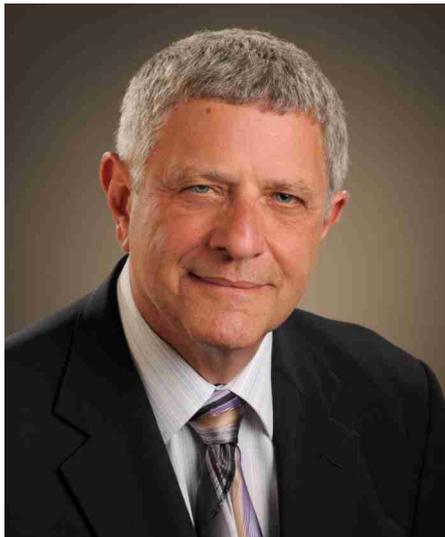


**With the development of an Early Test for Down's syndrome that used one of their Optical Filters, Chroma Technology Corp. has proven to be a Great Asset to the Biotech and Biomedical Industries in Developing Breakthrough Medical Technologies**

**Industrial  
Filters**

**Chroma Technology Corp.  
10 Imtec Lane  
Bellows Falls, VT 05101  
802-428-2500  
www.chroma.com**



**Paul Millman  
CEO**

**BIO:** Paul Millman is President of Chroma Technology Corp., an employee-owned company in Rockingham, VT. He is President of the Board of Directors of the Vermont Employee Ownership Center, is a current Board member of the Vermont Campus Compact and served two terms on the Board of Vermont Businesses for Social Responsibility. He is also a member of the Vermont Business Roundtable. He earned a BA from the New School for Social Research and an M.Ed in elementary school education

from Antioch New England. Some have observed that the latter degree prepared him well to function in today's business world. In 2011 Inc. Magazine listed Chroma Technology Corp. among The Top Twenty Small Company Workplaces in the US. It was the Vermont Chamber of Commerce' 2006 Exporter of the Year and Business Ethics Magazine Living Economy Award Winner in 2004.

**About Chroma Technology Corp.:**

Chroma Technology Corp. is a manufacturer of interference filters for the ultra-violet, visible and near-infrared portions of the spectrum, including band pass, multiple band pass, and long and short pass filters, as well as beamsplitters, dichroic mirrors and laser rejection filters. We specialize in precision spectral control, including extra high signal-to-noise ratio filters and those with rapid cut-on and cut-off profiles. The manufacturing process involves precisely depositing, in a vacuum, extremely thin layers of two or more materials on a glass or similarly transparent substrate. Chroma was organized by several talented individuals who wanted to create a working environment entirely different from the typical corporate structure. Founded in Brattleboro, Vermont, in May 1991, Chroma quickly established itself as a leader in filter designs. From its inception, Chroma has worked closely with the community of molecular and cell biologists worldwide to develop the best possible solutions to applications requiring fluorescence filters. As an employee owned company, it has grown from six employees with sales of \$314,200 in its first year of business, to over

100 employees with sales offices in Europe and Asia and \$20+ million in sales. Chroma is a principal supplier to three of the four major microscope manufacturers and a secondary supplier of the fourth. The remainder of Chroma's business comes from manufacturers in bioscience instrumentation, bio-medical instrumentation, pharmaceutical research, astronomy and laser-based instrumentation. Chroma's filters are distributed worldwide with nearly half of its business from international sales.

**Interview conducted by:  
Lynn Fosse, Senior Editor  
CEOCFO Magazine**

**CEOCFO:** Mr. Millman, what is the story about Chroma?

**Mr. Millman:** Chroma is twenty one years old. We started the company in 1991. There were six of us. The impetus for starting the company was my being fired from the company that we all worked for that made similar kinds of products. We really had no idea what we were doing by starting a company, but we were naïve enough to try to do it and it worked. We started in an incubator space in Brattleboro Vermont. We had twenty eight hundred square feet and bought used equipment. The used equipment came from the semiconductor industry and we rebuilt it to make optical filters. One of the six of us had an idea about how to automate the equipment, which was a major breakthrough. We could make better product that way. That was the summer of 1991. We started shipping filters in October of 1991 and we have been growing ever since.

