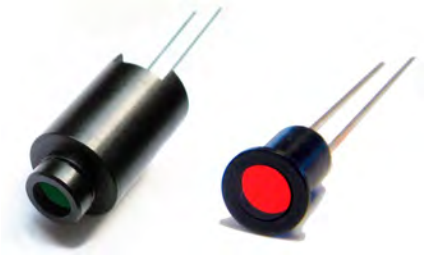
PYNCO®

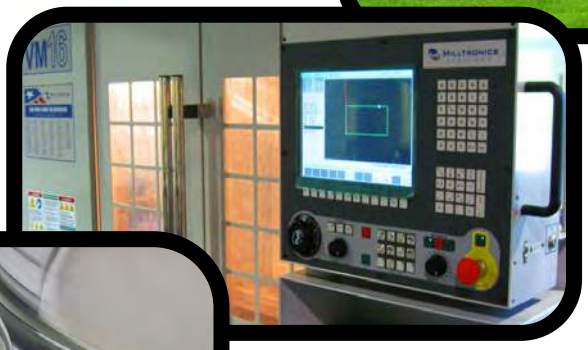
NIGHT VISION

CATALOG 2015



Featuring:

- Custom NVIS Filters, Incandescent and LED
- Filtered Lamp Assemblies, Annunciators and Indicators
- Flat Filters, Ring Filters and Hemispherical Domes
- Spectroradiometric Testing, Research and Design
- Custom Milling up to 18”x18”
- Assembly and Kitting



Our CNC machining process produces superior products, lower prices & shorter lead times.

Revision 5.8

Night Vision Catalog 2015

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Night Vision Catalog 2015

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About Pynco

Pynco Inc. is an industry leader in the manufacturing of custom optical flat filters and night vision (NVIS) filter products. Since operations began in 1987, Pynco has become the primary supplier of NVIS filter products to the defense aerospace industry. Many of the products that we manufacture are unique per customer specifications. Our 2015 Night Vision Catalog displays a portion of our product offerings by organizing the most common NVIS Filter Lamp Assembly (FLA) products. If you don't see what your looking for, just ask a Pynco representative and we should be able to provide an option.

Instead of forming our NVIS filters in a mold, our products are machined in-house by advanced vertical CNC milling centers. This process provides lower prices, shorter lead times, improved dimensional consistency and superior spectral transmittance. Pynco's optical filters will exhibit improved chromaticity, radiance and transmittance characteristics versus competitor products.

We combine a world class machining center with advanced research and design capabilities, years of assembly and kitting experience and a personal touch that lets our customers know that we enjoy exceeding their expectations. Our capabilities are always expanding as we continue to create unique parts and devices at our clients' requests.

Pynco also excels in the precision machining of a variety of glass & plastic materials. We manufacture acrylic windows, lenses and panel blanks, as well as a wide range of products from polymers and polycarbonates. For a list of materials, see our capabilities section (page 5).

Sometimes it may be the smallest part that makes the crucial difference for our customers. Our sales staff, as well as our physicists and engineers, are always ready to assist our clients with design plans, manufacturing, assembly and testing.

Quality

The quality management system at Pynco has been assessed and approved by NQA USA (National Quality Assurance U.S.A.) against the provisions of both AS9100C and ISO 9001-2008 standards.

Pynco manufactures all NVIS filters to comply with MIL-L-85762A & MIL-STD-3009, as well as unique customer specifications. Aviation colors are certified per MIL-C-25050.

When approached by a customer, we typically evaluate the technical requirements and perform the necessary empirical measurements to determine the best technical solution to meet client specifications. We prepare comparative technical reports so our customers can assess their options for optimum performance, or, in turn, inform their customers.

Products are inspected and shipped with a certificate of conformance. Our customers take comfort in knowing that upon receipt, all products are ready for installation and all characteristics adhere to the required standards and specifications. Pynco excels as an optical filter manufacturer offering maximum integrated services from design goals to finished product.

Capabilities & CNC Processes

We specialize in the manufacturing of precision-machined parts from raw stock or cast materials with a full range of manual and CNC machining equipment.

Custom Machining, Grinding and Polishing of Glass & Plastic Materials
Products for Aerospace, Defense, Biotech, and Commercial customers
NVIS flat filters, FLAs and a variety of Optical Flat Panel Display Filters
Acrylic Panel Blanks, Windows and Lenses
SMD LED Filters, LED Filtered Lamp Assemblies
Interference and Absorption Filters (IR, Long & Short Wave)
NVIS Filtered (MS) Lamp Assemblies (Flat and Hemispherical Domes)
NVIS Sunlight Readable Annunciators & Flat Filters
Custom NVIS Filters, Ring Filters and Indicators
Sunlight Readable and Night Vision Glass Technologies
Custom Plastic and Aluminum Machining of Fixtures and Parts
Assembly and Kitting Services per Customer Specification
Electromagnetic Relay Systems for Military Aircraft
Spectroradiometric Measurement Service
Research, Design and Testing Services
Light Sources: LED, LCD, Incandescent

Glass Materials

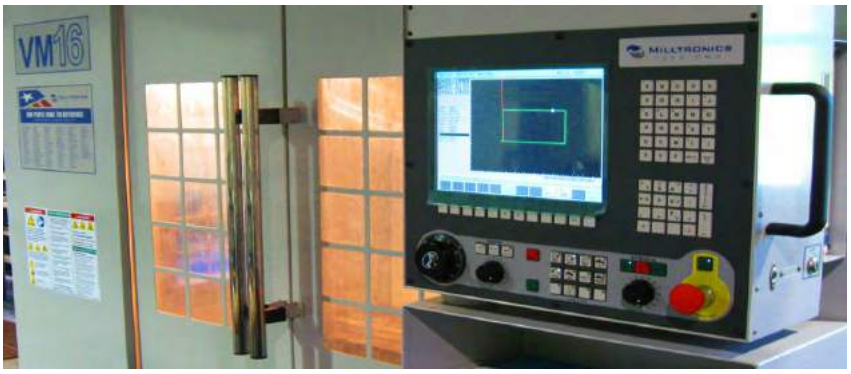
Borofloat
Borosilicate
Silicate
Phosphate
Soda Lime
Quartz
Sapphire

Plastic Materials

Acrylic
Acetal
HDPE
Peek
PFA
Polycarbonate
Polystyrene
PPO
PTFE
PVC
Teflon

CNC Process Capabilities:

CNC Machining, Grinding and Polishing
ID & OD Grinding & Polishing
Micro Drilling & Machining
Dicing, Slicing and Lapping
Spherical Machining
Optical Windows and Lenses
Cylindrical Polishing
Beveling
Coating Removal
Cutting, Drilling and Etching
Edging (round, square, elliptical)
Laminating
Lap Grinding and Polishing
Ultrasonic Cleaning
Ultrasonic Degreasing



Grinding & Polishing

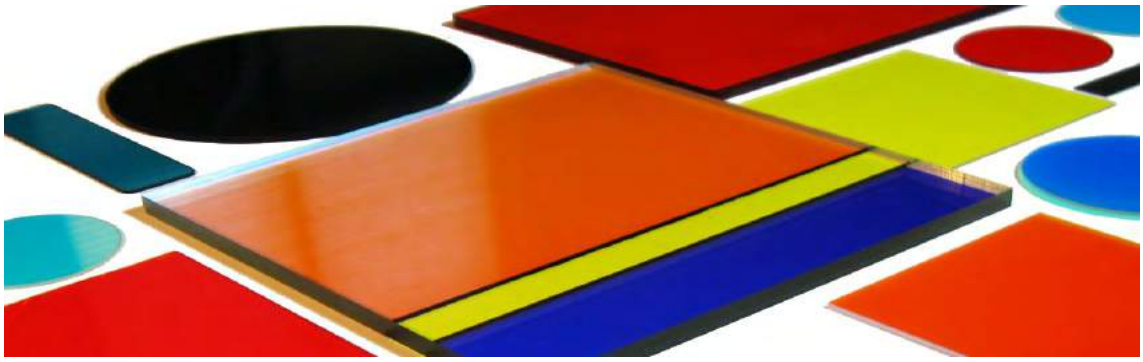
Pynco provides grinding and polishing services for all NVIS colored glass filters. Fast and reliable, Pynco offers precision craftsmanship in standard and custom sizes. We can polish one or both sides and machine custom dimensions.

Common glass thicknesses are as follows:
1mm (.040”), 1.5mm (.060”), 2mm (.080”)

Our offerings are available in three grades of glass material quality. By providing multiple grade and price point options, our customers can choose the appropriate material depending on the specific customer application. All NVIS glass materials are scanned and tested and include certificates of conformance with delivery.

Pynco can also grind and polish non-NVIS glass materials as well as customer-supplied material. We do recommend Pynco-supplied glass for faster, more reliable service.

Contact a Pynco representative today for pricing and custom options.



Flat Glass Filters

Pynco manufactures a variety of custom optical interference and absorption filters. Our high performance flat glass Night Vision filters are designed with superior color and NVIS radiance in order to meet military specifications listed in MIL-STD-3009. Aside from flat NVIS filters, our offerings include IR, long & short wave pass filters. We can fabricate monolithic filters, as well as multi-layer filters that combine various optical properties. With our advanced testing and measurement capabilities and our precision machining experience, we produce superior filters with very tight tolerances. Reference our flat glass filter options on page 9.

Inventory Management

Pynco's custom inventory strategies will be a decisive benefit for your delivery expectations. If your organization orders specific parts on a regular basis or might know of a potential future delivery requirement, Pynco can manufacture extra quantities, large or small, to be placed in inventory. If an emergency arises, we will have you covered. As a matter of fact, in 2011, 25% of all orders shipped the next day. Imagine… ordering NVIS filters and having them arrive on your dock the very next morning. Can your current NVIS supplier do that?

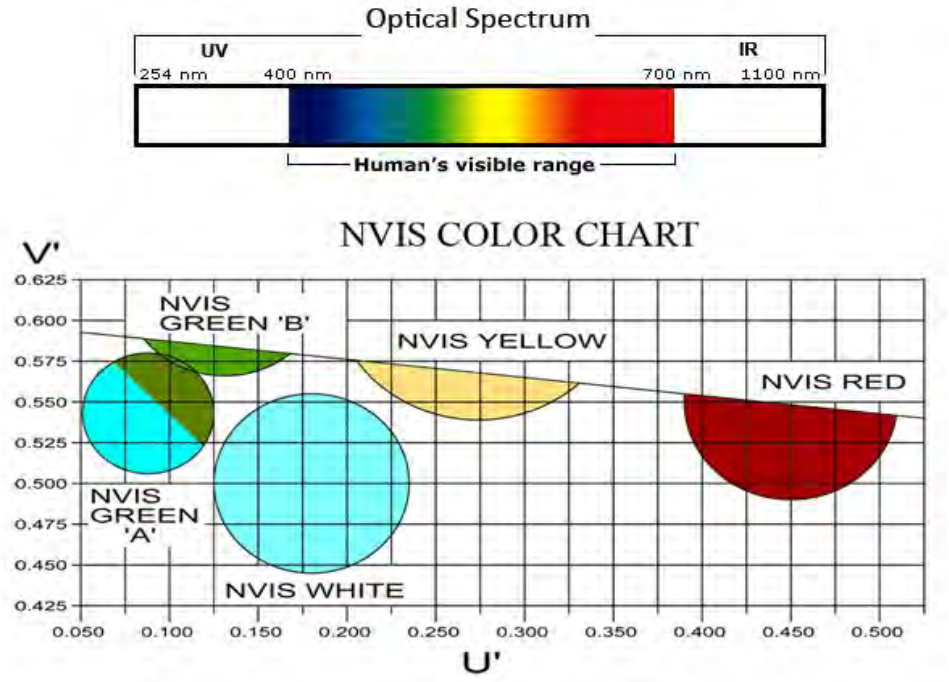
Assembly & Kitting

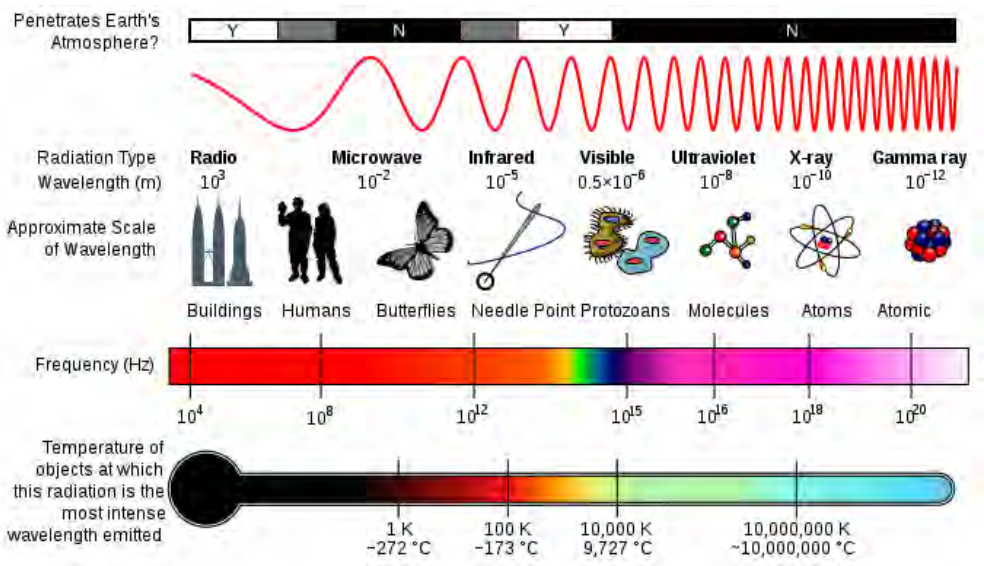
Pynco's experienced assembly departments have been kitting and assembling customized products for over twenty-five years. This experience, combined with our quality control and streamlined processes, allows for fast, reliable service.

We can assemble our in-house manufactured parts as well as third-party parts for customized applications. Our manufacturing and assembly personnel will make sure that our clients receive what they need and when they need it.

Testing & Measurement

In the world of optics, research, design and testing are crucial steps during the development of customized products. From product development to the final inspection, our experts provide the answers to fulfill the wishes of our most demanding clients. Our engineers work directly with customers to assist with research and design plans, manufacturing, and assembly.





