CHROMA®

Custom & OEM

Filter Design

Custom & OEM Benefits

Latest coating technologies

Competitive pricing

Fast, on-time deliveries

All filters manufactured in Vermont

View of Coating Hall

Custom & OEM
Filter Design

At Chroma Technology, we consider ourselves to be partners with our customers. With 25 years of experience serving the scientific, biomedical and photonics communities, we know how to design and deliver optical filters that do precisely what our customers need. Whether it's long-term, high-volume production or a one-off custom solution, we create exactly what you need to help make your next product a success.

Working with Chroma

Why Choose **Chroma**

High-Volume Manufacturing

High-volume manufacturing is the core of Chroma's business. For 20 years we've been major suppliers to the largest microscope manufacturers as well as to providers of light-based instrumentation, such as DNA sequencers, flow cytometers and plate readers. More recently, optical filters for point-of-care devices have become high-volume products.

Filter Design and Applications Expertise

High-content analysis and Raman spectroscopy are additional fields where Chroma has provided filter design and applications expertise for major manufacturers. Machine vision, industrial imaging, colorimetry and automated driver-assistance technology are examples of non-fluorescence-based imaging applications served by Chroma.

Small Quantities and Prototypes

If you require small quantities or prototypes, Chroma stands alone. Since its inception, Chroma has partnered with scientists and engineers who need solutions but can't afford the higher prices our competitors charge for custom work.

Purpose-Driven

We believe it's a privilege to be chosen as your supplier and to provide the support to help realize your vision of improving the world through science. By thinking of our customers as stakeholders in this way, we've earned the distinction of being named a B Corp. As a B Corp, we're required to value more than just the bottom line, and we do this through serving the greater scientific community every day.

Good communication means that problems are solved in the design phase, resulting in a product that works as desired, and at the best price.

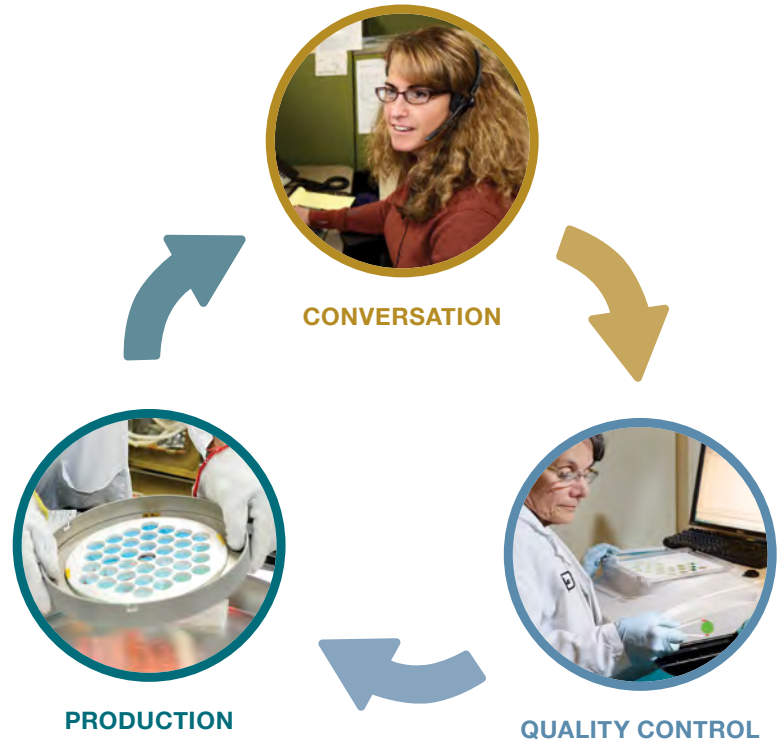
Our **Process**

Chroma does more than simply design filters for you – we help you solve your optical problems.

Chroma's process of working with you begins with effective communication. To develop precise optical filters meeting your specific needs, we first work to understand the application the filters will be used in.

