photobiologyFilters Version 0.2.3
Catalogue of filters

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1 Introduction

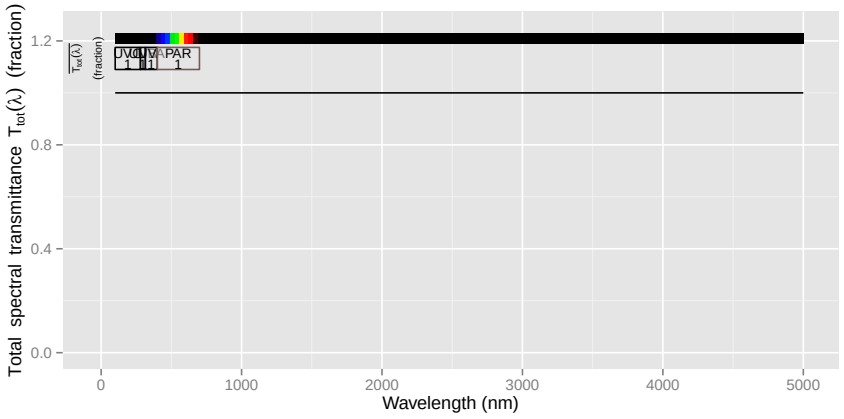
```
library(ggplot2)
library(photobiologyFilters)
library(photobiologygg)
```

```
filter.plotter <- function(filter_name, w.low=280, w.high=1100){
  obj.name <- paste(filter_name, ".spct", sep="")
  spct <- get(obj.name)
  trim_spct(spct, waveband(c(w.low, w.high)), fill=NULL)
  print(plot(spct) + labs(title=obj.name) + theme_bw(10))
}
```