* Image taken from Wikipedia.org

Measurement Tool:
The OL 750-D Spectroradiometer enables turnkey measurements of aircraft display and lighting compatibility with night vision systems (NVIS), such as night vision goggles to MIL-L-85762A and MIL-STD-3009.

Application Type: NVIS compatibility, Aircraft lighting and display (cockpit and external)

Spectral Range: 380 - 930nm

Spectroradiometric Measurements:

Chromaticity
Photometric Transmission (%Y)
Luminance (fL)
Radiance (W/ (sr * mm^2))
Irradiance (W / mm^2)
Transmittance
Reflectance
Mean Spherical Candle Power (MSCP)
Recertification

Light Sources Include: LED, LCD, Incandescent

Understanding Pynco Part Numbers

Flat Glass Filter Options

To order Flat Filters, Pynco will need to know the dimensional constraints including thickness, width and length (or diameter for round flat filters). Aside from dimensional characteristics, the second aspect is choosing the appropriate optical filter or combination. Displayed below are a list of optical and NVIS filter options. As mentioned, many of these filters can be combined for custom applications. Other options may include etching, legends, metalized edges, edge wrapping etc...

Colored Filter Options

NVIS Green 'A', Lower, MIL-SPEC
NVIS Green 'A', Mid, MIL-SPEC
NVIS Green 'A', Upper, MIL-SPEC
NVIS Green 'B', MIL-SPEC
NVIS Yellow Class A, MIL-SPEC
NVIS Yellow Class B
NVIS White, MIL-SPEC
NVIS Red, MIL-SPEC

NVG Green 'A', not MIL-SPEC
NVG Green 'B', not MIL-SPEC
NVG Yellow, not MIL-SPEC
NVG Red, not MIL-SPEC
NVG White, not MIL-SPEC

Aviation Green,
Aviation Yellow
Aviation Red
Aviation White
Aviation Blue

IPL Red
IPL White
Air Force Blue-White

Light Sources:
LED, LCD, Incandescent

Surface Quality: 80-50

Optical Filter Options

Absorption Filters
Anti-Reflection
Band-Pass Filters
High Contrast
High Brightness
ITO
Interference Filtering
- Short Wave Pass Filters
- Long Wave Pass Filters

Metallic Coatings
Military Spec Compliant Filters
Neutral Density
Notch Filtering
NVG Compatible Filters
NVIS Compatible Filters
Sunlight Readability
VIS / NIR Applications

More Options

Diffused Surfaces
Edge Wrapping
Etching
Legends
Metalized Edges
Polished Surfaces
Ridged Bonding

Contact a Pynco representative today for customized options, pricing and lead times.

Monolithic Thickness Options

Flat Filters - Incandescent

NVIS Green 'A' (Low)

0.75 mm
1.0 mm
1.5 mm
2.0 mm
2.5 mm
3.0 mm
4.0 mm

NVIS Green 'A' (Mid)

0.5 mm
1.0 mm
1.5 mm
2.0 mm
3.0 mm

NVIS Green 'A' (Upper)

1.0 mm

NVIS Green 'B'

1.0 mm
1.5 mm
2.0 mm
2.5 mm
3.0 mm

NVIS White

1.0 mm
2.0 mm

NVIS Yellow (Class B)

1.0 mm
1.5 mm
2.0 mm
2.5 mm
3.0 mm

Flat Filters - LED

NVIS Green 'A'

0.5 mm
2.0 mm

NVIS Green 'B'

2.0 mm

NVIS White

0.5 mm
1.0 mm
1.5 mm
2.0 mm

NVIS Yellow (Class B)

2.0 mm

Understanding Pynco Part Numbers

NVIS Filter Options for Incandescent Illumination

Pynco uses a schema to help our customers organize our most common filters and related assemblies. This page displays general part number options for NVIS filters with and without subminiature assemblies. Assembly options are displayed in the legends on the right. For specific assembly options, reference the appropriate page later in this catalog.

NVIS Filters with Subminiature Assemblies

1) SIZE……Select a sub-miniature package width (T-1, T-3¼, etc…)

2) FORM……..…Choose a filter shape / form-factor (Flat Top or Hemispherical Dome)

3) BASE……....Select a connector option (Midget Flange, Bayonet, etc…)

4) COLOR…..…..Select one of our NVIS color options

5) FINISH…….....Polished or Unpolished

6) VOLTAGE……Choose the appropriate Voltage

7) CURRENT……Choose the appropriate Amperage

Sample Part using the schema above: **T134-HD-MF-GB-P-28v-20mA**

(T-1 ¾ / Hemispherical Dome / Midget Flange / Green B / Polished / 28 Volt / 20 mA)

NVIS Filters without Assemblies

1) FORM…….....Choose the filter shape / form-factor (Ring filter, Bathtub, etc…)

2) COLOR……..Select one of our NVIS color options

3) FINISH……..Polished or Unpolished

4) O.A.L.……Overall Length

5) O.D.……..Outside Diameter

Note: ….For capped filters, add AL (for aluminum) or SS (for stainless steel) at the end

Note: ….For "Bathtub" filters, OD will be replaced with two qualifiers "Length" and "Width"

Note: ….All dimensions are (+0.000" / -0.005") in tolerance, unless otherwise specified

Sample Part using the schema above: **RF-GB-P-240-210**

(Ring Filter / Green B / Polished / .240" OAL / .210" OD)

PART NUMBER LEGEND

1)	BASE SIZE
T1	T-1 (3mm)
T134	T-1¾ (5mm)
T314	T-3¼

2)	FORM FACTOR
RF	Ring Filter
HD	Hemispherical Dome
FD	Flat Glass Dome
BT	Bathtub

3)	BASE OPTIONS
BP	Bi-Pin
BAY	Bayonet
GW	Gull Wing (Type II)
IBP	Integral Bi-Pin
MF	Midget Flange
MG	Midget Groove
SM	Sub-Midget
WL	Wire Lead (Type I)

4)	NVIS COLOR
GAL	Green A (Low)
GAM	Green A (Mid)
GAU	Green A (Upper)
GB	Green B
YB	Yellow (Class B)
W	NVG White
WNF	White (NVIS Friendly)
WHT	White (High Transmission)

5)	FINISH
P	Polished (both sides)
U	Unpolished (both sides)

6) VOLTAGE
5
14
28

7) mA Examples	
20	21
24	60
115	125

Understanding Pynco Part Numbers

NVIS Filter Options for LEDs & Indicators

Pynco uses a schema to help our customers organize our most common filters and related assemblies. This page displays general part number options for LED filters with and without subminiature assemblies. Assembly options are displayed in the legends on the right. For specific assembly options, reference the appropriate page later in this catalog.

LED NVIS & NVG filters with subminiature assemblies

1) SIZE……...Select a sub-miniature package (T-1¾)

2) FORM……...Choose a form-factor (Ring Filter, Bathtub, etc…)

3) BASE……Select a lead option (bi-pin, bayonet, midget flange, etc…)

4) COLOR……..Select one of our NVIS or NVG color options

5) FINISH……...Polished or Unpolished

6) VOLTAGE……Choose the appropriate Voltage

Note: …….. For all LED current (mA) ratings, see the specific part description page

Sample Part using the schema above: **T134-HD-MF-LGB-P-28v**

(T-1 ¾ / Hemispherical Dome / Midget Flange / LED Green B / Polished / 28 Volts)

NVIS Indicators with assemblies

1) FORM……Indicator Aluminum Housing, Flanged Top Housing, etc...

2) BASE……Options include: Bi-Pin, Wire Lead

3) COLOR……..Select one of our NVIS or NVG color options

4) FINISH……...Polished or Unpolished

5) O.A.L.……Overall Length

6) O.D......Outside Diameter

Note: ……. Contact Pynco for customized indicator assemblies

Sample Part using the schema above: **FD-BP-LGB-P-320-180**

(Flat Glass Dome / Bi-Pin / LED Green B / Polished / OAL/ OD)

PART NUMBER LEGEND

1)	BASE SIZE
T134	T-1¾ (5mm)

2)	FORM FACTOR
HD	Hemispherical Dome
FD	Flat Glass Dome
AH	Aluminum Housing
CO	Custom Option

3)	BASE OPTIONS
BP	Bi-Pin
IBP	Integral Bi-Pin
MF	Midget Flange
MG	Midget Groove
WL	Wire Terminal (Type I)

4)	NVIS COLORS
LGAL	Green A (Low)
LGAM	Green A (Mid)
LGB	Green B
LYB	Yellow (Class B)
LW	White
LWV	NVG White
LRNF	Red (NVIS Friendly)

5)	FILTER FINISH
P	Polished (both sides)
U	Unpolished (both sides)

6) INCANDESCENT VOLTAGE
5
14
28

NVIS Color Options

NVIS Filter Color Information

NVIS Green 'A', Lower - (Lowest on the u' v' scale) Used for cockpit information and status indicators. Reference our Green 'A' color data on page 13.

NVIS Green 'A', Mid - (Middle on the u' v' scale) offering lower transmission than the standard Green 'A', while offering higher transmission than Intruder Green 'A', Upper. Reference the Intruder Green 'A', Mid color data on page 14.

NVIS Green 'A', Upper - (Highest on the u' v' scale) offering the lowest transmission of the three Green 'A' color options. Reference the Intruder green 'A', Upper color data on page 15.

NVIS Green 'B' - Originally designed for it's sunlight readability and higher color and luminance contrast. Currently Used for Status indicators and information. Reference our Green 'B' color data on page 16.

NVIS Yellow (Class A) - Used for cockpit warning, caution and status indicators. Only used as a flat filter. Class A is more sensitive because of the extended response from the visible to the NIR region.

NVIS Yellow (Class B) - Used for cockpit warning, caution and status indicators. Commonly used as a flat filter, rarely used as a ring or bathtub filter. Class b includes less response in the visible light region. Reference our Yellow 'B' color data on page 17.

NVIS White - This NVIS compliant filter is used for workstation illumination, status indicators and information.

NVG White - This filter is just outside the military specification because of its chromaticity, yet our 'NVG White' is compliant with the NVIS radiance portion of MIL-STD-3009. The 'NVG White' does meet the chromaticity requirements of RTCA DO-275. Reference our 'NVG White' color data on the top of page 18.

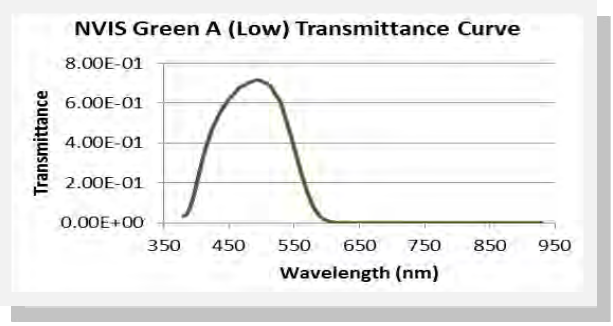
NVIS Friendly White - This filter is just outside military specifications because of its increased NVIS radiance. Our 'Friendly White' is still NVG compatible, while providing higher transmittance for unique applications where MIL specs are not required. Reference our 'NVIS Friendly White' data on page 19.

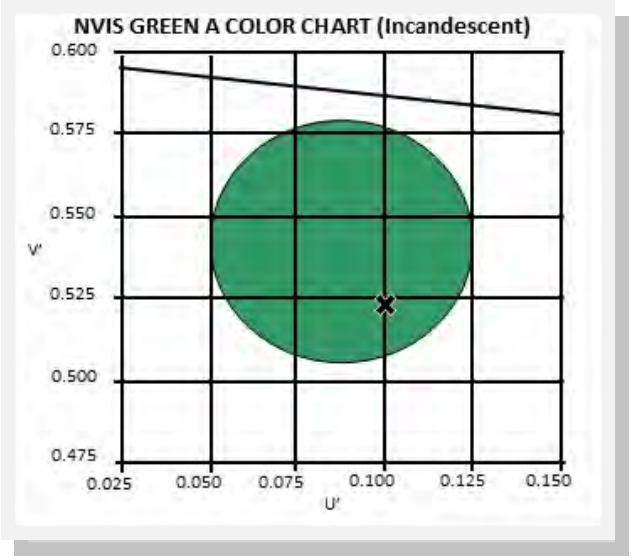
NVIS Friendly White HT - This filter offers an even higher transmission than our 'NVIS Friendly White' filter while still maintaining NVG compatibility. Reference our NVIS Friendly White (HT) data on page 19.

