXTILE AND CLOTHING	9	12
4. WOOD	5	8
5. FURNITURE AND FIXTURE	9	11
6. PAPER AND ALLIED PRODUCT	7	13
7. PRINTING, PUBLISHING AND ALLIED	5	9
8. PRIMARY METAL	1	2
9. FABRICATED METAL PRODUCT	11	15
10. MACHINERY	12	19
11. TRANSPORTATION EQUIPMENT	0	7
12. ELECTRICAL AND ELECTRONIC PRODUCTS	13	11
13. NON-METALLIC MINERAL PRODUCTS	3	4
14. PETROLEUM AND CHEMICALS	3	5
15. OTHER MANUFACTURING	13	14
TOTAL	6	10

TABLE 27

NO PLAN TO USE AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP BECAUSE IT IS NOT COST EFFECTIVE.
BY INDUSTRY
(SHIPMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
IND							
1. FOOD, BEVERAGE AND TOBACCO	9	18	25	10	14	8	18
2. RUBBER AND PLASTIC	13	24	29	15	12	5	24
3. LEATHER, TEXTILE AND CLOTHING	10	20	20	12	12	7	13
4. WOOD	13	13	13	6	9	8	10
5. FURNITURE AND FIXTURE	10	23	20	7	9	4	14
6. PAPER AND ALLIED PRODUCT	12	15	19	3	4	6	16
7. PRINTING, PUBLISHING AND ALLIED	4	9	13	4	11	5	10
8. PRIMARY METAL	3	1	5	6	4	1	5
9. FABRICATED METAL PRODUCT	12	25	23	13	15	5	19
10. MACHINERY	11	34	30	21	19	5	23
11. TRANSPORTATION EQUIPMENT	4	9	23	3	4	1	8
12. ELECTRICAL AND ELECTRONIC PRODUCTS	6	32	31	13	13	5	16
13. NON-METALLIC MINERAL PRODUCTS	7	17	22	13	8	4	7
14. PETROLEUM AND CHEMICALS	10	9	24	11	7	7	9
15. OTHER MANUFACTURING	10	20	19	14	12	7	19
TOTAL	8	15	22	9	9	5	13

TABLE 28

NO PLAN TO USE TECHNOLOGY FOR OTHER REASONS
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH									
	1A CAD/CAE	1B CAD/CAM	1C CAD PROC	2A FMC/S	2B NC/CNC	2C LASER	2D ROBOT PP	2E ROBOT DTH	3A AS/RS	3B AGVS
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP	OF SHIP	OF SHIP	OF SHIP	OF SHIP	OF SHIP	OF SHIP	OF SHIP	OF SHIP	OF SHIP
IND										
1. FOOD, BEVERAGE AND TOBACCO	6	8	9	7	8	9	9	12	10	12
2. RUBBER AND PLASTIC	4	6	6	9	9	11	12	13	8	7
3. LEATHER, TEXTILE AND CLOTHING	7	12	12	11	10	11	9	11	13	12
4. WOOD	8	9	10	8	8	8	8	9	8	11
5. FURNITURE AND FIXTURE	4	5	7	7	4	8	8	9	5	7
6. PAPER AND ALLIED PRODUCT	1	2	5	4	3	4	5	5	8	8
7. PRINTING, PUBLISHING AND ALLIED	2	11	12	5	8	4	4	4	4	11
8. PRIMARY METAL	4	11	17	8	6	16	21	22	24	21
9. FABRICATED METAL PRODUCT	5	7	9	8	6	20	10	12	10	16
10. MACHINERY	3	4	14	9	2	8	10	6	8	7
11. TRANSPORTATION EQUIPMENT	0	1	1	1	2	3	3	3	10	5
12. ELECTRICAL AND ELECTRONIC PRODUCTS	6	10	15	8	4	16	10	13	12	13
13. NON-METALLIC MINERAL PRODUCTS	2	6	5	4	4	4	9	12	5	4
14. PETROLEUM AND CHEMICALS	0	0	1	3	3	3	3	4	1	5
15. OTHER MANUFACTURING	2	6	7	5	4	5	5	4	7	5
TOTAL	3	6	7	6	5	8	8	9	9	10

(CONTINUED)

TABLE 28

IND PLAN TO USE TECHNOLOGY FOR OTHER REASONS
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH									
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PRDG C	5E COMP C	6A MRP	6B MRP II	7A CIM
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP	OF SHIP	OF SHIP	OF SHIP	OF SHIP	OF SHIP	OF SHIP	OF SHIP	OF SHIP	OF SHIP
IND										
1. FOOD, BEVERAGE AND TOBACCO	7	7	6	6	10	7	6	9	10	7
2. RUBBER AND PLASTIC	9	9	5	7	7	6	4	5	9	11
3. LEATHER, TEXTILE AND CLOTHING	10	10	8	7	12	8	7	7	9	12
4. WOOD	6	9	10	10	10	3	9	10	10	12
5. FURNITURE AND FIXTURE	9	9	9	8	8	10	8	4	5	9
6. PAPER AND ALLIED PRODUCT	7	4	4	3	7	1	2	7	11	6
7. PRINTING, PUBLISHING AND ALLIED	5	13	4	4	9	4	3	7	8	14
8. PRIMARY METAL	18	7	2	5	7	4	6	20	23	10
9. FABRICATED METAL PRODUCT	10	9	9	7	15	5	6	8	13	9
10. MACHINERY	8	7	7	10	10	8	8	9	10	19
11. TRANSPORTATION EQUIPMENT	2	3	2	3	3	1	3	4	6	5
12. ELECTRICAL AND ELECTRONIC PRODUCTS	7	11	6	5	6	6	4	12	13	10
13. NON-METALLIC MINERAL PRODUCTS	2	2	8	4	9	2	3	5	5	5
14. PETROLEUM AND CHEMICALS	1	2	3	3	4	1	1	1	3	2
15. OTHER MANUFACTURING	5	4	5	5	7	7	7	1	4	5
TOTAL	6	6	5	5	7	4	4	7	9	7

(CONTINUED)