2 Dummy filters

2.1 Perfectly clear filter

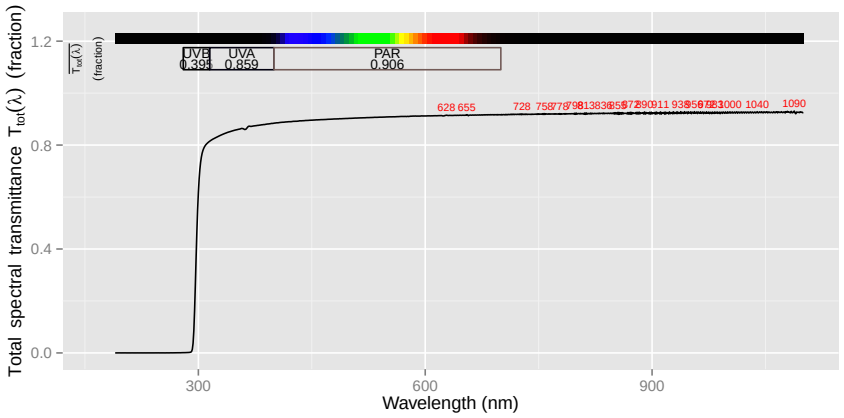
```
plot(clear.spct)
```

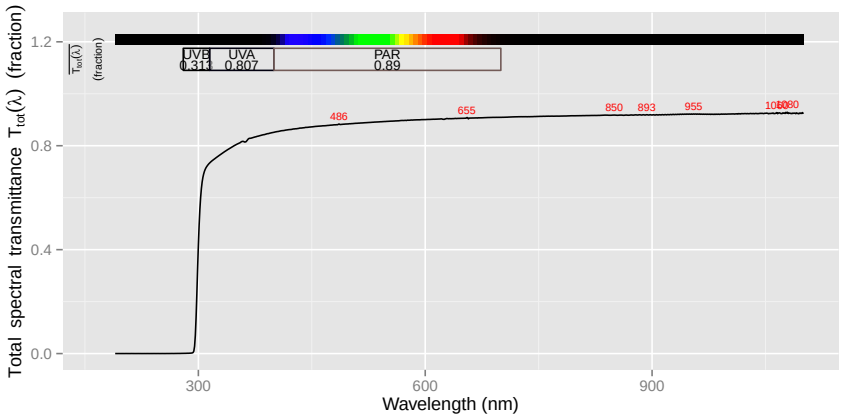


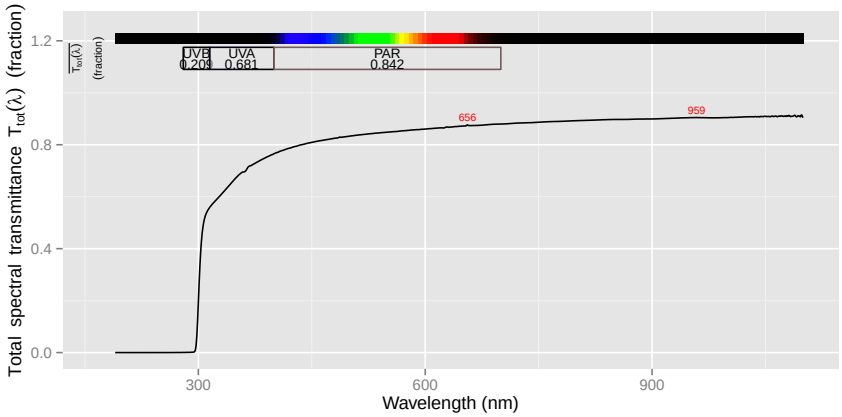
3 Plastic films

3.1 Cellulose diacetate

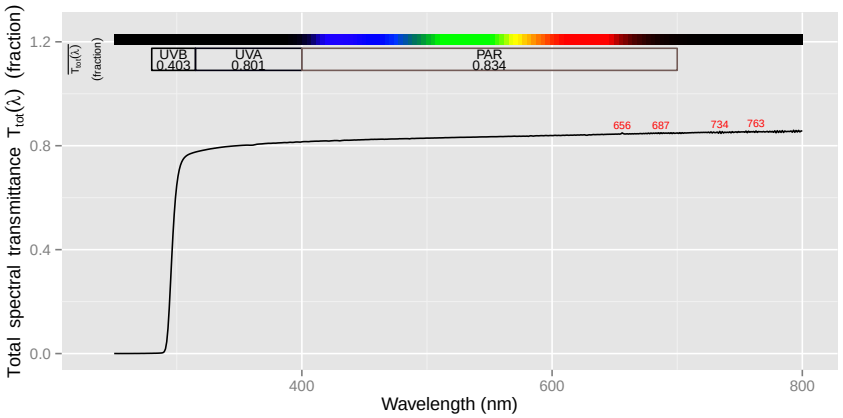
```
plot(acetate.115um.new.spct)
plot(acetate.250um.new.spct)
plot(acetate.480um.new.spct)
```

