

CURRICULUM VITAE

MICHAEL BARSKY

PERSONAL

Place and date of birth: Voroshilovograd, USSR, 3 January 1936
Marital status: Married + 2
Immigrated to Israel: August 22, 1990
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EDUCATION

1971: Doctor of Technical Sciences.
Thesis: "Processes of gravity classification for bulk materials."
Department of Chemical Engineering, Ural Polytechnic Institute, USSR

1964: Ph.D. in Technical Sciences.
Thesis: Research into optimal methods for cascade separation.
Department of Chemical Engineering, Ural Polytechnic Institute, USSR

1955-1960: M.S. Degree in Mechanical Engineering. Department of Chemical Engineering, Ural Polytechnic Institute, USSR

EMPLOYMENT HISTORY

1991 Appointed Researcher Grade A+, The Institutes for Applied Research, Ben-Gurion University of the Negev, Beer-Sheva, Israel

1988-1990: Manager of Russian Engineering Center for Dry Fractionation Methods, Russian Academy of Sciences Center at Ekaterinburg

1983-1987: Organization and management of Laboratory for Study of Dry Beneficiation Methods, Ural Polytechnic Institute, Ekaterinburg

1973-1990: Head of the Department for Silicate Industry Equipment and Automatic Control (Ural Polytechnic Institute, Ekaterinburg)

ADVANCED SCIENTIFIC DEGREES

1974: Conferred title of Full Professor, Ural Polytechnic Institute, Ekaterinburg

1967: Conferred title of Docent, Ural Polytechnic Institute, Ekaterinburg

AWARDS

1985: Gold Medal, Leipzig Muster Messe, Category: Cascade classifier
1992: Prize from the Ministry of Science and Technology for outstanding work in the framework of the Program for Absorption of Immigrant Scientists
1998: First prize among five awarded to immigrant scientists who contributed to the economic growth of the State of Israel
2000: Certificate of Honor at the 15th Congress of the Israel Society of Chemistry and Mining Science

SCIENTIFIC INTERESTS

Theoretical

1. Mass processes; chaos and its influence on the formation of the basic features of mass processes
2. Dynamics of the motion of two-phase flows in critical regimes; physical foundations of flows of this type
3. Size reduction of solid materials; physical foundations of superfine grinding of materials
4. Separation of free-flowing materials in air and gaseous streams

Applied

1. Dry methods of cascade classification of powders
2. Air-type grinding mills for superfine grinding
3. Cascade-type dust removal units
4. Cascade mixers for free-flowing materials
5. Aerodynamic dosing device for free-flowing materials

PATENTS

57 USSR Inventor's Certificates, of which 6 have been patented in W. Germany, France and Austria.

USSR Certificates of Authorship Nos.

522860, 580016, 643188, 671840, 688248, 753491, 753491, 787113, 797767, 799837, 848087, 878356, 831216, 822928, 839614, 899163, 854461, 900876, 908426, 919994, 913202, 977070, 977071, 983364, 988363, 998347, 1022756, 1088817, 1098594, 1093364, 119743, 1122376, 1141331, 1214249, 1236653, 1240472, 1255630, 1265002, 1264508, 1328999, 13290000, 1338890, 1338900, 1337151, 1350994, 1398180, 1427272, 1422478, 1445017, 1435324.

INNOVATIVE TECHNOLOGIES (representative selection)

1. A classifier was developed on contract from Occidental Petroleum (USA) at the potash production plant in Berezniky. With a product yield of 40 t/h, it is capable of dedusting fine grained potash down to limit of 200 μ m. A high quality product is obtained (fine particle content less than 0.6%).
2. In Feteshk quarry in Moldavia, dry dressing was introduced in crushing of tailings, to produce construction sands for concrete production (product yield 85 t/h). Any solid reject could be processed by this method for construction use.
3. At the Balashevsk preparation plant for foundry sands, a dry method of dressing was organized. Four operation lines have been running, with a product yield of 20 t/h.
4. Phosphorite dry ore dressing at the Chilisaik chemical plant, Aktubinsk region, productivity 100 t/h.
5. Potassium ore dry dressing (Berezniky).
6. At Volkovisk (Byelorussia) foundry equipment plant, aggregates production was organized to regenerate foundry sands.

