HEBO

SPEZIALGLAS

Heat-Absorbing Filters

ISK-Types Standards

Matte Platten

210 × 210 × 2,5 mm

210 × 210 × 5 mm

210 × 210 × 9 mm

HEBO Spezialglas

Exclusive Partner (Europe)

with ISUZU Glass

V. 23/06/01

Standards Heat-Absorbing Filter Glass

ISK 150 (≈ KG 2)
ISK 153
ISK 157 (≈ KG 1)
ISK 167 (≈ KG 3)
ISK 171 (≈ KG 5)
ISK 370 (≈ KG 4)

Available dimension
210 × 210 +3/-0 mm

Thicknesses
2,5 + 0,5 / -0 mm
5,0 + 0,5 / -0 mm
9,0 + 0,5 / -0 mm

Edge
As sawn or broken

Surfaces
As sawn

Surface-roughness
< 3 µm Rq

Polished filtersamples (ex stock)
Available dimension
50,0 x 50,0 ± 0,2 mm

Thicknesses
1,0 ± 0,1 mm
2,0 ± 0,1 mm
3,0 ± 0,1 mm
4,0 ± 0,1 mm

Both surfaces polished P3; S/D 60:40
Edge grinded; Protection-chamfers 0,2 to 0,4 mm

Deliveries
Within one day (subject to prior sale)
EXW Aalen – Germany
Shipped across UPS

No minimum order quantity or value.

Special dimensions or thicknesses available upon request.
Customized processing possible (sawing, grinding, polishing, tempering and coating).
Prices upon request.

Meaning of sign
λ(nm): Wavelength
Ti: Internal Transmittance
nd: Refractive Index
T(%): External Transmittance
OD: Optical Density

REACH-Customer Information

EU directive 1907/2006 (REACH) – Frankfurt am Main, Germany, July 24, 2009

Dear Customer,
ISUZU Glass Deutschland GmbH is well aware of the EU directive 1907/2006 (REACH). We do not manufacture and we do not import chemical substances into the European Community. ISUZU Glass Deutschland GmbH is supplying finished and semi-finished products to costumers in Europe.

In accordance to REACH, the supplied products are “articles”, because an article is the term for any object that has been given a specific shape, surface or design which determines its function to a greater degree than does its chemical composition. Furthermore, in case of proper use of our products, there is no intended release of chemicals. Under REACH only substances imported into the EU have to registered, preparations or articles are not subject to register.

For any further questions, please contact us.

ISUZU Glass Co. Ltd.
Naoki Kikuchi
General Manager

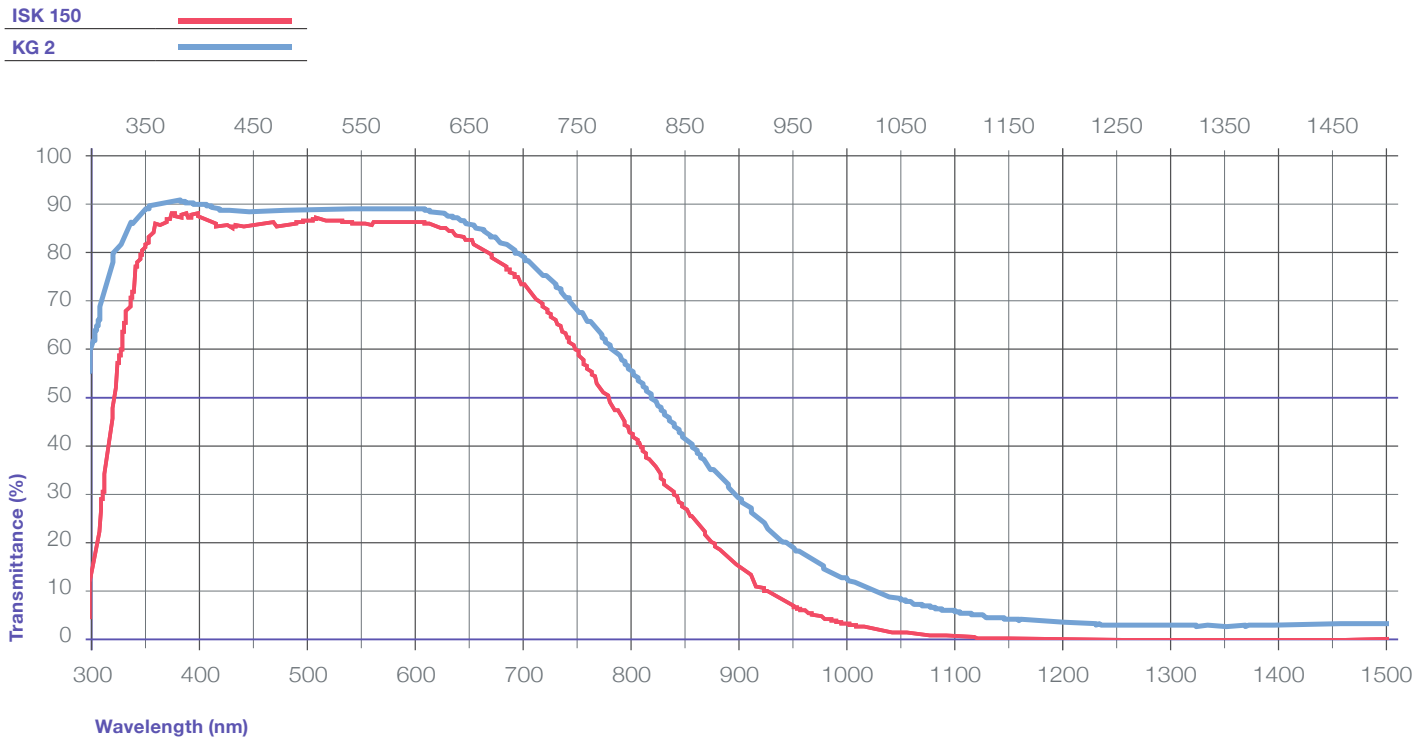
Certification that Hazardous Chemical Substances are not Used

