



CORE BUSINESS, CORE VALUES

I'll start by saying a large "Thank you" to each and every customer and supplier who has supported Höganäs's growth and development in the past few years. Your understanding and enthusiasm has helped to minimize potential disturbance caused to your business by our expansion, both in market reach and production capacity.

Our growth is always motivated by an ambition to completely fulfil commitments to each and every customer – both the contract specifying content, quality, uniformity and schedule and our underlying promise "the Lowest Total Cost for the Customer".

Höganäs does not take this ambition lightly. The only way to ensure its fulfillment is by examining each expansion decision we make in the light of the questions: Does it reinforce our reliability as a producer and supplier? Does it contribute to the long-term stability and competitiveness of the markets we serve? Does it also serve to drive development forward, so that both our customers and we will continue to prosper?

Höganäs has found that focusing on our core business, metal powder, still leaves plenty of room for development and growth. In fact, we'll have our hands full for many years to come just working together with customers to fulfill the potential that metal powders offer. That's why I'd like to repeat our promise as a supplier to provide you with the reliability, stability and support that will help your business to grow.

This issue of Powder News has much to report, in terms of people and events as well as business developments. Enjoy your reading. Sincerely,

CLAES LINDQVIST



Coldstream expands into the future

In the past few years, the market has clearly signaled its interest in high-alloy powders, and Höganäs's own recent global growth has underscored the need to increase our high-alloy output capability.

Our Coldstream Division has made major investments to 'ramp up' production capacity, through both acquisition and organic growth.

By 1st quarter 2001, water-atomized powder output will be increased to 30,000 tons per annum. Gas-atomized output will also increase during 2001 to 6,000 tons yearly, and a further expansion to 10,000 tons is planned in the near future.

All this expansion is well justified by projected global market growth, but particularly in respect of the US and Asian markets.

Expanded capability

Potential application areas for high-alloy powders span the spectrum and, regardless of the product, a key word is development. ▶

ALSO IN THIS ISSUE:

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- PM2000 Kyoto
- New Tokyo office
- 10th anniversary for Taiwan
- Metallography school
- Stony Creek takes shape
- Powder People
- Upcoming events

► New application areas must be nurtured if they are to grow, and Coldstream places high value on collaboration with the customer.

Working together to optimize product and cost benefits both parties. Coldstream purposefully maintains a tight-knit organizational structure in order to supply the resources and expertise to help an application flourish. At the same time, it can draw on Höganäs's comprehensive range of resources and support in R&D, production and logistics. The result is a unique combination of competence and focus.

Which high-alloy powder is selected depends entirely on its end use. Production is always based on the most suitable process for achieving desired performance characteristics. Coldstream has the R&D, technical support and production capability to ensure customers a high-alloy powder that delivers high added value to their application.

What is Coldstream?

This question sounds strange, but it definitely is worth asking.

Many Höganäs customers, and even some Höganäs employees, will think we mean the production facility in Ath, Belgium for gas-atomized-, micronized- and water-atomized powders, or the gas-atomizing plant at Höganäs. The recent acquisition of UK-based Powdrex Ltd., the world's premier producer of water-atomized high-speed steel powder, may also come to mind.

It's much more than that. In late 1999, a new business unit came to life within the Höganäs organization: the Coldstream Division.

High-alloy competence

In brief, Coldstream is the Höganäs High-Alloy Division, with a mandate to develop, produce and deliver high-alloy powders that ensure customers high added value. Its production capabilities include water-atomized, gas-atomized and micronized powders.

Customers, facing ever-higher performance demands and constantly growing competition, must deliver better, more cost efficient product solutions. High-alloy powders deliver proven benefits in P/M, brazing, thermal surfacing, welding and filter applications.

P/M is an excellent example. High-alloy P/M automotive exhaust components are already gaining market share, and the range expands steadily as customers identify potential.

All potential application areas are being vigorously pursued, not least the thermal surfacing that gives base metals a durable high-performance coating. Here, the company's standing as a market leader can be

measured both in the development of processes and the powders that serve them.

Expanding output capability is one way to ensure the market a steady supply of high-alloy powders. Our optimism is grounded in

the knowledge that, together with our customers, we can deliver end-product capabilities that are competitive not only in performance, but also in price.

Stony Creek timeline



North American Höganäs Inc.'s new production plant at Hollsopple, PA, will go 'on-line' 3rd Quarter, 2001. Offering customers a world-class production resource for atomized iron and steel powders, Stony Creek's output will start at 100,000 tons per year, with expansion potential to almost 300,000 tons.

