HORIBA JOBIN YVON

Scientific diffraction gratings / Custom gratings

Gratings for astronomy & space experiments

Commitment to quality

HORIBA Jobin Yvon offers complete customer service, including expert technical advice for optimizing system configurations to meet customers' needs.

HORIBA Jobin Yvon is ISO 9001:2000 certified, and our well-staffed departments are committed to customer satisfaction and product quality.

Gratings for astronomy and space experiments

Holographic master and replica gratings

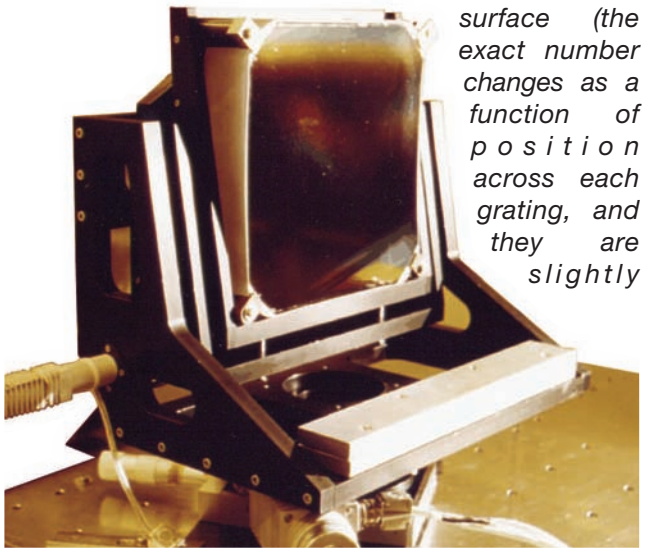
HJY expertise in gratings for space experiments

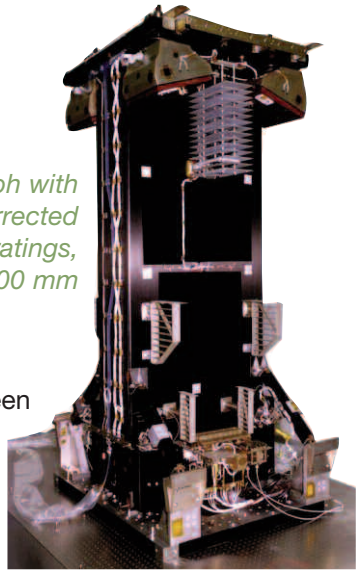
HJY has been producing gratings for space experiments since 1968. The first ruled gratings were produced for the French space experiment D_2A in 1970.

HJY has produced some of the most technically-challenging space-flight gratings ever designed, applications ranging from off-plane X-ray gratings to toroidal VLS gratings for the VUV and transmission deep groove gratings for the IR range.

For example, HJY produced the four gratings for NASA/JHU FUSE spectrograph.
The gratings are 5800 gr/mm, aberration corrected, holographically ruled on 300x300 mm, aspherical light weight ceramic.

A prototype FUSE spectrograph grating being removed from a vacuum tank in a clean room at HORIBA Jobin Yvon. The FUSE gratings are approximately a foot square with 5300-5800 lines per millimeter etched onto the surface (the exact number changes as a function of position across each grating, and they are slightly curved). These etchings are what disperse far-UV light into a spectrum for analysis, and provide the high spectral resolution of the spectrograph.





FUSE spectrograph with four aberration corrected holographic gratings, 5800 l/mm, 300x300 mm

HJY has also often been selected by NASA and ESA for their most demanding missions. A very reduced list includes:

SOHO SUMER	France + Germany
SOHO UVCS	USA
STIS (Hubble telescope)	USA
GALEX	USA + France
ROSETTA Alice	USA + France
COS (Hubble telescope)	USA
SOFIS	Japan
SPICAM/ MARS Express	France
OMI - EOS	Netherlands
LYMAN FUSE	USA + France
ROALEX	USA
GOMOS (Hubble telescope)	France + Belgium
MERIS/ENVISAT	France
UVS MARS	Japan
GOME	Italy
WEASAT	China

Recently we produced gratings for missions such as EVE (NASA/LASP) and SSULI (NRL).