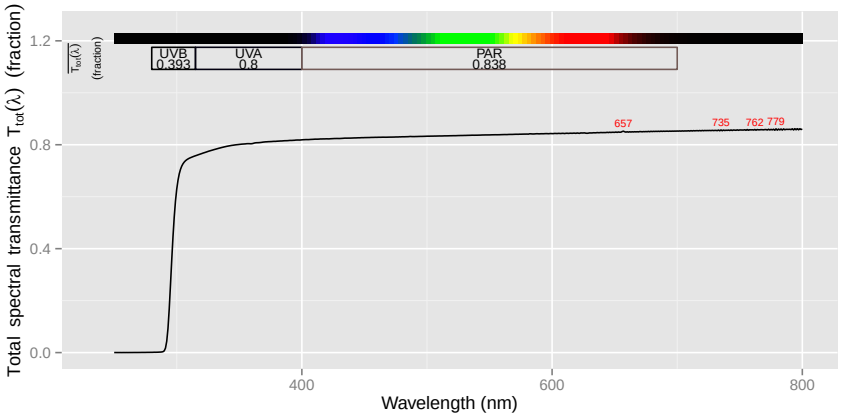


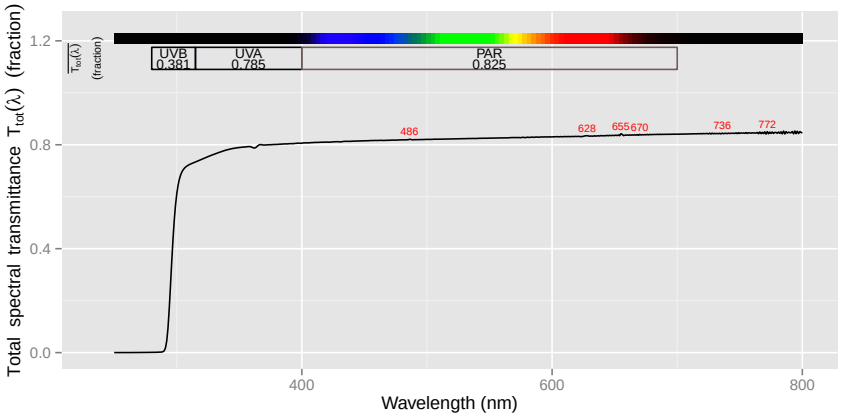


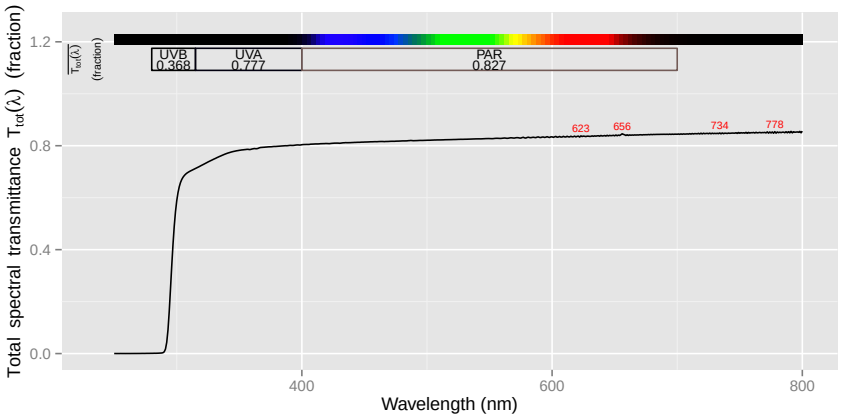


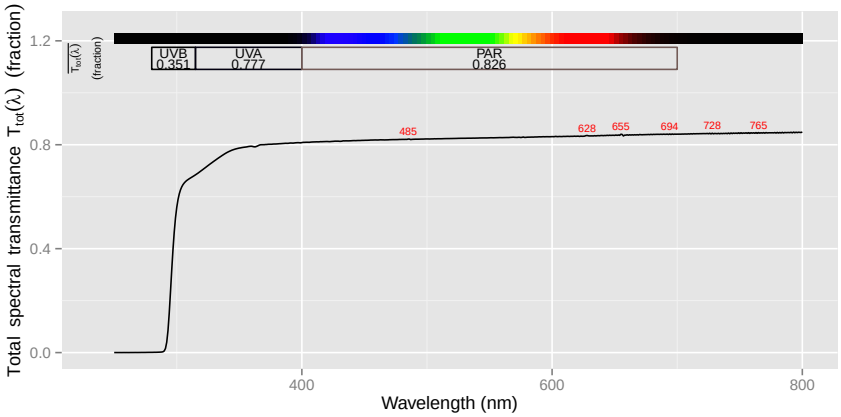

```
plot(acetate.ageing0.spct)
plot(acetate.ageing20.spct)
plot(acetate.ageing30.spct)
plot(acetate.ageing60.spct)
plot(acetate.ageing100.spct)
plot(acetate.ageing180.spct)
plot(acetate.ageing300.spct)
```

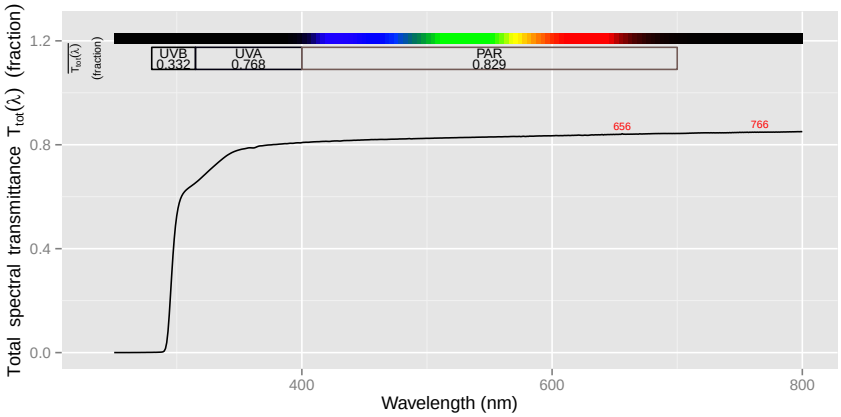

Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
1.2
0.8
0.4
0.0
$\overline{T_{tot}(\lambda)}$ (fraction)
UVB 0.403
UVA 0.801
PAR 0.834
656
687
734
763
400
600
800
Wavelength (nm)

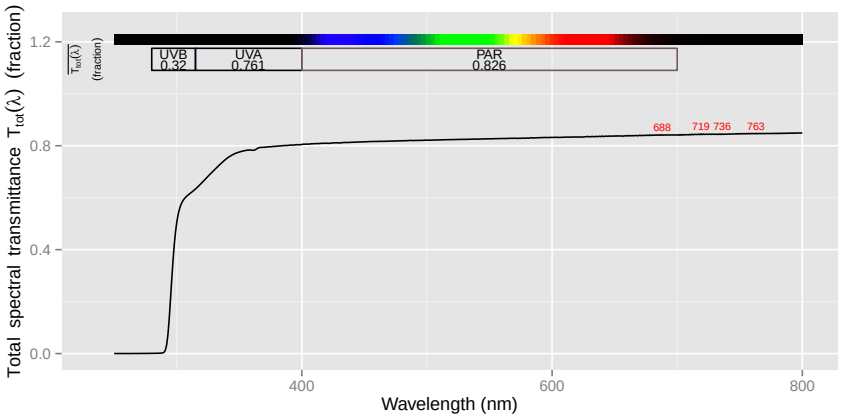

Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
1.2
0.8
0.4
0.0
$\overline{T_{tot}(\lambda)}$ (fraction)
UVB 0.393
UVA 0.8
PAR 0.838
657
735
762
779
400
600
800
Wavelength (nm)


Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
1.2
0.8
0.4
0.0
$\overline{T_{tot}(\lambda)}$ (fraction)
UVB 0.381
UVA 0.785
PAR 0.825
486
628
655
670
736
772
400
600
800
Wavelength (nm)


Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
1.2
0.8
0.4
0.0
$\overline{T_{tot}(\lambda)}$ (fraction)
UVB 0.368
UVA 0.777
PAR 0.827
623
656
734
778
400
600
800
Wavelength (nm)

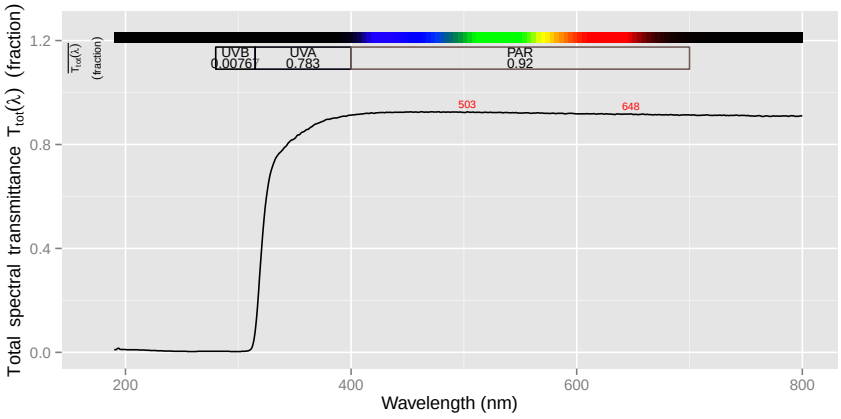

Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
1.2
0.8
0.4
0.0
$\overline{T_{tot}(\lambda)}$ (fraction)
UVB 0.351
UVA 0.777
PAR 0.826
485
628
655
694
728
765
400
600
800
Wavelength (nm)


Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
1.2
0.8
0.4
0.0
$\overline{T_{tot}(\lambda)}$ (fraction)
UVB 0.332
UVA 0.768
PAR 0.829
656
766
400
600
800
Wavelength (nm)