Converting an existing high-alloy steel facility to production of atomized powder is no small job. A corps of technical experts and consultants are on the spot, to ensure that it's done right, and that all schedules are met.

The conversion project is headed by Ulf Håkansson, who also converted and managed the Höganäs Halmstad Plant. A full-time Pennsylvania resident since autumn 1999, Ulf draws on the specialist expertise of a corps of technical staff from Höganäs, Halmstad and Pyron, who rotate through Hollsopple as project requirements dictate.

Currently, the plant interior is in the final stages of transformation to house water-atomized production – with a good

deal of roof raising going on. Much of the equipment has been purpose-built to Höganäs specifications, based on the development work and quality standards evolved in the construction and conversion of the Höganäs and Halmstad plants. By the time the plant comes on line, Höganäs will have invested about 100 million dollars in the North American market.

Ready to roll

Autumn 2001 approaches quickly, and the company is now focusing much activity around the Stony Creek facility.

In January, the Tech Center and corporate management will move from Bethlehem to the Hollsopple plant. However, Bethlehem will remain the sales office for North American P/M business for the time being. Further, three to four technical staff from the Höganäs engineering department will settle in at Hollsopple, as installation, commissioning and testing of production equipment gets under way.

Says Ulf Holmqvist, president of North American Höganäs Inc.: "During 2001, we will further expand our presence by adding more engineers with focus on technical customer support and development. We will be fully prepared to answer customers' expectations when production comes on-line this autumn."

When friction is critical

There are a handful of metal powder companies in the world who really understand braking applications. In March 2000, two of them joined forces. When the Pyron Corporation became a member of the Höganäs Group, the union did more than just consolidate production capability.

Pyron is North America's leading manufacturer of iron powders for friction products. Its R-12 hydrogen-reduced sponge iron powder is the universally specified choice for OEM brake friction products. This, together with a further select range of powders, has enabled the company to build a strong market position in friction applications.

Höganäs, with its strong global marketing position, offers a perfect complement to Pyron. As the world's foremost manufacturer of iron-based powders, Höganäs's own friction powder capabilities are not inconsiderable.

Together, the two companies' friction product range comprises a comprehensive selection of powders that serve the needs of OEM as well as after-market producers. Henceforth, it will be marketed under the range name "Pyron Friction Products".

Step on the brakes

A brake lining's exact composition is often a closely guarded secret – the process of achieving it almost as much an art as a science. With price ceilings, regulatory restrictions and hungry competitors, you need ingenuity and resources to achieve a winning product.

Rapid absorption and dispersal of heat are critical criteria, and semi-metallic brake linings are statistically proven to offer the best overall performance. Iron powder, a key ingredient, reduces weight and material



usage at the same time its high internal porosity and large surface area delivers the most effective friction characteristics. These features also help to minimize brake noise, while the material's chemical compatibility with a wide variety of friction formulations ensures reliable bonding with other components. Lastly, and in keeping with today's regulatory environment, iron powder has a benign environmental effect.

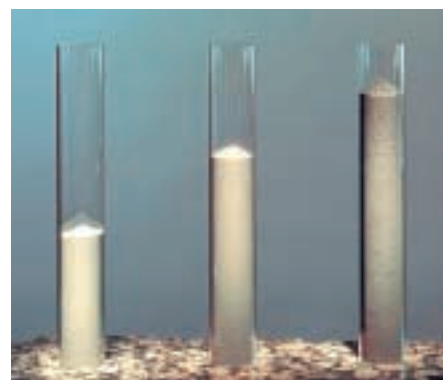
Full speed ahead

Both Pyron and Höganäs have long traditions of collaboration with customers. Their fusion provides friction product manufacturers with an excellent opportunity: expand development potential without dramatically increasing overheads.

Says Dean Howard, Marketing Manager for the Pyron Friction Product range: "Customers should consider us an extension of their organization. The development resources and process know-how we're prepared to share with customers can make a critical difference, both in performance and in time-to-market. And, with powder production in eight different countries, we've

got the resources to ensure reliable delivery for on-time production of semi-metallic brake linings."

The Pyron Friction Product range is now available worldwide. For more information, contact your nearest Höganäs representative.



The same weight, but different volumes. The powder in the beaker at right has the lowest volumetric weight and the highest specific surface area, giving you an unbeatable cost-performance ratio.