HJY receives NASA award

HJY received the NASA award “Commitment to Excellence in Technology Achievement” for its grating technology contribution for its specific support on the COS project.

Gratings for astronomy and space experiments

"In recognition of your holographic gratings for the COS instrument that will enable a new generation of scientific exploration for the Hubble Space Telescope […] and every person who looks to the sky in wonder […] **the gratings were delivered above the specification, on time and within cost,**" said Prof. Jim Green.

Production and test facilities

HORIBA Jobin Yvon's underground grating labs provide the necessary environmental stability required to mechanically rule and holographically record the highest-specification diffraction gratings.

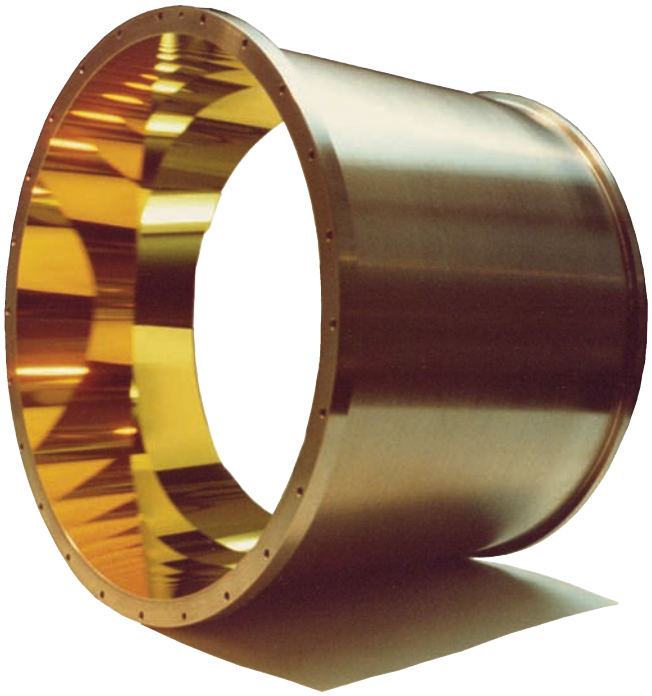
Our ruling engines, lasers, collimators, optical components, and chemical processing equipment are housed in clean rooms throughout the facility.

Coating and chemical operations are performed in our own processing laboratory. The lab is geared to accommodate all the company's replication and deposition requirements with equipment including fully-automatic high-vacuum evaporation systems.

All equipment involved in handling and processing of master gratings are operated in different cleanrooms down to class 100.

Space qualification

Space qualification was achieved for HJY's ruled and holographic gratings (masters and replicas) by the French CNES as early as 1971 and 1972, when we produced gratings for the D_2B satellite.



Wolter mirror (manufactured by replication)

LDEF (Long Duration Exposure Facility)
NASA experiment

HORIBA Jobin Yvon ruled and holographic gratings were aboard the LDEF satellite, which stayed in space for 69 months before retrieval by the Space Shuttle. Extended space vacuum experiments (34000 orbits, with thermal cycling each orbit) demonstrated that HJY's ruled and holographic gratings (masters and replicas) maintained wavefront quality, stray light levels, and absolute efficiency under harsh space conditions.

Bulk transmission gratings for astronomy

Holographic ion-etched ruled transmission gratings

High-efficiency IR transmission gratings (grisms) engraved into fused silica substrates

In many astronomy applications, grisms (transmission gratings patterned on a prism) are widely used for in-line dispersion of an infrared spectrum.
In the infrared, classical replicated grisms present many limitations. The epoxy layer, necessary for replication, absorbs infrared light. In addition, this epoxy layer compromises the integrity of the grism when used at low temperatures.