Our Engineering and OEM sales teams ask the right questions to help guide the filter design process. Then our manufacturing team crafts a reliable finished product that is exactly what you need and that performs to the highest standards of Chroma Technology.

This process is often a back-and-forth conversation. For example, we might realize in the early stages that your application could benefit from changes to the requested specifications, or we might notice that some specifications add unnecessary costs to the filter.



Working with Chroma

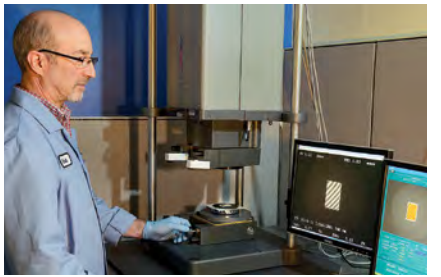
Our **Team**

We'd like you to meet some of our team members.

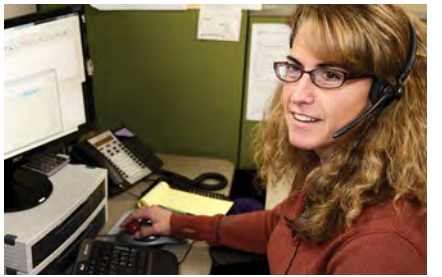
These are some of the dedicated professionals who will be quoting, designing and manufacturing your filters, whether directly or behind the scenes.

Engineering

Thin Film Coating



Quality Control



OEM Sales

Manufacturing

Capabilities and Applications

Thin Film **Optical Coatings**

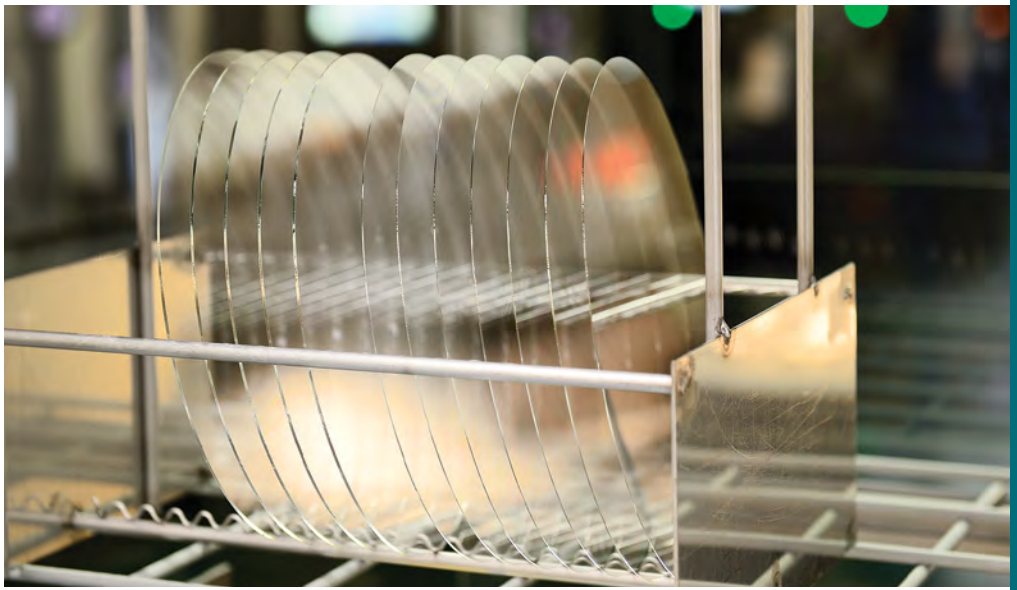
Sputtered Thin Film Coatings

Chroma Technology's modified magnetron thin film sputtering techniques provide unparalleled process control and reliable lot-to-lot consistency. This precision allows us to manufacture complex spectral designs for demanding applications. Our sputtered filters provide superior levels of environmental durability and longevity. As a result, our catalog products are covered by the industry's only Lifetime Warranty. For bespoke, custom and OEM filters with revision control, our warranty may vary.