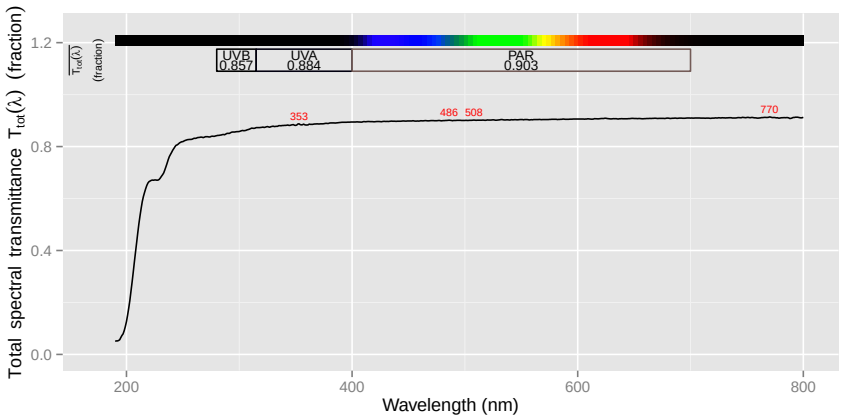
3.2 Polyester

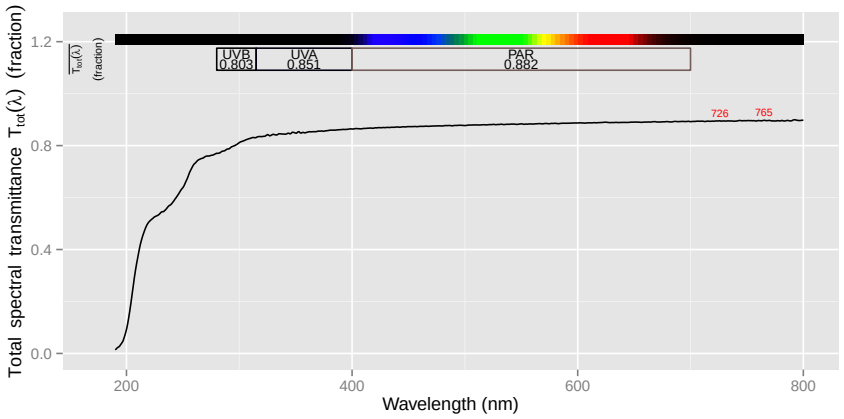
```
plot(polyester.new.spct)
```



3.3 Polythene

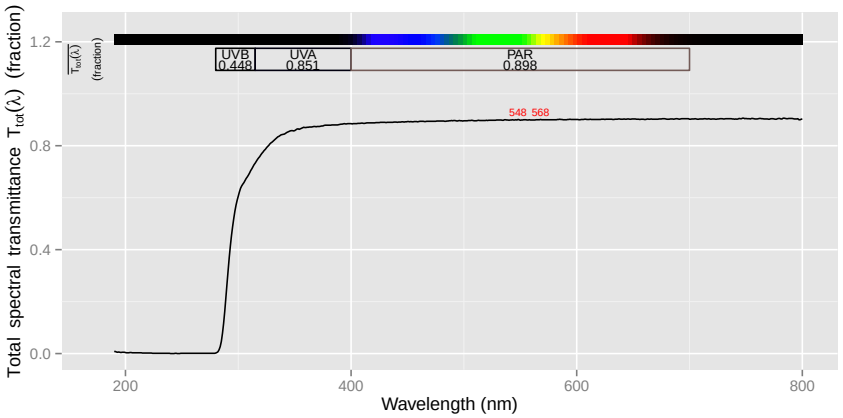
```
plot(polythene.new.spct)
plot(polythene.used.spct)
```

