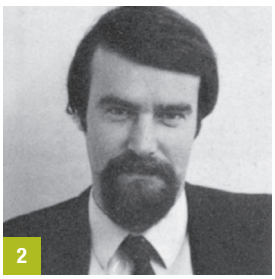
Chapter 2 1984 | 1988

1984 | 1988 **Board of Management**


1


2


3


4


5


6

1984-1987

1. Gjalt Smit Managing Director
2. Gerard Verdonschot Director Finance / Administration and Chief Financial Officer
3. Joop van Kessel Operations
4. Nico Hermans Development
5. Dr. Steef Wittekoek Chief Executive Scientist

1988

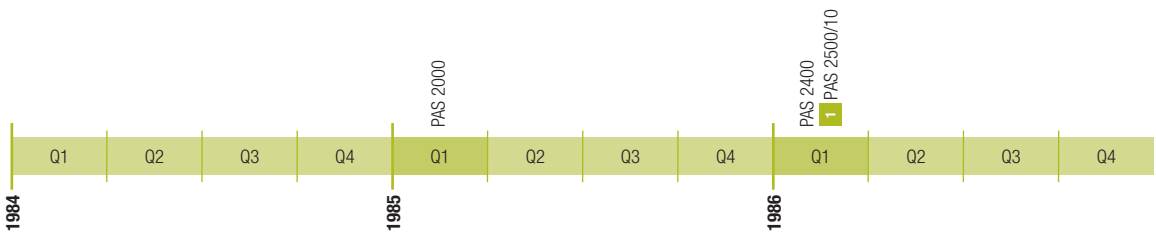
6. Willem Troost Managing Director
Gerard Verdonschot Director Finance / Administration and Chief Financial Officer
Joop van Kessel Operations
Nico Hermans Development
Dr. Steef Wittekoek Chief Executive Scientist

Product **Portfolio**

1

PAS 2500™/10 g-Line Stepper

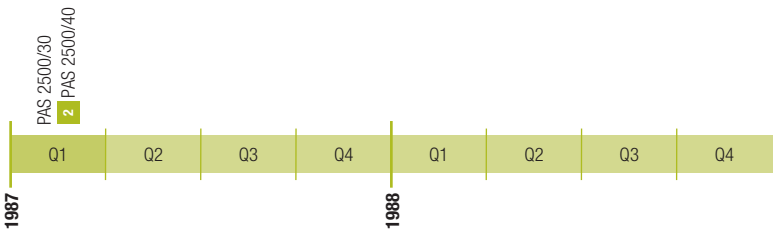
1986 saw the introduction of the PAS 2500/10. This system was the most successful g-line stepper type built by ASML. Its small footprints, big performance and high reliability made it a popular system with customers. Despite its respectable age, most of the 90 PAS 2500/10 systems built are still in active production with ASML customers worldwide.



2

PAS 2500/40 i-Line Stepper

The PAS 2500/40 was the first i-line system introduced by ASML in 1987. On its introduction, the system was the most productive solution available for leading-edge imaging at the 0.70-micron node. Since then, the system established itself as a low-cost alternative for non-critical imaging in mature as well as emerging lithography applications. The majority of PAS 2500/40 systems built are still in active production with ASML customers worldwide. In its lifetime of 10 years, a total of 113 /40s were built, the last of which rolled off the production line in 1997.



Taking on the competition

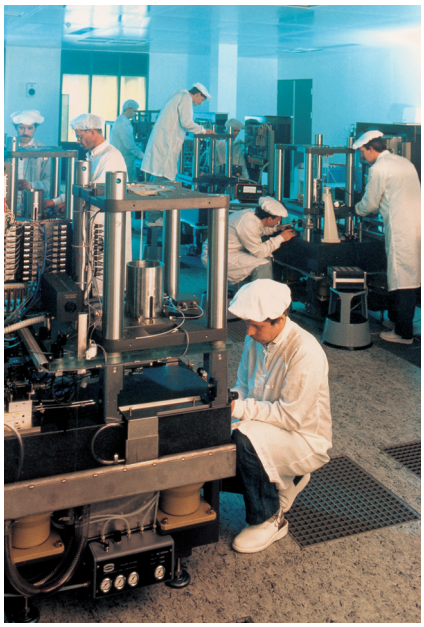
When the ASML joint venture first saw the light of day in 1984, there can be few companies whose early months have given rise to such mounting pessimism and gloom. The reason lay in our technological heritage.

Risky business

Unfortunately, the first stepper ASML was able to offer the world, the Philips Automatic Stepper (PAS) 2000, was already largely technically obsolete by the time it was produced. The stepping stage was powered hydraulically, and no customer would risk having pressurized oil in a clean room! What's more, the lenses supplied by our initial supplier were unsatisfactory: they had too small a field of projection, insufficient resolution and unreliable quality. We urgently needed to find a new way to power our stepping stages, and we needed a new supplier for our lenses.

Can we do it?

There was no time to lose. The major industry trade-fair, SEMICON West in the U.S., was fast approaching, and we needed to be able to show something that would convince the industry that we were a serious contender for their business. Our engineers quickly came up with a design that could be built in the 8 or 9 months we had left. It would showcase our new technologies: a new alignment system and, most importantly, an electrical stepping stage, also developed at the Nat Lab, replacing the old hydraulic system.



Ready just in time, this new machine — the PAS 2400 — did what it was supposed to do: it attracted interest and saved the day. More than that, it gave us vital market experience and created a solid basis from which we could grow.

Rapid development

The PAS 2400 was never intended to be more than a stop-gap measure. It was still based on the architecture of the obsolete PAS 2000, and we were still having difficulties with the lenses. We had managed to save face at SEMICON, but something would have to be done about both these problems — and fast.

We immediately launched into a highly intensive program of development. Within two years, we had produced our next generation of machines, the PAS 2500 family. This new series was electrically driven and equipped with excellent Zeiss lenses. And in terms of the working resolution it offered, it compared well with the best. Using g-line light (from a pressurized mercury lamp) with a wavelength of 436 nm, the first machine in the 2500 series delivered a working line-width resolution of 0.9 microns.

We now had a product that could take on the competition. ASML was in business.

Patents

An intellectual property department deals with patent, trademark, domain name and copyright matters. Patent matters relate to inventions and patents. Patents are legal instruments that explain how to produce or use inventions in exchange for a time-limited monopoly on such inventions. Today most patents are valid for twenty years from the date on which such patents were applied for.

1984 | 1988

The oldest lithography-related patent on record at ASML relates to an alignment system and dates back to January 1971. The first patent application filed after foundation of ASML and relating to developments for ASML was entitled "Device for exchanging masks"; the application was filed in May 1984, naming Rob Munnig Schmidt as inventor.

During the early years of ASML, on average about four patents per year were applied for, which is not much for a company that heavily invested in development of technology.

1989 | 1993

The company grew, but behavior regarding patents did not change much. The number of patents applied for counted at maximum about six per year. In February 1991, a patent entitled "Method of and device for repetitively imaging a mask pattern on a substrate using five measuring axes" was applied for, naming Martin van den Brink as inventor.

Steef Wittekoek, who worked at Philips Research Laboratories before joining ASML in 1984, initiated several patents. Later, he formed together with Martin van den Brink and Henk Meijer an invention review board, which urged Philips to apply for patents on important inventions.