ISUZU Glass Co., Ltd. Hiroyuki Takamichi, Japan, August 3, 2009

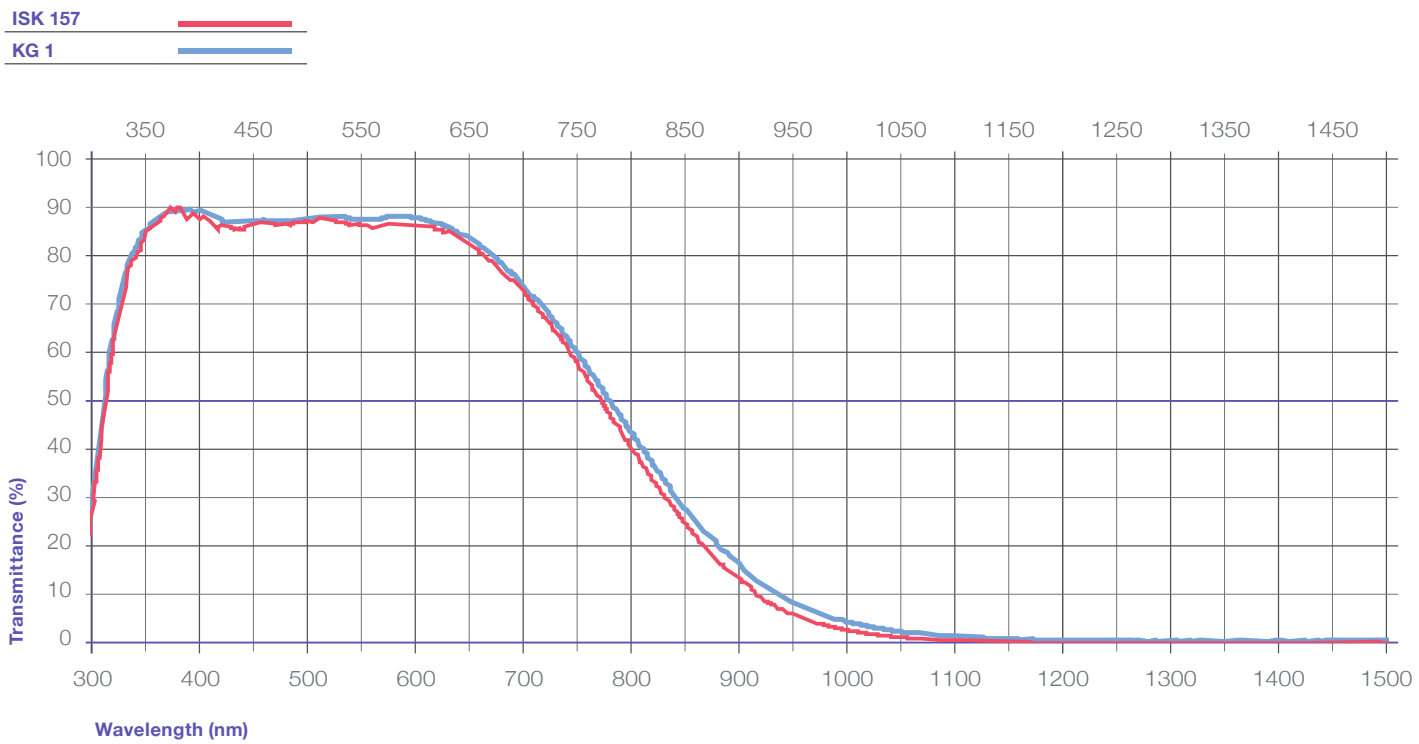
Regarding the following products and packaging materials that are being sold to your company and/or its affiliate we hereby certify that we are not using the substances describes in Environment Related Chemical Substance Sheet attached here to. Furthermore we hereby certify that following products are conformance with the regulations of EC-Directive 2002/95/EC (Rosh) together with the EC commission Decision 2005/747/EC.