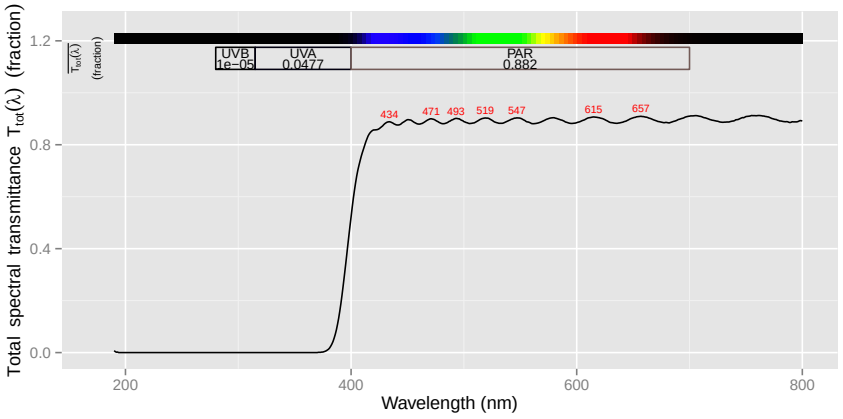


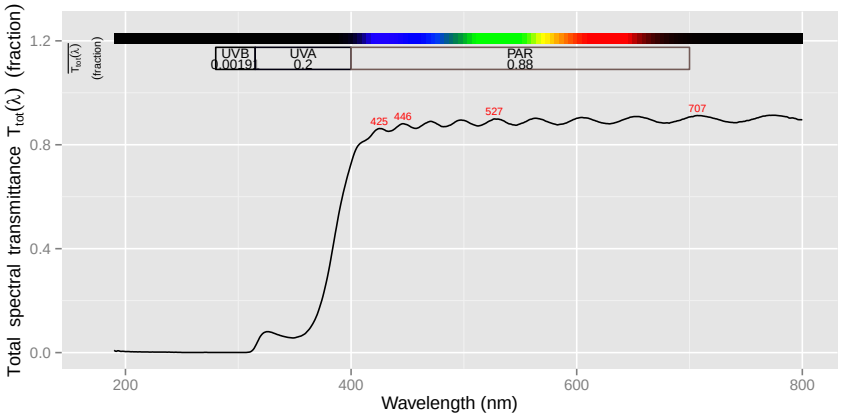


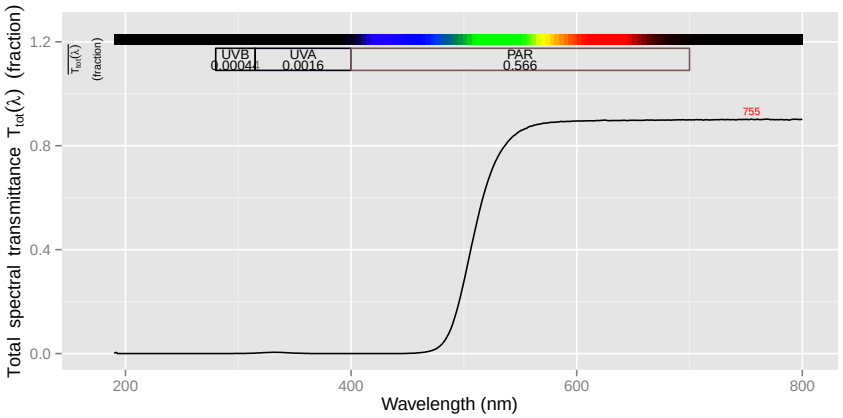
3.4 Rosco theatrical filters

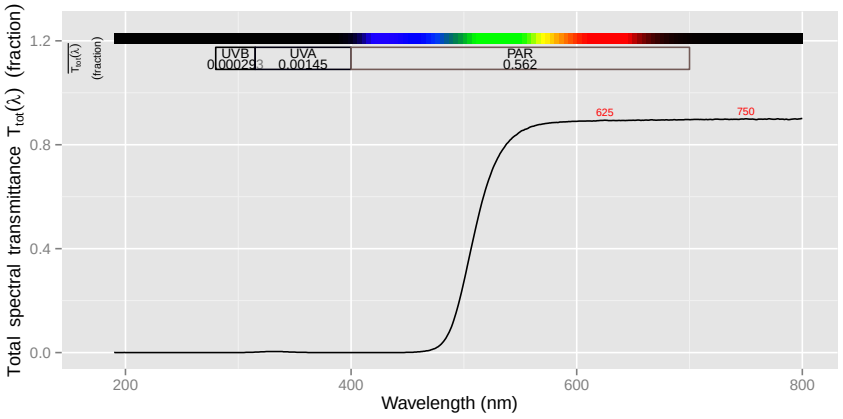
```
plot(clear.00.new.spct)
plot(uv.226.new.spct)
plot(uv.226.used.spct)
plot(canary.yellow.new.spct)
plot(canary.yellow.used.spct)
plot(moss.green.new.spct)
plot(moss.green.used.spct)
plot(rose.pink.new.spct)
plot(neon.pink.used.spct)
```

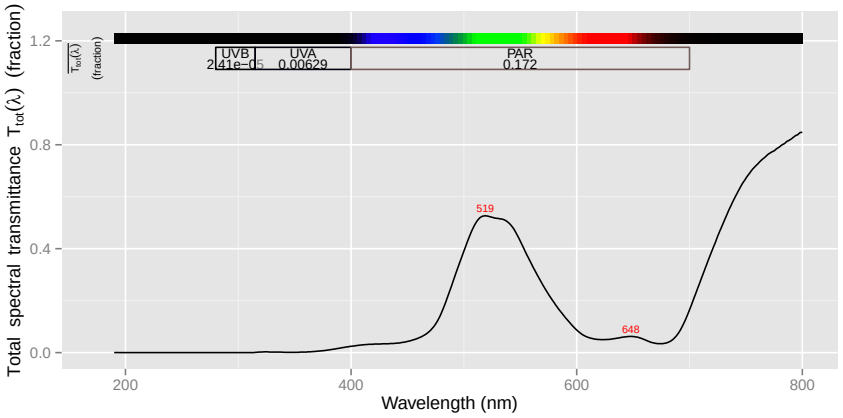

Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
$\overline{T_{tot}(\lambda)}$ (fraction)
UVB 0.448
UVA 0.851
PAR 0.898
548 568
1.2
0.8
0.4
0.0
200
400
600
800
Wavelength (nm)