1994 | 1998

After ASML was listed on the stock exchange in 1995, people realized that legal, intellectual property and tax expertise, which had up to that point been provided by Philips, should become part of the ASML organization. During rapid expansion in complexity, variety and volume of ASML's technical activities,

an in-house Corporate Patents and Trademarks department was created by Ton van Hoef in July 1997. One of the first tasks of the department was to increase patent and trademark awareness at ASML. Adequate communication between the engineers —particularly project leaders — and the patents department was aimed at various stages of projects, so that ASML could prevent infringement of third party patents and apply for patent protection. For trademark proposals, the same applied to Marketing employees.

The main goal of the Corporate Patents and Trademarks department was to protect the investments in development of technology, so we could ensure that our competitors could not simply copy or use the final results of our high research and development investments.

The new approach started to yield fruits: over 70 ASML inventions were reported in the first six months of 1998, and an increasing number of patent applications were filed.

1999 | 2004

Patent issues became a priority within ASML in this period. The Corporate Patents & Trademarks department was renamed to Corporate Intellectual Property, and the patent strategy was adapted, resulting in increased activities and department growth. The awareness of patents within the ASML organization further increased after the Patent Award Program was introduced in August 2002. The Patent Award Program rewards ASML employees who file patent applications. The number of invention disclosures grew. Nowadays for every two engineers, at least one invention proposal is submitted per year! More than one out of three invention proposals are turned into patent applications. Having a patent is considered a distinguished honor. We've come a long way from having a handful to hundreds of patent applications per year!

ASML
around the world

Building 1 in Veldhoven

After its founding on April 1, 1984, ASM Lithography was situated in wooden barracks on the Philips premises in Strijp, Eindhoven in the Netherlands. But ASML knew they needed to get their own premises to really become independent. ASML started searching for a suitable location based on their requirements that the location should be close to the Philips Physics Laboratories (Nat Lab) and the Philips Machine Fabrieken. ASML wanted an area that would draw a lot of attention, and have good access roads from the main airports. ASML found a location in Veldhoven that was ideal for their operations, but this area was not intended for industry. However, the Province gave Veldhoven permission to change the designation of the area. Construction started in November 1984, and in August 1985, the building was ready.

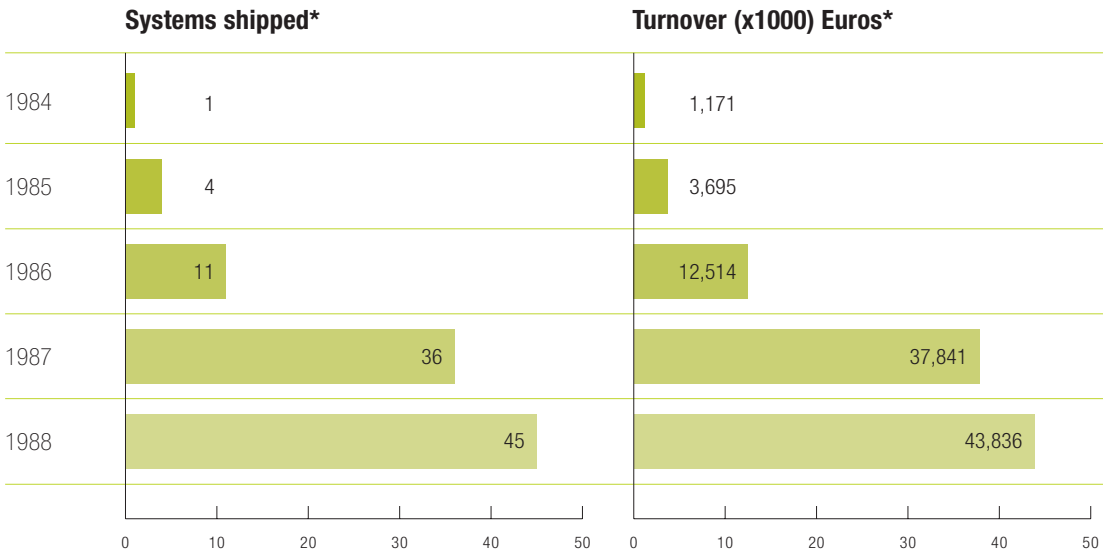
In addition to Veldhoven, in July 1984, there were a handful of employees located in Tempe, Arizona in the U.S. In 1985, ASML extended its market reach overseas, and Tempe became the North American headquarters.

By 1988, ASML in the U.S. consisted of 84 employees in five locations: Tempe, Arizona; Boise, Idaho; Dallas, Texas; Austin, Texas; and San Jose, California.

In 1988, ASML made its first forays into the Asia-Pacific market, where it began by focusing in the region's fastest growing segment, Taiwan.

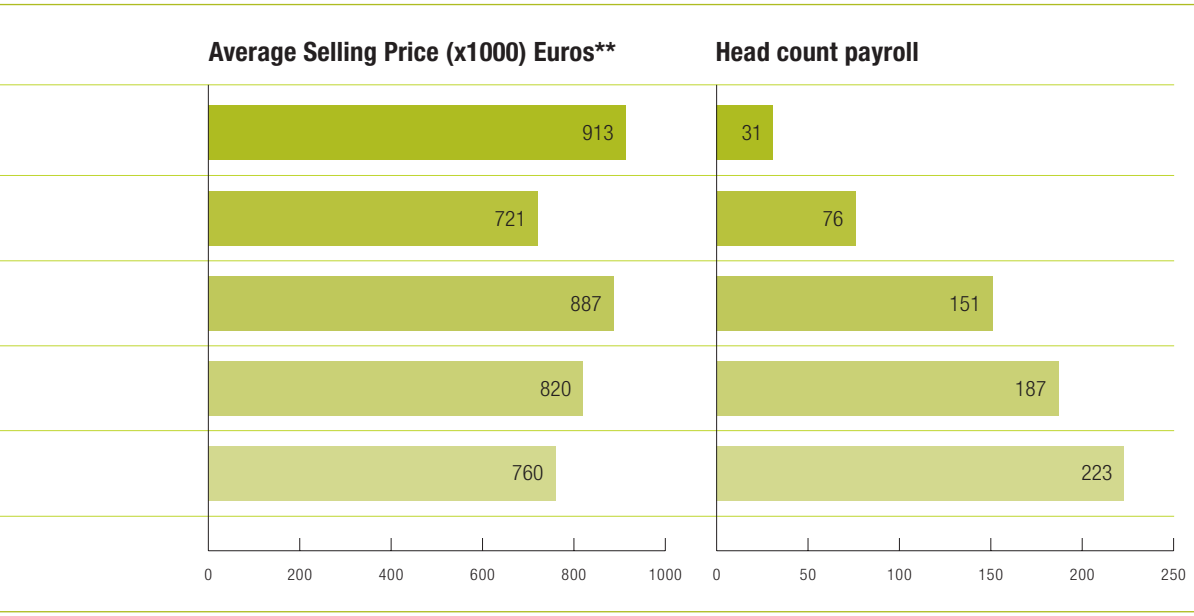
ASML office in Tempe, Arizona

1984 | 1988 **Statistics**



* Systems shipped & turnover: ASML

** Average Selling Price estimated



ASM Lithography was considered a "high-tech startup" company when it was formed on April 1, 1984 by ASMI and Philips in Eindhoven, the Netherlands. Like most start-ups, it encountered problems. In 1988, Philips made arrangements with a banking consortium to keep ASM Lithography afloat.