TABLE 28

NO PLAN TO USE TECHNOLOGY FOR OTHER REASONS
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH	
	7B SCAOA	7C AI/ES
	PERCENT	PERCENT
	OF SHIP	OF SHIP
IND		
1. FOOD, BEVERAGE AND TOBACCO	6	11
2. RUBBER AND PLASTIC	8	17
3. LEATHER, TEXTILE AND CLOTHING	10	14
4. WOOD	11	13
5. FURNITURE AND FIXTURE	10	13
6. PAPER AND ALLIED PRODUCT	7	13
7. PRINTING, PUBLISHING AND ALLIED	11	14
8. PRIMARY METAL	7	19
9. FABRICATED METAL PRODUCT	10	17
10. MACHINERY	18	23
11. TRANSPORTATION EQUIPMENT	4	5
12. ELECTRICAL AND ELECTRONIC PRODUCTS	9	21
13. NON-METALLIC MINERAL PRODUCTS	2	7
14. PETROLEUM AND CHEMICALS	1	4
15. OTHER MANUFACTURING	7	6
TOTAL	7	11

TABLE 29

NO PLAN TO USE AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP FOR OTHER REASONS.
BY INDUSTRY
(SHIPMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
IND							
1. FOOD, BEVERAGE AND TOBACCO	10	14	13	7	12	12	12
2. RUBBER AND PLASTIC	7	19	8	11	12	9	21
3. LEATHER, TEXTILE AND CLOTHING	13	17	14	12	16	9	15
4. WOOD	10	13	11	9	14	12	16
5. FURNITURE AND FIXTURE	7	13	7	9	13	8	14
6. PAPER AND ALLIED PRODUCT	6	6	10	8	9	11	14
7. PRINTING, PUBLISHING AND ALLIED	12	9	12	13	10	8	16
8. PRIMARY METAL	17	29	29	18	9	25	22
9. FABRICATED METAL PRODUCT	12	25	16	10	20	15	22
10. MACHINERY	15	18	8	8	16	15	31
11. TRANSPORTATION EQUIPMENT	1	6	11	3	6	6	5
12. ELECTRICAL AND ELECTRONIC PRODUCTS	17	22	14	11	13	15	22
13. NON-METALLIC MINERAL PRODUCTS	6	15	7	2	15	7	10
14. PETROLEUM AND CHEMICALS	1	4	6	2	8	3	6
15. OTHER MANUFACTURING	8	7	7	5	8	4	8
TOTAL	8	13	12	7	11	10	13

TABLE 30
THE USE OF TECHNOLOGY
BY PROVINCE AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH									
	1A CAD/CAE	1B CAD/CAM	1C CAD PROC	2A FMC/S	2B NC/CNC	2C LASER	2D ROBOT PP	2E ROBOT OTH	3A AS/RS	3B AGVS
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
PRO										
NEWFOUNDLAND	15	10	13	4	6	1	2	2	14	1
PRINCE EDWARD ISLAND	6	.	.	.	4	1	.	.	.	.
NOVA SCOTIA	16	4	1	3	5	0	.	1	1	0
NEW BRUNSWICK	17	5	12	4	14	1	0	0	1	1
QUEBEC	17	8	4	10	17	3	4	6	5	5
ONTARIO	18	6	4	8	15	1	5	2	4	2
MANITOBA	17	9	6	6	10	3	1	2	4	2
SASKATCHEWAN	18	6	2	2	7	6	1	.	1	.
ALBERTA	19	3	2	3	10	2	0	0	5	.
BRITISH COLUMBIA	13	9	2	4	10	2	2	1	3	1
TOTAL	17	7	4	7	14	2	3	3	4	2

(CONTINUED)

TABLE 30
THE USE OF TECHNOLOGY
BY PROVINCE AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH									
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PROG C	5E COMP C	6A MRP	6B MRP II	7A CIM
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
PRO										
NEWFOUNDLAND	4	3	18	2	15	10	8	21	13	4
PRINCE EDWARD ISLAND	4	2	7	4	1	4	2	20	20	.
NOVA SCOTIA	5	4	6	5	2	10	6	9	4	2
NEW BRUNSWICK	3	5	5	4	14	11	10	19	19	1
QUEBEC	12	10	18	17	14	17	13	20	11	4
ONTARIO	9	9	11	8	12	22	14	18	12	6
MANITOBA	4	5	5	5	5	13	8	14	9	2
SASKATCHEWAN	4	4	9	6	2	6	5	12	4	1
ALBERTA	6	4	5	4	3	15	8	11	5	1
BRITISH COLUMBIA	8	10	5	5	6	14	7	15	6	2
TOTAL	9	8	11	9	10	18	12	17	10	4

(CONTINUED)

TABLE 30

THE USE OF TECHNOLOGY
BY PROVINCE AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH	
	7B SCADA	7C AI/ES
	PERCENT	PERCENT
	OF EST.	OF EST.
PRO		
NEWFOUNDLAND	13	2
PRINCE EDWARD ISLAND	.	.
NOVA SCOTIA	4	1
NEW BRUNSWICK	3	1
QUEBEC	8	1
ONTARIO	8	3
MANITOBA	5	1
SASKATCHEWAN	1	0
ALBERTA	3	1
BRITISH COLUMBIA	3	0
TOTAL	6	2

TABLE 31

THE USE OF AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP . BY PROVINCE
(ESTABLISHMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
PRO							
NEWFOUNDLAND	23	8	14	5	34	23	13
PRINCE EDWARD ISLAND	6	4	.	4	11	20	.
NOVA SCOTIA	19	8	1	6	11	9	5
NEW BRUNSWICK	18	17	2	5	23	21	4
QUEBEC	19	26	9	14	36	22	10
ONTARIO	20	23	6	11	32	18	13
MANITOBA	20	15	4	6	21	15	6
SASKATCHEWAN	21	15	1	4	15	14	3
ALBERTA	19	14	5	8	21	11	4
BRITISH COLUMBIA	18	15	3	12	22	16	4
TOTAL	19	21	6	11	30	18	9

TABLE 32
THE USE OF AT LEAST ONE OF THE 22 TECHNOLOGIES
BY INDUSTRY AND PROVINCE
(ESTABLISHMENT WEIGHTED)

