



# The Daily

Statistics Canada

Tuesday, June 19, 1990

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For release at 10:00 a.m.

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## MAJOR RELEASE

- Survey of Diffusion of Technology in the Mining Industry, January 1990** 2  
 Over 80% of Canadian mines surveyed who had adopted advanced technologies reported that their expectations had been met or exceeded.

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### Survey of Diffusion of Technology in the Mining Industry January 1990

The survey of Diffusion of Technology in the Mining Industry is the first national survey conducted by Statistics Canada to measure the degree of utilization of computer-based technologies for all mining operations in Canada. It is intended to help the industry appraise its current and projected use of selected technologies.

More than three-quarters of the mines surveyed use one or more of the 28 specified advanced technologies. Two-thirds have seen positive improvements in productivity, more than half have realized improved product quality; and two-thirds have experienced a reduction in operating costs. For highlights see page 2 of today's Daily.

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**MAJOR RELEASE**

**Survey of Diffusion of Technology in the Mining Industry**

January 1990

The ability of Canadian mines to adopt and diffuse technology has a considerable impact on their ability to remain competitive. Rapid adoption of new technologies is vitally important to future prosperity.

Twenty-eight advanced technologies and applications were surveyed in January 1990. They fell into four general categories: automated material handling; communications and networks; control; and automated processing systems. The questionnaire was mailed to all 324 known mines in Canada. A response rate of 97% was achieved indicating the great interest of the mining industry in advanced technology.

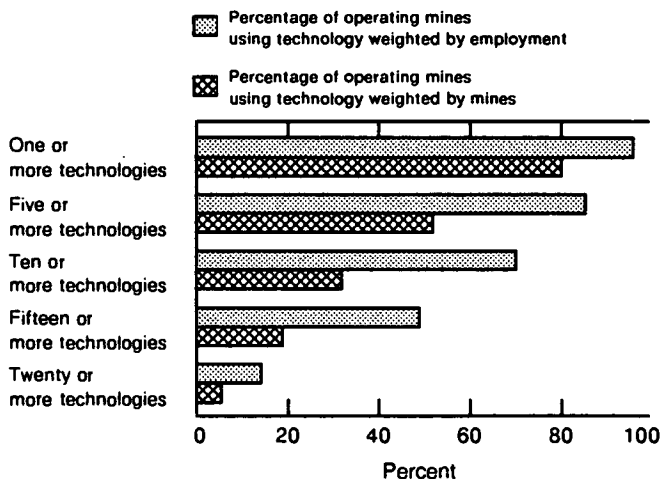
**Highlights**

**Use of Advanced Mining Technologies**

- Over half (52%) of operating mines (representing 85% of total employment in the mining industry) use at least five of the 28 advanced technologies. However, when considering the use of 15 technologies or more, the numbers drop significantly to 19% of the mines (accounting for 49% of total employment in the industry).

Chart 1

**Use of Advanced Mining Technology**



**Leading Technologies**

- The leading technologies were: programmable logic controllers (78%), automatic bin level measurement (77%), flow density measurement (74%), and analog controllers (72%). This reflects the progression from the analog to the digital techniques.

**Less-used Technologies**

- Less frequent use was made of the following technologies: automated T.V. image analysis (19%), on-stream size analysis (28%), near-stream analysis (25%), and open pit data communication networks (24%).

**Planned Use of Technologies**

- Respondents were asked to identify if they planned to increase current usage of the technologies surveyed. Significant growth is planned in the next three years in underground data communication networks (64%), programmable logical controllers (50%), supervisory control and data acquisition (49%), integrated expert systems for process control (49%), and on-line statistical process control (48%). Respondents not currently using the technologies identified the following top three technologies they were planning to adopt in the next three years: on-line statistical process control (28%), interactive expert systems for process control (20%), and in-plant data networks linking automated processes (14%).

**Expectations Met or Exceeded**

- Overall satisfaction with the technologies surveyed was very high. Over 80% of respondents felt their expectations have been met or exceeded, except for automated bin level measurement, where 26% felt their expectations were not met.

**Use by Industry**

- Nickel-copper mines, iron mines, potash mines and copper and copper-zinc mines were the most likely to have introduced advanced technologies. Salt mines, gypsum mines, other metal mines, and other non-metal mines had the lowest incidence of technology use.

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**Use by Size of Mine**

- Large mines, those employing over 250 employees, made significantly greater use of the technologies, while mines with under 50 employees hardly used the technologies.

**Use by Province**

- Mining establishments in Ontario, New Brunswick, Saskatchewan, the Northwest Territories, British Columbia and Manitoba had the highest rate of utilization of advanced technologies.

**Ownership**

- There is no clear overall trend in the use of technologies between Canadian owned mines and mines owned by the United States. However, Canadian mines made greater use of control technologies.

**Age of Mine**

- The number of years the mine has been in operation appears to be a factor influencing the use of these technologies. Mines in operation for under five years use the technologies less, which reflect the small amount of ores reserves and the use of older refurbished equipment.