Social events

Veldhoven

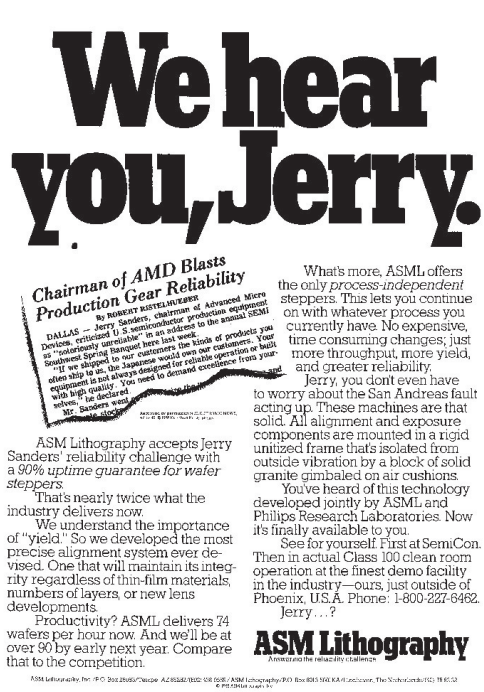
- **November 1984:** First party for all employees in “De Boschhoeve” in Nuenen, the Netherlands
- **April 1985:** Every employee in Eindhoven (still at the Philips facilities) gets a “Bossche bol”
- **December 1985:** Open days at new Veldhoven facilities for ASML employees and their families. In total there were 850 visitors – a big success!
- **1987:** In Veldhoven, the personnel association Trendsteppers is founded. The goal of the Trendsteppers is to improve contact between employees by organizing all kinds of activities, such as sports events, canoe tours and a "Sinterklaas" celebration in December.
- **June 1987:** Arizona Ball. 330 Veldhoven employees and their partners joined this party with Western-look, barbecue and several artists.
- **October 1988:** “Black & White party” was held in party center Animali in Eindhoven
- **December 1988:** The first annual Christmas dinner was organized by Trendsteppers in Veldhoven

1

3

2

1984 | 1988 **Advertising**



We hear you, Jerry.

Chairman of AMD Blasts Production Gear Reliability

By ROBERT RISTELHUEBER

DALLAS — Jerry Sanders, chairman of Advanced Micro Devices, criticized U.S. semiconductor production equipment as "notoriously unreliable" in an address to the annual SEMI Southwest Spring Banquet here last week.

"If we shipped to our customers the kinds of products you often ship to us, the Japanese would own our customers. Your equipment is not always designed for reliable operation or built with high quality. You need to demand excellence from yourselves," he declared.

Mr. Sanders went on [illegible]

ASM Lithography accepts Jerry Sanders' reliability challenge with a *90% uptime guarantee for wafer steppers.*

That's nearly twice what the industry delivers now.

We understand the importance of "yield." So we developed the most precise alignment system ever devised. One that will maintain its integrity regardless of thin-film materials, numbers of layers, or new lens developments.

Productivity? ASML delivers 74 wafers per hour now. And we'll be at over 90 by early next year. Compare that to the competition.

What's more, ASML offers the only *process-independent* steppers. This lets you continue on with whatever process you currently have. No expensive, time consuming changes; just more throughput, more yield, and greater reliability.

Jerry, you don't even have to worry about the San Andreas fault acting up. These machines are that solid. All alignment and exposure components are mounted in a rigid unitized frame that's isolated from outside vibration by a block of solid granite gimbaled on air cushions.

You've heard of this technology developed jointly by ASML and Philips Research Laboratories. Now it's finally available to you.

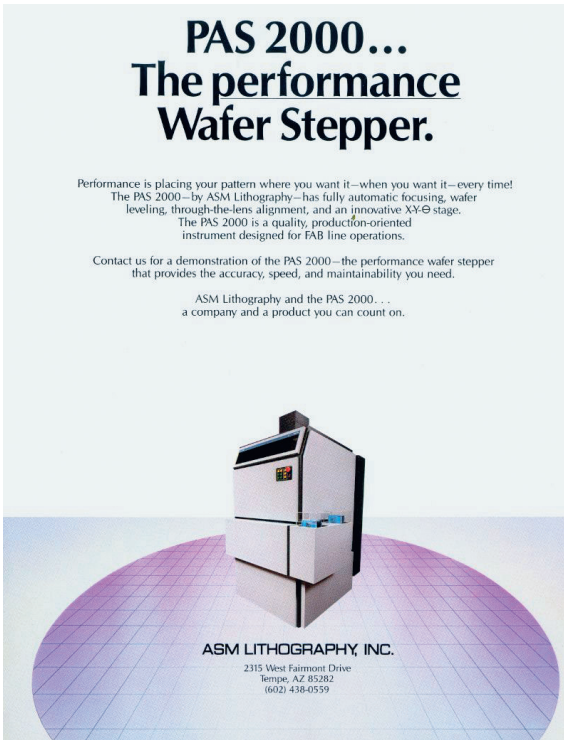
See for yourself. First at SemiCon. Then in actual Class 100 clean room operation at the finest demo facility in the industry—ours, just outside of Phoenix, U.S.A. Phone: 1-800-227-6462.

Jerry...?

ASM Lithography

A venture in the reliability challenge.

ASM Lithography, Inc. / P.O. Box 23845/Tempe, AZ 85282/(602) 438-0559 / ASM Lithography/P.O. Box 880/5500 AW Veldhoven, The Netherlands/(31) 40-65 53



PAS 2000... The performance Wafer Stepper.

Performance is placing your pattern where you want it—when you want it—every time! The PAS 2000—by ASM Lithography—has fully automatic focusing, wafer leveling, through-the-lens alignment, and an innovative X-Y-θ stage. The PAS 2000 is a quality, production-oriented instrument designed for FAB line operations.

Contact us for a demonstration of the PAS 2000—the performance wafer stepper that provides the accuracy, speed, and maintainability you need.

ASM Lithography and the PAS 2000... a company and a product you can count on.

ASM LITHOGRAPHY, INC.

2315 West Fairmont Drive
Tempe, AZ 85282
(602) 438-0559

Does your wafer stepper alignment system perform like this?

Then it's time you learned about the PAS wafer steppers from ASM Lithography. Our 3 Sigma overlay accuracy is the best in the business: +/−0.125 micron with the PAS 2000. And an incredible +/−0.1 micron with the PAS 2500.

This unsurpassed accuracy lets you use more real estate by allowing you to shrink the die size. And you can finally utilize the inherent resolution of the leading edge stepper lens.

The system also aligns all layers to the zero layer. You won't spend time putting additional markers on subsequent layers and then not realizing the accuracy you'd hoped for.

If your alignment system is always out of line, call 1-800-227-6462 for details on the PAS 2000 and 2500.

ASM Lithography
Answering the reliability challenge.

ASM Lithography, Inc. / P.O. Box 26083 / Tempe, AZ 85282 / (602) 438-0559
ASM Lithography B.V. / P.O. Box 8805 / 5605 L.V. Eindhoven, The Netherlands / (40) 58 08 00

"PHILIPS WOULDN'T RISK ITS $1 BILLION INVESTMENT ON ANY OTHER STEPPER."

C. Krijgsman
Senior Managing Director
Chairman, Executive
Committee Integrated Circuits
N.V. Philips Company
Semiconductor Division

Europe's number one semiconductor manufacturer has spent five years and a billion dollars investing in new semiconductor technology to position itself as a worldwide market leader. Results of this development were the production of the most densely packed (90mm²) and fastest (25ns) 1 megabit SRAM ever and the large volume purchase of ASM Lithography PAS 2500 steppers.