	IND									
	1. FOOD, BEVERAGE AND TOBACCO	2. RUBBER AND PLASTIC	3. LEATHER, TEXTILE AND CLOTHING	4. WOOD	5. FURNITURE AND FIXTURE	6. PAPER AND ALLIED PRODUCT	7. PRINTING, PUBLISHING AND ALLIED	8. PRIMARY METAL	9. FABRICATED METAL PRODUCT	10. MACHINERY
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
PRO										
NEWFOUNDLAND	40		100	20	50	82	97		29	100
PRINCE EDWARD ISLAND	56						50		67	
NOVA SCOTIA	43	72	19	2	42	60	42	50	20	5
NEW BRUNSWICK	38	35	35	52	13	67	8	50	15	45
QUEBEC	67	64	38	44	52	70	41	87	63	74
ONTARIO	54	54	35	50	18	58	52	66	51	67
MANITOBA	46	46	32	36	59	52	18	78	24	44
SASKATCHEWAN	52	50	7	69	50	25	50	100	33	51
ALBERTA	44	45	21	32	36	66	51	67	25	43
BRITISH COLUMBIA	40	41	52	41	27	69	53	40	34	79
TOTAL	53	54	37	42	35	63	47	69	48	65

(CONTINUED)

TABLE 32

THE USE OF AT LEAST ONE OF THE 22 TECHNOLOGIES
BY INDUSTRY AND PROVINCE
(ESTABLISHMENT WEIGHTED)

	INDUSTRY					
	11. TRANSPORTATION EQUIPMENT	12. ELECTRICAL AND ELECTRONIC PRODUCTS	13. NON-METALLIC MINERAL PRODUCTS	14. PETROLEUM AND CHEMICALS	15. OTHER MANUFACTURING	TOTAL
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
PROVINCE						
NEWFOUNDLAND	100	.	42	63	.	49
PRINCE EDWARD ISLAND	.	.	.	16	9	31
NOVA SCOTIA	50	85	50	11	34	32
NEW BRUNSWICK	27	.	53	.	22	34
QUEBEC	63	84	50	65	70	54
ONTARIO	86	69	35	56	25	50
MANITOBA	70	50	78	40	20	38
SASKATCHEWAN	28	64	42	14	35	44
ALBERTA	35	58	41	84	5	37
BRITISH COLUMBIA	47	47	47	49	30	43
TOTAL	70	69	44	55	35	48

TABLE 33

THE USE OF AT LEAST ONE OF THE 17 TECHNOLOGIES
BY INDUSTRY AND PROVINCE
(ESTABLISHMENT WEIGHTED)

	IND									
	1. FOOD, BEVERAGE AND TOBACCO	2. RUBBER AND PLASTIC	3. LEATHER, TEXTILE AND CLOTHING	4. WOOD	5. FURNITURE AND FIXTURE	6. PAPER AND ALLIED PRODUCT	7. PRINTING, PUBLISHING AND ALLIED	8. PRIMARY METAL	9. FABRICATED METAL PRODUCT	10. MACHINERY
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
PRO										
NEWFOUNDLAND	35	.	100	20	50	82	97	.	14	100
PRINCE EDWARD ISLAND	16	.	.	.	.	.	17	.	87	.
NOVA SCOTIA	34	72	17	2	42	60	42	50	20	5
NEW BRUNSWICK	32	35	4	52	13	67	3	50	15	45
QUEBEC	66	51	35	43	42	68	41	87	63	74
ONTARIO	46	52	32	49	17	51	28	68	49	61
MANITOBA	39	46	31	21	39	48	17	78	22	44
SASKATCHEWAN	52	50	7	54	50	25	49	100	33	49
ALBERTA	36	45	13	30	32	52	51	67	25	43
BRITISH COLUMBIA	17	38	35	41	25	69	52	28	28	68
TOTAL	45	49	33	41	29	59	35	68	46	60

(CONTINUED)

TABLE 33

THE USE OF AT LEAST ONE OF THE 17 TECHNOLOGIES
BY INDUSTRY AND PROVINCE
(ESTABLISHMENT WEIGHTED)

	IND					
	11. TRANSPORTATION EQUIPMENT	12. ELECTRICAL AND ELECTRONIC PRODUCTS	13. NON-METALLIC MINERAL PRODUCTS	14. PETROLEUM AND CHEMICALS	15. OTHER MANUFACTURING	TOTAL
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.
PRO						
NEWFOUNDLAND	100	.	42	63	.	48
PRINCE EDWARD ISLAND	.	.	.	16	9	13
NOVA SCOTIA	50	85	50	11	30	29
NEW BRUNSWICK	27	.	53	.	22	31
QUEBEC	62	74	49	62	57	51
ONTARIO	83	63	35	48	22	43
MANITOBA	63	50	78	40	20	34
SASKATCHEWAN	5	84	39	14	35	42
ALBERTA	16	58	41	63	4	35
BRITISH COLUMBIA	37	47	43	47	24	38
TOTAL	65	63	43	50	30	43

TABLE 34
THE USE OF TECHNOLOGY
BY PROVINCE AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH									
	1A CAD/CAE	1B CAD/CAM	1C CAD PROC	2A FMC/S	2B NC/CNC	2C LASER	2D ROBOT PP	2E ROBOT OTH	3A AS/RS	3B AGVS
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
PRO										
NEWFOUNDLAND	14	5	12	1	12	0	0	7	14	1
PRINCE EDWARD ISLAND	2	.	.	.	23	21	.	.	.	.
NOVA SCOTIA	27	10	1	6	23	1	.	16	9	1
NEW BRUNSWICK	26	10	3	10	10	1	6	0	1	9
QUEBEC	50	19	11	19	33	8	11	11	14	11
ONTARIO	53	24	15	23	33	11	21	23	16	11
MANITOBA	42	23	13	8	25	16	4	3	5	3
SASKATCHEWAN	47	9	7	18	11	2	6	.	4	.
ALBERTA	48	6	14	16	9	5	1	1	16	.
BRITISH COLUMBIA	34	19	10	19	21	10	4	0	12	5
TOTAL	49	20	13	21	30	9	15	16	15	9

(CONTINUED)