7. At Solikamsk potash plant (Perm region) a classifier was introduced for granulated fertilizer non-sieve fractionation for class 1 mm; productivity 50 t/h.
8. At Serov (Sverdlovsk) ferroalloy plant, a classifier operates to extract ferroalloy particles from slag reject, productivity 15 t/h.
9. In Sverdlovsk a facility was set up to produce floating feed for artificial fish breeding.
10. At Aktubinsk chromium compound plant, a shop for powder production was opened (plasma spray), productivity 100 kg/h.
11. Mendeleevsk chemical plant, facility for silica gel two-phase classification.
12. At Asbest concrete production plant, a facility for variable size concrete aggregation, dedusting used, productivity 80 t/h.
13. For scientific purposes, facilities were designed to develop different ceramic high temperature superconductive products, machine-applied ceramics, solid fuel elements, etc.
14. The above mentioned-developments have also been used to produce radioceramics, superfine sorbents for nuclear radiation, zeolites, kaolins, fluorites etc. The classification range varies from 2 to 10 mm.

In 1985 at the Industrial Fair in Leipzig cascade type classifiers were awarded a Golden Medal.

At the 2nd International Separation Congress (Hamilton, Canada, 1989, October), a report on the above mentioned discovery was awarded one of the six medals of the Canadian Engineering Association.

PUBLICATIONS (PARTIAL LIST)

3 professional monographs and 190 articles in scientific journals in Russian.

Monographs (in Russian):

1. Gravity classification of free-flowing materials. Moscow, "Nedra", 1974.
2. Optimization of processes for separation of free-flowing materials. Moscow, "Nedra", 1978.
3. Powder classification. Moscow, "Nedra", 1980.

Refereed paper in English:

1. Barsky, M., V.I. Revnivitsev, Hydrodynamical research of gravity classification processes and their intensification methods development, International Congress of processing of mining, Oxford University, London, 1973.

Monographs in English:

M. Barsky, E. Barsky, Cascade Separation of Pourable Materials, accepted in Cambridge International Science Publishing.

Articles in English

- Barsky, M., Barsky, E. Chaos and order in turbulent ascending two-phase flow. In proceedings of the "International Conference on Discrete Chaotic Dynamics in Nature and Society", to be held at Ben-Gurion University of the Negev, Beer-Sheva, Israel, on 19-22 October, 1998.
- Barsky, M.; Barsky, E. Criterion for evaluation of the efficiency of separation of pourable material into n components. 15th Conference of the Israel Mineral Science and Engineering Association; 2000, Dec. 20-22; Haifa. (Proceedings, p. 19-21). (In Hebrew).
- Barsky, M.; Barsky, E. General trends of gravity separation. In: Massacci, P., ed. Proceedings of the XXI International Mineral Processing Congress, vol. C. Amsterdam: Elsevier; 2000: p. C7-57-C7-62.
- Barsky M., Barsky, E., Criterion for efficiency of separation of a pourable material into N components, *Computer Applications in the Minerals Industries*, Swets & Zeitlinger, (2001), p. 507-508.
- Barsky, M., Barsky, E., Algorithms for optimization of classification of a pourable material into N components, *Computer Applications in the Minerals Industries*, Swets & Zeitlinger, (2001), p. 509-510.
- Barsky, M., Barsky, E., Optimal air flow velocities in gravity separation processes and its relationship with particles hovering and precipitation velocities, *Mineral Processing Journal*, Enrichment of Ores, St. Peterburg, 2 (2002), pp. 22-25, (in Russian).
- Barsky, M., Barsky, E., Mathematical model of a duplex cascade process of separation, *Scientific Israel-Technological Advantages*, 4 (2002), pp. 25-35.
- Barsky, M., Barsky, E. Quality of separation of a large number of components, "Sortieren" N2. , Berlini pp. 66-68, (2002)
- M. Barsky, E. Barsky, M. Orenbach, Development of cascade multiscrubber for capturing of very fine dust, *Scientific Israel-Technological Advantages*, Vol. 4, (2002), pp. 98-107.
- M. Barsky, E. Barsky, A. Covorov, Lifting power and structure of two-phase flows in gravity separation regimes, *Scientific Israel-Technological Advantages*, Vol. 4, (2002) pp. 112-119.
- M. Barsky, E. Barsky, Master curve of Sseparation processes, *Physical Separation in Science and Engineering*, Vol. 13, No. 1, (2004), pp. 1-13.
- M. Barsky, E. Barsky, Relationships between fractional separation curves and quantitative optimization criteria in the separation of pourable materials, *Physical Separation in Science and Engineering*, Vol. 13 no. 2, (2004), pp. 41-51.