Mr. Krijgsman says, *"Our leading edge sub-micron CMOS process needs production machines that work around the clock with an alignment accuracy of 0.15 microns. The most accurate system today is the PAS 2500 stepper. Basic technology for this stepper was first developed in our own laboratories, so we knew it could do the job."*

Discover what AMD, Cypress, MMI, Philips, and Signetics already know: the PAS 2500 delivers the finest yields, best utilization, and maximum productivity yet achieved in lithography.

For further information and application notes, contact us at:

ASM Lithography, Inc.
2315 W. Fairmont Drive
Tempe, AZ 85282
USA
602-438-0559

ASM Lithography, B.V.
Meierijweg 15
5503 HN Veldhoven
The Netherlands
31-40-580600

ASM Asia
6/F Watson Center
16 Kung Yip St Kwai Chung
Hong Kong
(0) 287961

ASM Lithography

A joint venture of Philips and ASM International

Supplier **Partnerships**

PHILIPS

Our history began at Philips. Our technology was invented at the Philips Physics Laboratories, and our first system bears the name of Philips (PAS = Philips Automatic Stepper). Eventually we became ASML, and Philips ended up being both a customer, a supplier and a technology partner.

In the early days, all bolts and nuts were derived from Philips. Since everything we needed was also used by Philips, we used their procurement channels. Once a week a commercial representative of Philips came over to pick up the order forms for anything that Philips Machine Fabrics could produce. We talked about quota and delivery times without mentioning the costs. We operated as colleagues.

Supplier **Partnerships**

The cooperation between Carl Zeiss and ASML began in 1983, when ASML was still part of Philips. Since then Zeiss has been ASML's supplier of lithography optical systems, which are a fundamental part of our systems.

ASML and Zeiss have operated as two companies in one business. Our close relationship has been jointly shaped over our many years in business together. Many Zeiss employees regularly visit Veldhoven, and quite often Zeiss has ASML employees on their premises in Oberkochen in the South West of Germany. When employees from the two companies are together, there is great mutual respect and commitment between the companies.

The first lens Zeiss produced for ASML was for the ASML stepper PAS 2500/10. This lens was 60 cm (1.96 feet) long and weighed 15 kg (33 pounds), and was so good that our competition copied them. This was quite a compliment for Zeiss! Today's lenses are about 100 cm (3.28 feet) long and weigh 230 kg (507 pounds).

Interview **Sophia Loozen**

In 1984, Sophia Loozen became the first secretary to ASML's Board of Management. Against the odds, she succeeded in bringing some order to the company's administrative chaos.

Order, order

When I started as Gjalt Smit's secretary, Gjalt was very clear about ASML's lack of structure, but his enthusiasm was infectious. He told me to do whatever I thought necessary to create order. At the time, we were camped out in Philips' wooden barracks with no sales, no money and a constant stream of people passing through my office to pick up a drink or some stationery. I hardly slept a wink in my first month!

As well as being secretary to the Board, I was responsible for every support function, from the travel office to the reception and even the cafeteria — it would have been impossible had we not had a flat hierarchy with short lines of communication. I was also involved in the work with the unions to sort out the benefits package for staff who'd come over from Philips. Urged on by Gjalt, I was the only woman on ASML's Works Council — sometimes a tricky role to reconcile with my duties for the Board!

Once we moved into our first building, it was easier to put the adminisitrative processes on a more professional footing. I remember how proud we were of the building itself — our very own "great white hope"! ASML felt like one big family working as hard as possible to survive. We even had a saying we'd use whenever times were tough: "We're about to fall into the abyss — but we'll be cheering as we go!"

Interview **Joop van Kessel**

Joop van Kessel, former Vice President of Operations, reflects on the practical issues facing ASML in its first few years.

A running start

On ASML's first day, we faced what seemed to be insurmountable obstacles: a crowded and uncertain market and a product — the PAS 2000 — that was technically obsolete. Moreover, we no longer had the safety of being part of Philips' vast organization. Operationally, we had to start over, setting up a purchasing group and manufacturing line, sourcing suppliers, implementing a logistics control and management information system, and much, much more.

To survive, we had to be efficient. My role was essentially to enable the production of an increasing number of steppers.

To achieve this, we set up a Manufacturing Engineering group to enable concurrent engineering and to ensure that the products ASML developed could actually be manufactured efficiently. I also helped to identify the criteria for ASML's first building in Veldhoven. Finding the right site and architect wasn't easy, and once we had found them, we began construction immediately.

What strikes me most about this period is the incredible motivation of ASML's employees. We all knew we had to move fast, so everyone pulled together, pooling their creativity to solve problems and avoid expensive delays. We also focused on working collaboratively with suppliers, outsourcing everything that wasn't a core competence. In fact, we were following the principles of Total Quality Management long before ASML officially adopted them! It paid off — by 1985, we had developed and manufactured the PAS 2400. The PAS 2500 followed in May 1986 and was ASML's first truly competitive product.

Interview **Richard George**

Richard George, former Project Manager for the PAS 2500 and later VP of System Engineering, remembers the race to build ASML's first products.

Building the PAS 2500

I had worked on Philips' stepper prototypes since 1977, so I joined ASML in 1984 fully aware of the technical problems we faced. The pressure was on; we had less than two years to build a commercial machine. Without modular design, development and manufacturing, we wouldn't make it. I immediately split the design into subsystem modules, each one a manageable project with its own software, mechanical design and electrical subprojects and its own project leader. This created a clear chain of command. I also established the Systems Group to create the overall system design, check specifications and make sure everything fit together from a design perspective. We lacked system engineering terminology that would allow project teams to communicate effectively. Fortunately, Wim Hendriksen soon brought over the terminology used by teams at Philips Medical Systems. We also lacked people — there were originally just 17 of us in Development, so recruitment was fast, furious and a team effort.

What strikes me now is the freedom I was given by ASML's management team, including Financial Controller Gerard Verdonschot and Development Manager Nico Hermans. My job was simply to get the machine built, and I was given all the people and funding I needed to get it done on time!

Shortly after we shipped the first PAS 2500, I moved to Tempe to build up our customer base. Marketing was a totally new role for me, and not an easy one. I didn't even have a demo model — just slides and the ability to convey the conviction that our stepper could increase productivity for our clients.

Interview **Hendrik Kerkhofs**

Packing & Shipping group leader Hendrik Kerkhofs recalls how the department went from wrapping machines up in duvets to a sophisticated logistics system.

Wrapping it up

When I joined ASML as a warehouse employee in 1985, I didn't think I'd be here long — we didn't seem to sell anything! I was amazed at how little work I had initially and how amateurish the organization of the warehouse seemed to be. That soon changed as we moved to new, bigger and more modern premises, and by 1988 our team of four had grown to eight. These eight people did everything and anything to do with getting machines from the plant to the customer, including parts processing, prepacking, packing, transport and storage.

Because we knew the machines inside out, other staff always came to us if they wanted to know something. With all those people milling around "thinking," the warehouse often looked more like a car workshop, and my colleagues and I used to think we were the only ones actually working…

Transportation was tricky at first. To make our first shipment, worth NLG 2 million (~1 million U.S. dollars), "temperature-controlled," we had to wrap it in duvets! We did whatever was needed — there was a great team spirit, and every Friday there were "tea concerts" (all-employee meetings).

As ASML grew, so did our workload, and our systems became more sophisticated. We often worked Saturdays, and there was always a big rush between Christmas and the New Year. We no longer knew everyone by sight or name — I'll never forget how a new warehouse employee refused to let CEO Gjalt Smit into the warehouse because he didn't know him!