TABLE 34
THE USE OF TECHNOLOGY
BY PROVINCE AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH									
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PROG C	5E COMP C	6A MRP	6B MRP II	7A CIM
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
PRO										
NEWFOUNDLAND	12	13	10	5	12	33	33	29	29	7
PRINCE EDWARD ISLAND	38	16	10	28	14	28	6	32	32	.
NOVA SCOTIA	35	39	49	20	24	61	59	44	23	4
NEW BRUNSWICK	21	22	31	37	25	49	45	32	30	5
QUEBEC	34	36	43	39	33	61	49	51	32	19
ONTARIO	31	37	44	41	41	67	52	51	36	28
MANITOBA	18	20	23	18	17	51	30	43	17	7
SASKATCHEWAN	14	19	27	9	10	42	21	19	13	1
ALBERTA	31	33	28	24	34	69	57	40	28	14
BRITISH COLUMBIA	30	30	30	25	22	59	45	45	27	14
TOTAL	31	35	41	37	35	64	50	49	33	21

(CONTINUED)

TABLE 34

THE USE OF TECHNOLOGY
BY PROVINCE AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH	
	7B SCADA	7C AI/ES
	PERCENT	PERCENT
	OF SHIP.	OF SHIP.
PRO		
NEWFOUNDLAND	21	9
PRINCE EDWARD ISLAND	-	-
NOVA SCOTIA	45	6
NEW BRUNSWICK	20	3
QUEBEC	34	4
ONTARIO	37	9
MANITOBA	16	0
SASKATCHEWAN	13	5
ALBERTA	36	1
BRITISH COLUMBIA	24	4
TOTAL	34	7

TABLE 35

THE USE OF AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP, BY PROVINCE
(SHIPMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATI- ONS AND CONTROL	6. MANUFACTURI- NG INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
PRO							
NEWFOUNDLAND	25	12	14	22	49	31	30
PRINCE EDWARD ISLAND	2	23	.	38	47	32	.
NOVA SCOTIA	27	30	10	47	68	52	45
NEW BRUNSWICK	29	19	9	23	54	43	26
QUEBEC	52	53	21	42	77	55	40
ONTARIO	56	51	20	42	81	53	43
MANITOBA	48	41	7	24	63	46	18
SASKATCHEWAN	48	25	4	19	52	19	14
ALBERTA	48	25	16	40	77	41	37
BRITISH COLUMBIA	42	35	13	36	68	47	30
TOTAL	52	47	18	41	77	51	40

TABLE 36

THE USE OF AT LEAST ONE OF THE 22 TECHNOLOGIES
BY INDUSTRY AND PROVINCE
(SHIPMENT WEIGHTED)

	IND									
	1. FOOD, BEVERAGE AND TOBACCO	2. RUBBER AND PLASTIC	3. LEATHER, TEXTILE AND CLOTHING	4. WOOD	5. FURNITURE AND FIXTURE	6. PAPER AND ALLIED PRODUCT	7. PRINTING, PUBLISHING AND ALLIED	8. PRIMARY METAL	9. FABRICATED METAL PRODUCT	10. MACHINERY
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
PRO										
NEWFOUNDLAND	38	.	100	62	39	99	48	.	66	100
PRINCE EDWARD ISLAND	87	.	.	.	.	.	33	.	96	.
NOVA SCOTIA	81	98	93	14	99	99	29	99	56	42
NEW BRUNSWICK	77	62	32	88	74	97	91	100	93	90
QUEBEC	89	83	67	59	64	90	92	100	95	96
ONTARIO	81	90	76	75	69	89	64	97	76	94
MANITOBA	70	92	68	81	74	83	65	96	70	80
SASKATCHEWAN	66	14	41	96	66	90	38	100	41	83
ALBERTA	79	73	88	86	73	86	88	93	69	72
BRITISH COLUMBIA	86	68	74	89	46	97	81	85	52	93
TOTAL	81	87	71	77	67	92	73	97	78	91

(CONTINUED)

TABLE 36

THE USE OF AT LEAST ONE OF THE 22 TECHNOLOGIES
BY INDUSTRY AND PROVINCE
(SHIPMENT WEIGHTED)

	INDUSTRY					
	11. TRANSPORTATION EQUIPMENT	12. ELECTRICAL AND ELECTRONIC PRODUCTS	13. NON- METALLIC MINERAL PRODUCTS	14. PETROLEUM AND CHEMICALS	15. OTHER MANUFACTURING	TOTAL
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
PRO						
NEWFOUNDLAND	100	.	41	96	.	57
PRINCE EDWARD ISLAND	.	.	.	15	84	71
NOVA SCOTIA	85	97	74	96	66	85
NEW BRUNSWICK	73	.	83	.	42	64
QUEBEC	99	94	96	99	73	88
ONTARIO	100	98	91	97	77	90
MANITOBA	97	94	95	76	48	78
SASKATCHEWAN	70	90	84	90	53	75
ALBERTA	54	94	79	98	49	86
BRITISH COLUMBIA	84	88	93	81	39	86
TOTAL	99	96	91	93	73	88

TABLE 37

THE USE OF AT LEAST ONE OF THE 17 TECHNOLOGIES
BY INDUSTRY AND PROVINCE
(SHIPMENT WEIGHTED)

	IND									
	1. FOOD, BEVERAGE AND TOBACCO	2. RUBBER AND PLASTIC	3. LEATHER, TEXTILE AND CLOTHING	4. WOOD	5. FURNITURE AND FIXTURE	6. PAPER AND ALLIED PRODUCT	7. PRINTING, PUBLISHING AND ALLIED	8. PRIMARY METAL	9. FABRICATED METAL PRODUCT	10. MACHINERY
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
PRO										
NEWFOUNDLAND	30	.	100	62	39	99	48	.	26	100
PRINCE EDWARD ISLAND	57	.	.	.	.	.	3	.	98	.
NOVA SCOTIA	60	98	77	14	99	99	29	99	56	42
NEW BRUNSWICK	64	62	27	88	74	97	55	100	93	90
QUEBEC	85	78	64	55	81	88	92	100	95	96
ONTARIO	76	86	70	75	64	88	59	97	70	92
MANITOBA	68	92	65	75	51	77	63	96	67	80
SASKATCHEWAN	66	14	41	94	66	90	36	100	41	77
ALBERTA	79	73	45	83	49	80	88	93	68	72
BRITISH COLUMBIA	78	63	70	89	34	97	75	84	47	92
TOTAL	76	84	66	76	61	91	70	97	73	90