Varied Coating Technologies

Sputtered oxide-dielectric coatings are the most common type of thin films we manufacture, and they offer the greatest flexibility and durability. Sputtered metal and sputtered metal-dielectric coatings offer the widest spectral ranges of attenuation of undesired wavelengths. Our sputtered metal-dielectric UV filters provide the industry's highest transmission in their class while blocking out-of-band wavelengths out to and beyond the IR.

Chroma Technology still maintains an e-beam and thermal resistive coating capacity for applications that may benefit from these technologies.



Clean glass, blank slate.
Your next optical filter.

Manufacturing

Capabilities and Applications

Sputtered Oxide **Coating Performance**

Sputtered Oxide-Dielectric Interference Coatings	SINGLE & MULTI BANDPASS	LONG/SHORTPASS	NOTCH	DICHROIC BEAMSPLITTER
Typical Transmission Performance [1,2]	93-99%	95-99%	95-99%	94-98%
Typical Optical Density/Reflection [1,2]	OD6-8+	OD6-8+	OD6+	Reflection >98%
Spectral Range	200-3000nm	200-3000nm	300-2000nm	200-3000nm
Transition Slope/Edge Steepness [3,4]	<1%	<0.25%	<1%	<2%
Environmental/Physical Durability and Tolerance Standard, Exceeds:	**a, b, c, d, e** *(see below)*	**a, b, c, d, e**	**a, b, c, d, e**	**a, b, c, d, e**
Temperature Extremes – Short Duration	400° C/-200° C	400° C/-200° C	400° C/-200° C	400° C/-200° C

[1] *Specifications vary according to design, available upon request*
[2] *Values refer to performance over intended spectral range*
[3] *Typical values; steeper slopes available by design*
[4] *Slope of pass and notch filters measured from 50% of TMax - OD5; slope of dichroics measured from 10%T - 90%T*

a = *ISO 9022-2-11-03;* **b** = *ISO 9022-2-11-06;* **c** = *MIL-C-48497A 4.5.4.1;* **d** = *ISO 9022-2-12-06;* **e** = *ISO 9211-4-04-08*

Applications and Filter **Types**

Chroma has long served customers in the Scientific, Biomedical and Photonics communities. Markets that are growing rapidly for Chroma include Industrial Imaging/Detection and related fields.

Applications

FLUORESCENCE

- Fluorescence Microscopy
- DNA sequencing
- Point-of-Care
- Flow Cytometry
- High Content Analysis & Screening
- Surgical Devices
- Forensics
- Microplate Readers
- Hyperspectral Imaging
- Dye Penetrant Inspection
- Semiconductor Fabrication/Inspection

PHOTONICS

- Raman Microscopy
- Raman Handheld Devices
- Machine Vision
- Colorimetry
- Environmental Monitoring
- Remote Sensing
- Astronomy
- Aerospace & Space Exploration
- Advanced Driver Assistance Systems
- Multivariate Optical Elements

Filter Types

PASS FILTERS

- Single & Multi Bandpass
- Longpass & Shortpass
- Notch Rejection
- Narrow Band Laser Line Filters
- Laser Diode & LED Clean-up Filters
- Neutral Density Filters
- Polarizers

BEAMSPLITTERS & MIRRORS

- Beamsplitters, including Long & Shortpass and Reflecting Band Dichroics
- Multi Band Dichroic Beamsplitters
- Half Mirrors & Ratiometric Beamsplitters (50/50, 80, 20, etc. Beamsplitters)
- Hot Mirrors & Cold Mirrors
- Fully Reflective Mirrors

Quality Control

Measuring
Spectral Performance

Chroma Technology employs a suite of advanced Cary spectrophotometers, covering 200-NIR.

We perform spectral measurement of every production lot to ensure filters meet specification requirements. We assign specifications for catalog products, which we've developed through 25 years of experience. For our OEM customers and those requesting bespoke parts, we provide the specified spectral performance.