NVIS Color & Spectral Data

Green 'A' (Low)

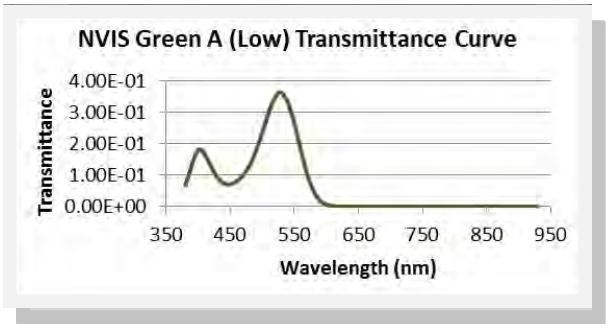
	Chromaticity		Photopic Transmission	NVIS Radiance	
Light Source	u'	v'	Y(%)	NR_A	NR_B
Incandescent (CCT=2200K)	0.100	0.524	17.6	6.50E-11	4.70E-12

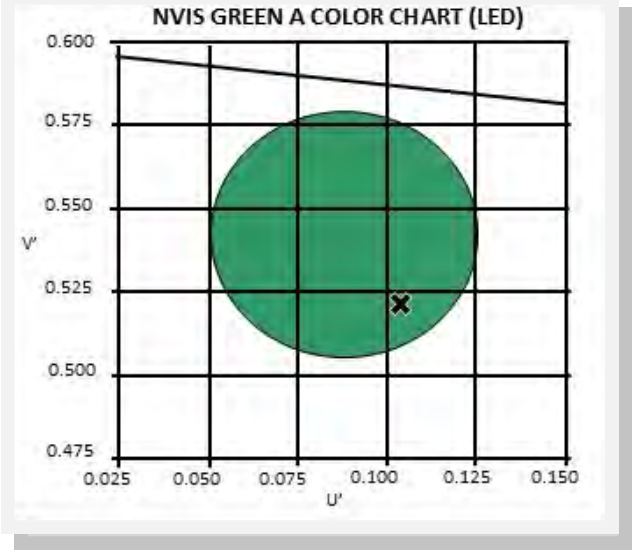




Incandescent

LED



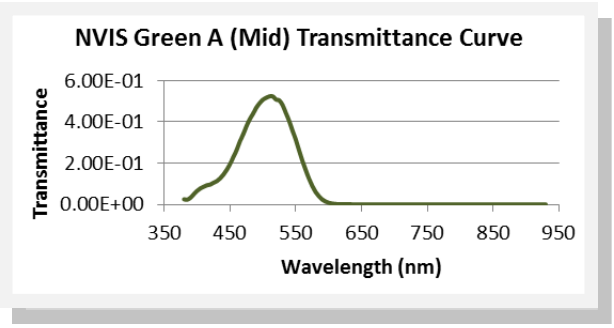


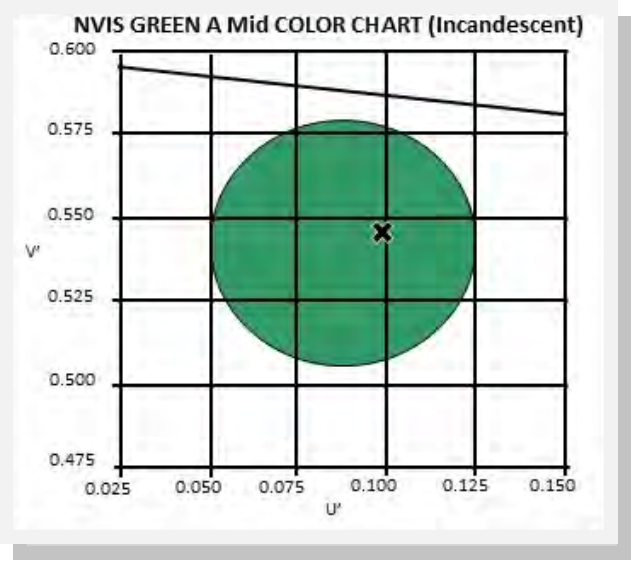
	Chromaticity		Photopic Transmission	NVIS Radiance	
Light Source	u'	v'	Y(%)	NR_A	NR_B
White LED (CCT=6815K)	0.105	0.521	18.7	5.30E-11	3.80E-12
Nichia NSSW100DT White LED	0.106	0.536	17.8	5.60E-11	4.10E-12

NVIS Color & Spectral Data

Green 'A' (Mid)

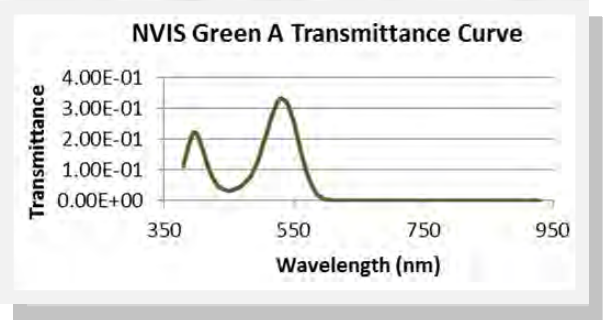
	Chromaticity		Photopic Transmission	NVIS Radiance	
Light Source	u'	v'	Y(%)	NR_A	NR_B
Incandescent (CCT=2200K)	0.099	0.544	16.8	6.70E-11	4.50E-12

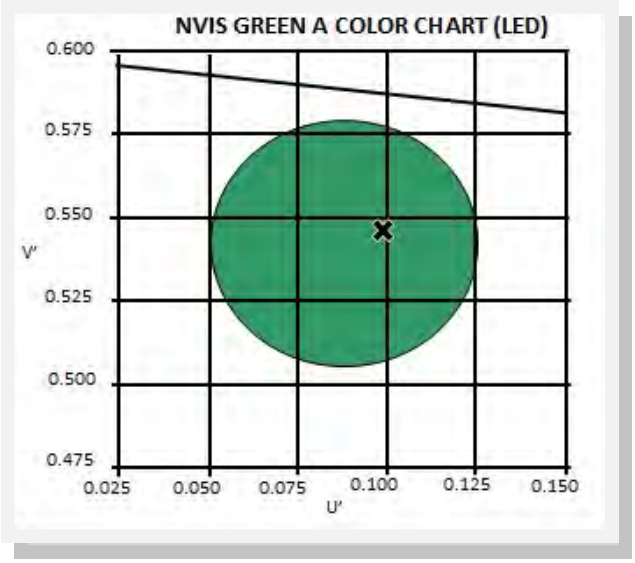




Incandescent

LED



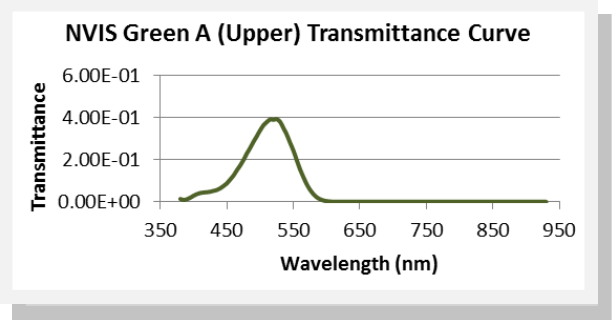


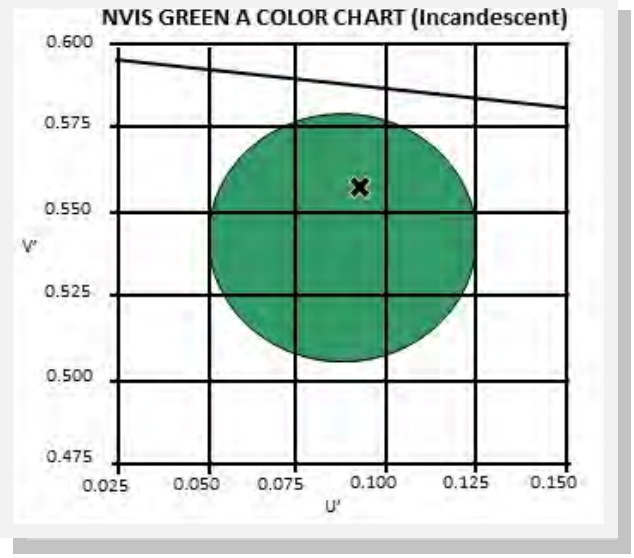
	Chromaticity		Photopic Transmission	NVIS Radiance	
Light Source	u'	v'	Y(%)	NR_A	NR_B
White LED (CCT=6815K)	0.100	0.544	17.1	5.00E-11	3.50E-12
Nichia NSSW100DT White LED	0.102	0.555	16.4	5.30E-11	3.80E-12

NVIS Color & Spectral Data

Green 'A' Intruder (Upper)

	Chromaticity		Photopic Transmission	NVIS Radiance	
Light Source	u'	v'	Y(%)	NR_A	NR_B
Incandescent (CCT=2200K)	0.095	0.557	11.5	5.60E-11	4.00E-12

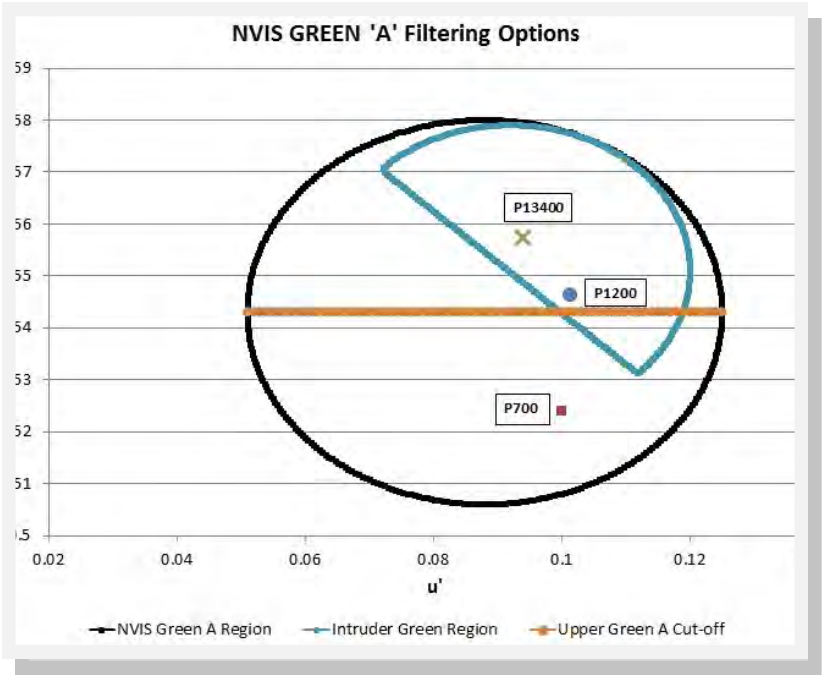




Incandescent

Green 'A' Filter Options

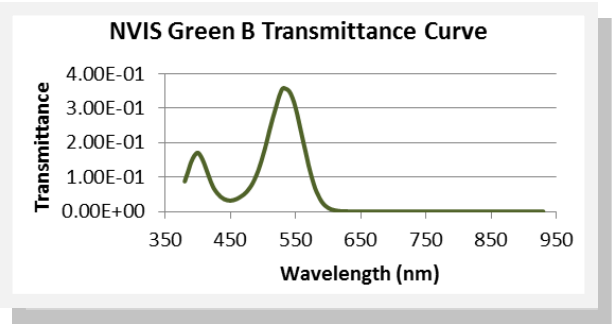
Pynco manufactures three MIL SPEC versions of NVIS Green A. The original Standard Green A will offer the highest transmission, while the Intruder series will provide a deeper green filter color. Our Upper Intruder filter provides additional compatibility with comparable filters across the industry.

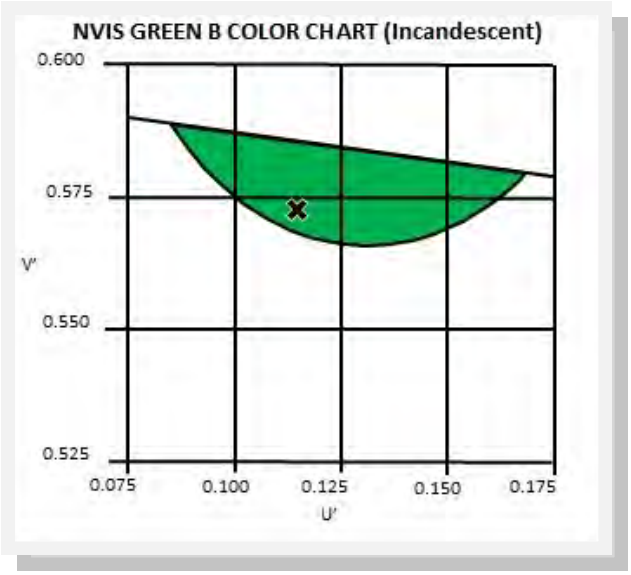


NVIS Color & Spectral Data

Green 'B'

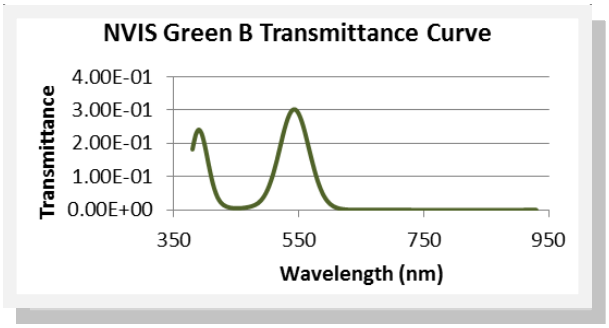
	Chromaticity		Photopic Transmission	NVIS Radiance	
Light Source	u'	v'	Y(%)	NR_A	NR_B
Incandescent (CCT=2200K)	0.114	0.570	12.4	1.10E-10	1.60E-11

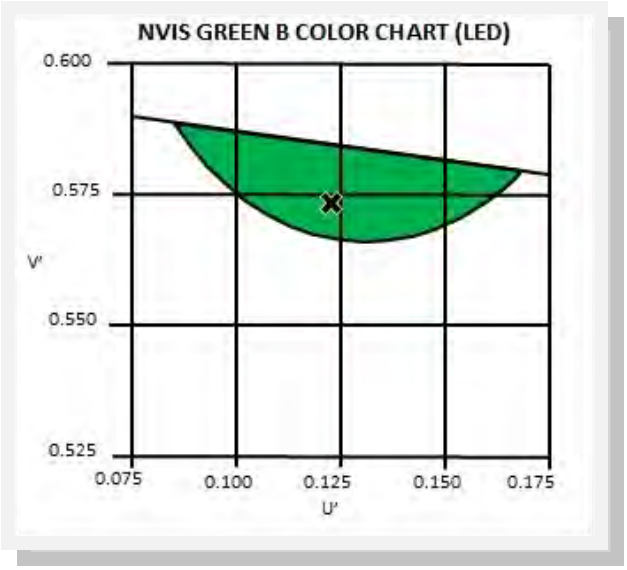




Incandescent

LED



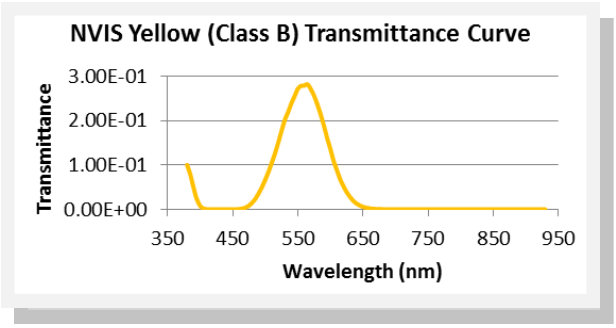


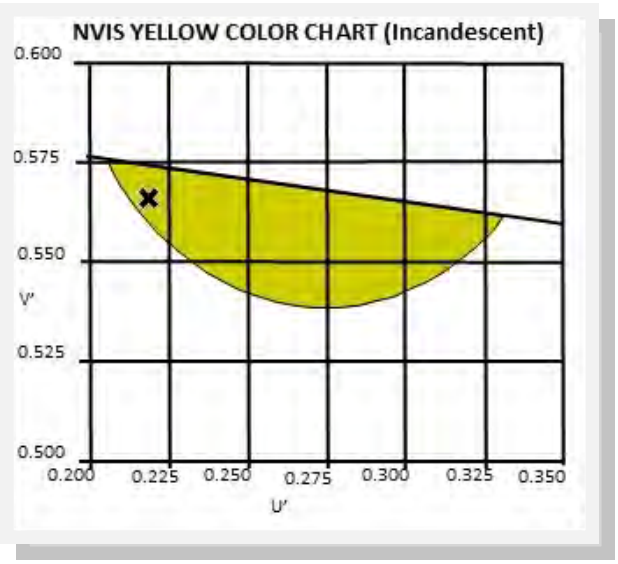
	Chromaticity		Photopic Transmission	NVIS Radiance	
Light Source	u'	v'	Y(%)	NR_A	NR_B
White LED (CCT=6815K)	0.117	0.571	17.2	8.90E-11	9.40E-12
Nichia NSSW100DT White LED	0.121	0.574	16.9	9.60E-11	1.10E-11