ISUZU Glass Co. Ltd.
Hiroyuki Takamichi

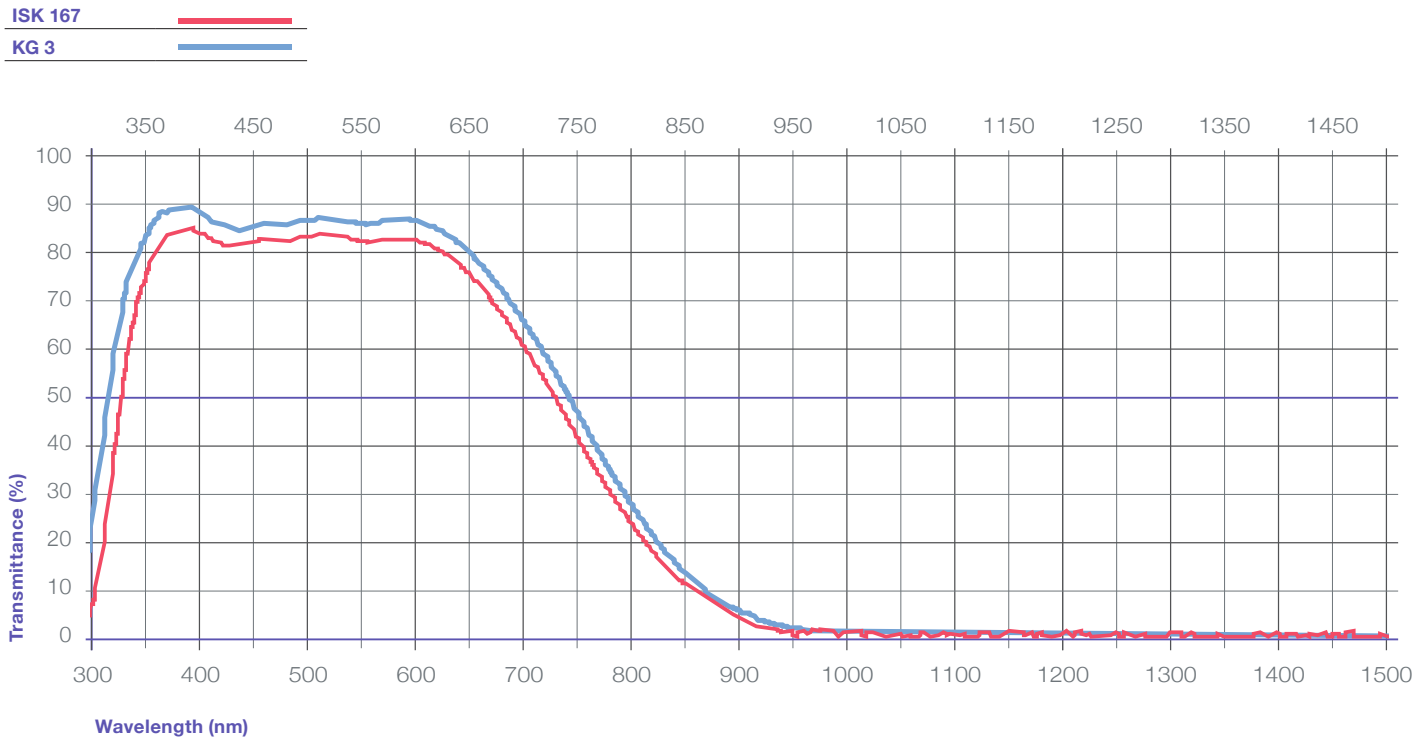
Comparison ISK 150 and Schott KG 2



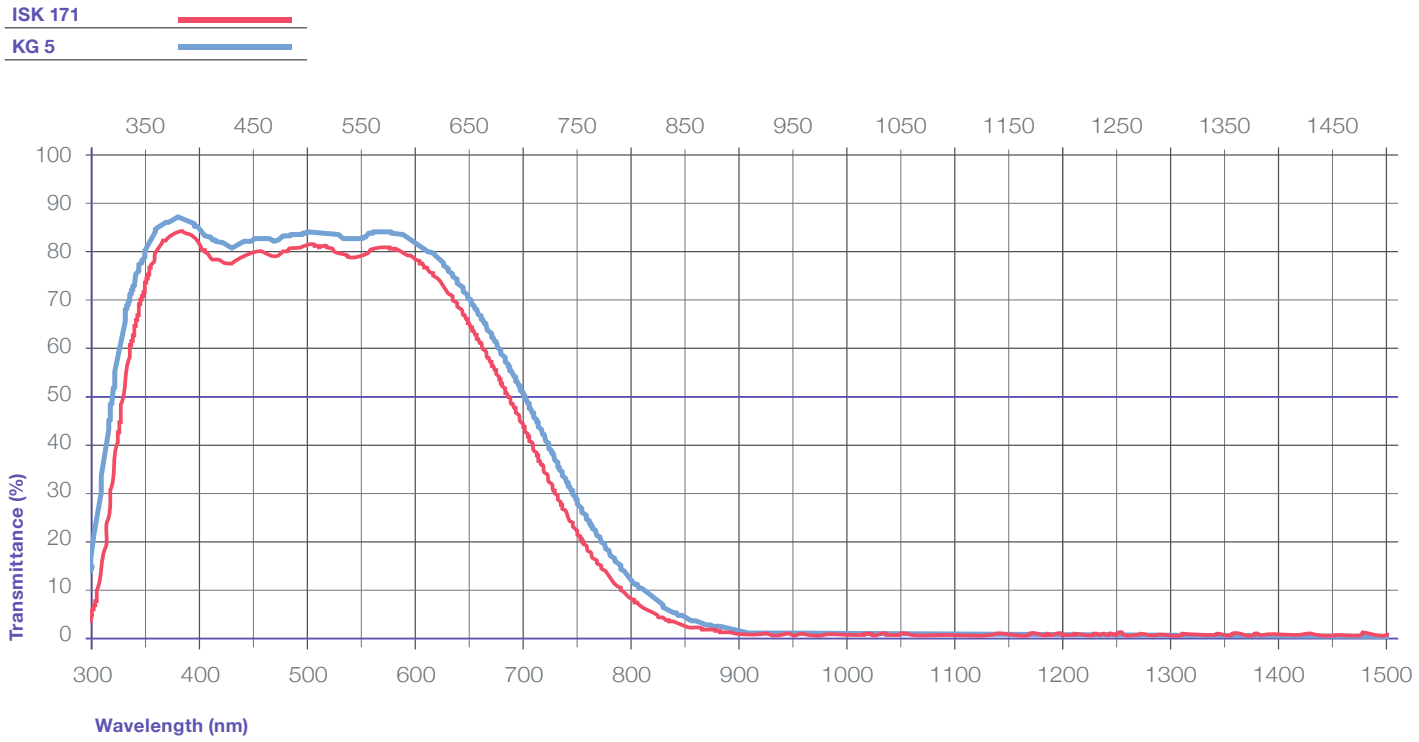
Comparison ISK 157 and Schott KG 1



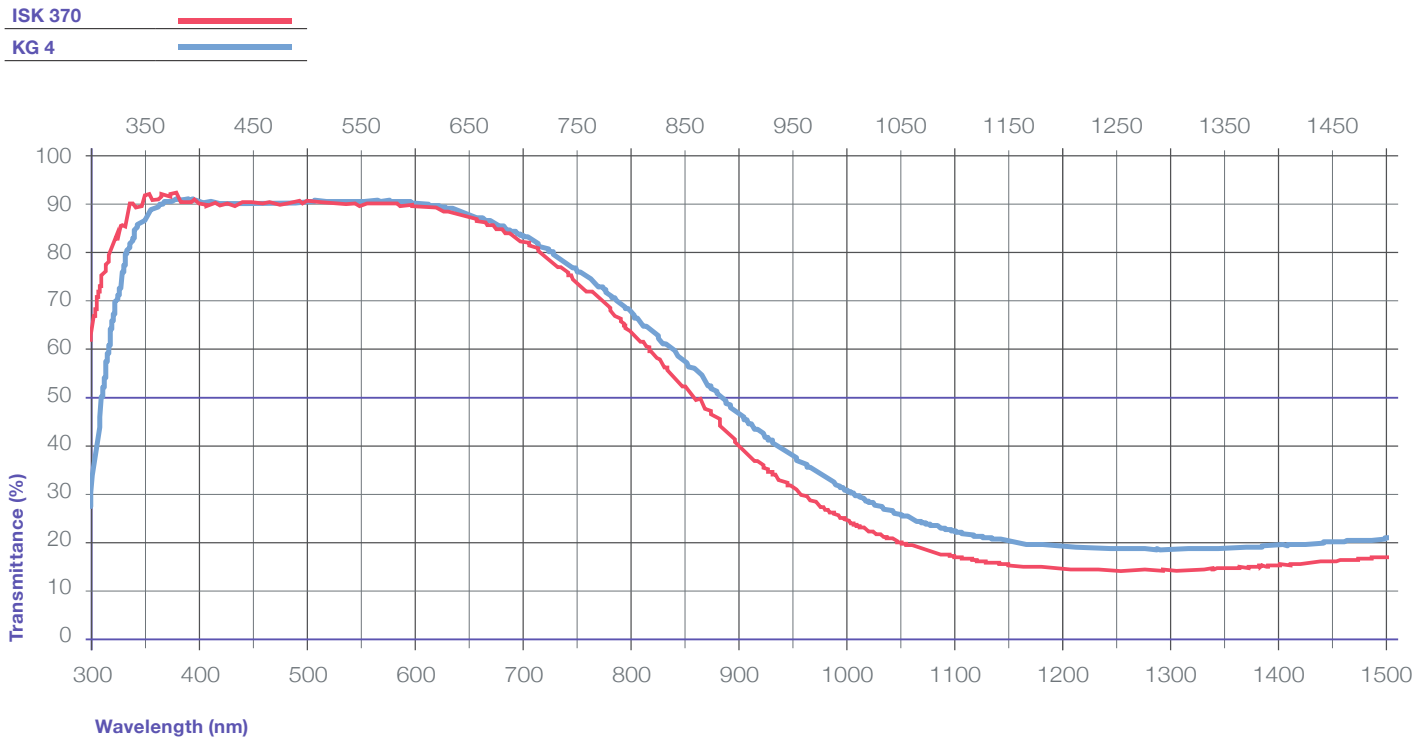
Comparison ISK 167 and Schott KG 3



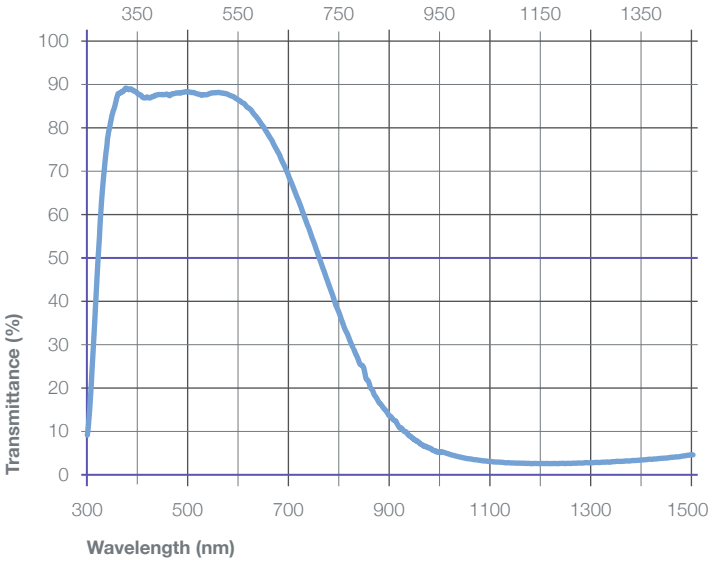
Comparison ISK 171 and Schott KG 5



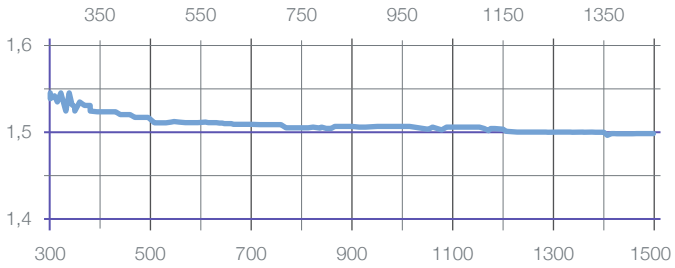
Comparison ISK 370 and Schott KG 4



ISK 150 (Thickness 2 mm)



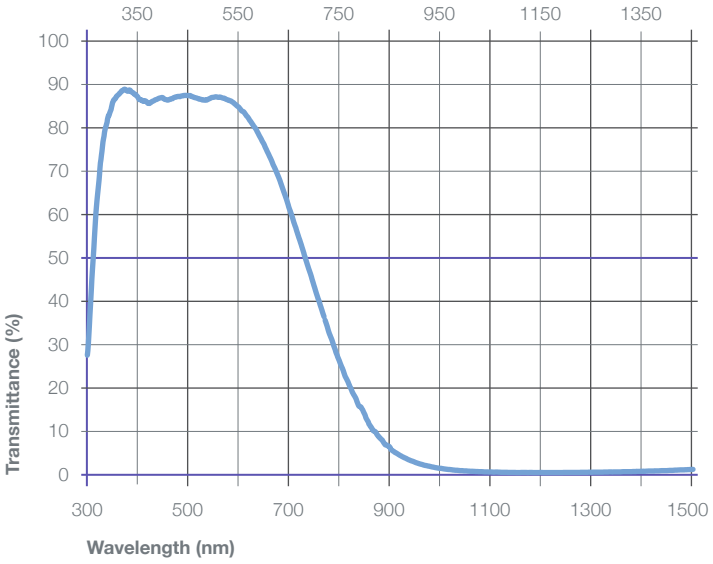
	λ(nm)	T(%)	Ti	OD	Nd
Set Wavelength (nm)	500,00	88,556	0,964	0,053	1,516
Transmittance 50 %	321,20	50,000	0,547	0,301	1,534
Transmittance 50 %	760,02	50,000	0,543	0,301	1,508
d-line	587,56	87,547	0,952	0,058	1,512
e-line	546,07	88,320	0,960	0,054	1,513



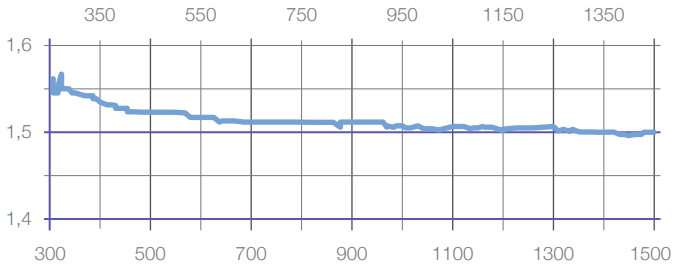
Wavelength	T(%)	Ti	OD	Nd
300	9,142	0,100	1,039	1,532
310	25,543	0,280	0,593	1,543