(CONTINUED)

TABLE 37

THE USE OF AT LEAST ONE OF THE 17 TECHNOLOGIES
BY INDUSTRY AND PROVINCE
(SHIPMENT WEIGHTED)

	IND					
	11. TRANSPORTATION EQUIPMENT	12. ELECTRICAL AND ELECTRONIC PRODUCTS	13. NON- METALLIC MINERAL PRODUCTS	14. PETROLEUM AND CHEMICALS	15. OTHER MANUFACTURING	TOTAL
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.	OF SHIP.
PRO						
NEWFOUNDLAND	100	.	41	96	.	52
PRINCE EDWARD ISLAND	.	.	.	15	84	47
NOVA SCOTIA	85	97	74	96	59	79
NEW BRUNSWICK	73	.	83	.	42	60
QUEBEC	98	92	95	97	63	86
ONTARIO	99	96	91	95	88	87
MANITOBA	97	94	95	76	48	76
SASKATCHEWAN	56	90	75	90	53	73
ALBERTA	48	94	79	98	47	84
BRITISH COLUMBIA	82	88	89	63	31	81
TOTAL	98	95	90	90	64	85

TABLE 38

FOR GOODS OF OWN MANUFACTURE, WHAT WAS THE PERCENTAGE OF THE
VALUE OF SHIPMENTS EXPORTED FROM THIS PLANT IN THE LAST YEAR
(ESTABLISHMENT WEIGHTED)

	QB1					ALL PERCENT OF EST.
	NOT ANSWERED	< 50%	>= 50%	NIL	N/A	
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	
IND						
1. FOOD, BEVERAGE AND TOBACCO	0	30	16	53	-	99
2. RUBBER AND PLASTIC	0	55	17	28	-	100
3. LEATHER, TEXTILE AND CLOTHING	0	38	11	50	-	99
4. WOOD	2	36	24	38	-	100
5. FURNITURE AND FIXTURE	-	39	6	55	-	100
6. PAPER AND ALLIED PRODUCT	-	45	23	32	-	100
7. PRINTING, PUBLISHING AND ALLIED	0	25	15	56	4	100
8. PRIMARY METAL	-	62	28	10	-	100
9. FABRICATED METAL PRODUCT	0	43	13	44	-	100
10. MACHINERY	0	56	31	12	-	99
11. TRANSPORTATION EQUIPMENT	-	40	41	20	-	101
12. ELECTRICAL AND ELECTRONIC PRODUCTS	-	50	36	14	-	100
13. NON-METALLIC MINERAL PRODUCTS	-	28	12	60	-	100
14. PETROLEUM AND CHEMICALS	3	50	13	33	0	99
15. OTHER MANUFACTURING	0	35	7	57	-	99
TOTAL	1	38	17	44	1	101

TABLE 39

WHERE IS MOST OF THE RESEARCH AND DEVELOPMENT WORK DONE FOR
THIS PLANT
(ESTABLISHMENT WEIGHTED)

	Q82					ALL
	NOT ANSWERED	CONTRACTED	WITHIN	ELSEWHERE	NO R&D DONE	
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	
IND						
1. FOOD, BEVERAGE AND TOBACCO	.	5	37	36	22	100
2. RUBBER AND PLASTIC	.	4	47	14	34	99
3. LEATHER, TEXTILE AND CLOTHING	0	8	38	3	51	100
4. WOOD	2	9	33	6	50	100
5. FURNITURE AND FIXTURE	.	1	54	8	37	100
6. PAPER AND ALLIED PRODUCT	.	6	46	29	20	101
7. PRINTING, PUBLISHING AND ALLIED	1	9	24	6	61	101
8. PRIMARY METAL	.	2	54	14	30	100
9. FABRICATED METAL PRODUCT	.	7	47	6	41	101
10. MACHINERY	0	9	43	27	20	99
11. TRANSPORTATION EQUIPMENT	.	1	51	33	15	100
12. ELECTRICAL AND ELECTRONIC PRODUCTS	.	4	60	20	16	100
13. NON-METALLIC MINERAL PRODUCTS	.	13	34	19	34	100
14. PETROLEUM AND CHEMICALS	3	4	39	39	15	100
15. OTHER MANUFACTURING	0	6	37	10	47	100
TOTAL	0	7	39	14	39	99

TABLE 40

WHERE IS MOST OF THE FORMAL TRAINING DONE FOR YOUR STAFF IN
THIS PLANT
(ESTABLISHMENT WEIGHTED)

	Q83					ALL
	NOT ANSWERED	PURCHASE	WITHIN	ELSEWHERE	NONE	
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	
IND						
1. FOOD, BEVERAGE AND TOBACCO	.	9	57	20	13	99
2. RUBBER AND PLASTIC	.	17	47	12	23	99
3. LEATHER, TEXTILE AND CLOTHING	1	16	45	10	29	101
4. WOOD	5	15	41	17	23	101
5. FURNITURE AND FIXTURE	.	16	60	12	12	100
6. PAPER AND ALLIED PRODUCT	.	15	63	17	5	100
7. PRINTING, PUBLISHING AND ALLIED	.	17	53	18	12	100
8. PRIMARY METAL	.	27	45	17	11	100
9. FABRICATED METAL PRODUCT	.	16	60	15	9	100
10. MACHINERY	.	21	51	15	13	100
11. TRANSPORTATION EQUIPMENT	.	12	59	20	9	100
12. ELECTRICAL AND ELECTRONIC PRODUCTS	.	22	60	9	9	100
13. NON-METALLIC MINERAL PRODUCTS	.	11	67	17	5	100
14. PETROLEUM AND CHEMICALS	3	19	58	11	10	101
15. OTHER MANUFACTURING	0	5	49	13	32	99
TOTAL	1	15	53	15	16	100