NVIS Color & Spectral Data

Yellow (Class B)

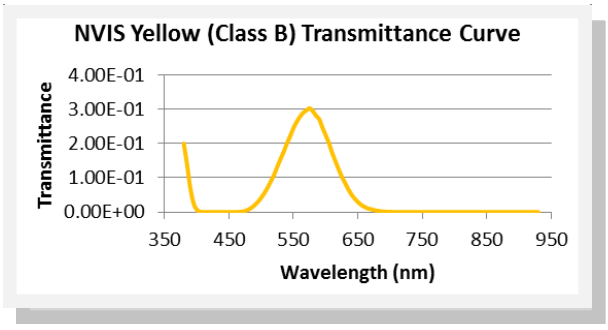
	Chromaticity		Photopic Transmission	NVIS Radiance	
Light Source	u'	v'	Y(%)	NR_A	NR_B
Incandescent (CCT=2200K)	0.217	0.565	16.0	-	6.3E-8

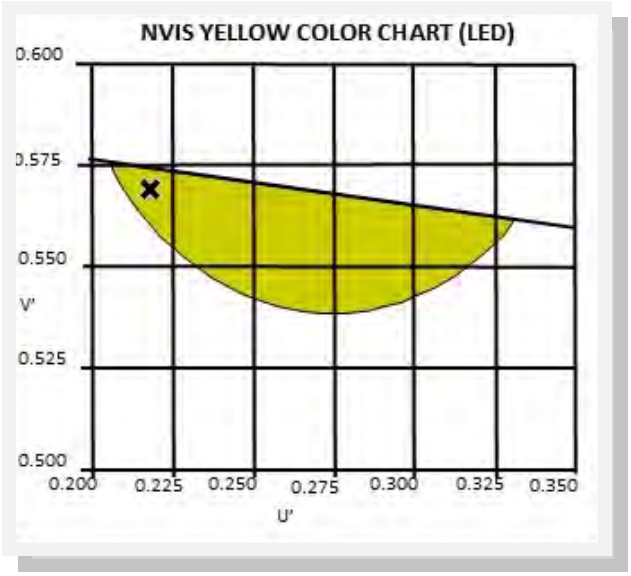




Incandescent

LED



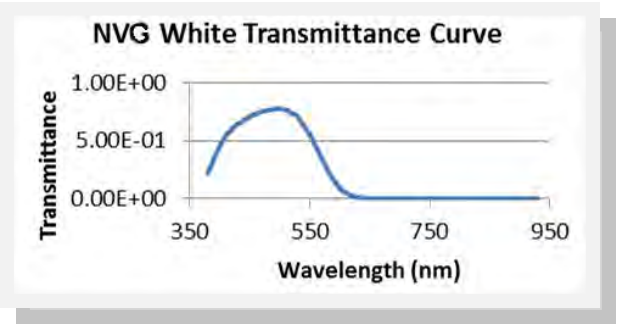


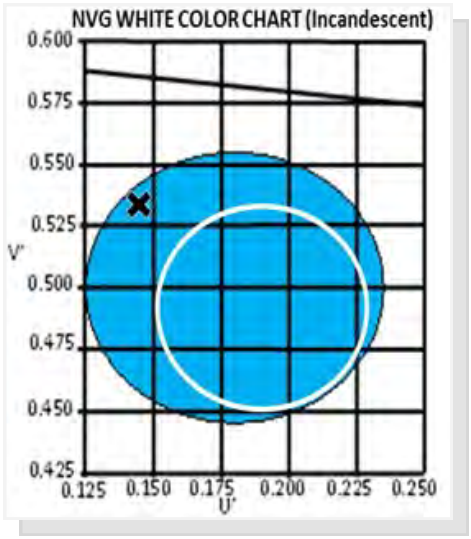
	Chromaticity		Photopic Transmission	NVIS Radiance	
Light Source	u'	v'	Y(%)	NR_A	NR_B
White LED (CCT=6815K)	0.215	0.565	22.9	-	9.60E-8
Nichia NSSW100DT White LED	0.215	0.565	22.9	-	9.60E-8

NVIS Color & Spectral Data

NVG White

	Chromaticity		Photopic Transmission	NVIS Radiance	
Light Source	u'	v'	Y(%)	NR_A	NR_B
Incandescent (CCT=2200K)	0.139	0.535	29.6	7.00E-10	8.80E-11

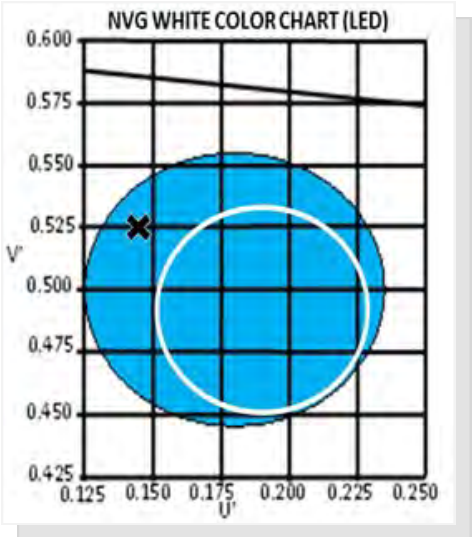




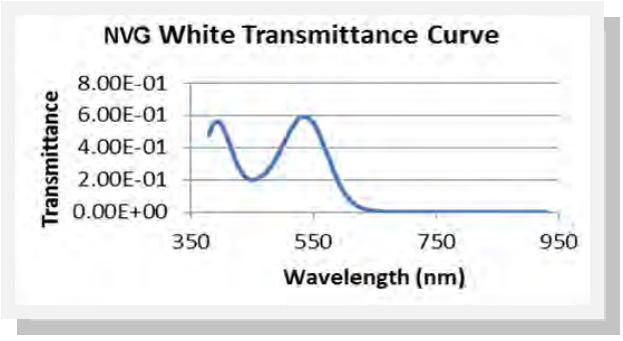
Blue Region: RTCA DO-275; White Boundary: MIL-STD-3009

Incandescent

LED



Blue Region: RTCA DO-275; White Boundary: MIL-STD-3009

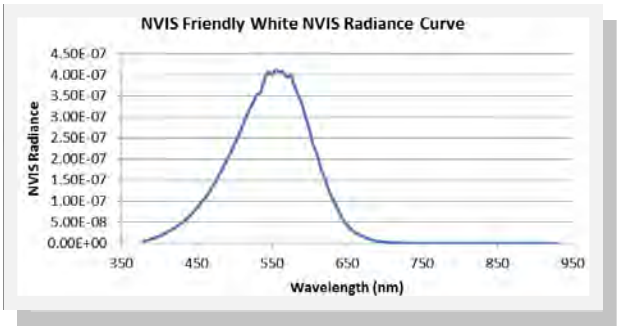


	Chromaticity		Photopic Transmission	NVIS Radiance	
Light Source	u'	v'	Y(%)	NR_A	NR_B
White LED (CCT=6815K)	0.140	0.507	40.0	4.80E-10	6.60E-11
Nichia NSSW100DT White LED	0.143	0.525	39.1	5.70E-10	7.50E-11

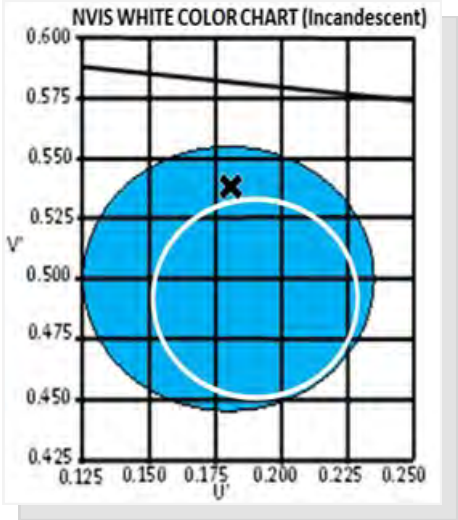
NVIS Color & Spectral Data

NVIS Friendly White

	Chromaticity		Photopic Transmission	NVIS Radiance	
Light Source	u'	v'	Y(%)	NR_A	NR_B
Incandescent (CCT=2200K)	0.179	0.538	45.5	4.10E-9	1.30E-9



Incandescent

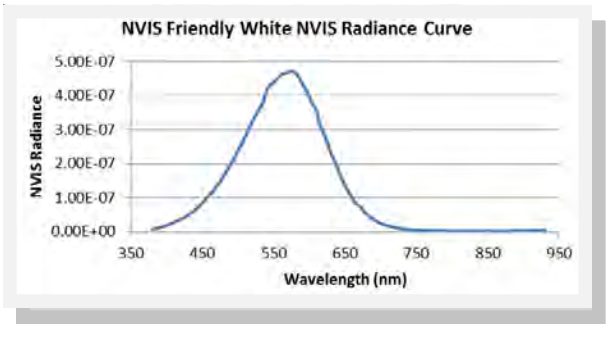


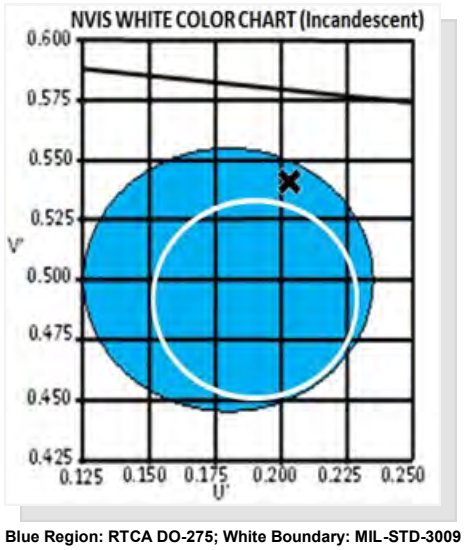
Blue Region: RTCA DO-275; White Boundary: MIL-STD-3009

NVIS Friendly White HT

High Transmission

Incandescent





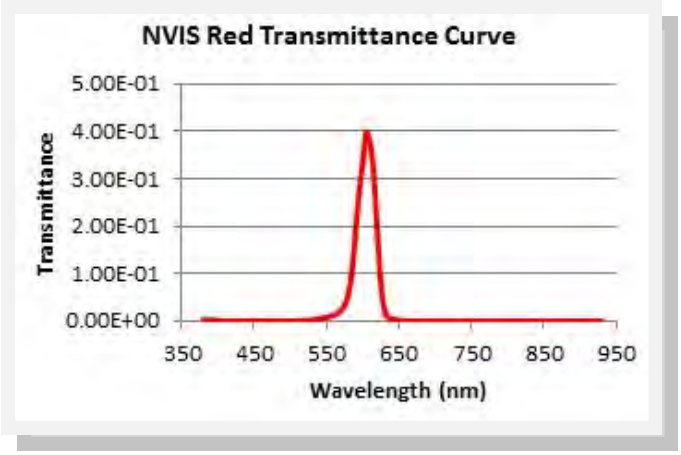
Blue Region: RTCA DO-275; White Boundary: MIL-STD-3009

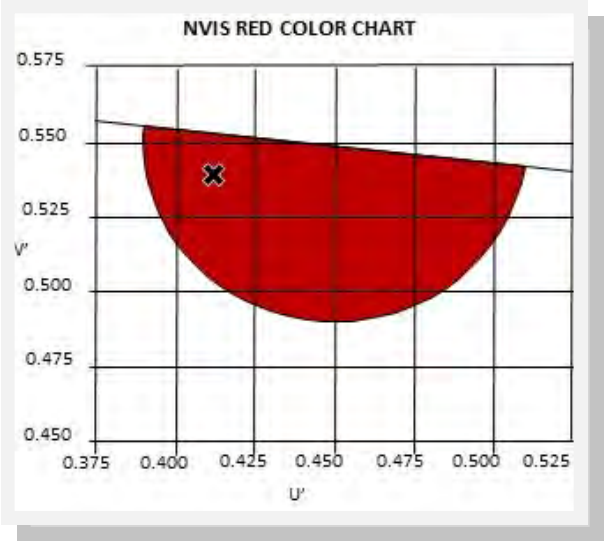
	Chromaticity		Photopic Transmission	NVIS Radiance	
Light Source	u'	v'	Y(%)	NR_A	NR_B
Incandescent (CCT=2200K)	0.203	0.540	53.9	1.10E-8	5.10E-9

NVIS Color & Spectral Data

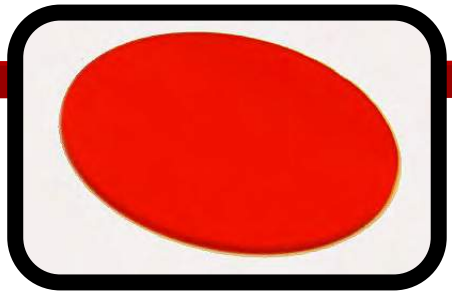
NVIS Red

	Chromaticity		Photopic Transmission	NVIS Radiance	
Light Source	u'	v'	Y(%)	NR_A	NR_B
Incandescent (CCT=2200K)	0.412	0.538	9.7	-	7.15E-8