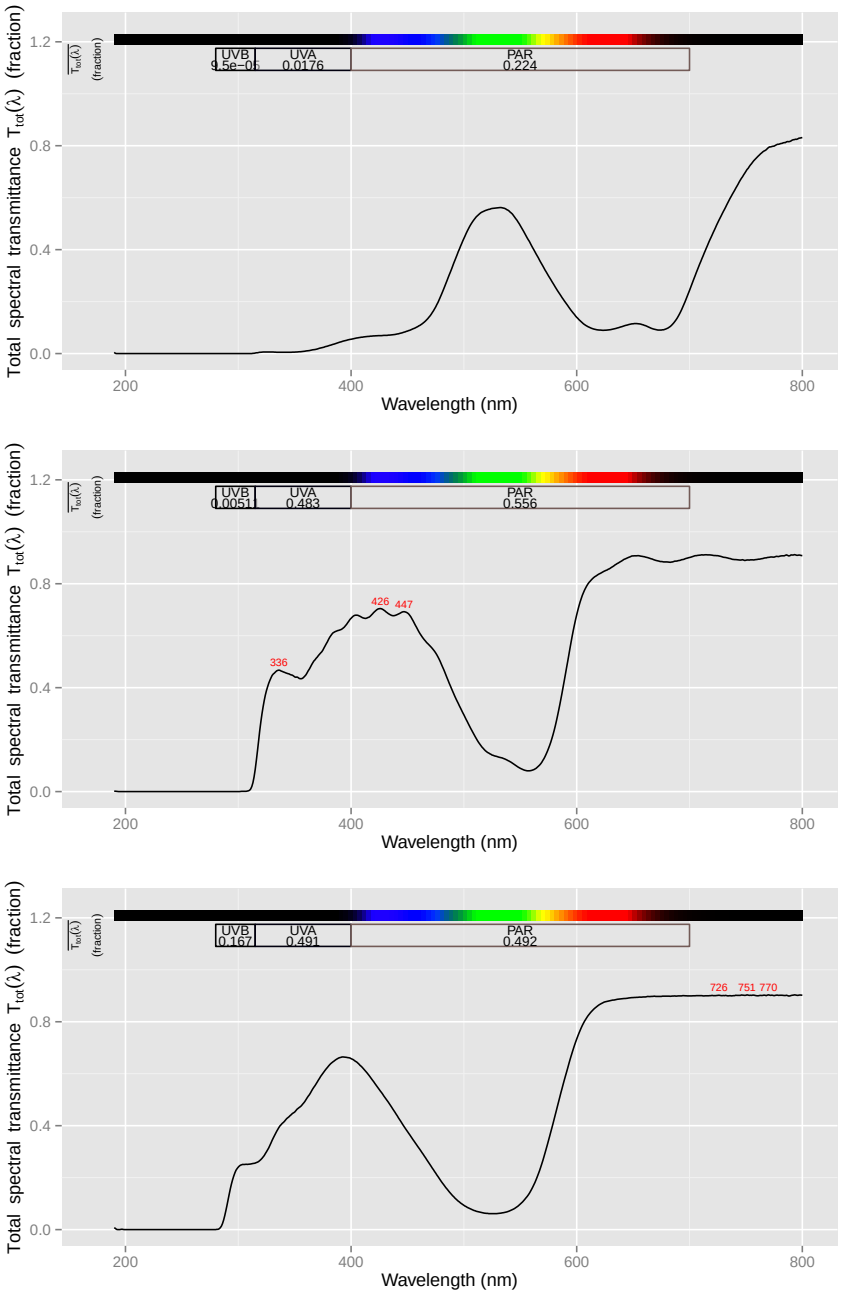

Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
$\overline{T_{tot}(\lambda)}$ (fraction)
UVB 1e−05
UVA 0.0477
PAR 0.882
434 471 493 519 547 615 657
1.2
0.8
0.4
0.0
200
400
600
800
Wavelength (nm)


Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
$\overline{T_{tot}(\lambda)}$ (fraction)
UVB 0.00191
UVA 0.2
PAR 0.88
425 446 527 707
1.2
0.8
0.4
0.0
200
400
600
800
Wavelength (nm)


Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
$\overline{T_{tot}(\lambda)}$ (fraction)
UVB
0.00044
UVA
0.0016
PAR
0.566
755
1.2
0.8
0.4
0.0
200
400
600
800
Wavelength (nm)

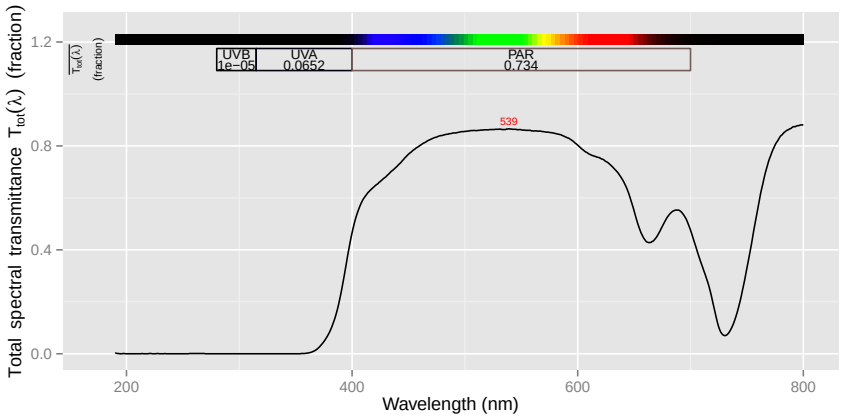

Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
$\overline{T_{tot}(\lambda)}$ (fraction)
UVB
0.00029
UVA
0.00145
PAR
0.562
625
750
1.2
0.8
0.4
0.0
200
400
600
800
Wavelength (nm)