TABLE 47

HOW DIFFICULT HAS IT BEEN TO HIRE SKILLED PERSONNEL TO WORK
WITH THE TECHNOLOGIES USED IN THIS PLANT
(ESTABLISHMENT WEIGHTED)

	QB4					ALL PERCENT OF EST.
	NOT ANSWERED	NOT DIFFICULT	SOME PROBLEMS	VERY DIFFICULT	N/A	
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	
1NO						
1. FOOD, BEVERAGE AND TOBACCO	4	49	30	12	5	100
2. RUBBER AND PLASTIC	9	32	25	26	7	99
3. LEATHER, TEXTILE AND CLOTHING	13	34	27	16	10	100
4. WOOD	7	47	23	20	4	101
5. FURNITURE AND FIXTURE	15	17	32	36	1	101
6. PAPER AND ALLIED PRODUCT	10	32	40	16	3	101
7. PRINTING, PUBLISHING AND ALLIED	8	40	33	19	1	101
8. PRIMARY METAL	1	21	38	29	11	100
9. FABRICATED METAL PRODUCT	0	23	34	33	3	99
10. MACHINERY	0	37	37	24	2	100
11. TRANSPORTATION EQUIPMENT	9	27	43	19	2	100
12. ELECTRICAL AND ELECTRONIC PRODUCTS	2	30	42	22	4	100
13. NON-METALLIC MINERAL PRODUCTS	3	36	39	22	.	100
14. PETROLEUM AND CHEMICALS	10	48	28	12	2	100
15. OTHER MANUFACTURING	2	47	27	21	3	100
TOTAL	6	37	32	22	4	101

TABLE 42

FOR THOSE TECHNOLOGIES IN SECTION A THAT ARE USED IN THIS
PLANT, HAVE ANY BEEN MODIFIED TO IMPROVE THEIR OUTPUT?
(ESTABLISHMENT WEIGHTED)

	Q85				ALL PERCENT OF EST.
	NOT ANSWERED	YES	NO	N/A	
	PERCENT	PERCENT	PERCENT	PERCENT	
	OF EST.	OF EST.	OF EST.	OF EST.	
INO					
1. FOOD, BEVERAGE AND TOBACCO	4	42	11	43	100
2. RUBBER AND PLASTIC	5	34	16	44	99
3. LEATHER, TEXTILE AND CLOTHING	1	25	7	67	100
4. WOOD	3	34	14	49	100
5. FURNITURE AND FIXTURE	2	16	30	52	100
6. PAPER AND ALLIED PRODUCT	.	34	30	37	101
7. PRINTING, PUBLISHING AND ALLIED	1	36	14	49	100
8. PRIMARY METAL	0	53	13	34	100
9. FABRICATED METAL PRODUCT	1	30	14	55	100
10. MACHINERY	0	36	25	39	100
11. TRANSPORTATION EQUIPMENT	7	43	8	42	100
12. ELECTRICAL AND ELECTRONIC PRODUCTS	0	31	27	43	101
13. NON-METALLIC MINERAL PRODUCTS	4	24	14	58	100
14. PETROLEUM AND CHEMICALS	4	39	19	38	100
15. OTHER MANUFACTURING	2	17	15	65	99
TOTAL	2	32	15	51	100

TABLE 43

FOR GOODS OF OWN MANUFACTURE, WHAT WAS THE PERCENTAGE OF THE
VALUE OF SHIPMENTS EXPORTED FROM THIS PLANT IN THE LAST YEAR?
(SHIPMENT WEIGHTED)

	QB1					ALL
	NOT ANSWERED	< 50%	>= 50%	NIL	N/A	
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	
IND						
1. FOOD, BEVERAGE AND TOBACCO	1	56	12	31	.	100
2. RUBBER AND PLASTIC	0	66	27	7	.	100
3. LEATHER, TEXTILE AND CLOTHING	0	56	11	33	.	100
4. WOOD	1	33	55	11	.	100
5. FURNITURE AND FIXTURE	.	54	22	25	.	101
6. PAPER AND ALLIED PRODUCT	.	38	55	7	.	100
7. PRINTING, PUBLISHING AND ALLIED	0	42	12	45	0	99
8. PRIMARY METAL	.	58	39	3	.	100
9. FABRICATED METAL PRODUCT	0	41	36	22	.	99
10. MACHINERY	1	58	39	3	.	101
11. TRANSPORTATION EQUIPMENT	.	11	67	22	.	100
12. ELECTRICAL AND ELECTRONIC PRODUCTS	.	52	41	7	.	100
13. NON-METALLIC MINERAL PRODUCTS	.	53	18	29	.	100
14. PETROLEUM AND CHEMICALS	5	58	20	16	0	99
15. OTHER MANUFACTURING	0	57	16	26	.	99
TOTAL	1	45	35	20	0	101

TABLE 44
WHERE IS MOST OF THE RESEARCH AND DEVELOPMENT WORK DONE FOR
THIS PLANT
(SHIPMENT WEIGHTED)

	QB2					ALL
	NOT ANSWERED	CONTRACTED	WITHIN	ELSEWHERE	NO R&D DONE	
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	
IND						
1. FOOD, BEVERAGE AND TOBACCO	.	7	46	39	9	101
2. RUBBER AND PLASTIC	.	5	45	43	8	101
3. LEATHER, TEXTILE AND CLOTHING	0	3	60	12	24	99
4. WOOD	0	19	33	23	25	100
5. FURNITURE AND FIXTURE	.	1	63	22	14	100
6. PAPER AND ALLIED PRODUCT	.	14	30	39	17	100
7. PRINTING, PUBLISHING AND ALLIED	0	11	37	16	37	101
8. PRIMARY METAL	.	4	72	20	4	100
9. FABRICATED METAL PRODUCT	.	5	44	36	14	99
10. MACHINERY	0	2	55	36	7	100
11. TRANSPORTATION EQUIPMENT	.	1	17	61	21	100
12. ELECTRICAL AND ELECTRONIC PRODUCTS	.	0	49	48	3	100
13. NON-METALLIC MINERAL PRODUCTS	.	8	33	52	6	99
14. PETROLEUM AND CHEMICALS	1	6	29	56	7	99
15. OTHER MANUFACTURING	0	8	49	18	26	101
TOTAL	0	6	39	41	14	100