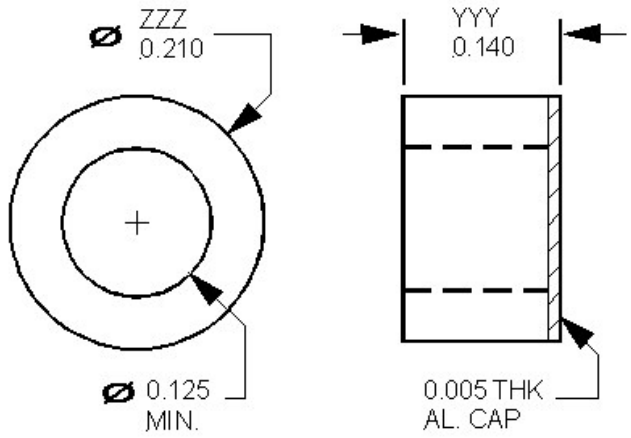
Incandescent



RING FILTERS

Incandescent

EXAMPLE: Ring Filter with Cap (Heat-Sink)



Part Number Example (RF-GB-P-140-210)				
Form	Color	f) Finish	YYY) OAL	ZZZ) OD
RF	GB	P	140	210

NVIS Color	Part Number
Green B	**RF-GB**-f-YYY-ZZZ
Green A (Low)	**RF-GAL**-f-YYY-ZZZ
Green A (Mid)	**RF-GAM**-f-YYY-ZZZ
Green A (Upper)	**RF-GAU**-f-YYY-ZZZ
Yellow (Class B)	**RF-YB**-f-YYY-ZZZ
NVG White	**RF-W**-f-YYY-ZZZ
Friendly White	**RF-WNF**-f-YYY-ZZZ
Friendly White (HT)	**RF-WHT**-f-YYY-ZZZ

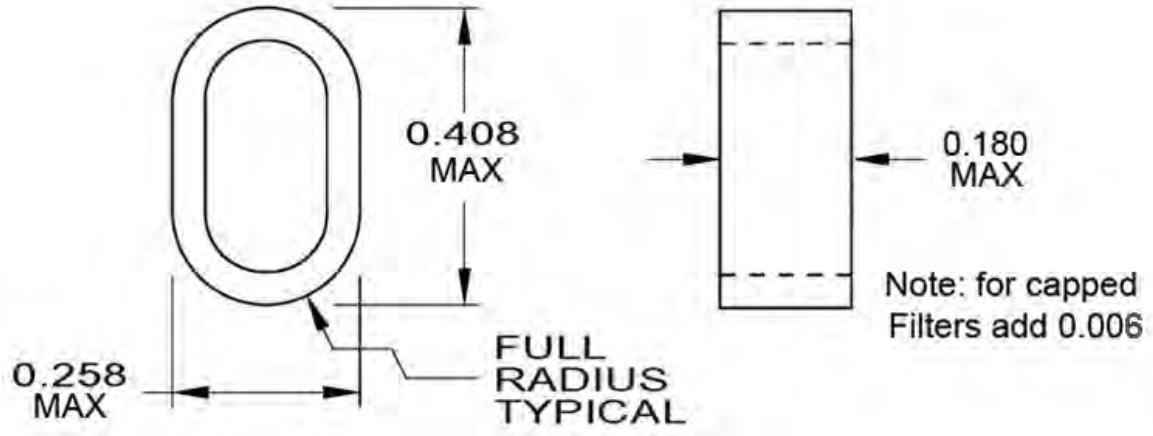
f) Polishing Options	
P	Polished
U	Unpolished

Common Dimensions	
OAL YYY	**OD ZZZ**
140	210
145	245
150	135
155	190
160	255

* All dimensions are in 0.001", and (+0.000 / -0.005) in tolerance, unless otherwise specified.
* Product dimensions include 0.005" aluminum cap.
* For capped filters, add AL (for aluminum) suffix at the end (Example: RF-GB-P-140-210-AL).
* For customized dimensions that are not listed, contact a Pynco representative to discuss your options.
* 'Friendly White' filters are standard brightness. Friendly White (HT) equals high transmission.

BATHTUB FILTERS

Incandescent



Part Number Example: (BT-GB-P-180-258-408)					
Form	Color	f) Finish	XXX) Height	YYY) Width	ZZZ) Length
BT	GB	P	180	258	408

NVIS Color	Part Number
Green B	**BT-GB**-f-XXX-YYY-ZZZ
Green A (Low)	**BT-GAL**-f-XXX-YYY-ZZZ
Green A (Mid)	**BT-GAM**-f-XXX-YYY-ZZZ
Green A (Upper)	**BT-GAU**-f-XXX-YYY-ZZZ
Yellow (Class B)	**BT-YB**-f-XXX-YYY-ZZZ
White	**BT-W**-f-XXX-YYY-ZZZ
Friendly White	**BT-WNF**-f-XXX-YYY-ZZZ
Friendly White (HT)	**BT-WHT**-f-XXX-YYY-ZZZ

f) Polishing Options	
P	Polished
U	Unpolished

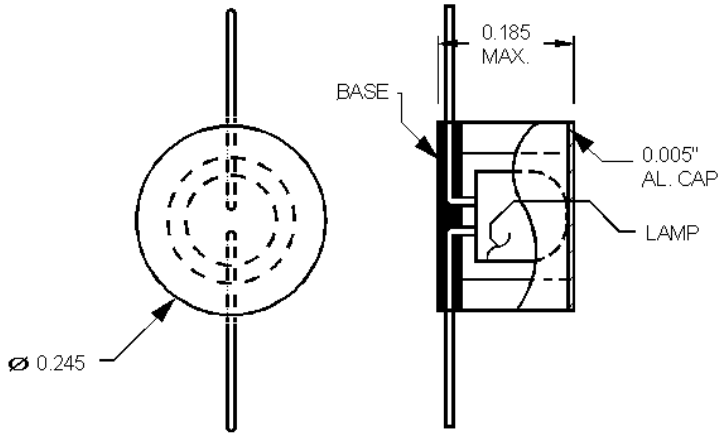
Common Dimensions		
Height XXX	**Width YYY**	**Length ZZZ**
110	218	366
125	218	366
130	258	408
180	258	408

* All dimensions are in 0.001", and (+0.000 / -0.005) in tolerance, unless otherwise specified.
* For capped filters, add SS (for stainless steel) at the end (Example: BT-GB-P-180-258-408-SS).
* Stainless steel caps are 0.006" nominal.
* For customized dimensions that are not listed, contact a Pynco representative to discuss your options.
* 'Friendly White' filters are standard brightness. Friendly White (HT) equals high transmission.

Filtered Lamp Assemblies (FLAs)

Incandescent

FLA with Gull Wing lead



Part Number Example (RF-WL-GB-P-185-210-28v-20mA)							
Form	b) Base	Color	f) Finish	YYY) OAL	ZZZ) OD	v) Voltage	mA) Current
RF	WL	GB	P	185	210	28v	20mA

NVIS Color	Part Number Options
Green B	**RF**-b-**GB**-f-YYY-ZZZ-v-mA
Green A (Low)	**RF**-b-**GAL**-f-YYY-ZZZ-v-mA
Green A (Mid)	**RF**-b-**GAM**-f-YYY-ZZZ-v-mA
Green A (Upper)	**RF**-b-**GAU**-f-YYY-ZZZ-v-mA
Yellow (Class B)	**RF**-b-**YB**-f-YYY-ZZZ-v-mA
Friendly White	**RF**-b-**WNF**-f-YYY-ZZZ-v-mA
Friendly White (HT)	**RF**-b-**WHT**-f-YYY-ZZZ-v-mA

Common Dimensions	
YYY) OAL	ZZZ) OD
185	210
190	245
	255
	280

b) Base Options	
GW	Gull Wing (Type I)
WL	Wire Lead (Type II)
BP	Bi-Pin

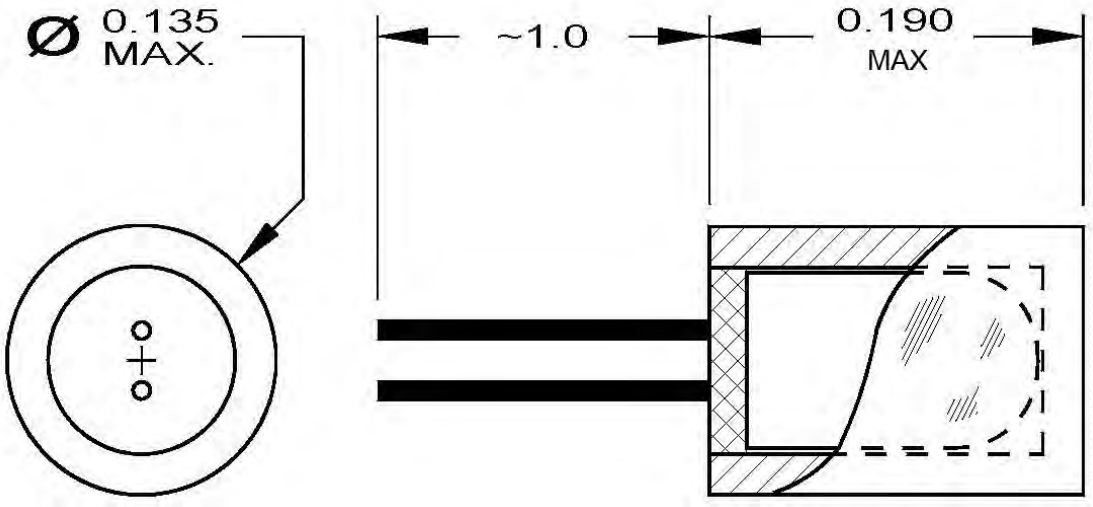
f) Polishing Options	
P	Polished
U	Unpolished

v) Voltage	mA) Current Options
5	20, 60, 75, 115, 125
14	40
28	20

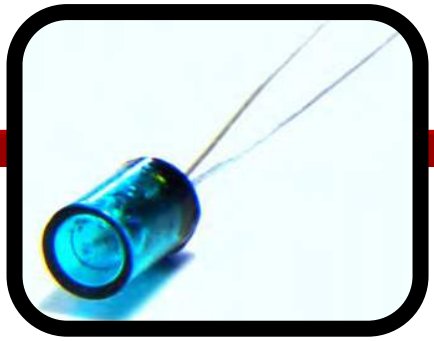
* All dimensions are in 0.001", and (+0.000 / -0.005) in tolerance, unless otherwise specified.
* For customized dimensions that are not listed, contact a Pynco representative to discuss your options.
* Product dimensions include 0.005" aluminum cap.
* Current (mA) ratings are nominal.
* 'Friendly White' filters are standard brightness. Friendly White (HT) equals high transmission.

T-1 Direct Replacement - Short (5v)

Incandescent



Short version with Wire lead



Part Number Example (T1SH-FD-GAM-P-5v-60mA)					
Size	Form	Color	f) Finish	v) Voltage	mA) Current
T1SH	FD	GAM	P	5v	60mA

NVIS Color	Part Number
Green A (Mid)	**T1SH-FD-GAM**-f-**5v**-mA
Friendly White	**T1SH-FD-WNF**-f-**5v**-mA
Friendly White (HT)	**T1SH-FD-WHT**-f-**5v**-mA

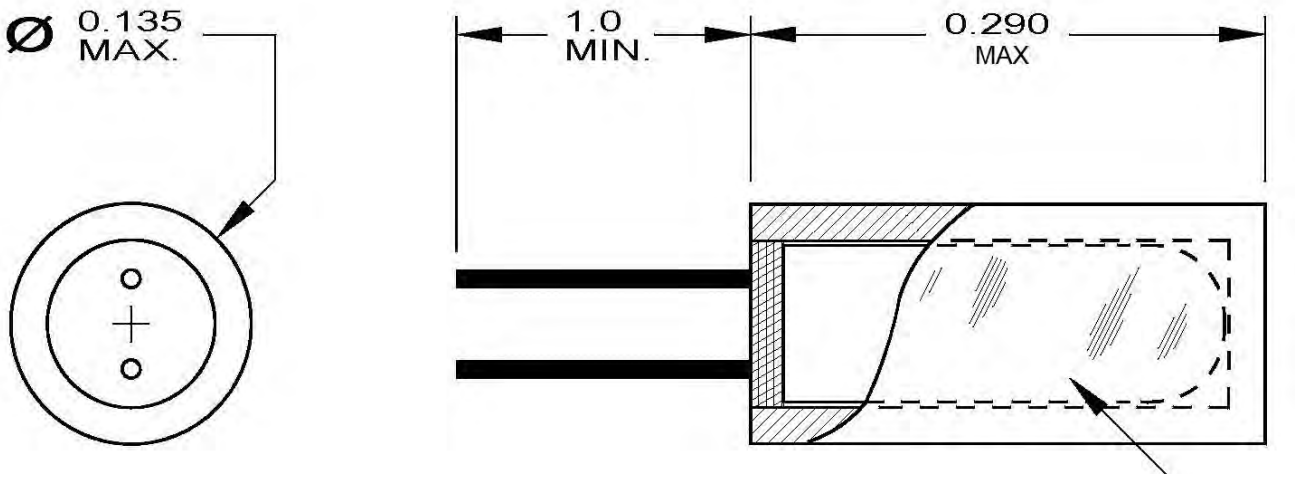
f) Polishing Options	
P	Polished
U	Unpolished

mA) Current Options
20, 60, 75, 115, 125

* All dimensions are in 0.001", and (+0.000 / -0.005) in tolerance, unless otherwise specified.
* T1 replacement assemblies are only sold with a Flat Glass Dome filter and Wire Leads (Type I).
* Available with Bi-Pin lead (pin diameter: 0.016 nominal, spacing: 0.050 nominal) - Reference Bi-Pin lead on page 27.
* Current (mA) ratings are nominal.
* 'Friendly White' filters are standard brightness. Friendly White (HT) equals high transmission.