**CEO CFO:** Was the company always employee owned?

**Mr. Millman:** It was always employee owned.

**CEO CFO:** What are you making and who is using your filters?

**Mr. Millman:** We make optical filters. Optical filters are technically interference filters. Optical filters take the broad spectrum of light and limit the portion of the spectrum that can go through the filter. We can take white light and allow only the UV or violet or blue, green or red to pass through. Primarily, we manufacture for the biotech and biomedical both manufacturing and research communities. Indirectly, it is always the research community and clinical community, because even if we supply a manufacturer their product then gets sold to that community. A smaller portion of what we do goes to amateur astronomers. A smaller portion of that also goes to professional astronomers. Another smaller portion goes to the machine vision industry and another smaller portion goes to Raman Spectroscopy. Primarily, the end users of our filters or the instruments that are made by our customers are biologists, chemists, physicists, medical researchers and medical practitioners.

**CEO CFO:** Why do your customers want a Chroma filter as opposed to someone else's?

**Mr. Millman:** It is not to say that we do not have competition, but when we started we started with an ethos that said "we are going to provide our customers with what they need and we are going to do it the very best way we know how." We are always going to be available to them for consultations, for special work, and we are not going to charge exorbitant amounts that they cannot afford because they have science to do. We do not want to stop science because we want to make exorbitant profits. It is not to say that we are not profitable. We are very profitable. However, we will do things for scientists that other companies will charge dramatically more

than we will, because we feel the need to support that community.

**CEO CFO:** Does everyone know about Chroma that should?

**Mr. Millman:** Other than possibly in countries that are just emerging in the biotech industry, right now we have customers all over the world. Something around fifty two percent of our sales are overseas. Our primary markets are Germany, Japan, Singapore, Israel, Canada, Australia and now China. We have a sales office outside of Munich and we have a sales office in Xiamen on the coast.

**CEO CFO:** Would you tell me about the decision to move to China?

**Mr. Millman:** We opened up an office there around two years ago. China is a large potential market. It is increasingly becoming a large market for us,

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**- Paul Millman**

but at that time was a large potential market for us. China is either manufacturing for western biotech companies or for the indigenous biotech industry developing in China. China is also investing very heavily in biotech. It is probably the biggest investor in biotech of the world's nations right now. We had a reputation already in China. We had a customer, a microscope manufacturer that sought us out because they wanted to capitalize on our reputation, so they could say that they were supplying filters with their microscopes that were made by Chroma Technology. There was a German microscope company at one point that wanted to put the slogan "Chroma inside" on their microscopes and we suggested that Intel might not like that. Our reputation is spread far and wide. The eastern European countries that are entering in to the biotech arena now are just beginning

to find us. While we have had customers who are scientists and end users over there, we are now beginning to have customer who are manufacturers. Does everybody know us? I do not know if "everybody" knows us, but our reputation is pretty diverse and spread out.

**CEO CFO:** What is new in the optical filter industry?

**Mr. Millman:** I do not know that there is anything new. There are a few different ways of making optical filters. During the past ten years or so the filter making community has gravitated toward a technology called "sputtering". Most of us are doing the majority of our work that way these days. The filters are more durable and they transmit more light. By transmitting more light, in most situations, you get better results with your instrument;

whether it is a microscope or a sequencing system or a PCR machine. These are all instruments in biology and in the biomedical area that use optical filters to perform.

**CEO CFO:** Would you tell us about the 89 North subsidiary?

**Mr. Millman:** 89 North was started after we attempted to acquire a small instrument manufacturer. When that deal broke apart we felt that our best road was to start our own company in the small instrument area in order to diversify our product line. Chroma is a very healthy niche business, but we wanted to have a more diverse product line. Therefore we started 89 North. It is a small company. It is in Burlington Vermont as opposed where Chroma is in Bellows Falls Vermont. Burlington, you may know, is the largest town in the state. That is where the University is. We wanted to be close to the University and their engineering school. We wanted to be in a place where we could attract engineers. Vermont is sometimes a difficult environment because most of the towns are very small. Young single people tend to want to be in bigger environments where they can have a bigger social life and our little "three thousand people" towns do not often