PM 2000 highlights Asian

Kyoto, the former capital of Japan was the host for the millennium's first International Conference on Powder Metallurgy.

For nearly a week in the middle of November 2000, two thousand P/M delegates and their spouses enjoyed Kyoto as the setting for a hectic round of presentations, exhibits, discussions and entertainment. Nearly one hundred different exhibits showcased suppliers of P/M products, consumables and production equipment, from Japan and around the world.



Accompanying spouses were able to enjoy the many beautiful temples and scenic attractions of Kyoto and Nara. Conference participants didn't completely escape the cultural attractions, however. Organizers included Kabuki Theater, samisen orchestra and other artistic tidbits in the opening ceremonies – to the surprise and vigorous applause of attendees!

Gathering the global family

This year, the Höganäs exhibition expanded on the theme "Truly global, truly focused".

With a 'map' of the globe captured within its approximately 200 square meter area, the stand mirrored the operating principles that Höganäs builds its business on: quality, continuous development, and close collaboration with customers in order to ensure the Lowest Total Cost in their production. At the same time, the 'global' theme enabled us to spotlight each of our production units and present their resources, capabilities and potential.

With production at ten different facilities in eight countries this gave us quite a story to tell, but visitors were enthusiastic and the activity level was high throughout the conference. The stand's open layout,



There was plenty of activity at PM 2000, at the exhibitions and technical sessions...

strategically placed interactive presentations and well-stocked bar made for a constant flow of traffic.

Höganäs Evening

What would a P/M congress be without the traditional Höganäs evening?

This year, the event put a new twist on the term 'traditional'. The entertainment highlight came after dinner, when an avant-garde drum group named DaDaDaDan Tenko gave a highly energetic presentation of their art. Though it has its roots in the traditional Japanese music, it definitely communicates the energy of today. By the



end of their 30 minute-long performance, almost the entire audience was on its feet, vigorously applauding! A truly unforgettable experience!

The party was held on PM 2000's third night, at the Takaragaike Prince Hotel, just minutes from the conference center. After a long day of meetings and exhibitions, the 500 invited guests first relaxed and mingled before proceeding to the banquet hall, where toastmaster Mr. Isamu Kamikura, Höganäs Japan KK's Customer Manager welcomed them to the festivities. In his opening speech, Höganäs CEO Claes Lindqvist reminded guests that vigorous

P/M capabilities



... as well as the more informal get-togethers.

continued development on all fronts is the key to expanding P/M's position in the global production economy.

After a sumptuous buffet and DaDa-DaDan Tenko's unforgettable performance, the gathered throng was serenaded by a dance orchestra playing '50's rock n'roll tunes, as well as newer hits. Shy at first, guests soon took to the floor, keeping the band busy until the early hours.

Technical presentations

As much as the opportunity for companies to display their capabilities, any P/M conference also brings industry colleagues together

– to meet, discuss and debate developments.

PM 2000 was no different. The five days of technical sessions and workshops included more than 600 presentations by over 1,000 authors, with a large share from Japan and other Asian countries. Topics ranged from powder composition and die-filling simulation, to hard metals and friction materials, to mechanical alloys and new P/M applications. Special areas of focus were chrome materials, warm compaction and bonded mixes.

An interesting aspect of this year's sessions was the initiative taken by the JPMA to introduce special sessions with open and

forthright case studies in production and development. A welcome addition, and one we hope to see repeated at future conferences, especially if we can all agree on a common measurement standard!

Overall, the tone of the sessions was very positive. Höganäs representatives presented a total of ten papers – all of which are available in PDF format at our website – on the following topics:

- Life Cycle Assessment (LCA) of Powder Metallurgy
- Thermodynamic and Kinetic Behaviors of Astaloy CRM
- Material Aspects of Selectively Densified Transmission Gears
- Pre-Alloyed Chromium Material with Consistent Properties for Medium Strength Applications
- Die Filling Capability of Powder Mixes
- Soft Magnetic Composites: Materials with Tuneable Magnetic Properties
- Experience with Warm Compaction of Densmix Powders in the Production of Complex Parts
- Materials for Highly Loaded Parts such as Connecting Rods
- Insulated Iron Powder (SMC) used as Soft Magnetic Material in a Rotating Electrical Machine
- Mechanical Properties and Dimensional Stability Obtained with Different Alloying Techniques

Knowledge is power. In almost every industry, companies accept this maxim as a fundamental truth – and its fulfillment as a critical competitive tool. It's clearly the reason why the Höganäs P/M School, now in its eighth year, has enjoyed such great success.