Interview **Gjalt Smit**

ASML's first CEO, Gjalt Smit, recalls his initial shock at discovering the many hurdles facing the newly formed joint venture, and the thrill of creating a company that overcame the odds.

Going for gold

When I accepted the role of CEO, I had very little idea what I was getting into! Filled with great enthusiasm but with somewhat less technical and industry knowledge, I was staggered when my key managers explained that our technology was unsellable and the market expected us to fail. It was clear that if we tried to play catch up with the existing players in the unstable lithography market, we were doomed. Our only chance lay in "going for gold" — leapfrogging ahead to meet the demand on the horizon for a new generation of highly productive steppers with high-resolution lenses. Of course, that required considerable investment…

From the start, I knew the best role I could play was as team coach, helping others to build an effective organization. Although events unfolded at lightning speed, ASML developed an effective logistics and manufacturing operation in a very systematic way — we worked out what needed to be done and how the various parties would need to work together to achieve it. Our shared sense of urgency proved a tremendous advantage: there was no time for departments or individuals to work in isolation — we had to work as a team.

We would never have succeeded without the right company culture, and I was committed to fostering an environment in which people felt free to take chances but were supported in making decisions. I aimed for a culture more like Silicon Valley, nurturing it in every way I could — be it through compulsory two-week training courses for every new member of staff, daily "morning prayers" at which project teams met to review progress, or the twice-weekly “tea concerts” (all-employee meetings) at which every-one came together to hear one employee give an update on his or her area.

This kind of focus is what allowed us to forge ahead and gain a foothold in the U.S. market by introducing the PAS 2400 as an interim system, thereby establishing a customer base and fledgling service organization in the U.S., and preparing

the way for the successful PAS 2500. In retrospect, luck played a part too; the market's implosion and the shakeout that followed in 1986 bought us some time, while handicapping our competitors and delaying a new wave of investment. Because we didn't have our own facilities, we had outsourced much of our production, and so were less hindered by overcapacity than others.

"I knew the best role I could play was as team coach, helping others to build an effective organization"

The best testimony to the company we'd created in such a short time came from my daughter, Alessandra. Invited by an American employee to visit the application lab, she commented on how happy everyone seemed! And we were — out of almost nothing, we had created the skeleton of the thriving business ASML is today.

Cypress has been a customer of ASML since 1986. In fact, they were the first U.S. customer to buy our PAS 2500 systems. Since then, Cypress has been a very loyal customer — although they are fairly small, they have always bought a share of our portfolio. This year they received their first TWINSCAN system from ASML.

Cypress Semiconductor supplies a wide variety of ICs directed mainly toward data communications, telecommunications, personal computers, and military systems applications. Cypress was founded in 1982 and is based in San Jose, California, The four product divisions are Memory, Datacom, Timing Technology, and Personal Communications.

Cypress has acquired 14 companies since 1999. The companies are typically small, in the development stage of new technology, and strategically aligned to Cypress' end markets. The majority of Cypress' acquisitions have been focused on strengthening the company's data communications capabilities.
Cypress chose ASML as their sole supplier because of ASML's technology leadership and assistance with Cypress' technology roadmap. There have been numerous Joint Development Agreements that have helped both ASML and Cypress to improve their competitiveness. Cypress has Executive Reviews four times per year, two of which are focused on operations and two on technology.

Cypress has recently announced a Technology Center that will offer foundry services to small start ups that require the high capital costs of 193-nm tools required for 65-nm to 90-nm designs. ASML's XT:1250B will be the key capital equipment used to help Cypress succeed in this new endeavor. ASML will be processing wafers within this Technology Center for our own use over the next three years. This center is also used as their R&D center.

PHILIPS

Philips Semiconductors is a division of Koninklijke Philips Electronics N.V., one of the world's largest electronics companies with over 200,000 employees worldwide. Philips Electronics began operations in 1891 and has been processing semiconductors for over 45 years. And of course, ASML was born of an alliance between Philips and ASMI 20 years ago.

The very first system ASML delivered was to Philips in 1985. The way that system was transported was far different from the way it is done today. Back then, balloons were used as locking tools. A local mover drove the system to Philips with the restriction that the truck was not allowed to brake because of the possibility of damaging the system. So the truck ignored all the traffic laws in order to deliver the system safely!

Since the delivery of that first system 20 years ago, Philips has continued to be a very loyal and important customer for ASML. Philips has bought a large range of systems over the last 20 years. Today, about 160 systems are still in production in different Philips factories all over the world, and they are producing a wide variety of products.

Philips was the key to ASML's beginning, but it will continue to be an important customer well into our future as well.

1984 | 1988 **Facts**

1984

- Philips finds a suitable partner in ASMI, after failed discussions with the U.S. companies Cobilt in 1981 and Varian and Perkin-Elmer in 1982 and 1983
- ASML started under the name ALS, Advanced Lithography Systems. But because ALS is also a disease (Amyotrophic Lateral Sclerosis, also known as Lou Gehrig's Disease), the name was altered to ASM Lithography B.V.
- On April 1, 1984, ASM Lithography B.V. was founded. ASM Lithography B.V. was a joint venture of Nederlandse Philips Bedrijven B.V. and Advanced Semiconductor Materials International N.V.
- Shareholder equity was fixed at NLG 13.5M (about $4M in those days), not bad for a start-up, but not as much as was needed
- ASML took over the electrical stage design from Philips Research Laboratories for a couple of million Dutch guilders

1985

- ASML extended its market reach overseas; a North American headquarters was established in Tempe, Arizona
- May 1985: the transition system PAS 2400 (between the oil driven PAS 2000 and the later PAS 2500) was introduced at SEMICON West, and the PAS 2500 was announced one year later
- At the end of 1985, Monolithic Memories (MMI, later acquired by AMD) became our first PAS 2400 customer

1986

- The first PAS 2500 system was shipped to Philips at the beginning of the year

1987

- ASML experienced stabilization in 1987. There was a less sharp growth of the market and drastic improvements in the cost structure (after three years of volume production, aggressive market entrance and a strong growth in personnel)
- Great progress was made in the development process, in making the systems production ready and getting control over the production process
- ASML made its first steps toward volume orders
- ASML installed an evaluation machine at ERSO in Taiwan
- In 1987 ASML began preparing for a successor generation; the PAS 5000/50 with a UV-light source and the PAS 5000/70 with a DUV-light source

1988

- There was a strong revival in the market in the second half of the year
- ASML made its first forays into the Asia-Pacific market, where we began by focusing in the region's fastest growing segment, Taiwan

Turbulent times

Can I interest you in… ?

Who would have wanted to be an ASML salesperson in those early days? The only product the company had was the PAS 2000 stepper. Certainly, the market for steppers was growing, but it was already being served by nine or ten well-established suppliers. There was hardly room for another. Few people had heard of ASML, and with no customers, the company could not rely on testimonials or recommendations. Based in Europe, the company was also far away from most of its potential customers, who were on the other side of the Atlantic. Any one of these factors on its own would make it difficult to get a foot in the door. Put them together and it became virtually impossible.

Faster

Something clearly needed to be done. But what? From talks (in focus groups) with people from a number of U.S. chip manufacturers, it became clear that a radically new technology was required. ASML set about developing it — fast. A preliminary version, to test the market, was completed in just six months, with the definitive model ready twelve months later. This rapid pace was only possible because a new approach was adopted: modular design and concurrent engineering. That meant work could be carried out on many parts at the same time. The product, the PAS 2500, would be destined for a great future. But for now, the speed at which it was developed gave the whole company a much needed boost of confidence. A sense that we were embarking on a great adventure was beginning to take hold.