T-1 Direct Replacement - Long (14v & 28v)

Incandescent



Long version with Wire lead

Part Number Example (T1LG-FD-GAM-P-14v-50mA)					
Size	Form	Color	f) Finish	v) Voltage	mA) Current
T1LG	FD	GAM	P	14v	50mA

NVIS Color	Part Number
Green A (Mid)	**T1LG-FD-GAM**-f-v-mA
Friendly White	**T1LG-FD-WNF**-f-v-mA
Friendly White (HT)	**T1LG-FD-WHT**-f-v-mA

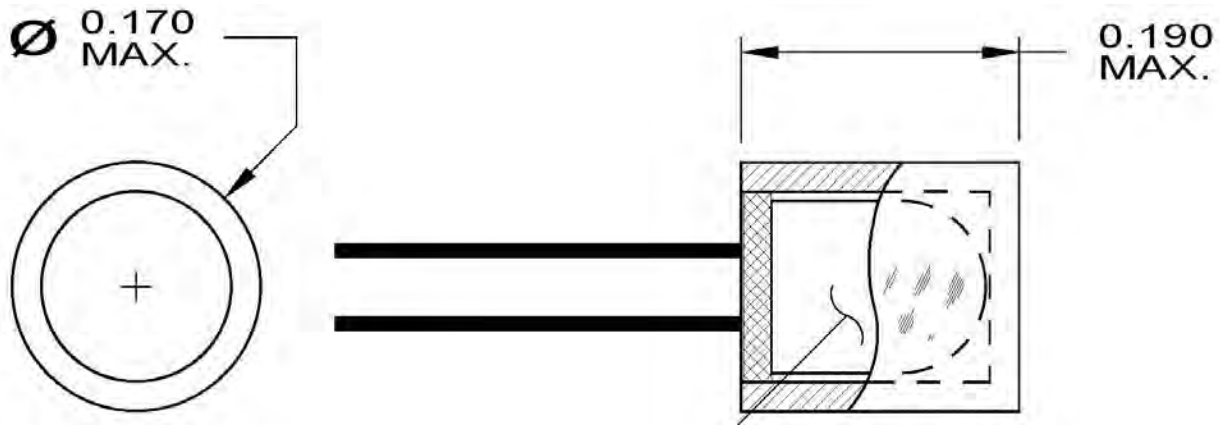
f) Polishing Options	
P	Polished
U	Unpolished

v)Voltage	mA)Current
14	50
28	24

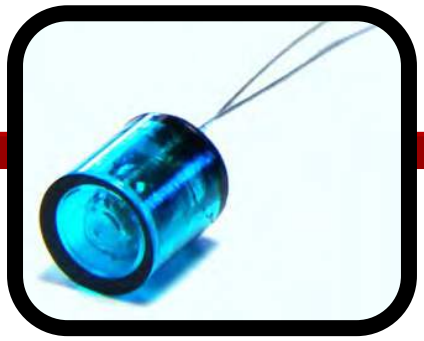
* All dimensions are in 0.001", and (+0.000 / -0.005) in tolerance, unless otherwise specified.
* T1 direct replacement assemblies (long) are only sold with a Flat Glass Dome filter and Wire Leads (Type I).
* Current (mA) ratings are nominal.
* 'Friendly White' filters are standard brightness. Friendly White (HT) equals high transmission.

T-1 Direct Replacement - Substitute

Incandescent



Substitute version with Wire lead



Part Number Example (T1SB-FD-GAM-P-28v-20mA)					
Size	Form	Color	f) Finish	v) Voltage	mA) Current
T1SB	FD	GAM	P	28v	20mA

NVIS Color	Part Number
Green A (Mid)	**T1SB-FD-GAM**-f-v-mA
Friendly White	**T1SB-FD-WNF**-f-v-mA
Friendly White (HT)	**T1SB-FD-WHT**-f-v-mA

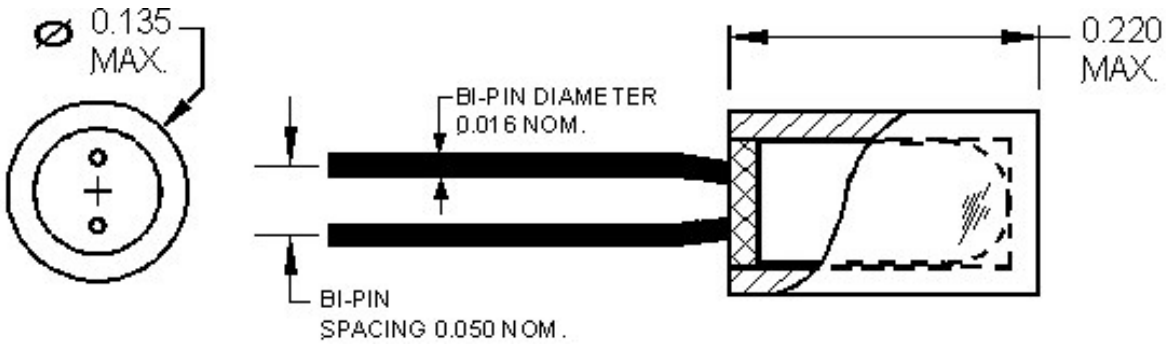
f) Polishing Options	
P	Polished
U	Unpolished

v) Voltage	mA) Current Options
5	20, 60, 75, 115, 125
14	40
28	20

* All dimensions are in 0.001", and (+0.000 / -0.005) in tolerance, unless otherwise specified.
* T1 replacement assemblies are only sold with a Flat Glass Dome filter and Wire Leads (Type I).
* Note: The "T1 Substitute" has a wider diameter than the standard T1 diameter.
* Current (mA) ratings are nominal.
* 'Friendly White' filters are standard brightness. Friendly White (HT) equals high transmission.

T-1 Direct Replacement - Bi-Pin

Incandescent



Replacement with Bi-Pin leads

Part Number Example (T1BP-FD-GAM-P-5v-115mA)					
Size	Form	Color	f) Finish	v) Voltage	mA) Current
T1BP	FD	GAM	P	5v	115mA

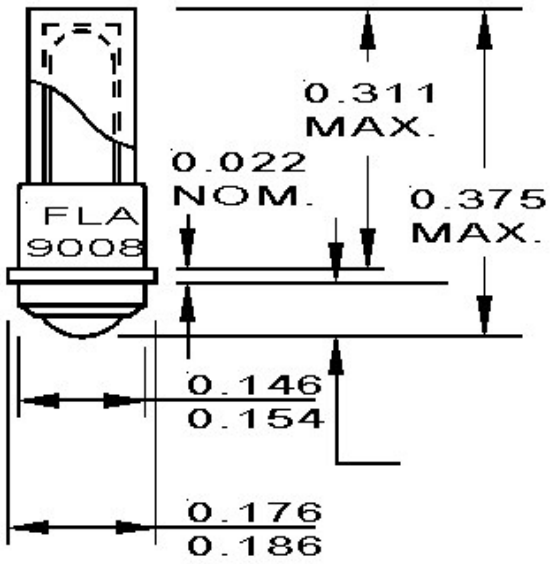
NVIS Color	Part Number
Green A (Mid)	T1BP-FD-GAM-P-5v-115mA
Friendly White	T1BP-FD-WNF-P-5v-115mA
Friendly White (HT)	T1BP-FD-WHT-P-5v-115mA

f) Polishing Options	
P	Polished

* All dimensions are in 0.001", and (+0.000 / -0.005) in tolerance, unless otherwise specified.
* This T1 replacement includes Bi-Pin leads instead of the typical Wire Leads (Type I).
* Current (mA) ratings are nominal.
* 'Friendly White' filters are standard brightness. Friendly White (HT) equals high transmission.

T-1 Sub-Midget Flanged FLA - Flat Dome

Incandescent



T-1: Part Number Example (T1-FD-SM-GAM-P-28v-24mA)						
Size	Form	Base	Color	f) Finish	v) Voltage	mA) Current
T1	FD	SM	GAM	P	28v	24mA

NVIS Color	Part Number Options
Green A (Mid)	**T1-FD-SM-GAM-P**-v-mA
Friendly White	**T1-FD-SM-WNF-P**-v-mA
Friendly White (HT)	**T1-FD-SM-WHT-P**-v-mA

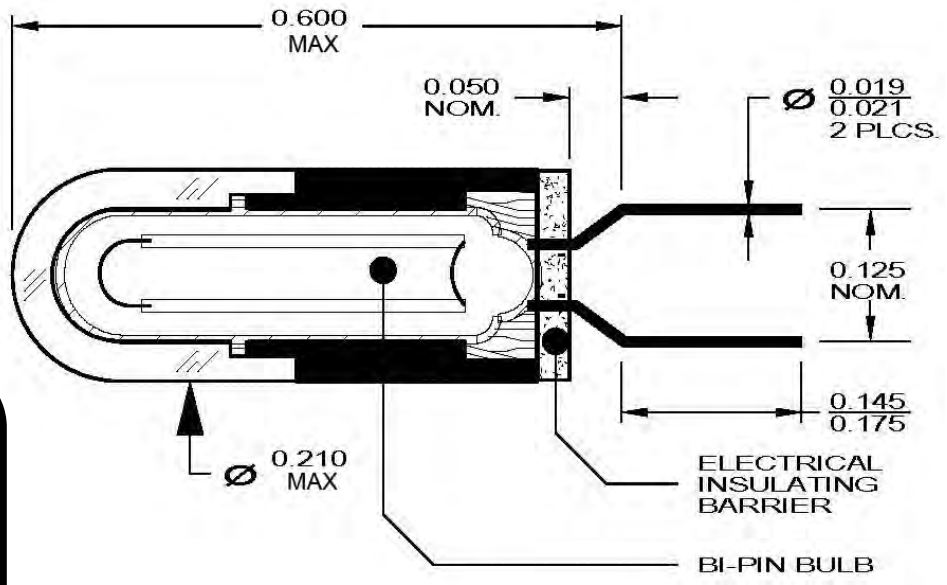
f) Polishing Options	
P	Polished

v)Voltage	mA)Current
5	115
28	24

* All dimensions are in 0.001", and (+0.000 / -0.005) in tolerance, unless otherwise specified.
* Current (mA) ratings are nominal.
* 'Friendly White' filters are standard brightness. Friendly White (HT) equals high transmission.

T-1¾ Bi-Pin - Hemispherical Dome

Incandescent



Part Number Example (T134-HD-BP-GAL-P-28v-20mA)						
Size	Form	Base	Color	f) Finish	v) Voltage	mA) Current
T134	HD	BP	GAL	P	28v	20mA

NVIS Color	Part Number Options
Green B	**T134-HD-BP-GB-P**-v-mA
Green A (Low)	**T134-HD-BP-GAL-P**-v-mA
Green A (Mid)	**T134-HD-BP-GAM-P**-v-mA
Friendly White	**T134-HD-BP-WNF-P**-v-mA
Friendly White (HT)	**T134-HD-BP-WHT-P**-v-mA

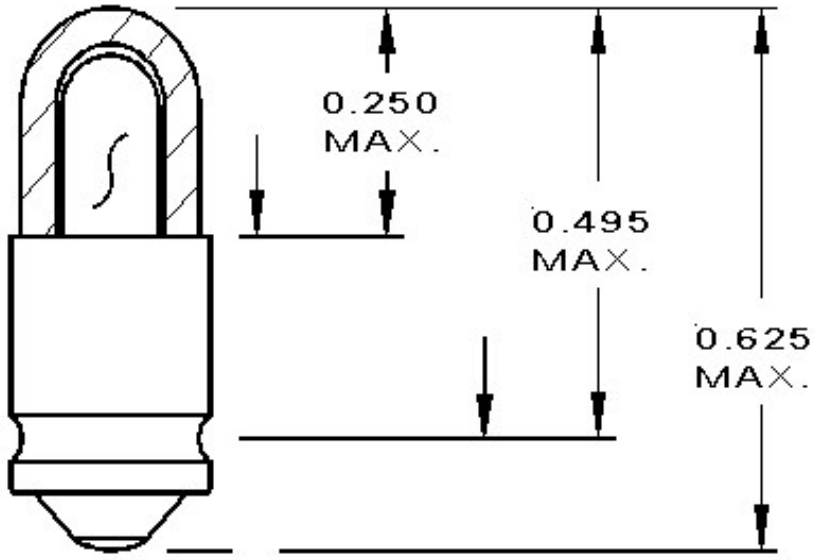
f) Polishing Options	
P	Polished (both sides)

v)Voltage	mA)Current
5	115
14	65
28	20

* All dimensions are in 0.001", and (+0.000 / -0.005) in tolerance, unless otherwise specified.
* Current (mA) ratings are nominal.
* 'Friendly White' filters are standard brightness. Friendly White (HT) equals high transmission.

T-1¾ Midget Groove - Hemispherical

Incandescent



Part Number Example (T134-HD-MG-GB-P-28v-24mA)						
Size	Form	Base	Color	f) Finish	v) Voltage	mA) Current
T134	HD	MG	GB	P	28v	24mA

NVIS Color	Part Number
Green B	**T134-HD-MG-GB-P**-v-mA
Green A (Low)	**T134-HD-MG-GAL-P**-v-mA
Green A (Mid)	**T134-HD-MG-GAM-P**-v-mA
Yellow (Class B)	**T134-HD-MG-YB-P**-v-mA
Friendly White	**T134-HD-MG-WNF-P**-v-mA
Friendly White (HT)	**T134-HD-MG-WHT-P**-v-mA

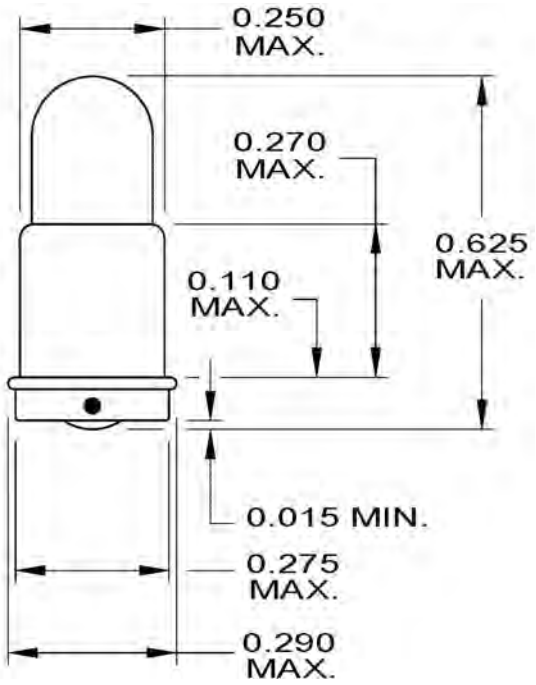
f) Polishing Options	
P	Polished (both sides)

v)Voltage	mA)Current
5	60
14	40
28	24

* All dimensions are in 0.001", and (+0.000 / -0.005) in tolerance, unless otherwise specified.
* Current (mA) ratings are nominal.
* 'Friendly White' filters are standard brightness. Friendly White (HT) equals high transmission.