Spectral Range	DYNAMIC RANGE	SPECTRAL RESOLUTION
200-3300nm	100%T → OD8	Resolve spectral features 1 Å or greater

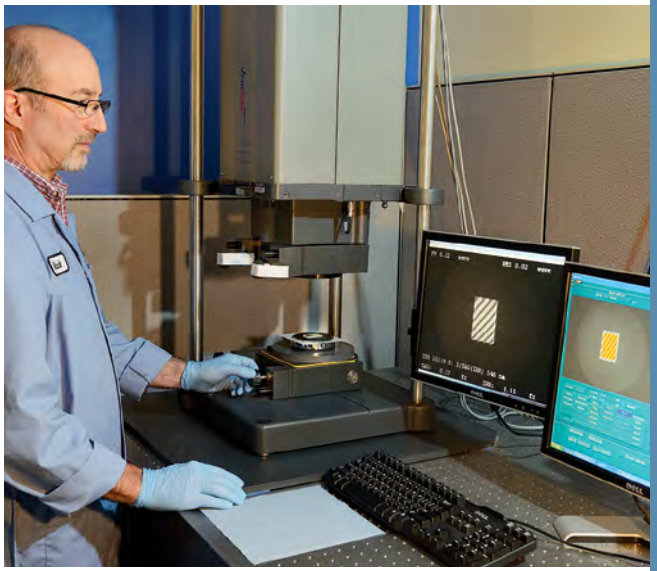
Our various Cary spectrophotometers
cover a range of capabilities, including measurement of Optical Density values ≈OD8

Measuring
Physical Properties

Using Zygo interferometers and custom-built autocollimators, Chroma Technology is able to offer precise measurements of Transmitted Wavefront Distortion (TWD), surface flatness (Reflected Wavefront Distortion/2) and parallelism (wedge).

We measure physical dimensions of size according to specifications and perform routine surface quality inspections such as S/D (Scratch/Dig), and we ensure that shipped products are free of any cosmetic defects.

Transmitted Wavelength Resolution	SURFACE FLATNESS RESOLUTION	PARALLELISM
1/20λ	1/20λ	1 arcsecond



Our Zygo interferometers

allow us to consistently certify products with exceedingly flat surfaces after coating. Our flatness specs are of finished product, not incoming substrates.

Vision Guided
Automation

Chroma Technology is implementing the automation of some processes, including filter inspection.

Inspection Automation

Robotic Handling
Automation of activities, such as transferring and loading of filters into spectrophotometers, saves time and minimizes errors.

About Chroma

Chroma was organized in 1991 by several talented individuals who wanted to create a working environment entirely different from the typical corporate structure. Chroma Technology is 100% employee-owned. All manufacturing occurs in the United States, with worldwide distribution and sales support.

Easy Online Ordering

Visit www.chroma.com to order online.

Ordering by Phone

Call +1-802-428-2500 or 1-800-824-7662

Lifetime Warranty

Terms:

Net 30 days

FOB: Chroma Technology, Bellows Falls, VT

May 2017

US Corporate Headquarters
10 Imtec Lane
Bellows Falls, Vermont 05101 USA
sales@chroma.com
Tel: 1-800-824-7662
+1-802-428-2500

Chroma Technology GmbH
Maximilianstrasse 33
D-82140 Olching, Germany
europe@chroma.com
Tel: +49-8142-2847525

Chroma China
Rm 803, Building No.16
Yuanbo Wuli
Xingjin Road, Jimei District
Xiamen City, Fujian Province
361021 China
china@cn.chroma.com
Tel: +86-0592-5062089

Chroma Technology Japan
8F Yokohama Onoecho Building
4-57 Onoecho Naka-ku
Yokohama 231-0015 Japan
japan@chroma.com
Tel: +81-045-285-1583

CHROMA

An Employee-Owned Company
Producing the World's Finest Optical Filters and Filter Sets