provide that and Burlington does. It is sometimes easier to attract younger people to work in the Burlington area than it is in the Bellows Falls area. We tend to attract mostly "family people" to Bellows Falls. The product line of 89 North right now is primarily light sources for microscopes and instruments. They have a potentially wider audience than we do because they can provide light to instruments that do not necessarily use optical filters. It has been a major learning experience for us. The sum total of our business experience in running a business was Chroma, because that was our first venture into managing a business for those of us who started it. 89 North has a whole different array of issues. It did not become a commercial success as quickly as we hoped it would. We have had to reorganize both the company and our thinking to put it on the path to success. I believe it is now very definitely on the path to success. You have to understand that in employee owned companies employee owners tend to be very fiscally conservative, because it is their money. Therefore, they tend to not want to make major investments, because that is part of their profit sharing and all of the things that are involved in share ownership. Therefore, it presents us with different problems than it would present to a traditionally owned company.

**CEOCFO:** You are in the Inc 5000 once again. Would you tell us about that?

**Mr. Millman:** It came as a big surprise to us the first year that we were recognized in the Inc 5000. I think we have been recognized three or four years in a row, now. What happens is, someone sends you an email that says "send us your financial reports to see if you are eligible to be part of this." At one point it was "the fastest growing companies in Vermont" and then it was the "Inc 5000". So we send off our data and all of a sudden you get this email that says "you are on the list and do not tell anyone yet, this

will come out in April." Then all of a sudden you are in a different world. You are being recognized nationally or internationally. It is a very great experience. We are never very high up in the Inc 5000, but we are on it and that is wonderful.

**CEOCFO:** What has surprised you the most as the business has developed and grown?

**Mr. Millman:** When we started we just wanted to make enough money so that we could live. In the second year, our sales went from about three hundred and eighteen thousand to one and a half million, something like that. We were shocked. It was apparent to us that we were actually on a roll and we were going to be a growing and successful company. It was when we passed three million dollars in sales that the real shock set in, because the company that we had worked for before, which was around for a lot longer than we were, had its peak at a little over three million in sales. All of a sudden we are up there and we are being approached by manufacturers from other countries who have the capability of making optical filters, but they wanted our anyway, because of our reputation. That came as a major surprise. The microscope industry was largely "if it is not made here we do not use it". That may mean that it is either made by them or made in their respective countries. All of a sudden we were supplying all of them. For me, that was a most amazing experience. I remember being on a train in Germany, having just had a meeting with one of the German microscope companies and they said "Okay, we are now going to buy filter sets from you." It was this incredibly heady experience, because this was a big company. I called back to Vermont and said "they are going to buy their filter sets from us" and nobody responded. They said "that is nice; I have to go to work." There are many heady experiences that have come from being Chroma Technology. Part of them on

the business side is being an important supplier to these major companies. We had an experience one year, we were working with a small advertising agency at the time, and there was a woman in her late thirties that was our ad rep. Having not had children she and her husband were not expecting to ever get pregnant. It did not seem to be in the cards; however, she did! Being thirty nine she went for genetics counseling and amniocentesis. The physician told them, on a Friday that there was the very real probability that their child was going to be born with Down's syndrome. He used an old methodology for that diagnosis. There was a new methodology around that used our filters and on Monday they did that test. It very clearly showed that there was no Trisomy. There was a Disomy and therefore the child was not going to be a Down's syndrome child. That was a wonderful moment in history, when what we do contributed to this joy. More than one of our customers has won Nobel prizes. Those are great moments in history. On the other hand, there is also when our employees started buying houses because our salary structure rewards jobs that other kinds of companies would not reward so highly. Therefore, our salary structure is inverted. People in the more production oriented jobs; machine operation, assembly, shipping and all those types of jobs, generally are paid well above market, while people in my position are generally paid below market. Therefore, people who never expected to be able to own homes were all of a sudden buying quality homes. Those were great moments! Vermont has a very active business community and the fact that that business community welcomed me into it, the Vermont Business Roundtable which is an organization of CEO's and presidents invited me to join; that was a great moment in history. There are all sorts of things that have come about because of Chroma that none of us expected.



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