RESEARCH REPORTS

- Barsky, M. Development of system for separation of dust; semiannual report 15 February-15 August 1992. Report No. BGUN-ARI-35-92; Aug. 1992. (In Hebrew).
- Barsky, M. Separation of fine materials; annual report August 1992-July 1992. Report No. BGUN-ARI-37-92; July 1992. (In Hebrew).
- Barsky, M. Materials separation and dust absorption under conditions of Dead Sea Works; annual report January-December 1992. Report No. BGUN-ARI-58-92; Dec. 1992. (In Hebrew).
- Barsky, M. Separation of fine materials; progress report for the period August-December 1992. Report No. BGUN-ARI-1-93; Jan. 1993. (In Hebrew).

- Barsky, M. Separation of powders; annual report March 1992-February 1993. Report No. BGUN-ARI-3-93; Feb. 1993. (In Hebrew).
- Barsky, M. Separation of fine materials; annual report March 1992-February 1993. Report No. BGUN-ARI-3a-93; Jan. 1993.
- Barsky, M. Study of the aerodynamics of separation of powders of new materials in the range of <50 micron, <10 micron; annual report August 1992-July 1993. Report No. BGUN-ARI-29-93; June 1993. (In Hebrew).
- Barsky, M. Cascade mixing apparatus based on gravitation; progress report August-October 1993. Report No. BGUN-ARI-80-93; Dec. 1993. (In Hebrew).
- Barsky, M. Separation of powders; annual report for the period March 1993-February 1994. Report No. BGUN-ARI-2-94; Jan. 1994.
- Barsky, M. Aerodynamic research of the process of separation of powders of new substances in the range of <50 micron, <10 micron; final report August 1993-July 1994. Report No. BGUN-ARI-52-94; July 1994. (In Hebrew).
- Barsky, M. Development of device with a capacity of 20 ton per hour for the removal of dust from magnesium chloride flakes; report for the period November 1992-May 1993. Report No. BGUN-ARI-77-94; Nov. 1994. (In Hebrew).
- Barsky, M. Separation of powders; final report for the period March 1994-April 1995. Report No. BGUN-ARI-25-95; April 1995.
- Barsky, M. Development of a device and process for polishing granular potash; final report November 1994-April 1995. Report No. BGUN-ARI-30-95; Apr. 1994. (In Hebrew).
- Barsky, M.; Barsky, S.; Acselrod, J.; Shtorch, L.; Bekerman, I. Results of examination of dust removal system operated on drying oven B1 in the Dead Sea Works; interim report March-June 1995. Report No. BGUN-ARI-43-95; June 1995. (In Hebrew).
- Barsky, M. Results of testing of a dust pumping system mounted on drying oven B1 in the Dead Sea Works; final report March-August 1995. Report No. BGUN-ARI-54-95; Aug. 1995. (In Hebrew).
- Barsky, M. Improving the efficiency of dust trapping in dry processes; annual report January-December 1995. Report No. BGUN-ARI-72-95; Nov. 1995. (In Hebrew).
- Barsky, M. System for trapping dust in the loading pit in Ashdod port; semiannual report June-November 1996. Report No. BGUN-ARI-53-96; October 1996. (In Hebrew).
- Barsky, M. System for trapping dust emitted in the production of potash at Dead Sea Works (515/B ovens). Annual report November 1995-November 1996. Report No. BGUN-ARI-56-96; October 1996. (In Hebrew).
- Barsky, M. Recommendations for improving "Malbenim" production unit; final report October-November 1996. Report No. BGUN-ARI-64-96; December 1996.
- Barsky, M. System for trapping dust in the unloading pit in Ashdod port; report for the period December 1996-February 1997. Report No. BGUN-ARI-3-97; January 1997. (In Hebrew).
- Barsky, M. Analysis of joint operation of fans in dust trapping system of fluidized-bed furnaces at the metallic magnesium plant; semiannual report for the period October 1996-March 1997. Report No. BGUN-ARI-9-97; March 1997.
- Barsky, M. Development of scrubber for furnace B1 of potash drying unit at the Dead Sea Works; report for the period June-August 1997. Report No. BGUN-ARI-32-97; July 1997.