Correct microstructure interpretation is the goal.

Cultivating greater metallographic know-how

In 2000, the school expanded its enterprise by creating a whole new section: the Höganäs Metallography School. The purpose of the Metallography School is to provide training in accurate interpretation of metallic microstructures. Generating valuable quality- and process-improvement feedback, metallographic capability offers the P/M producer a competitive advantage.

Clear signals

The three well attended sessions during 2000 have verified that the Metallography School is worthy of permanent status.

Each seminar can take a maximum of seven participants. Says Björn Lindqvist, principal at the school: "it's essential that participants get not only theory but also practical training and opportunity to discuss methodology. Available resources and the need for quality assurance are what limit class size".

Lasting three full days, the seminar is about 30% theory and 70% practice. "A certain level of theoretical understanding is a prerequisite for attendance, because we



November's graduates.

deal here with the specifics of metallographic analysis. Though both parts are equally important," says Lindqvist "it's essential that participants get a strong grip on sample preparation, etching and interpretation, in order to ensure that they follow correct procedure. Wrongly prepared samples give completely misleading results. We therefore study both correctly- and incorrectly prepared samples, in order to underline the important differences."

For companies planning to benefit fully from the training's potential, access to a

light optical microscope should be a 'given'. Even producers who haven't yet invested in such instrumentation should consider the program however, because it provides an objective overview of the potential gains which metallographic capability offers.

There are already four Metallography School sessions planned for 2001 – two each in the spring and autumn. One of the latter will be held in the USA – at North American Höganäs's Stony Creek Tech Center.

For more details about the Metallography School, contact your Höganäs representative.

A typical curriculum at the Metallography School:

- Day 1** Nomenclature, phase diagrams, diffusion, sample preparation (cutting, grinding, polishing)
- Day 2** Continuous cooling transformations, mechanical properties, etchants for iron-base materials, etching procedure (correct- and incorrect etching)
- Day 3** Microstructure interpretation – homogenous and heterogeneous structures, practical exercises/case studies

10 years of growing business

More than 150 guests attended the party celebrating the 10th anniversary of Höganäs Taiwan Ltd. (HTL). The guest roster included users of iron- and high-alloy steel powders from Taiwan and other Asian countries, bankers and other business contacts that have supported HTL's growth, as well as Höganäs visitors from around the world.

There was plenty of cause for celebration, of course! Since 1991, when the first representative office was established to improve service to the producers using our products, the company's powder sales volume has tripled. All thanks to the efforts of a small but effective sales, service and warehouse operation managed by seven very capable people. Today, HTL has customers in practically every industry using iron or steel powder, including P/M, welding, etc.

Entrepreneurs all

Höganäs has conducted business with Taiwanese customers for many years.

In fact, a large share of the metal powder consumed by Taiwanese producers is shipped directly to a select number of customers, in accordance with their planned production schedules. The past ten years

have seen a very favorable development not only for P/M and welding powders from Sweden, but also for high-alloy powders from Höganäs Belgium.

There is no question that the entrepreneurial spirit is strong in Taiwan. One clear proof of this is the large number of smaller customers that Höganäs serves. They are an important reason for our warehousing operation there, which enables immediate delivery of a range of standard powders. Service and support from HTL provides an important knowledge resource to stimulate growth.

Celebrating the future

Held on November 11, just before the 2000 Powder Metallurgy World Congress in Kyoto, the celebration took place at the Westin Resort Hotel, outside Taipei.



Claes Lindqvist, CEO of Höganäs, strikes the traditional gong to broadcast the good news of HTL's 10th anniversary.

After a welcoming speech by Holger Persson (HTL's Managing Director since '91), a buffet dinner was served, to the accompaniment of a live band. The evening finished with a 'bang' – a traditional 10-minute string of firecrackers was lit to chase away demons and bring good fortune.

According to all reports, guests judged the event to be a success and an auspicious start to Höganäs Taiwan Ltd's. second decade of growth.

New Tokyo office innaugurated

PM2000 gave Höganäs Japan KK the perfect opportunity to invite Höganäs employees from around the world to an intimate 'family' gathering.



Clearly happy about the new office.

The occasion? Nothing less than an informal inauguration of the new Tokyo sales office. With its growing business, and a regular stream of visitors from other Höganäs offices, the 11-member sales and marketing team was urgently in need of more space.