320	47,555	0,520	0,323	1,533
330	66,010	0,723	0,180	1,536
340	77,702	0,850	0,110	1,536
350	83,566	0,913	0,078	1,531
360	87,787	0,958	0,057	1,526
370	88,608	0,968	0,053	1,532
380	89,236	0,973	0,049	1,525
390	88,982	0,970	0,051	1,524
400	88,089	0,961	0,055	1,527
410	87,232	0,950	0,059	1,522
420	87,327	0,952	0,059	1,522
430	87,541	0,954	0,058	1,522
440	87,903	0,957	0,056	1,520
450	87,916	0,957	0,056	1,519
460	87,862	0,957	0,056	1,519
470	88,122	0,959	0,055	1,518
480	88,350	0,962	0,054	1,518
490	88,469	0,963	0,053	1,516
500	88,556	0,964	0,053	1,516
510	88,415	0,962	0,053	1,516
520	88,039	0,958	0,055	1,515
530	87,905	0,956	0,056	1,515
540	88,059	0,958	0,055	1,515
550	88,327	0,960	0,054	1,514
560	88,420	0,961	0,053	1,513
570	88,239	0,959	0,054	1,513
580	87,875	0,955	0,056	1,512
590	87,425	0,950	0,058	1,512
600	86,628	0,941	0,062	1,512
610	85,915	0,934	0,066	1,512
620	84,782	0,921	0,072	1,511