**Impact on Output, Product Quality and Costs**

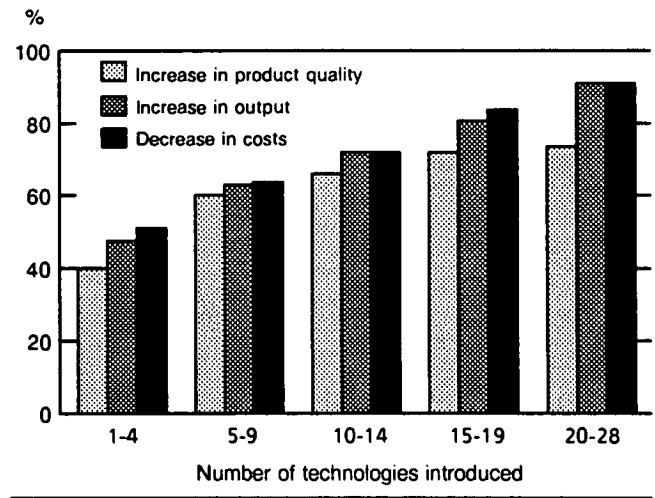
- Almost two out of three mines (63%) improved their output by introducing the technologies. The highest impact was in iron mines (100%), other metal mines (100%), copper and copper-zinc mines (89%), silver-lead-zinc mines (88%) and potash mines (70%).
- Over one out of every two mines (56%) experienced improved product quality by adopting advanced computer-based technologies. This was most evident in the following industries: iron (100%), nickel-copper (100%), copper and copper-zinc (78%), silver-lead-zinc (75%), other metal mines (75%), and uranium mines (71%).
- Almost two out of every three mines surveyed (65%) experienced a reduction in costs by the introduction of the new technologies; in 27% there was no change in costs, while in 9% there was an increase in costs. Decreased costs due

to technology use were prevalent in the following mining industries: iron (100%), silver-lead-zinc (100%), asbestos (100%), copper and copper-zinc (89%), uranium (86%), potash (82%), and nickel-copper (80%). Five mining industries responded that they had experienced an increase in costs due to the introduction of the new technologies, these were: gypsum (22%), coal (20%), other non-metal (19%), gold (11%), and copper and copper-zinc mines (6%).

- There was a positive correlation between increased use of technology and its beneficial impact on output, quality and costs.

**Chart 2**

**Impact Based on the Number of Technologies Introduced**



This survey is the result of cooperation between several government departments: Industry, Science and Technology Canada, Canada Centre for Mineral and Energy Technology (CANMET), Communications Canada, and Statistics Canada who conducted the survey.

More information, including obtaining a copy of the full statistical results of the Survey of Diffusion of Technology in the Mining Industry, is available from François Bolduc (613-951-7529), Statistics Canada or Michael Clapham (613-954-2868), Industry, Science and Technology Canada or Jay Pathak (613-996-5863), CANMET. ■

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## DATA AVAILABILITY ANNOUNCEMENTS

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### Tobacco Products

May 1990

Canadian tobacco product firms produced 4.35 billion cigarettes in May 1990, a 10.7% decrease from the 4.87 billion cigarettes manufactured during the same period in 1989.

Production for January to May 1990 totalled 20.50 billion cigarettes, down 10.6% from 22.93 billion cigarettes for the corresponding period in 1989.

**Available on CANSIM: matrix 46.**

Order the May 1990 issue of *Production and Disposition of Tobacco Products* (32-022, \$5/\$50). See "How to Order Publications".

For further information on this release, contact Brian Preston (613-951-3511), Industry Division. ■

### Production, Shipments and Stocks on Hand of Sawmills in British Columbia

April 1990

Sawmills in British Columbia produced 2 995 700 cubic metres of lumber and ties in April 1990, a decrease of 3.3% from the 3 096 500 cubic metres produced in April 1989.

January to April 1990 production was 12 029 600 cubic metres, an increase of 1.4% over the 12 018 600 cubic metres produced over the same period in 1989.

**Available on CANSIM: matrix 53 (series 1.2, 2.2 and 3.2).**

The April 1990 issue of *Production, Shipments and Stocks on Hand of Sawmills in British Columbia* (35-003, \$7.10/\$70) will be available at a later date. See "How to Order Publications".

For more detailed information on this release, contact Jock Dobie (604-666-2671), Pacific Region, Statistics Canada, Sinclair Centre, 757 West Hastings Street, Vancouver, B.C. V6C 3C9. ■

### Steel Exports

May 1990 (Preliminary)

Data on preliminary steel exports for May 1990 are now available.

The final data will be published in *Primary Iron and Steel*, May 1990 (41-001, \$5/\$50). See "How to Order Publications".

For further information on this release, contact G.W. Barrett (613-951-3515), Industry Division. ■

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## PUBLICATIONS RELEASED

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**Monthly Production of Soft Drinks, May 1990.**

**Catalogue number 32-001**

(Canada: \$2.70/\$27; United States: US\$3.20/US\$32;  
Other Countries: US\$3.80/US\$38).

**Aviation Statistics Centre Service Bulletin, Vol. 22,  
No. 6, Aviation, June 1990.**

**Catalogue number 51-004**

(Canada: \$9.30/\$93; United States:  
US\$11.20/US\$112; Other Countries:  
US\$13/US\$130).

**Department Store Monthly Sales, Including  
Concessions, by Province and Metropolitan Area,  
June 1990.**

**Catalogue number 63-004**

(Canada: \$2.70/\$27; United States: US\$3.20/US\$32;  
Other Countries: US\$3.80/US\$38).

**Heavy Engineering Contractors, The Construction  
Industry 1987.**

**Catalogue number 64-209**

(Canada: \$22; United States: US\$26; Other  
Countries: US\$31).

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**The  
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### Statistics Canada's Official Release Bulletin for Statistical Information

Catalogue 11-001E. Price: Canada: \$120.00 annually; United States: US\$144.00 annually;  
Other Countries: US\$168.00 annually

Published by the Communications Division  
Statistics Canada, 3-N, R.H. Coats Bldg., Ottawa K1A 0T6.

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