T-1¾ Midget Flange - Hemispherical

Incandescent



Part Number Example (T134-HD-MF-GB-P-28v-24mA)						
Size	Form	Base	Color	f) Finish	v) Voltage	mA) Current
T134	HD	MF	GB	P	28v	24mA

NVIS Color	Part Number
Green B	**T134-HD-MF-GB-P**-v-mA
Green A (Low)	**T134-HD-MF-GAL-P**-v-mA
Green A (Mid)	**T134-HD-MF-GAM-P**-v-mA
Yellow (Class B)	**T134-HD-MF-YB-P**-v-mA
Friendly White	**T134-HD-MF-WNF-P**-v-mA
Friendly White (HT)	**T134-HD-MF-WHT-P**-v-mA

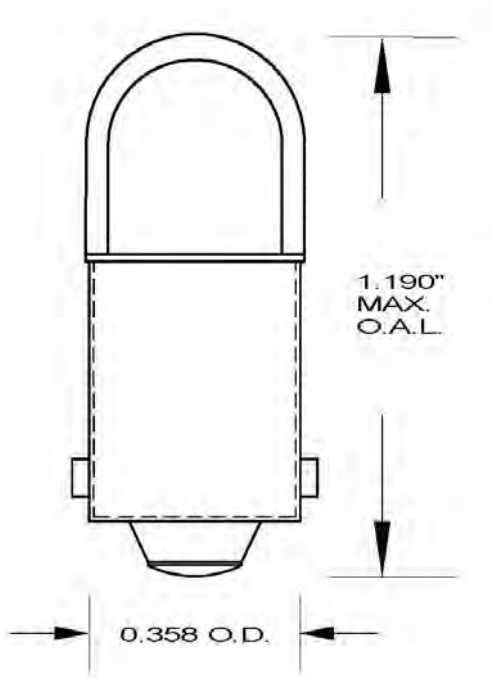
f) Polishing Options	
P	Polished (both sides)

v)Voltage	mA)Current
5	60
14	40
28	24

* All dimensions are in 0.001", and (+0.000 / -0.005) in tolerance, unless otherwise specified.
* Current (mA) ratings are nominal.
* 'Friendly White' filters are standard brightness. Friendly White (HT) equals high transmission.

T-3¼ Bayonet Base - Hemi-Dome (28v)

Incandescent



Part Number Example (T314-HD-BAY-GB-P)				
Size	Form	Base	Color	f) Finish
T314	HD	BAY	GB	P

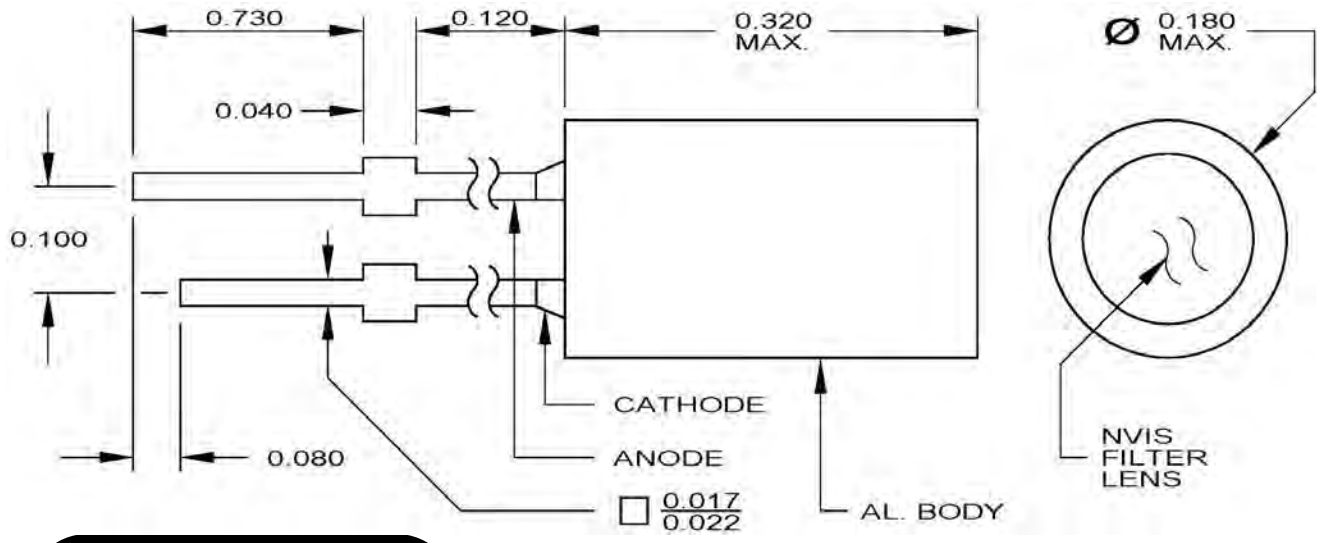
NVIS Color	Part Number
Green B	T314-HD-BAY-GB-P
Green A (Low)	T314-HD-BAY-GAL-P
Green A (Mid)	T314-HD-BAY-GAM-P
Yellow (Class B)	T314-HD-BAY-YB-P
Friendly White	T314-HD-BAY-WNF-P
Friendly White (HT)	T314-HD-BAY-WHT-P

f) Polishing Options	
P	Polished (both sides)

* All dimensions are in 0.001", and (+0.000 / -0.005) in tolerance, unless otherwise specified.
* T-3¼ assemblies normally use the Bayonet base connector. Contact Pynco for customized options.
* T-3¼ assemblies operate at 28 volts and 85 mA in current.
* 'Friendly White' filters are standard brightness, (HT) equals high transmission.

LED Indicator - Aluminum Housing

L E D L i g h t i n g



NVIS Assembly with Thru-Hole Leads

Part Number Example (AH-BP-LYB-P-320-180)					
Form	Base	Color	f) Finish	OAL	OD
AH	BP	LYB	P	320	180

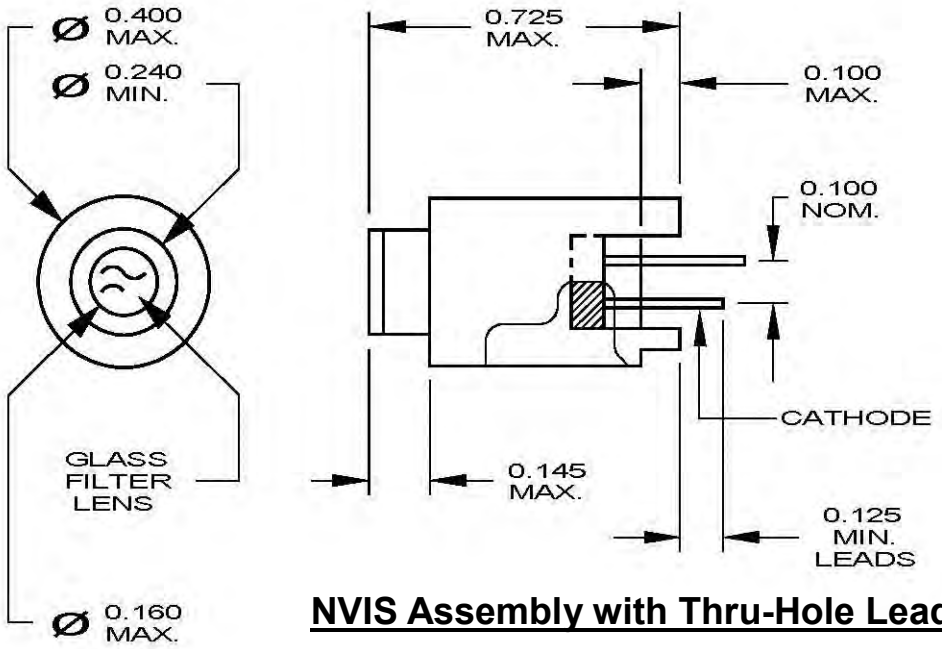
NVIS Color	Part Number
Green A (Low)	AH-BP-LGAL-P-320-180
Green A (Mid)	AH-BP-LGAM-P-320-180
Yellow (Class B)	AH-BP-LYB-P-320-180
White	AH-BP-LW-P-320-180
Red	AH-BP-LR-P-320-180

f) Polishing Options	
P	Polished (both sides)

* All dimensions are in 0.001", and (+0.000 / -0.005) in tolerance, unless otherwise specified.
* This LED indicator assembly will operate at 20mA in current.

NVIS Green 'B' LED Indicator

LED Lighting



NVIS Assembly with Thru-Hole Leads

Part Number Example (WBH-BP-LGB-725-400)				
Form	Base	Color	OAL	OD
WBH	BP	LGB	725	400

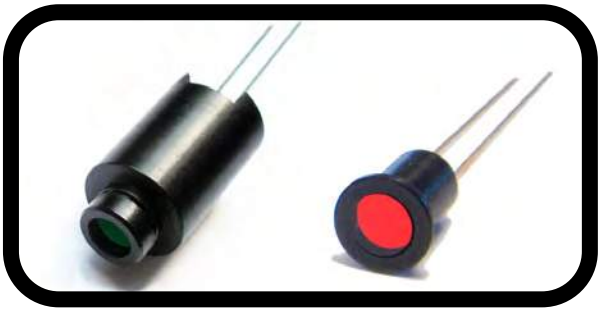
NVIS Color	Part Number
Green B	WBH-BP-LGB-725-400

* All dimensions are in 0.001", and (+0.000 / -0.005) in tolerance, unless otherwise specified.
* This assembly meets OEM customer luminance when measured at 4mA in current.

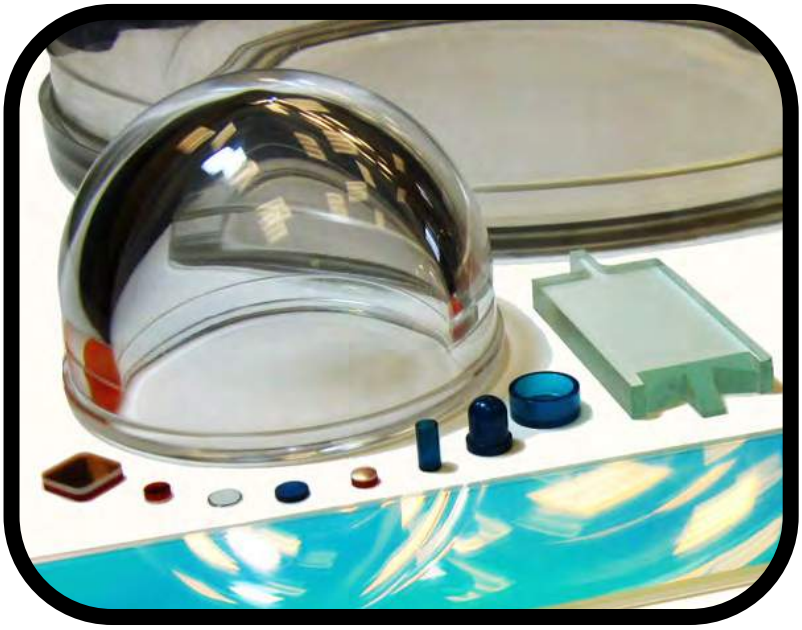
Custom Machined Products & Assemblies

Sunlight Readable Annunciators

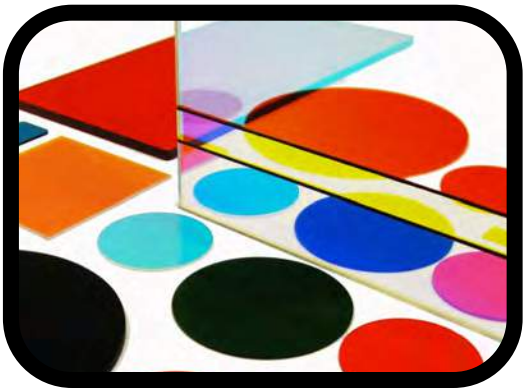
Indicators & Press To Test



Custom Glass & Polymeric Products



Flat Glass Filters



- Contact a Pynco representative today for customized options, pricing and lead times.

GLOSSARY

AR Coating: An anti-reflection (AR) coating is a type of optical coating applied to the surface of lenses and other optical devices to reduce reflection. This improves the efficiency of the system since less light is lost.

CIE Color Coordinate System: The fundamental definitions of color are expressed in terms of the "standard observer" and coordinate system adopted by the International Commission on Illumination (C.I.E.) at Cambridge, England, in 1931 and published in the Journal of the Optical Society of America, Vol. 23, page 359, October 1933. Wherever chromaticity coordinates (x, *y,* z) appear in this document, they relate to this system. The CIE 1976 uniform chromaticity scale (UCS) diagram is the CIE 1931 chromaticity diagram redrawn with the x and y axes subjected to a linear transformation as defined in CIE Publication 15, Supplement 2, 1978.

Class A NVIS: Class A NVIS is not compatible with red cockpit lights because of the overlap between the spectrum of red light and the sensitivity of Class A NVIS.

Class B NVIS: Class B NVIS is compatible with NVIS Red and therefore is compatible with properly filtered red lights and color electronic displays that meet the requirements.

Class C NVIS: Some aircraft have a heads up display (HUDs) that use a hologram as the reflective element in the combining glass. Holograms typically work with only one wavelength of light. This feature can be used to improve the efficiency and see-through clarity of the HUD, but it means the light coming from the HUD is concentrated at one wavelength. Since this wavelength is in the green part of the spectrum and is blocked by the minus blue filter in the NVIS, it is nearly impossible to see a holograph HUD with Class A or B NVIS. Consequently, modified NVIS have been built and tested which have a "notch" or "leak " in the green part of the spectrum. The Class C filter is sometimes called the "leaky green" filter.

Coatings: Multi-layer films applied by vacuum deposition methods which alter the optical characteristics of the substrate on which they are deposited.