Wavelength	T(%)	Ti	OD	Nd
630	83,412	0,906	0,079	1,510
640	81,975	0,891	0,086	1,510
650	80,259	0,872	0,096	1,511
660	78,355	0,851	0,106	1,509
670	76,288	0,829	0,118	1,511
680	74,112	0,805	0,130	1,510
690	71,580	0,778	0,145	1,509
700	68,740	0,747	0,163	1,509
710	65,835	0,716	0,182	1,509
720	62,926	0,684	0,201	1,509
730	59,702	0,649	0,224	1,509
740	56,603	0,615	0,247	1,507
750	53,392	0,580	0,273	1,508
760	50,008	0,543	0,301	1,508
770	46,727	0,508	0,330	1,507
780	43,444	0,472	0,362	1,507
790	40,006	0,435	0,398	1,507
800	37,010	0,402	0,432	1,507
850	23,447	0,255	0,630	1,508
900	13,553	0,147	0,868	1,509
950	7,976	0,087	1,098	1,509
1000	5,139	0,056	1,289	1,506
1050	3,812	0,041	1,419	1,507
1100	3,062	0,033	1,514	1,505
1150	2,704	0,029	1,568	1,503
1200	2,621	0,028	1,581	1,504
1250	2,622	0,028	1,581	1,502
1300	2,786	0,030	1,555	1,502
1350	3,124	0,034	1,505	1,501
1400	3,417	0,037	1,466	1,499
1450	3,897	0,042	1,409	1,498
1500	4,616	0,050	1,336	1,497

ISK 153 (Thickness 2 mm)



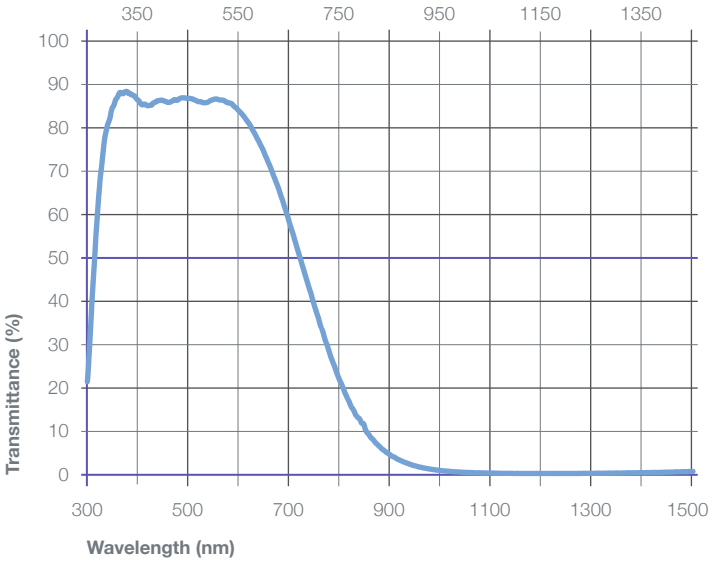
	λ(nm)	T(%)	Ti	OD	Nd
Set Wavelength (nm)	500,00	87,699	0,956	0,057	1,523
Transmittance 50 %	311,64	50,000	0,549	0,301	1,548
Transmittance 50 %	732,29	50,000	0,544	0,301	1,512
d-line	587,56	86,191	0,938	0,065	1,518
e-line	546,07	87,226	0,950	0,059	1,519



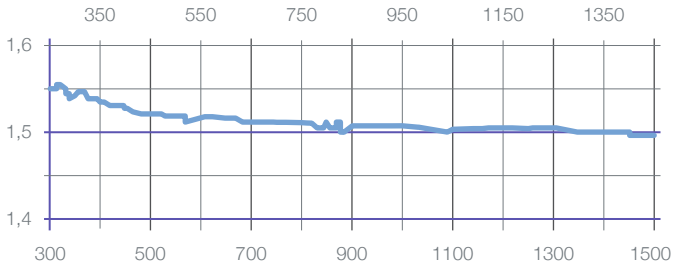
Wavelength	T(%)	Ti	OD	Nd
300	27,656	0,304	0,558	1,550
310	47,091	0,519	0,327	1,556
320	64,591	0,711	0,190	1,557
330	75,935	0,833	0,120	1,547
340	82,197	0,902	0,085	1,548
350	86,109	0,943	0,065	1,542
360	87,745	0,961	0,057	1,543
370	88,877	0,974	0,051	1,543
380	88,692	0,971	0,052	1,542
390	88,390	0,967	0,054	1,538
400	87,356	0,956	0,059	1,538
410	86,468	0,945	0,063	1,533
420	85,902	0,940	0,066	1,536
430	86,429	0,944	0,063	1,530
440	86,956	0,949	0,061	1,529
450	87,188	0,952	0,060	1,529
460	86,665	0,946	0,062	1,527
470	87,149	0,951	0,060	1,526
480	87,509	0,954	0,058	1,524
490	87,714	0,956	0,057	1,524
500	87,699	0,956	0,057	1,523
510	87,343	0,952	0,059	1,522
520	86,973	0,948	0,061	1,522
530	86,669	0,944	0,062	1,520
540	86,867	0,946	0,061	1,519
550	87,285	0,950	0,059	1,519
560	87,291	0,950	0,059	1,519
570	87,105	0,948	0,060	1,518
580	86,658	0,943	0,062	1,517
590	86,006	0,936	0,065	1,518
600	85,002	0,925	0,071	1,517
610	83,909	0,913	0,076	1,516
620	82,301	0,895	0,085	1,516

Wavelength	T(%)	Ti	OD	Nd
630	80,572	0,877	0,094	1,516
640	78,613	0,855	0,105	1,515
650	76,410	0,831	0,117	1,514
660	73,880	0,804	0,131	1,514
670	71,267	0,775	0,147	1,514
680	68,486	0,745	0,164	1,513
690	65,189	0,709	0,186	1,512
700	61,646	0,671	0,210	1,512
710	58,083	0,632	0,236	1,512
720	54,546	0,593	0,263	1,512
730	50,827	0,553	0,294	1,512
740	47,179	0,513	0,326	1,511
750	43,432	0,473	0,362	1,512
760	39,773	0,433	0,400	1,512
770	36,142	0,393	0,442	1,511
780	32,508	0,354	0,488	1,511
790	29,237	0,318	0,534	1,512
800	26,117	0,284	0,583	1,510
850	13,874	0,151	0,858	1,510
900	6,275	0,068	1,202	1,512
950	2,861	0,031	1,544	1,509
1000	1,491	0,016	1,826	1,507
1050	0,906	0,010	2,043	1,506
1100	0,648	0,007	2,189	1,505
1150	0,518	0,006	2,285	1,505
1200	0,535	0,006	2,272	1,505
1250	0,547	0,006	2,262	1,502
1300	0,585	0,006	2,233	1,502
1350	0,666	0,007	2,177	1,501
1400	0,802	0,009	2,096	1,501
1450	0,973	0,011	2,012	1,499
1500	1,253	0,014	1,902	1,497