- Barsky, M. Development of a system for lifting and conveying water or liquids containing chemically active substances without pumping; semiannual report June-November 1998. Report No. BGUN-ARI-41-98; Nov. 1998.
- Barsky, M. Development of a system for lifting and conveying water or liquids containing chemically active substances without pumping; semi-annual report December 1998-May 1999. Report No. BGUN-ARI-19-99; May 1999.
- Barsky, M. Development of classifier and a cyclone for the production of optical whiteners; annual report June 1999-May 2000. Report No. BGUN-ARI-17-2000; April 2000. (In Hebrew).
- Barsky, M. Scrubber for capturing very fine dust for conditions in Periclase; report for the period November 1999-November 2000. Report No. BGUN-ARI-33-2000; Nov. 2000.
- Barsky, M. Development of cascade multiscrubber for capturing very fine dust; report for the period June 2000-May 2001. Report No. BGUN-ARI-6-2001; May 2001.
- Barsky, M. and Barsky, E. Development of a cyclone for the production system of Cotnion in Makhteshim; interim report November 2001-February 2002. Report No. BGUN-ARI-8-2002 (in Hebrew).
- Barsky, M., Barsky, E. Development of cascade multiscrubber for capturing very fine dust; report for the period June 2001-May 2002 Part II, Report No. BGUN-ARI-10-2002.
- Barsky, M. Development of cascade multiscrubber for capturing very fine dust. Part II. Report No. BGUN-ARI-10-2002.
- Barsky, M. פיתוח ציקלון למיתקן יצור כותניון Report No BGUN-ARI-8-2002

PROJECTS CARRIED OUT IN ISRAEL, 1992-

A. Dead Sea Works

1. Flexible seals on lower part of cyclones for all ovens. Reduction of dust release by a factor of 1.73. (1992)
2. Classifier for magnesium flakes with throughput of 30 tons per hour. Chemical Division. (1993)
3. Rehaul and optimization of dust capture system at the Gilun plant. Quantity of dust captured increased by 27%. (1994)
4. Optimization of dust trapping system at Aramot oven. Dust release reduced by a factor of 2.3. (1995)
5. New cyclones with 98.5% dust trapping efficiency developed for oven B₁. (1995)
6. Classifier with an output of 140 tons/h for "Gilun" (2002)

B. Makhteshim

1. Separator for the production of "Malbinim-Optim". (1994)
2. Ball scrubber for trapping dust on furnace for the production of "Cotnion". Dust remaining in flue gases downstream from scrubber: 7 mg/m³. (1995)
3. Cyclone connected to furnace for the production of "Malbinim-Optim", efficiency 98.5%. (1996)
4. Optimization of gas dynamics regime in furnace for the production of "Cotnion". (1997)
5. Pneumatic device for lifting "Malbinim-Optim" powder by a height of 17 m using a blower. (1999)

6. Classifier with an output of 3 tons/h for the production process of optical whiteners. (2002)
7. Cyclone for the production process of optical whiteners. (2002)
8. Pneumatic transport for lifting liquids to a height of 26 m (2002).
9. Cyclone for the production system of Cotnion. (2003)

C. Periclase

1. Three cyclones 3.6 m in diameter. (2000)

GRANTS

1. In 1987 won Grant from State Committee of Science and Technology for research on: "Classification of powders for superconducting materials". The Grant continued for 3 years and overall financing was \$ 0.5 million. Project included supplying all scientific establishments in USSR involved in research on superconductivity with these powders.
2. Wolfson Foundation, beginning 01.02.92, \$75,000.
3. Ministry of Science and Technology, Israel, beginning 01.08.91, \$75,000.
4. Ministry of Industry and Trade, Israel, beginning 01.01.95, I.S.160,000 per year for three years.
5. Ministry of Industry and Trade, Israel, 1998, 1999. 2000, NIS 20,000 a year.

SCIENTIFIC CONFERENCES

1. 10th International Congress for Enrichment, London, 1973.
Report appeared in Oxford publication among 40 reports selected by Congress organizers.
2. 2nd International Congress on Separation, Canada, October, 1989.
Report awarded Gold Medal of Canadian Engineering Association (6 Medals awarded in all).
3. 12 reports at All Union Scientific Conferences, USSR.
4. Invitation received to take part in 1991 Congress on Grinding and Classification, Leipzig, Germany.
5. Invitation received to take part in Congress on Powders Technology, Sept. 1990.
6. 17th International Congress for Enrichment, Dresden, 1991.
7. XXI International Mineral Processing Congress, Roma, 2000.
8. XXII International Mineral Processing Congress, Cape Town, 2003.
9. XIII European Conference for Mathematics in Industry, Eindhoven, Netherlands, 2004.