Culture shift

The culture developing at ASML was like the dynamic, pioneering and egalitarian culture prevailing in Silicon Valley. New employees, many from the U.S. and the UK, helped to inject new ideas and attitudes. And, of course, this influx of new people also meant that training programs had to be developed and implemented.

Money worries

Meanwhile, money was a constant source of concern. The company had to leave its unsuitable accommodation on the Philips

site, but raising the funds to build new premises was not easy. In the end, NMB, a Dutch business bank, agreed to finance the building, leasing it to ASML. ASML would retain the right to buy it at a later date. The location was Veldhoven, close to Eindhoven, the home of Philips.

Implosion!

Just as things were beginning to look up, in 1986 the computer market suddenly collapsed to one-third of what it had been. This inevitably had a knock-on effect on chip manufacturers and on the market for chip-manufacturing equipment. This was the last thing that ASML needed right now. But, irony of ironies, it turned out to be an advantage. Several of the leaders in the field were wiped out, bankrupted by the lack of orders and their heavy commitments in terms of personnel and machinery.

The comeback kid

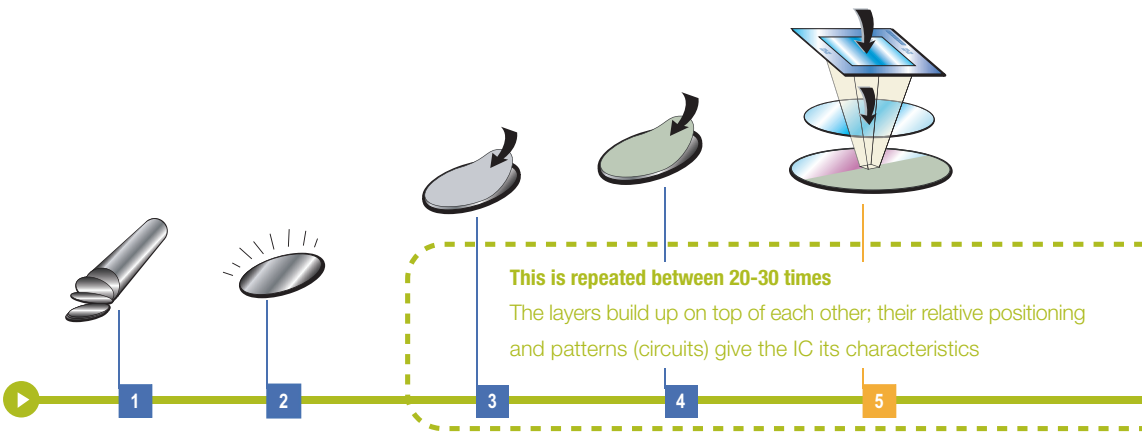
Precisely because it was free of such burdens, having always had to outsource much of its production, ASML emerged from the crisis relatively unscathed. Although debts were still running at NLG 100 million, the break-even point (finally reached in 1988) was within view. Most importantly, the company's investors kept their nerve. But the havoc that the crisis had wreaked on the major players in the field had a number of unexpected — and highly welcome — side-effects. First of all, lens maker Zeiss now became interested in ASML: the obstacles to their supplying the newcomer had disappeared. Secondly, those competitors that survived the crisis lacked the financial resources to invest heavily in developing "the next big thing." That meant that ASML was able to work on a new generation of machines, without fear of being pushed aside at any moment by a bigger and stronger rival. In due course, and benefiting from EU funds to promote R&D, ASML came up with what would turn out to be the most convincing next-generation technology available.

Calmer waters

As 1988 advanced, the first phase in the company's development was clearly drawing to a close. The PAS 2500 was a great commercial success. Thanks to a new sales and customer support network based in Tempe, Arizona, inroads were being made into the vital American market. Not that everything was easy; during the year, ASM International found itself unable to continue its investment in ASML, and Philips, though not without its own financial worries, bought its partner out. Meanwhile, in Veldhoven, manufacturing operations were running smoothly. Now there was more time and energy to look at matters such as quality care, cost control, organizational structure and logistics. An employees' association — Trendsteppers — was started. The company had gone through a turbulent period, and had survived. Now it was time for consolidation, reflection and stabilization. ASML was here to stay.

IC **Process**

The semiconductor manufacturing process



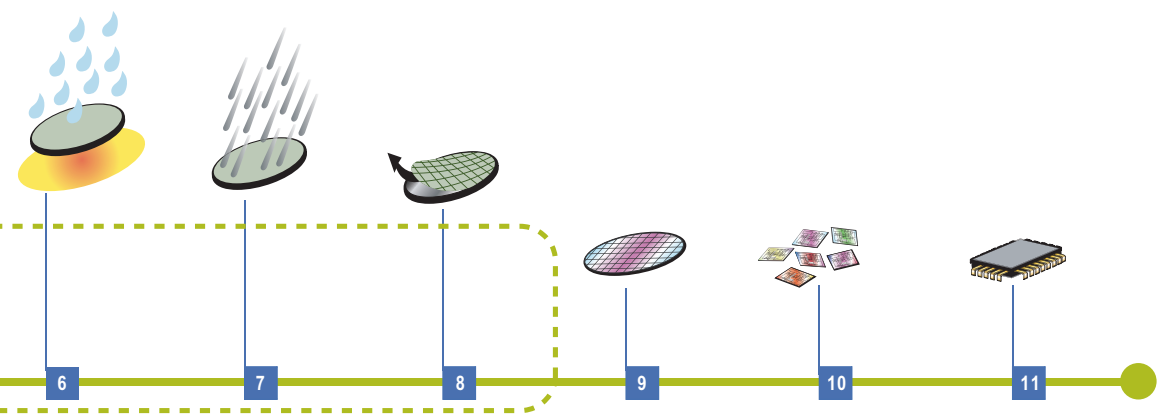
Slicing
A tube-like cylinder of silicon is cut into slices.

Polishing
The slice is polished to obtain an ultra-flat wafer. This is the basis for what will ultimately become a chip.

Material deposition or modification
A layer of material (e.g. silicon) is deposited onto the wafer. (During oxidation, a layer of silicon dioxide is created).

Photoresist coating (Track)
A thin layer of photo-resist is deposited on the wafer.

Exposure (Step & Scan)
A circuit pattern (reticle) is projected onto a section of the wafer using UV light. The light reacts with the photoresist and transfers the circuit image onto the wafer. This section of the wafer will eventually become an integrated circuit (IC). The wafer is then moved (stepped), and the process is repeated until the wafer is covered with many identical patterns, all of which will become ICs.



Developing and baking
The unexposed resist is washed away, leaving the exposed pattern on the wafer. The wafers are then baked to dry them, evaporate remaining solvents, and harden the photoresist.

Etching and ion implantation
This creates vertical “paths” between adjacent layers on the wafer.

Removing the photoresist (ashing)
The remaining pattern of photoresist is removed.

Completed wafer
Once the process has been repeated the required number of times, the result is a wafer full of completed ICs.

Separation
The wafer is cut up into individual ICs.

Packaging
The ICs are packed and connector pins are added to produce the finished chip.

ASML
Other suppliers

This drawing is intended to give a simplified overview of the semiconductor manufacturing process, as well as illustrate the role that ASML plays in the process.