ISK 157 (Thickness 2 mm)



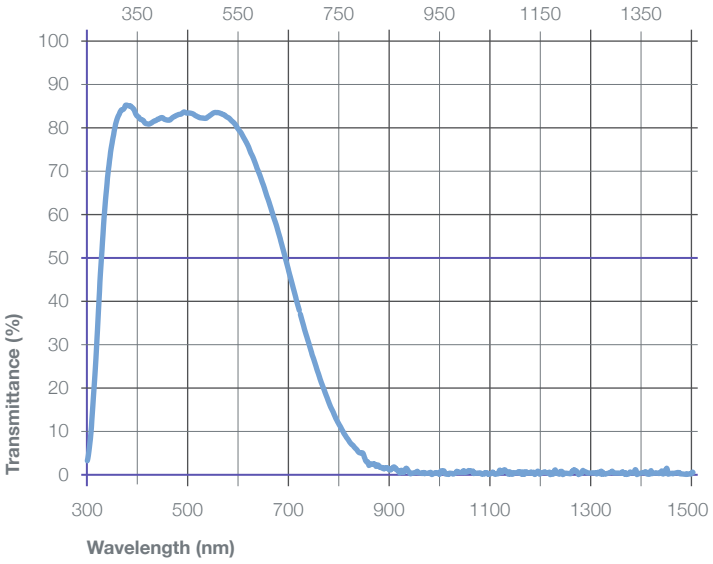
	λ(nm)	T(%)	Ti	OD	Nd
Set Wavelength (nm)	500,00	87,035	0,949	0,060	1,523
Transmittance 50 %	314,46	50,000	0,550	0,301	1,551
Transmittance 50 %	722,02	50,000	0,544	0,301	1,512
d-line	587,56	85,597	0,932	0,068	1,517
e-line	546,07	86,612	0,943	0,062	1,519



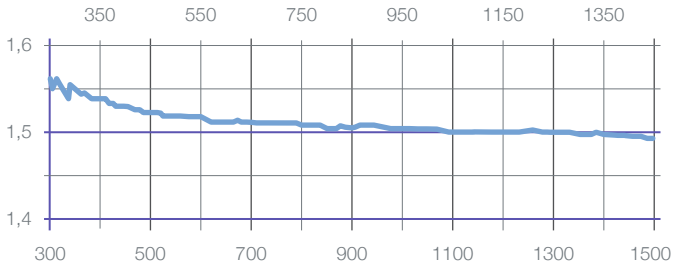
Wavelength	T(%)	Ti	OD	Nd
300	21,521	0,237	0,667	1,555
310	41,575	0,457	0,381	1,553
320	60,490	0,666	0,218	1,559
330	73,285	0,804	0,135	1,547
340	80,909	0,887	0,092	1,544
350	84,987	0,931	0,071	1,542
360	87,413	0,958	0,058	1,544
370	88,188	0,966	0,055	1,544
380	88,434	0,968	0,053	1,541
390	87,834	0,961	0,056	1,539
400	86,669	0,948	0,062	1,537
410	85,614	0,936	0,067	1,533
420	85,351	0,932	0,069	1,531
430	85,934	0,939	0,066	1,531
440	86,550	0,945	0,063	1,531
450	86,513	0,944	0,063	1,528
460	86,110	0,939	0,065	1,526
470	86,588	0,945	0,063	1,526
480	86,759	0,946	0,062	1,525
490	87,173	0,951	0,060	1,525
500	87,035	0,949	0,060	1,523
510	86,825	0,946	0,061	1,521
520	86,283	0,940	0,064	1,521
530	86,028	0,937	0,065	1,520
540	86,250	0,939	0,064	1,520
550	86,808	0,945	0,061	1,519
560	86,735	0,944	0,062	1,518
570	86,591	0,942	0,063	1,517
580	86,014	0,936	0,065	1,517
590	85,273	0,928	0,069	1,517
600	84,156	0,916	0,075	1,516
610	82,916	0,902	0,081	1,516
620	81,266	0,884	0,090	1,515

Wavelength	T(%)	Ti	OD	Nd
630	79,220	0,862	0,101	1,514
640	77,033	0,838	0,113	1,514
650	74,573	0,811	0,127	1,514
660	71,857	0,782	0,144	1,514
670	68,907	0,750	0,162	1,514
680	65,755	0,715	0,182	1,513
690	62,241	0,677	0,206	1,512
700	58,481	0,636	0,233	1,512
710	54,652	0,595	0,262	1,513
720	50,757	0,552	0,295	1,512
730	46,874	0,510	0,329	1,511
740	42,948	0,467	0,367	1,511
750	39,070	0,425	0,408	1,511
760	35,265	0,384	0,453	1,511
770	31,645	0,344	0,500	1,512
780	28,177	0,307	0,550	1,512
790	24,965	0,272	0,603	1,511
800	21,865	0,238	0,660	1,512
850	10,774	0,117	0,968	1,507
900	4,618	0,050	1,336	1,508
950	2,056	0,022	1,687	1,509
1000	0,976	0,011	2,010	1,507
1050	0,552	0,006	2,258	1,506
1100	0,390	0,004	2,409	1,505
1150	0,321	0,003	2,493	1,504
1200	0,296	0,003	2,528	1,504
1250	0,301	0,003	2,521	1,504
1300	0,335	0,004	2,474	1,501
1350	0,413	0,004	2,385	1,501
1400	0,482	0,005	2,317	1,499
1450	0,611	0,007	2,214	1,497
1500	0,779	0,008	2,108	1,495

ISK 167 (Thickness 2 mm)



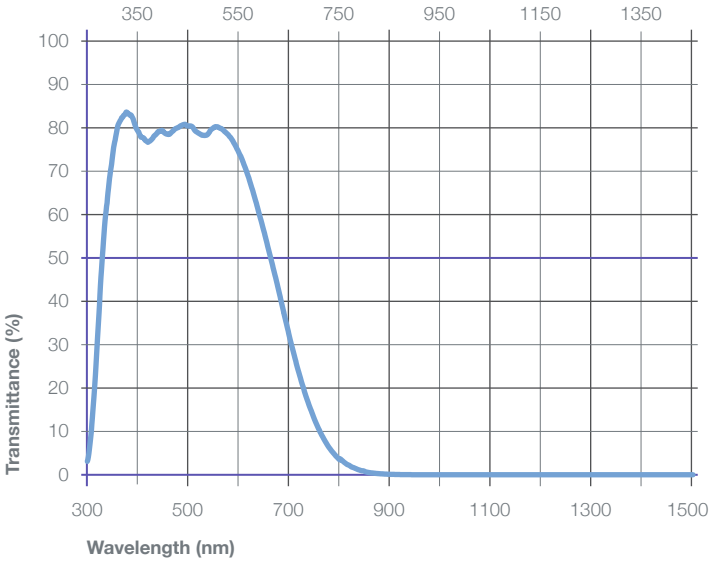
	λ(nm)	T(%)	Ti	OD	Nd
Set Wavelength (nm)	500,00	83,668	0,912	0,077	1,522
Transmittance 50 %	327,91	50,000	0,550	0,301	1,550
Transmittance 50 %	692,55	50,000	0,544	0,301	1,510
d-line	587,56	81,676	0,889	0,088	1,515
e-line	546,07	83,357	0,908	0,079	1,519