TABLE 45

WHERE IS MOST OF THE FORMAL TRAINING DONE FOR YOUR STAFF IN
THIS PLANT
(SHIPMENT WEIGHTED)

	Q83					ALL
	NOT ANSWERED	PURCHASE	WITHIN	ELSEWHERE	NONE	
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	
IND						
1. FOOD, BEVERAGE AND TOBACCO	.	21	56	18	6	101
2. RUBBER AND PLASTIC	.	20	57	19	5	101
3. LEATHER, TEXTILE AND CLOTHING	1	17	50	22	9	99
4. WOOD	0	18	55	20	7	100
5. FURNITURE AND FIXTURE	.	14	63	16	7	100
6. PAPER AND ALLIED PRODUCT	.	28	48	19	4	99
7. PRINTING, PUBLISHING AND ALLIED	.	27	49	19	5	100
8. PRIMARY METAL	.	38	38	23	2	101
9. FABRICATED METAL PRODUCT	.	25	59	10	7	101
10. MACHINERY	.	27	52	12	9	100
11. TRANSPORTATION EQUIPMENT	.	36	47	14	3	100
12. ELECTRICAL AND ELECTRONIC PRODUCTS	.	19	57	20	4	100
13. NON-METALLIC MINERAL PRODUCTS	.	20	66	13	1	100
14. PETROLEUM AND CHEMICALS	1	37	53	8	1	100
15. OTHER MANUFACTURING	0	12	69	8	11	100
TOTAL	0	27	52	16	5	100

TABLE 46

HOW DIFFICULT HAS IT BEEN TO HIRE SKILLED PERSONNEL TO WORK
WITH THE TECHNOLOGIES USED IN THIS PLANT
(SHIPMENT WEIGHTED)

	Q84					ALL PERCENT OF EST.
	NOT ANSWERED	NOT DIFFICULT	SOME PROBLEMS	VERY DIFFICULT	N/A	
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	
IND						
1. FOOD, BEVERAGE AND TOBACCO	2	36	39	20	3	100
2. RUBBER AND PLASTIC	4	15	50	30	1	100
3. LEATHER, TEXTILE AND CLOTHING	6	38	36	14	5	99
4. WOOD	2	39	37	21	0	99
5. FURNITURE AND FIXTURE	1	28	40	29	1	99
6. PAPER AND ALLIED PRODUCT	2	26	49	20	3	100
7. PRINTING, PUBLISHING AND ALLIED	3	44	37	15	0	99
8. PRIMARY METAL	0	44	38	17	1	100
9. FABRICATED METAL PRODUCT	4	20	44	31	0	99
10. MACHINERY	1	21	53	25	1	101
11. TRANSPORTATION EQUIPMENT	0	28	55	17	0	100
12. ELECTRICAL AND ELECTRONIC PRODUCTS	0	16	64	20	0	100
13. NON-METALLIC MINERAL PRODUCTS	0	33	48	18	.	99
14. PETROLEUM AND CHEMICALS	2	29	48	20	1	100
15. OTHER MANUFACTURING	2	33	48	15	2	100
TOTAL	2	31	46	20	1	100

TABLE 47

FOR THOSE TECHNOLOGIES IN SECTION A THAT ARE USED IN THIS
PLANT, HAVE ANY BEEN MODIFIED TO IMPROVE THEIR OUTPUT?
(SHIPMENT WEIGHTED)

	Q85				ALL
	NOT ANSWERED	YES	NO	N/A	
	PERCENT	PERCENT	PERCENT	PERCENT	
	OF EST.	OF EST.	OF EST.	OF EST.	
IND					
1. FOOD, BEVERAGE AND TOBACCO	1	58	16	26	101
2. RUBBER AND PLASTIC	1	65	14	20	100
3. LEATHER, TEXTILE AND CLOTHING	1	48	16	35	100
4. WOOD	0	53	20	27	100
5. FURNITURE AND FIXTURE	0	36	41	23	100
6. PAPER AND ALLIED PRODUCT	.	63	29	8	100
7. PRINTING, PUBLISHING AND ALLIED	1	51	18	31	101
8. PRIMARY METAL	3	80	9	7	99
9. FABRICATED METAL PRODUCT	1	58	17	23	99
10. MACHINERY	0	58	25	17	100
11. TRANSPORTATION EQUIPMENT	0	89	8	2	99
12. ELECTRICAL AND ELECTRONIC PRODUCTS	0	76	17	7	100
13. NON-METALLIC MINERAL PRODUCTS	0	56	24	20	100
14. PETROLEUM AND CHEMICALS	3	75	11	12	101
15. OTHER MANUFACTURING	1	47	17	35	100
TOTAL	1	67	15	16	99



SURVEY OF MANUFACTURING TECHNOLOGY

Statistics Act, Revised Statutes of Canada,
1985, chapter S19.Si vous préférez ce questionnaire en fran-
çais, veuillez cocher ☐Complete and return within 10 days after
receipt.

Confidential when completed.

Please correct any errors in name, address and postal code

Section A - TECHNOLOGY USE						
For EACH of the manufacturing technologies listed below, mark (X) in the column that best reflects your plant's use of that technology. Refer to Definition of Terms on the attached sheet. MARK ONLY ONE COLUMN BOX FOR EACH TECHNOLOGY.	Used in operations (1)	Not currently used in operations				
		Plan to use within:		No plans to use because:		
		The next 2 years (2)	2 - 5 years (3)	Does not apply to operations (4)	Not cost effective (5)	Other (6)
1. DESIGN AND ENGINEERING						
(a) Computer aided design (CAD) and/or computer aided engineering (CAE)						
(b) CAD output used to control manufacturing machines (CAD/CAM)						
(c) Digital representation of CAD output used in procurement activities						
2. FABRICATION AND ASSEMBLY						
(a) Flexible manufacturing cell(s) (FMC) or systems (FMS)						
(b) NC/CNC machine(s)						
(c) Materials working laser(s)						
(d) Pick and place robot(s)						
(e) Other robots						
3. AUTOMATED MATERIAL HANDLING						
(a) Automated storage and retrieval system (AS/RS)						
(b) Automated guided vehicle systems (AGVS)						
4. AUTOMATED SENSOR BASED INSPECTION AND/OR TESTING EQUIPMENT						
(a) Performed on incoming or in process materials						
(b) Performed on final product						
5. COMMUNICATIONS AND CONTROL						
(a) Local area network for technical data						
(b) Local area network for factory use						
(c) Inter-company computer network linking plant to subcontractors, suppliers, and/or customers						
(d) Programmable controller(s)						
(e) Computer(s) used for control on the factory floor						
6. MANUFACTURING INFORMATION SYSTEMS						
(a) Materials Requirement Planning (MRP)						
(b) Manufacturing Resource Planning (MRP II)						
7. INTEGRATION AND CONTROL						
(a) Computer integrated manufacturing (CIM)						
(b) Supervisory control and data acquisition (SCADA)						
(c) Artificial intelligence and/or expert systems						