The history of employee representation at ASML

When ASML was first formed, it was a small company with a great sense of commitment and togetherness among all employees. All attention was focused on work, but according to labor regulations in the Netherlands, an employee representative group needed to be formed. Works Councils, established in many European countries, are created so that employee's interests are considered in major corporate decisions. Works Councils are always made up of employees, who can be at any level of the organization, and are elected by their colleagues. Any employee with an employment contract from the country in which the Works Council is formed is eligible to vote. So for instance, all employees with a Dutch contract at ASML can vote for members of the Dutch Works Council.

In 1986, ASML employees, with the encouragement of then-CEO Gjalt Smit, elected its first Works Council. The group consisted of 9 members, one of which was the secretary of the Board of Management (see interview with Sophia Loozen). One of their first jobs was issuing an opinion (non-binding) on the appointment of the new Managing Director (a position that now translates to the CEO), who was Willem Troost.

Over the years, the Netherlands-based Works Council has grown from 9 members to 17 members today. Elections are held every three years. The size of the Works Council is based on the number of employees with a Dutch contract. When the company faces a major decision that will affect employees, the company issues a request for advice to the Works Council, who reviews the request and forms an opinion. By law, certain decisions require the Works Council's agreement, while in other cases, the Works Council's opinion is non-binding. The working relationship between the Works Council and the management has at times been difficult, as the Works Council has not always agreed with the way the company chose to approach its business needs. The fact that management and the Works Council have been able to work together is a

The Dutch Works Council in 2004

testament to the commitment on both sides to find workable solutions.
As the Works Council has matured over the years, they have moved from mostly responding to requests for advice from the company to initiating recommendations on their own. For example:

- In 1997, confronted with a number of female employees who were planning to quit working because they couldn't find appropriate day care for their children, the Works Council got involved. They went to Compensation and Benefits and began working up a proposal. Sunny Stalnaker, the manager of many of these women, and Peter Wennink, who had two young children of his own, lent a lot of support to the idea. The group effort paid off in 1998 with the introduction of Nano daycare for children of ASML employees.

- In 1998 the Works Council initiated a request for a no smoking policy in all ASML buildings. The negotiations went on for more than a year, but in 1999, new Dutch legislation was introduced that added urgency to the initiative. By spring of 1999, all ASML buildings in the Netherlands were smoke-free.

- In 1999, the Works Council suggested "the blue bicycle plan" to provide bikes at ASML buildings in Veldhoven so employees could cycle between buildings, rather than using the buses. The company decided instead to increase the number of shuttle buses and have them run more frequently, but the end result had a positive effect for employees.

- In 1999, the Works Council proposed an options incentive plan for all employees with a Dutch contract at levels 83-91. Employees are nominated to receive options by their managers, and the options vest after three years.

- In 1992, ASML had to consider layoffs for the first time in its history. The Works Council was able, through consultations with management, to reduce the total number of people laid off. In 2002, another layoff was announced. Here again, the Works Council got involved

Works **Council**

and was successful in reducing the number of cuts in the Netherlands by 10%. In 2003, the Reduction In Force (RIF) numbers were significantly decreased. This was partly due to the Works Council negotiations, and partly due to the industry upturn and associated pick up in business, which meant that some employees previously scheduled for layoff were able to be kept on.

Works Council members say it is challenging but rewarding to be part of a Works Council. It's especially challenging during industry downturns, because members have heavy responsibilities toward employees, but they also have a regular job that requires their time and attention. Managers work with Works Council members to ensure that they can focus on Works Council matters when needed without negative consequences. Those employees who choose to accept the responsibilities of joining the Works Council take on an admirable task on behalf of all Netherlands-based employees.

In France, the equivalent of the Works Council is called the DUP (Delegation Unique de Personnel). This translates to "Single Body of Representation." ASML employees in France elected a Works Council member in 1999. Because the office in France is relatively small, with 70 employees, there is only one representative.

And in 2003, an employee group called LMC (Labor Management Council) was formed in Korea. This employee representative board has 12 members: six from the management side (grade higher than 89), and six from the employee side. They meet once a month to deal with all issues that are raised, and to share information or policy that management wants to introduce.

Organizational structure

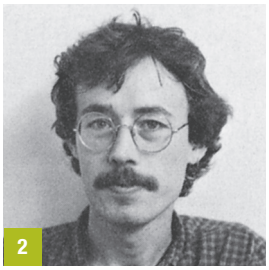
In December 1983, 45 Philips "litho employees" received a letter at their homes stating that as of April 1, 1984, they would leave the Philips organization and join a different company called ASM Lithography. These employees destined for ASML were not happy. Most of them were very well aware of the shaky competitive position of this new "outfit" they were obliged to join. The attitude among many of these Philips employees was skepticism. Some tried to find ways to stay within Philips. They did not want to join a start-up company with a very uncertain future. Finally, together with the Works Council, transition measures were defined to ensure no immediate negative financial consequences for the employees who were transferred.

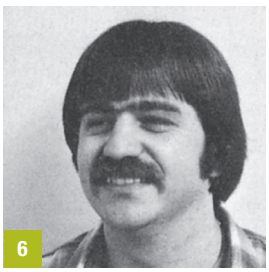
By the end of 1984, ASML already had its first hundred employees. During the turbulent period of 1984-1986, initiative, creativity and speed characterized the flat ASML organization, partly induced by the presence of the U.S. employees.

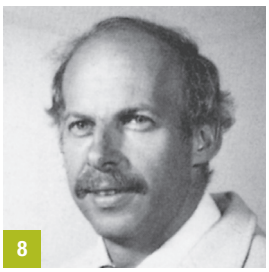
With only one location in the Netherlands, ASML was very far from the U.S. customers we were serving and whose needs we had to understand. To solve that problem, very soon after the start up, ASML rented an office building in Tempe, Arizona, near the U.S. subsidiary of ASMI in Phoenix. The new U.S. employees had to introduce themselves and their new company to customers, sell our systems, and provide service. An international company was born.

A look back
in time

In 1985, ASML printed a booklet called "Who's Who at ASML" that showed names and photographs of all employees. The following pages show those employees who were with the company in 1985 and are still with the company today (a few have had breaks in service, as indicated).

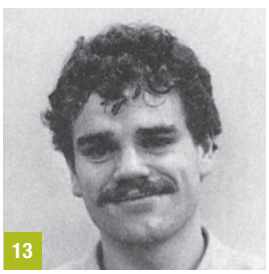


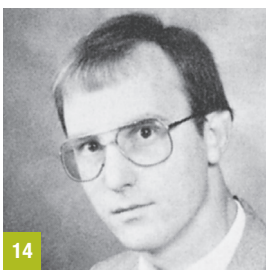




1. Ale Sytsma
2. Bartel Carrière
3. Cor Bressers
4. Cor Swinkels
5. Erik Corduwener
6. Geert Simons
7. Hans Hanegraaff
8. Henk Cornelis
9. Jean-Paul van den Heuvel*
10. Jo Roelofs
11. Jan van Malsen
12. Jeannette Isendoorn
13. Jelle Nije
14. Jos Coolsen
15. Jos Vreeker
16. Mark Drieman
17. Maurice Bonne
18. Robert Jongen*
19. Roger Stienen
20. Ton Knaapen
21. Ton Lammers
22. Fia Loozen
23. Theo Bartraij
24. Fried Verspaget
25. Rein Meijer
26. Andre van de Velde
27. Loes Vialle
28. Hendrik Kerkhofs