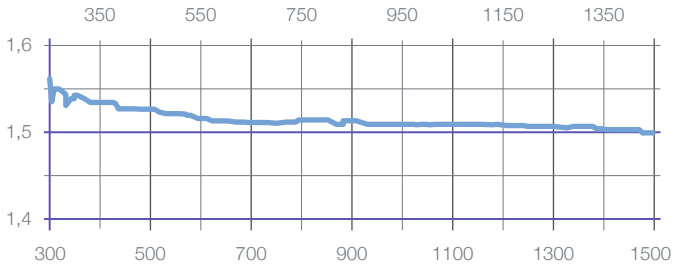
Wavelength	T(%)	Ti	OD	Nd
300	3,235	0,036	1,490	1,555
310	14,303	0,157	0,845	1,552
320	33,467	0,369	0,475	1,557
330	53,833	0,592	0,269	1,555
340	68,650	0,755	0,163	1,554
350	77,463	0,851	0,111	1,550
360	82,602	0,906	0,083	1,548
370	84,437	0,925	0,073	1,543
380	85,388	0,935	0,069	1,541
390	84,842	0,929	0,071	1,539
400	82,840	0,907	0,082	1,537
410	81,979	0,897	0,086	1,537
420	81,130	0,887	0,091	1,534
430	81,631	0,892	0,088	1,532
440	82,275	0,899	0,085	1,530
450	82,512	0,901	0,083	1,528
460	82,030	0,895	0,086	1,527
470	82,707	0,902	0,082	1,525
480	83,302	0,908	0,079	1,524
490	83,810	0,914	0,077	1,524
500	83,668	0,912	0,077	1,522
510	83,416	0,909	0,079	1,522
520	82,717	0,901	0,082	1,520
530	82,468	0,898	0,084	1,520
540	82,848	0,902	0,082	1,519
550	83,679	0,911	0,077	1,518
560	83,729	0,911	0,077	1,517
570	83,243	0,906	0,080	1,517
580	82,542	0,898	0,083	1,516
590	81,445	0,886	0,089	1,515
600	79,752	0,868	0,098	1,515
610	77,920	0,848	0,108	1,514
620	75,623	0,823	0,121	1,514

Wavelength	T(%)	Ti	OD	Nd
630	72,867	0,793	0,137	1,513
640	69,823	0,760	0,156	1,513
650	66,535	0,724	0,177	1,512
660	63,039	0,686	0,200	1,512
670	59,295	0,645	0,227	1,512
680	55,438	0,603	0,256	1,511
690	51,162	0,556	0,291	1,511
700	46,706	0,508	0,331	1,510
710	42,265	0,460	0,374	1,509
720	37,998	0,413	0,420	1,509
730	33,780	0,367	0,471	1,509
740	29,891	0,325	0,524	1,508
750	26,207	0,285	0,582	1,509
760	22,551	0,245	0,647	1,508
770	19,371	0,211	0,713	1,509
780	16,287	0,177	0,788	1,508
790	13,657	0,148	0,865	1,508
800	11,385	0,124	0,944	1,508
850	3,738	0,041	1,427	1,505
900	1,173	0,013	1,931	1,507
950	0,547	0,006	2,262	1,504
1000	0,766	0,008	2,116	1,505
1050	0,583	0,006	2,234	1,503
1100	0,291	0,003	2,536	1,503
1150	0,429	0,005	2,368	1,503
1200	0,397	0,004	2,401	1,502
1250	0,340	0,004	2,468	1,500
1300	0,429	0,005	2,368	1,499
1350	0,397	0,004	2,401	1,498
1400	0,470	0,005	2,328	1,498
1450	0,661	0,007	2,179	1,495
1500	0,547	0,006	2,262	1,494

ISK 171 (Thickness 2 mm)



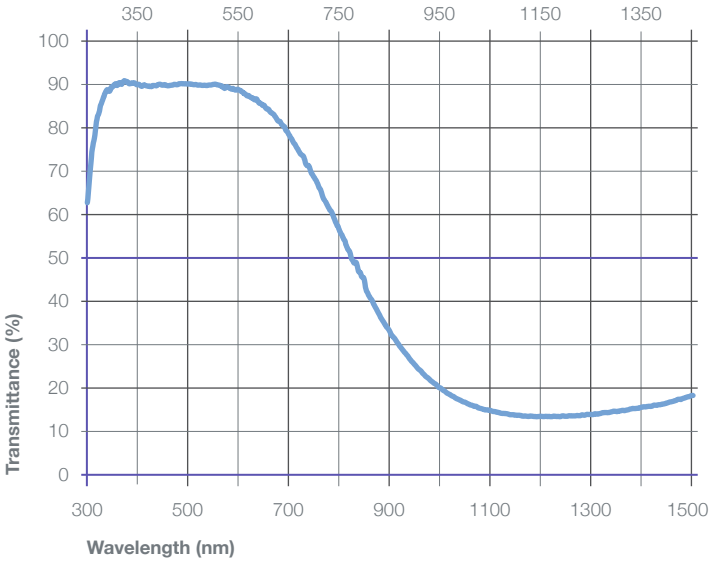
	λ(nm)	T(%)	Ti	OD	Nd
Set Wavelength (nm)	500,00	80,646	0,879	0,093	1,522
Transmittance 50 %	329,56	50,000	0,548	0,301	1,539
Transmittance 50 %	663,49	50,000	0,544	0,301	1,515
d-line	587,56	77,318	0,842	0,112	1,517
e-line	546,07	79,914	0,870	0,097	1,519