In fact, the new premises are no more than 500 meters from the old office in the Akasaka district of central Tokyo, but the fresh new locale and extra facilities it contains offer a welcome change. The "No Smoking" rule now in force will help to keep it fresh!

One feature especially appreciated by 'transient' Höganäs employees is the visitor's area, which is equipped with work spaces and network connections. In this mobile world, the opportunity to log in and deal with accumulating e-mail is not just a convenience – it's a necessity!

An international gathering

The inauguration brought together Höganäs staff from Sweden, Germany, Belgium, France, Spain, UK, Italy, India, Taiwan, Japan and the USA on the Friday after the conference. 'Viva Italia' is currently the rage in Tokyo and, after the ribbon cutting, champagne was accompanied by a wide assortment of Italian delicacies.

We congratulate Höganäs Japan KK on its beautiful new office!

POWDER PEOPLE

Our family continues to grow, particularly in North America and Sweden ...



MICHAEL LUTHERAN
Joined North American Höganäs Inc. as Vice President of Operations in September 2000. A metallurgical engineer, Michael's career in has

covered all phases of steel manufacturing from production to technical service & sales, and senior management. Since 1990, he has managed a powder production plant for Kobe Steel.



CHRIS ADAM
Comes to North American Höganäs Inc. as Production Manager for Finishing Operations at Stony Creek. With a B.Sc. in Ceramic Engineering,

Chris has worked closely with the P/M industry for 10 years, most recently as Quality Assurance Manager and Technical Service Manager at Kobelco Metal Powder of America.



DEAN HOWARD
In autumn 2000 Dean assumed global marketing responsibility for Pyron Friction Products, which include all Höganäs metal powders for friction applications. A graduate of Penn State University, with PMT Level 1 certification, Dean has served Pyron since 1997.



JOHN MAHL
As Pyron P/M Account Manager, and North American Höganäs's technical sales support for the Pyron range of P/M powders, John plays a

vital role in promoting Pyron's strengths to our wider market. John holds a Bachelor's Degree in Geological Sciences from the University of Buffalo and PMT Level 1 Certification.



TREVOR TOWNS
Trevor serves as North American Marketing Manager for all non-P/M applications, representing both the Pyron and Höganäs metal powder

product ranges. Trevor has a degree in Applied Geography from Illinois State University and PMT Level 1 certification.



PATRICIA JANSSON
As Höganäs's Senior Researcher for soft magnetic materials, Patricia has shepherded most of our SMC powder development from

idea to reality. She is now joining the marketing department, to help ensure that customers fulfill SMC's commercial potential.



IOANNIS ARVANATIDIS
A doctoral graduate of and, recently, a researcher at the Swedish Royal Institute of Technology, Ioannis now works with process develop-

ment at Höganäs R&D.



ALEXANDER HENRICH
In October 2000, Alexander joined the production department as a development engineer working with quality assurance. With a doctorate

from the Department of Analytical Chemistry at the Institute of Material Science, Darmstadt University of Technology, he is well equipped for his task.



PERNILLA JOHANSSON
With a fresh degree in civil engineering from Chalmers University of Technology in Gothenburg, Pernilla will serve as a development engineer in

the Metallographic section of Höganäs R&D.



ROSEMARIE YTTERGREN
Rosemarie joins the Marketing Department as Development Manager for Carrier Cores. A graduate of the Swedish Royal Institute of

Technology, with a degree in Material Sciences, Rosemarie lectured there before joining Höganäs in September 2000.

UPCOMING EVENTS

Höganäs attends and exhibits at a range of different conferences and exhibitions, to contribute to the technical programs and to showcase our capabilities for the market.

Our current show calendar is listed below. The latest show updates will also be available at our website.

MinskExpo

27–30 March

Minsk, Republic of Belorussia

The 8th International Specialized Exhibition, Powder Metallurgy, 2001

Professor Victor Mironov, Höganäs Representative for the Baltic States & Russia, will give a presentation titled "Metal powder for production of automotive components", together with Magnus Johansson, Area Marketing Manager for direct sales markets.

PM²TEC 2001

13–17 May

New Orleans, USA

International Conference on Powder Metallurgy & Particulate Materials

PM²TEC is the foremost annual meeting point for North America's powder metallurgical industry. North American Höganäs Inc. will host a major exhibit, and will be presenting several papers at the conference.

Höganäs

THE DIFFERENCE IS KNOWLEDGE

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