Section B - CHARACTERISTICS OF THIS ESTABLISHMENT

<p>1. For goods of own manufacture, what was the percentage of the value of shipments exported from this plant in the last year?</p> <p><input type="checkbox"/> Less than 50%</p> <p><input type="checkbox"/> 50% or more</p> <p><input type="checkbox"/> Nil</p>	<p>2. Where is most of the research and development work done for this plant?</p> <p><input type="checkbox"/> Contracted out</p> <p><input type="checkbox"/> Within this plant</p> <p><input type="checkbox"/> Elsewhere in the firm</p> <p><input type="checkbox"/> No research and development done</p>	<p>3. Where is most of the formal training done for your staff in this plant?</p> <p><input type="checkbox"/> Through purchase of training courses or seats in public or private institutions</p> <p><input type="checkbox"/> Within this plant</p> <p><input type="checkbox"/> Elsewhere in the firm</p> <p><input type="checkbox"/> No formal training provided</p>
<p>4. How difficult has it been to hire skilled personnel to work with the technologies used in this plant?</p> <p><input type="checkbox"/> Not difficult</p> <p><input type="checkbox"/> Some problems</p> <p><input type="checkbox"/> Very difficult</p>	<p>5. For those technologies in Section A that are used in this plant, have any been modified to improve their output?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Not applicable</p>	

COMMENTS

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Section C - CERTIFICATION

This report is substantially accurate and has been prepared in accordance with instructions.

Name of person to contact regarding this report	Signature of authorized person	
Telephone (including area code and extension) () - - -	Title	Date

DEFINITION OF TERMS FOR SECTION A

1. **COMPUTER-AIDED DESIGN (CAD) AND/OR COMPUTER-AIDED ENGINEERING** – Use of computers for drawing and designing parts or products for analysis and testing of designed parts or products.

COMPUTER-AIDED DESIGN (CAD) COMPUTER-AIDED MANUFACTURING (CAM) – Use of CAD output for controlling machines used to manufacture the part or product.

DIGITAL DATA REPRESENTATION – Use of digital representation of CAD output for controlling machines used to manufacture the part or product.

2. **FLEXIBLE MANUFACTURING CELLS (FMC)** – Machines with fully integrated material handling capabilities controlled by computers or programmable controllers, capable of single path acceptance of raw material and delivery of finished product.

FLEXIBLE MANUFACTURING SYSTEMS (FMS) – Two or more machines with fully integrated material handling capabilities controlled by computers or programmable controllers, capable of single or multiple acceptance of raw material and multiple path delivery of finished product.

NC/CNC MACHINES – A single machine either numerically controlled (NC) or computer numerically controlled (CNC) with or without automated material handling capabilities. NC machines are controlled by numerical commands, punched on paper or plastic mylar tape while CNC machines are controlled electronically through a computer residing in the machine.

MATERIALS WORKING LASER(S) – Laser technology used for welding, cutting, treating, scribing and marking.

ROBOTS – A reprogrammable, multifunctional manipulator designed to move materials, parts, tools or specialized devices through variable programmed motions for the performance of a variety of tasks.

PICK AND PLACE ROBOTS – A simple robot, with one, two or three degrees of freedom, which transfers items from place to place by means of point-to-point moves. Little or no trajectory control is available.

3. **AUTOMATED STORAGE AND RETRIEVAL SYSTEM (AS/RS)** – Computer-controlled equipment providing for the automatic handling and storage of materials, parts, subassemblies or finished products.

AUTOMATED GUIDED VEHICLE SYSTEMS (AGVS) – Vehicles equipped with automatic guidance devices programmed to follow a path that interfaces with work stations for automated or manual loading and unloading of materials, tools, parts or products.

5. **TECHNICAL DATA NETWORK** – Use of local area network (LAN) – technology to exchange technical data within design and engineering departments.

FACTORY NETWORK – Use of local area network (LAN) technology to exchange information between different points on the factory floor.

PROGRAMMABLE CONTROLLER – A solid state industrial control device that has programmable memory for storage of instructions, which performs functions equivalent to a relay panel or wired solid state logic control system.

COMPUTERS USED FOR CONTROL ON THE FACTORY FLOOR – Exclude computers imbedded within machines or computers used solely for data acquisition or monitoring. Include computers on the factory floor that may be dedicated to control, but which are capable of being reprogrammed for other functions.

6. **MATERIALS REQUIREMENTS PLANNING (MRP)** – Computer-based production management and scheduling system to control order quantities, inventory and finished goods.

MANUFACTURING RESOURCE PLANNING (MRP II) – A development of MRP for computer-based production management of machine loading and production scheduling, as well as inventory control and material handling.

7. **COMPUTER INTEGRATED MANUFACTURING (CIM)** – Totally automated production, in which all manufacturing processes are integrated and controlled by a central computer.

SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) – On-line, computer-based monitoring and control of process and plant variables at a central site.

ARTIFICIAL INTELLIGENCE (AI) – The ability of a machine to learn from experience and perform tasks normally attributed to human intelligence, e.g. problem solving, reasoning, understanding natural language.

EXPERT SYSTEMS – The computerization of knowledge of experts in narrowly defined fields, such as fault finding and designing.

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