To address these issues, HJY has designed and manufactured transmission gratings which are holographically patterned and etched directly into IR fused silica substrates.

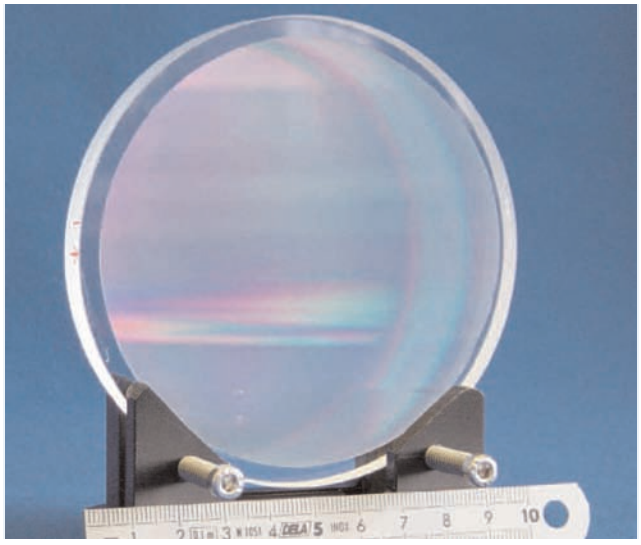
Three grating types were developed, for wavelengths ranging from 1 micron to 2.4 microns. The diffraction efficiency reaches 60% to 70% in natural light.

Engraved directly into fused silica, these gratings can survive very low temperature conditions and vacuum environments.

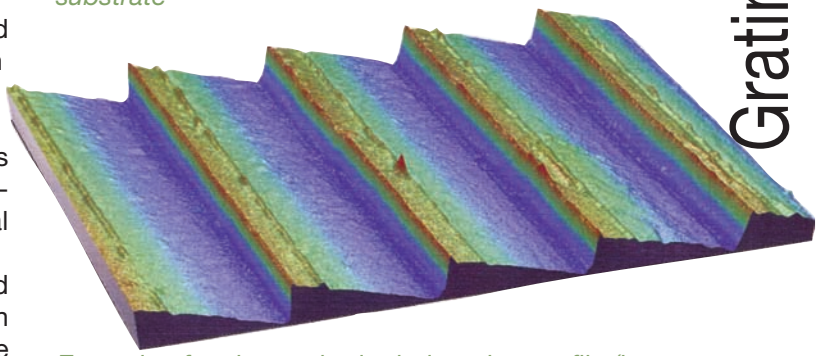
High-efficiency UV transmission gratings (grisms) engraved into CaF_2 substrates

Through our expertise in ion etching, HJY has developed a process which allows us to produce optimized groove patterns in CaF2. A master grating is ruled in a gold layer deposited on top of the grating substrate, and then the groove profile is transferred by ion etching directly into the substrate itself. The result is a monolithic sawtooth-profile grating which can withstand extreme temperatures and environmental conditions.
A saw-tooth profile transmission grating, ion-etched directly into a CaF_2 substrate for use at 140 nm in second order, has been successfully produced for the GALEX experiments.

Rosetta mission: fly by of Mars



Example of a high efficiency IR transmission grating (GRISM) directly etched into an IR grade fused silica substrate



Example of an ion-etched ruled grating profile (into CaF_2 material) made for the GALEX experiment

FAX FORM

For more information or custom grating / mirror quotations, please complete the corresponding request info on our web site: www.jobinyvon.com or send this completed form by fax.

The personal details that we use to provide or promote our products and services (for example your name and telephone number), will NOT be passed to ANY organization beyond the HORIBA Group, its Subsidiary or Associate Companies, Agents or Distributors to be used for marketing purposes.

Your Contact Details:

Last Name: . . . .

Title: . . . .

Dept: . . . .

State/Province: . . . .
Country: . . . .
(USA please include Zip)

Telephone: . . . .
Fax: . . . .

First Name: . . . .

Organization: . . . .