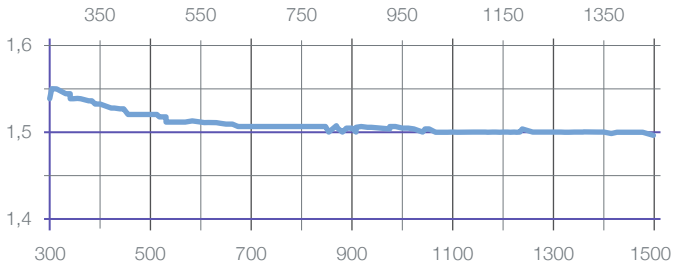
Wavelength	T(%)	Ti	OD	Nd
300	3,085	0,034	1,511	1,563
310	13,116	0,144	0,882	1,547
320	31,437	0,345	0,503	1,546
330	50,744	0,556	0,295	1,538
340	64,004	0,702	0,194	1,544
350	73,823	0,808	0,132	1,537
360	80,520	0,881	0,094	1,535
370	82,736	0,906	0,082	1,541
380	83,617	0,916	0,078	1,541
390	82,479	0,901	0,084	1,532
400	79,465	0,868	0,100	1,531
410	77,967	0,853	0,108	1,534
420	76,894	0,840	0,114	1,531
430	77,930	0,851	0,108	1,530
440	79,304	0,866	0,101	1,528
450	79,505	0,868	0,100	1,526
460	78,702	0,859	0,104	1,526
470	79,573	0,868	0,099	1,524
480	80,322	0,876	0,095	1,524
490	80,976	0,883	0,092	1,522
500	80,646	0,879	0,093	1,522
510	80,171	0,874	0,096	1,522
520	79,029	0,861	0,102	1,521
530	78,526	0,856	0,105	1,520
540	78,953	0,860	0,103	1,520
550	80,262	0,874	0,095	1,519
560	80,372	0,875	0,095	1,519
570	79,607	0,867	0,099	1,519
580	78,507	0,855	0,105	1,517
590	76,816	0,836	0,115	1,517
600	74,531	0,811	0,128	1,517
610	71,857	0,782	0,144	1,516
620	68,569	0,747	0,164	1,516

Wavelength	T(%)	Ti	OD	Nd
630	64,734	0,705	0,189	1,516
640	60,544	0,659	0,218	1,516
650	56,201	0,612	0,250	1,515
660	51,612	0,562	0,287	1,515
670	47,030	0,512	0,328	1,515
680	42,134	0,459	0,375	1,515
690	37,147	0,404	0,430	1,514
700	32,178	0,350	0,492	1,513
710	27,551	0,300	0,560	1,513
720	23,272	0,253	0,633	1,513
730	19,337	0,211	0,714	1,512
740	15,842	0,173	0,800	1,513
750	12,821	0,140	0,892	1,512
760	10,203	0,111	0,991	1,512
770	7,991	0,087	1,097	1,512
780	6,137	0,067	1,212	1,512
790	4,670	0,051	1,331	1,513
800	3,443	0,037	1,463	1,512
850	0,757	0,008	2,121	1,512
900	0,112	0,001	2,950	1,512
950	0,017	0,000	3,772	1,511
1000	0,003	0,000	4,499	1,509
1050	0,001	0,000	5,094	1,510
1100	0,000	0,000	5,473	1,509
1150	0,000	0,000	5,656	1,509
1200	0,000	0,000	5,755	1,507
1250	0,000	0,000	5,693	1,508
1300	0,000	0,000	5,671	1,507
1350	0,000	0,000	5,590	1,506
1400	0,000	0,000	5,348	1,504
1450	0,001	0,000	5,150	1,502
1500	0,001	0,000	4,880	1,502

ISK 370 (Thickness 2 mm)



	λ(nm)	T(%)	Ti	OD	Nd
Set Wavelength (nm)	500,00	90,390	0,984	0,044	1,519
Transmittance 50 %	-	-	-	-	-
Transmittance 50 %	823,49	50,000	0,543	0,301	1,508
d-line	587,56	89,316	0,971	0,049	1,513
e-line	546,07	90,162	0,981	0,045	1,519



Wavelength	T(%)	Ti	OD	Nd
300	62,911	0,689	0,201	1,537
310	75,405	0,828	0,123	1,548
320	82,874	0,911	0,082	1,556
330	86,596	0,948	0,063	1,540
340	89,045	0,975	0,050	1,539
350	89,709	0,983	0,047	1,543
360	90,139	0,986	0,045	1,537
370	90,733	0,993	0,042	1,539
380	90,772	0,993	0,042	1,536
390	90,656	0,991	0,043	1,534
400	90,301	0,987	0,044	1,533
410	90,014	0,983	0,046	1,530
420	89,917	0,982	0,046	1,530
430	90,052	0,982	0,046	1,526
440	90,261	0,984	0,045	1,526
450	90,115	0,982	0,045	1,524
460	89,972	0,981	0,046	1,523
470	90,182	0,983	0,045	1,522
480	90,319	0,984	0,044	1,521
490	90,440	0,985	0,044	1,520
500	90,390	0,984	0,044	1,519
510	90,224	0,982	0,045	1,518
520	90,101	0,981	0,045	1,517
530	90,052	0,980	0,046	1,517
540	90,126	0,981	0,045	1,516
550	90,302	0,982	0,044	1,515
560	90,137	0,980	0,045	1,515
570	89,604	0,974	0,048	1,515
580	89,548	0,974	0,048	1,514
590	89,218	0,970	0,050	1,513
600	89,003	0,968	0,051	1,513
610	88,196	0,959	0,055	1,513
620	87,666	0,953	0,057	1,512

Wavelength	T(%)	Ti	OD	Nd
630	86,822	0,944	0,061	1,511
640	86,026	0,935	0,065	1,511
650	85,453	0,929	0,068	1,511
660	84,375	0,917	0,074	1,511
670	83,267	0,905	0,080	1,511
680	81,758	0,888	0,087	1,511
690	80,579	0,876	0,094	1,510
700	78,564	0,853	0,105	1,509
710	76,579	0,832	0,116	1,509
720	74,669	0,811	0,127	1,509
730	73,045	0,794	0,136	1,509
740	71,133	0,773	0,148	1,508
750	68,705	0,746	0,163	1,508
760	66,271	0,720	0,179	1,508
770	63,490	0,690	0,197	1,509
780	61,343	0,667	0,212	1,508
790	58,986	0,641	0,229	1,509
800	56,331	0,612	0,249	1,508
850	44,200	0,480	0,355	1,503
900	32,924	0,358	0,482	1,505
950	25,308	0,275	0,597	1,505
1000	20,047	0,218	0,698	1,504
1050	16,677	0,181	0,778	1,504
1100	14,795	0,161	0,830	1,502
1150	13,762	0,149	0,861	1,502
1200	13,513	0,147	0,869	1,501
1250	13,531	0,147	0,869	1,500
1300	13,922	0,151	0,856	1,500
1350	14,639	0,159	0,834	1,499
1400	15,684	0,170	0,805	1,497
1450	16,658	0,180	0,778	1,495
1500	18,335	0,199	0,737	1,495

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