Compatible Interior Lighting: The aircraft interior lighting that provides acquisition of aircraft interior information with the unaided eye without degrading the image intensification capabilities of the NVIS during night flight operations.

Compliant: A device that can be used with night vision goggles while also meeting MIL SPEC requirements.

Contrast: The amount of emitted light from an illuminated or non-illuminated display compared to the ambient illuminance.

GLOSSARY

Covert: IR lights or lights that are typically filtered so they are not visible to the naked eye beyond 20 – 30 feet. These lights may be intended to provide illumination so that NVIS will work without adequate natural light. (The observer uses infrared to provide adequate illumination for the goggle. Infrared is needed when it is too dark for the goggle to work properly.)

Crewstation or Compartment: Per MIL-STD-3009, all crew member work stations or compartments, within the aircraft, are required to use NVIS in the performance of duties.

Diffuser: A device that diffuses or spreads out or scatters light in some manner. This will cause the emitted light to become more uniform to the viewer.

Diffusion: The scattering of incident light by reflection from, or transmission through, a rough surface.

Direct View Image NVIS (Type I): Any NVIS that uses the goggle and displays the intensified Image on a phosphor screen in the user's direct line of sight.

Electronic and/or Electro-Optical Displays: All displays capable of presenting a variety of different images on their screen. These displays may present characters, numerals, symbols, graphics, or video. They are based on a CRT, a dot matrix technology, or a segmented design, and may, or may not be, capable of portraying shades of gray.

Infrared (IR): Infrared energy is light that we cannot see, but our bodies can detect as heat. It includes the portion of the color spectrum with wavelengths longer than visible light.

Interior Lighting: All lighting within the aircraft including but not restricted to the following lighting systems:

A) Instrument
- Primary (Green A, Green B)
- Secondary

B) Console
- Primary (Green A, Green B)
- Secondary

C) Emergency
D) Warning, Caution, and Advisory displays and indicators (Yellow, Red)
E) Utility and Map (White)
F) Controls (Knobs, Handles, Push Buttons)
G) Compartment
H) Work and Inspection Lights (White)
I) Jump Lights (Yellow)

GLOSSARY

IR Mode: The infrared (IR) or covert mode for exterior lighting is defined as not viewable by a dark-adapted, unaided eye at a distance greater than 30 feet, in the dark, and when the system is on the ground.

ITO Coating: Indium Tin Oxide (ITO) is a transparent and conductive substance. The layers must be thin to provide substantial transparency, particularly at the blue end of the spectrum.

Light Leaks: Visual evidence through the NVIS of light emitted from a component from areas that are not intended to be illuminated.

Lighting Subsystem: All devices that emit or transmit light within the flight deck or other crew compartments and are attached to the aircraft power via a common dimmer control.

Lighting System: All devices that emit or transmit light within the flight deck or other crew compartments.

Luminance: Characterizes emission or reflection from flat, diffused surfaces. The luminance indicates how much luminous power will be perceived by an eye looking at the surface from a particular angle of view. Luminance is thus an indicator of how bright the surface will appear. [Units: candela per square meter (cd/m^2)]

MIL-L-85762A: This military standard was published in 1988 and served very well for eleven years as the standard definition and interface criteria for NVIS compatibility. It established performance, general configuration, testing, and acceptance requirements for NVIS compatible aircraft interior lighting. MIL-L-85762A applied to all systems, subsystems, component equipment and hardware which provide the lighting environment in aircraft crew stations and compartments where NVIS are used.

MIL-STD-3009: Developed in 2001, this new standard was derived from MIL-L-85762A as a way to preserve standard definition, and to comply with the Perry directive. This document no longer contains the lighting system design requirements that were in MIL-L-85762A, it now deals only with interface and performance requirements. MIL-STD-3009 also adds exterior lighting compatibility definitions and criteria as well as the 'Class C' NVIS standard to incorporate compatibility with HUD display technology.

NVG Compatible: Any device or filter that is compatible with night vision goggles, but does not necessarily comply with MIL SPEC.

GLOSSARY

NVG Filter: A night vision filter that is compatible with the goggle. The filter meets MIL-STD-3009 NVIS radiance requirements, but not the chromaticity specifications.

NVIS (Night Vision Imaging Systems): An illumination system that is compatible with night vision compliant goggles (via image intensifier tubes) to produce an enhanced image of a scene in light conditions too low for normal navigation and pilotage. All NVIS filters categorized in this catalog are MIL-STD-3009 compliant.

NVIS Filter: A night vision filter which is compliant with MIL-STD-3009 requirements for chromaticity and NVIS radiance.

NVIS Friendly Filter: A night vision compatible filter that does not meet all MIL-STD-3009 requirements for NVIS radiance and/or chromaticity specifications. NVIS friendly filters will still work effectively with night vision compliant goggles.

NVIS Radiance (NR): The amount of energy emitted by a light source that is visible through NVIS. (This is how sensitive the goggle will be to the light.)

Projected Image NVIS (Type II): Any NVIS that uses goggles and projects the intensified image on a see-through medium in the user's line of sight. This configuration allows simultaneous viewing of the intensified image and visual cues such as HUD (Head Up Display) symbols.

Radiance: The amount of light that passes through or is emitted from a source. This indicates how much of the power emitted by an emitting or reflecting surface will be received by an optical system.

Rated Drive Condition: The electrical power states obtained by conformance to the allowable electrical characteristics (voltage, current, pulse width modulation, frequency, etc.)

Secure: An Army definition, often applied to ground vehicles and equipment, meaning that the visible light emitted is reduced to the minimum needed to do the mission, and the near IR content is reduced to less than an estimated 5% of the visible light. (The observer has a limited range of use for the goggle. The goggles would be secure up to a certain distance.)

Spatter: Surface contamination resulting from the unintentional deposition of non-vaporized evaporant on the substrate.

Thin-film Interference: Patterns of light and dark bands of a generally parallel appearance caused by the additive effects of in-phase or out-of-phase wave fronts reflected from two or more surfaces.

TABLE II. Chromaticity requirements.

Lighting component(s)	Para.	TYPE 1 Class A u'_1	v'_1	r	cd/m^2 (fL)	NVIS Color	TYPE 1 Class B u'_1	v'_1	r	cd/m^2 (fL)	NVIS Color	TYPE II Class A u'_1	v'_1	r	cd/m^2 (fL)	NVIS Color	TYPE II Class B u'_1	v'_1	r	cd/m^2()	NVIS Color
Primary	4.3.4.1	.088	.543	.037	0.343 (0.1)	Green A						.088	.543	.037	0.343 (0.1)	Green A					
Secondary	4.3.4.2	.088	.543	.037	0.343 (0.1)	Green A						.088	.543	.037	0.343 (0.1)	Green A					
Illuminated controls	4.3.4.3	.088	.543	.037	0.343 (0.1)	Green A						.088	.543	.037	0.343 (0.1)	Green A					
Compartment lighting	4.3.4.4	.088	.543	.037	0.343 (0.1)	Green A			Same			.088	.543	.037	0.343 (0.1)	Green A			Same		
Utility, map, work, and inspection	4.3.4.5	.088	.543	.037	0.343 (0.1)	Green A			as			.088	.543	.037	0.343 (0.1)	Green A			as		
	4.3.4.5	.190	.49	.04	0.343 (0.1)	White			Class A			.190	.49	.04	0.343 (0.1)	White			Class A		
Caution and advisory signals	4.3.4.6	.088	.543	.037	0.343 (0.1)	Green A						.088	.543	.037	0.343 (0.1)	Green A					
Jump lights	4.3.4.7	.088	.543	.037	17.2 (5.0)	Green A						.088	.543	.037	17.2 (5.0)	Green A					
		.274	.622	.083	51.5 (15.0)	Yellow						.274	.622	.083	51.5 (15.0)	Yellow					
Special lighting components where increased display emphasis by highly saturated (mono-chromatic) color is necessary, or adequate display light readability cannot be achieved with "GREEN A"	All of the above	.131	.623	.057	0.343 (0.1)	Green B						.131	.623	.057	0.1	Green B					
Warning signal	4.3.4.8.1	.274	.622	.083	51.5 (15.0)	Yellow	.274	.622	.083	51.5 (15.0)	Yellow	.274	.622	.083	51.5 (15.0)	Yellow	.274	.622	.083	51.5 (15.0)	Yellow
		NOT APPLICABLE					.450	.550	.060	51.5 (15.0)	Red	NOT APPLICABLE					.450	.550	.060	51.5 (15.0)	Red
Master caution signal	4.3.4.8.2	.274	.622	.083	51.5 (15.0)	Yellow	Same as Class A					.274	.622	.083	51.5 (15.0)	Yellow	Same as Class A				

Where:
u'_1 and v'_1 = 1976 UCS chromaticity coordinates of the center point of the specified color area.
r = radius of the allowable circular area on the 1976 UCS chromaticity diagram for the specified color.
fL = footlamberts

TABLE III.a. NVIS radiance requirements using English units.

Lighting components		Paragraph	TYPE 1						TYPE II					
			Class A			Class B			Class A			Class B		
			Not Less Than: (NR_A)	Not Greater Than: (NR_A)	fL	Not Less Than: (NR_B)	Not Greater Than: (NR_B)	fL	Not Less Than: (NR_A)	Not Greater Than: (NR_A)	fL	Not Less Than: (NR_B)	Not Greater Than: (NR_B)	fL
Primary		4.3.5.1	---	$1.7x10^{-10}$	0.1	1/ Same as Class A			---	$1.7x10^{-10}$	0.1	1/ Same as Class A		
Secondary		4.3.5.2	---	$1.7x10^{-10}$	0.1				---	$1.7x10^{-10}$	0.1			
Illuminated controls		4.3.5.3	---	$1.7x10^{-10}$	0.1				---	$1.7x10^{-10}$	0.1			
Compartment		4.3.5.4	---	$1.7x10^{-10}$	0.1				---	$1.7x10^{-10}$	0.1			
Utility, map, work, and Inspection lights	Green	4.3.5.5	---	$1.7x10^{-10}$	0.1				---	$1.7\text{-}10^{-10}$	0.1			
	White	4.3.5.5		$1.0x10^{-9}$	0.1				---	$1.0\text{-}10^{-9}$	0.1			
Caution and advisory lights		4.3.5.6	---	$1.7x10^{-10}$	0.1				---	$1.7\text{-}10^{-10}$	0.1			
Jump lights		4.3.5.7	$1.7x10^{-8}$	$5.0x10^{-8}$	5.00	$1.6x10^{-8}$	$4.7x10^{-8}$	5.0	---	$5.0x10^{-8}$	5.0	---	$4.7x10^{-8}$	5.0
Warning signal		4.3.5.8	$5.0x10^{-8}$	$1.5x10^{-7}$	15.0	$4.7x10^{-8}$	$1.4x10^{-7}$	15.0	---	$1.5x10^{-7}$	15.0	---	$1.4x10^{-7}$	15.0
Master caution signal		4.3.5.8	$5.0x10^{-8}$	$1.5x10^{-7}$	15.0	$4.7x10^{-8}$	$1.4x10^{-7}$	15.0	---	$1.5x10^{-7}$	15.0	---	$1.4x10^{-7}$	15.0
Emergency exit lighting			$5.0x10^{-8}$	$1.5x10^{-7}$	15.0	$4.7x10^{-8}$	$1.4x10^{-7}$	15.0	---	$1.5x10^{-7}$	15.0	---	$1.4x10^{-7}$	15.0
Electronic and electro-optical displays (monochromatic)			---	$1.7x10^{-10}$	0.5	---	$1.6x10^{-10}$	0.5	---	$1.7x10^{-10}$	0.5	---	$1.6x10^{-10}$	0.5
Electronic and electro-optical displays (multi-color)	White		---	$2.3x10^{-9}$	0.5	---	$2.2x10^{-9}$	0.5	---	$2.3x10^{-9}$	0.5	---	$2.2x10^{-9}$	0.5
	MAX		---	$1.2x10^{-8}$	0.5	---	$1.1x10^{-8}$	0.5	---	$1.2x10^{-8}$	0.5	---	$1.1x10^{-8}$	0.5
HUD systems		4.3.5.10	$1.7x10^{-9}$	$5.1x10^{-9}$	5.0	$1.6x10^{-9}$	$4.7x10^{-9}$	5.0	---	$1.7x10^{-9}$	5.0	---	$1.6x10^{-9}$	5.0

Where:

NR_A = NVIS radiance requirements for Class A equipment.
NR_B = NVIS radiance requirements for Class B equipment.
fL = footlamberts

NOTE 1. For these lighting components, Class B equipment shall meet all Class A requirements of this specification. The relative NVIS response data for Class A equipment, $G_A(\lambda)$ (TABLE III.a), shall be substituted for $G_B(\lambda)$ to calculate NVIS radiance.

Metric Conversion

Millimeters to Inches Conversion Chart

mm	Inches	mm	Inches	mm	Inches
1	0.0394	21	0.8268	41	1.6142
2	0.0787	22	0.8661	42	1.6535
3	0.1181	23	0.9055	43	1.6929
4	0.1575	24	0.9449	44	1.7323
5	0.1969	25	0.9843	45	1.7717
6	0.2362	26	1.0236	46	1.8110
7	0.2756	27	1.0630	47	1.8504
8	0.3150	28	1.1024	48	1.8898
9	0.3543	29	1.1417	49	1.9291
10	0.3937	30	1.1811	50	1.9685
11	0.4331	31	1.2205	51	2.0079
12	0.4724	32	1.2598	52	2.0472
13	0.5118	33	1.2992	53	2.0866
14	0.5512	34	1.3386	54	2.1260
15	0.5906	35	1.3780	55	2.1654
16	0.6299	36	1.4173	56	2.2047
17	0.6693	37	1.4567	57	2.2441
18	0.7087	38	1.4961	58	2.2835
19	0.7480	39	1.5354	59	2.3228
20	0.7874	40	1.5748	60	2.3622

Contact a Pynco representative today. Our sales consultants, physicists and engineers are ready to assist our clients with pricing, R & D, manufacturing, assembly, testing and delivery.

Our NVIS customers include edge-lighted panel and instrument manufacturers, direct military, instrument and cockpit conversion shops. With 25 years of experience, Pynco's NVIS products are being used in virtually all aerospace defense platforms.

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