Address: . . . .
. . . .
. . . .
Postal Code: . . . .

E-Mail: . . . .

❑ Please keep me informed with up-to-date information.

Your Interest

My interest is:
❑ Information only ❑ Possible purchase ❑ I have funding ❑ I am applying for funds

I intend to purchase
❑ Now! ❑ Within 3 months ❑ Within 6 months ❑ Within 12 months ❑ More than 12 months

❑ Salesperson please call

Please Send Product Information For:

Gratings & OEM

❑ Diffraction Gratings
❑ Pulse Compression Gratings
❑ OEM Spectrometers
❑ Imaging CCDs
❑ Multi Channel Imaging

Vacuum UV

❑ Monochromators & Spectrographs
❑ Mirrors
❑ Gratings

My Application is:

We would be interested in learning more about your application. Please give details below:

. . . .
. . . .

Comments

Please include any comments or further information about your requirement below:

. . . .
. . . .

USA - HORIBA Jobin Yvon Inc
Tel: +1-732-494-8660
Fax: +1-732-549-5125
Email: info@jobinyvon.net

France - HORIBA Jobin Yvon SAS
Tel: +33 (0) 1 64 54 13 00
Fax: +33 (0) 1 69 09 07 21
Email: info@jobinyvon.fr

Japan - HORIBA Ltd
Tel: +81 (0) 3 38618231
Fax: +81 (0) 3 38618259
Email: info@horiba.co.jp

Germany - HORIBA Jobin Yvon GmbH
Tel: +49 (0) 89 46 23 17-0
Fax: +49 (0) 89 46 23 17-99
Email: info@jobinyvon.de

Italy - HORIBA Jobin Yvon SRL
Tel: +39 0 2 57603050
Fax: +39 0 2 57600876
Email: info@jobinyvon.it

UK - HORIBA Jobin Yvon Ltd
Tel: +44 (0) 20 8204 8142
Fax: +44 (0) 20 8204 6142
Email: info@jobinyvon.co.uk

China - HORIBA Jobin Yvon SAS
Beijing representative office
Tel: +86 (0) 10 8567 9966
Fax: +86 (0) 10 8567 9066
Shanghai representative office
Tel: +86 (0) 21 3222 1818
Fax: +86 (0) 21 6289 5553
Email: jjh@jobinyvon.cn

COMPANY PROFILE

HORIBA Jobin Yvon is one of the world's largest manufacturers of analytical and spectroscopic systems and components and we are committed to serving our customers with superior products and technical support.

Established in 1819, Jobin Yvon is part of the HORIBA Group which employs more than 4,500 people worldwide, with annual sales in excess of $900,000,000.

HORIBA Jobin Yvon, Sofie, Dilor, Spex and IBH are some of our well known and respected brand names.

HORIBA JOBIN YVON

USA: HORIBA Jobin Yvon Inc., 3880 Park Avenue, Edison, NJ 08820-3012, Toll-Free: +1-866-jobinyvon
Tel: +1-732-494-8660 Ext 232, Fax: +1-732-549-5125, E-mail: oem@jobinyvon.com, www.jobinyvon.com

France: HORIBA Jobin Yvon S.A.S., 16-18, rue du Canal, 91165 Longjumeau Cedex,
Tel: +33(0)164541338, Fax: +33(0)169099319, E-mail: oem.sales@jobinyvon.fr, www.jobinyvon.com

Japan: HORIBA Ltd., JY Optical Sales Dept, Higashi-Kanda, Daiji Building, 1-7-8 Higashi-Kanda
Chiyoda-ku, Tokyo 101-0031, Tel: +81 (0) 3 3861 8231, www.jyhoriba.jp

Germany: +49 (0) 89 462317-0 Italy: +39 0 2 57603050 UK: +44 (0) 20 8204 8142

China: +86 (0) 10 8567 9966

(All HORIBA Jobin Yvon companies were formerly known as Jobin Yvon)

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