*Returned after a period of absence


13


14

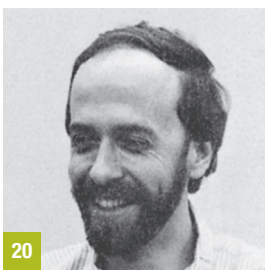

15

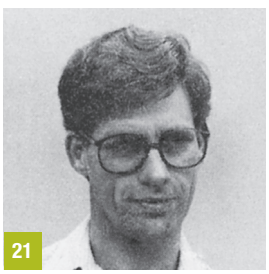

16


17


18


19

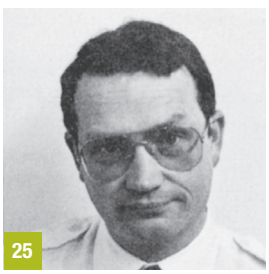

20


21


22


23

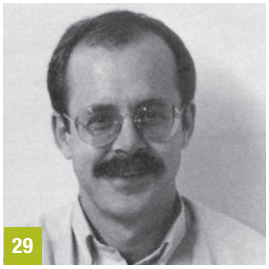

24


25


26

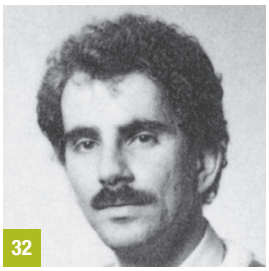

27


28


29


30

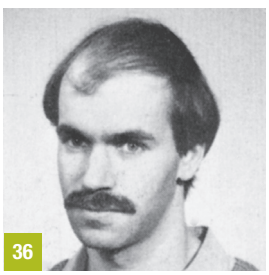

31


32


33


34


35

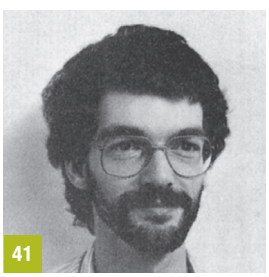

36

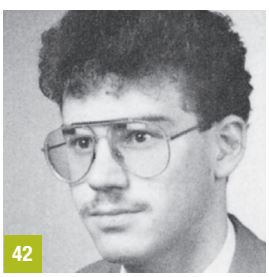

37

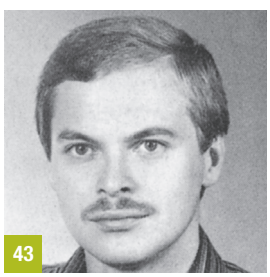

38

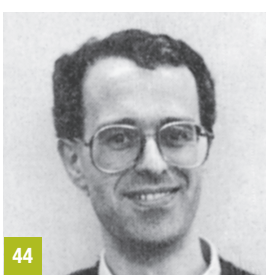

39


40


41

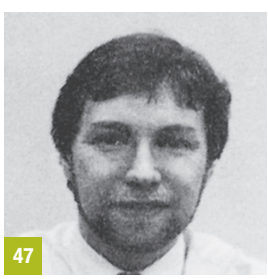

42

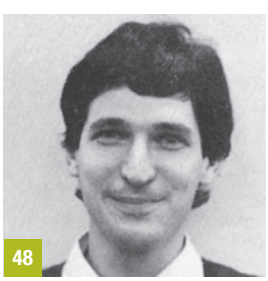

43

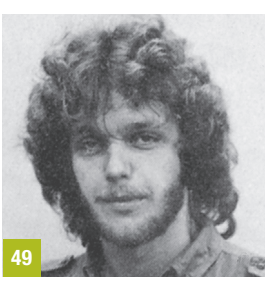

44


45

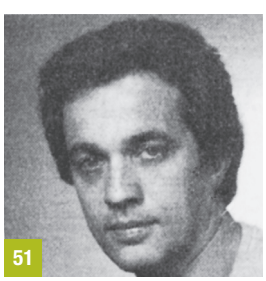

46


47


48


49


50


51

29. Jan Marius Schotsman
30. Piet Janssen
31. Hans van der Heijden
32. Rob van Wolferen
33. Henk van Engelen
34. Jan Dickhout
35. Toon van den Kerkhof
36. Jos Urselmann
37. Wil Duis
38. Martin van den Brink
39. Theo Fahner
40. Jan Dirk Cozijnsen
41. Henk Linders
42. Geert-Jan Poppelaars
43. Peter van de Biggelaar
44. Sjef van Geffen
45. Jan Gordon
46. Wim van den Heuvel
47. Frans Klaassen
48. Tiny van Mensvoort
49. Jac Stals
50. Arie Scheiberlich
51. Raymond Haghebaert
52. Chris de Mol
53. Bert de Kok
54. Martin Prins
55. Ben Slaghekke
56. Robert van der Smitte
57. Lex Baghuis
58. Herman Bogers
59. Hans Bollen
60. Cees Huizer
61. Peter Langeveld
62. Jan Luykx
63. Riet Boesten
64. Jaap Vink
65. Frits van Hout*
66. Edwin Buis
67. William van Uden

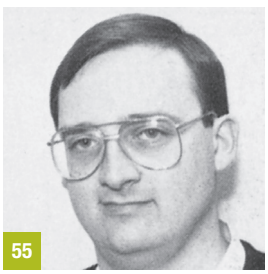
*Returned after a period of absence

1988
1987
1986
1985
1984


52


53


54


55


56


57


58

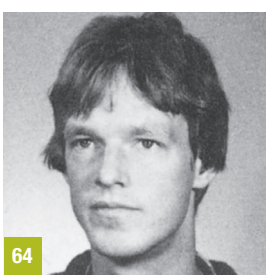

59


60

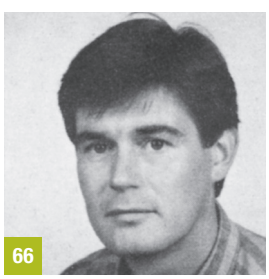

61


62


63


64


65


66


67

The **ASML logo**

1 ASM  Lithography

2 ASM | Lithography

3  ASM Lithography

What's in a name?

1 ASML, which was a partnership between ASMI and Philips, was first named ASM Lithography, with a logo that was based on the ASMI logo.

2 When ASMI ended the partnership in 1988, a new logo had to be created. There were talks about changing the name as well, but that didn't happen. Some felt the company was too young to be changing its name, so the name continued to be ASM Lithography. An American PR agency created a temporary logo.

3 In 1990, another logo made its entry, again designed by the same PR agency. This time an interpretation of the alignment marker became an integral part of the logo. The alignment marker was designed by Steef Wittekoek in the late 1970s and is used to align the wafer to the reticle, ensuring that the different pattern layers of the IC are exactly positioned on top of each other. We chose to represent the marker in our logo because, especially in the first difficult years of ASML, the ASML alignment system, together with the x-y stage, were seen as the strongest features in our systems.

4

5

6

4 In 1996, a Dutch-based graphics agency created a new logo. The existing logo was too long, and didn't show up well in the small print areas that were sometimes necessary. For the first time, "Lithography" was dropped below the name ASML. A new font reflected the international, leading-edge company we had grown into. Instead of 6 lines on each side, the marker now had only 5 lines. This made the logo clearer when printed in smaller sizes. All employees received a box with a booklet about the new logo, a pen and a diskette with templates for documents such as memos, using the new logo.

5 Starting around 1997-1998, without formal introduction but by communication through the grapevine, the horizontal line and the words ASM Lithography below it were eliminated from the logo.

6 In early 2001, ASML started a corporate identity project with the involvement of some external agencies. As part of that project, in July 2002 another update to the logo was introduced. That logo, still used today, shows a more pronounced alignment marker, the spacing between the letters has been changed and the "L" now has the same angle as the other letters.

Like the rest of the company, ASML's name and logo just keep getting better with age!