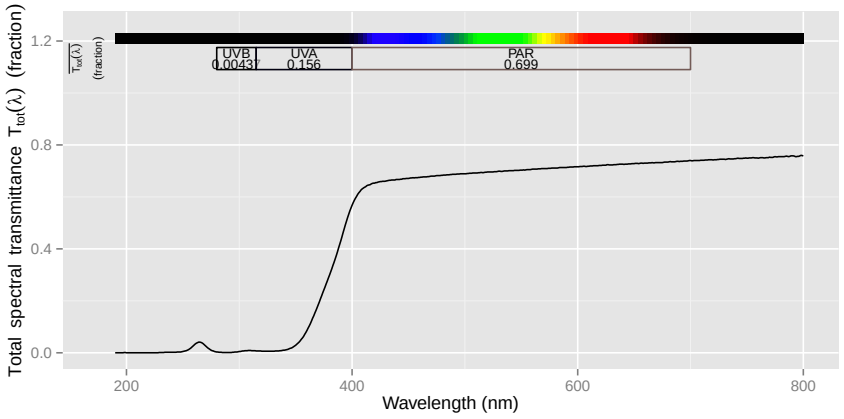

Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
$\overline{T_{tot}(\lambda)}$ (fraction)
UVB
2.41e−05
UVA
0.00629
PAR
0.172
519
648
1.2
0.8
0.4
0.0
200
400
600
800
Wavelength (nm)



3.5 Commercial greenhouse films from BPI Agri Visqueen

```
plot(solatrol.new.spct)
plot(luminance.new.spct)
```

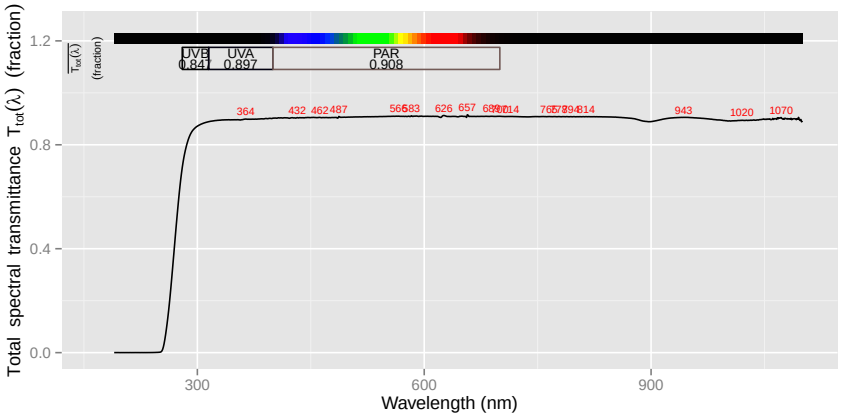


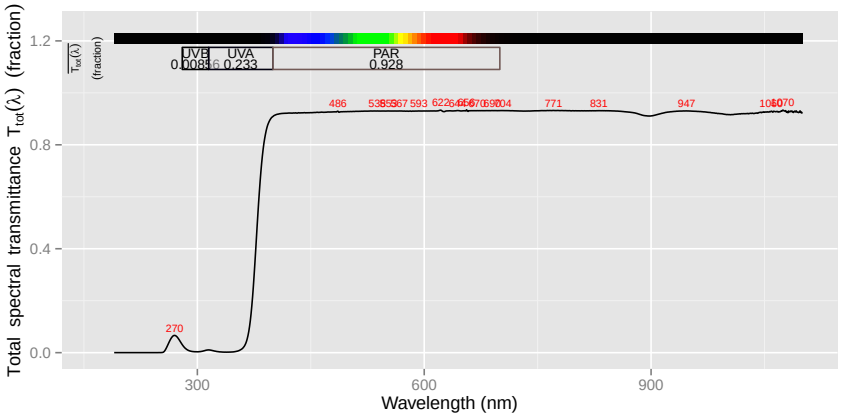


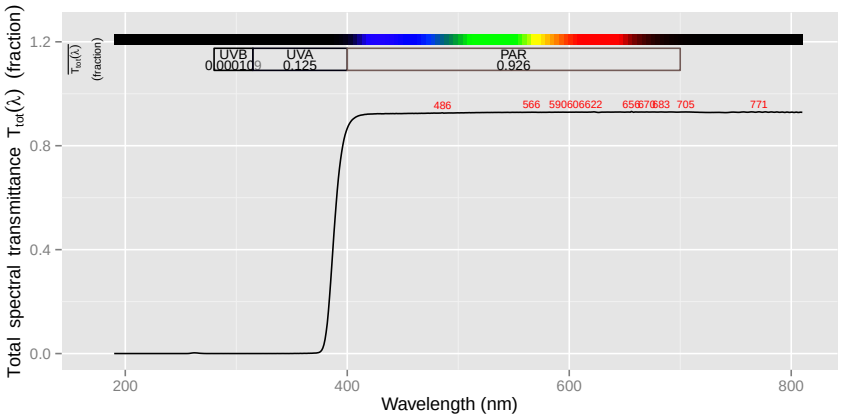
4 Plastic sheets

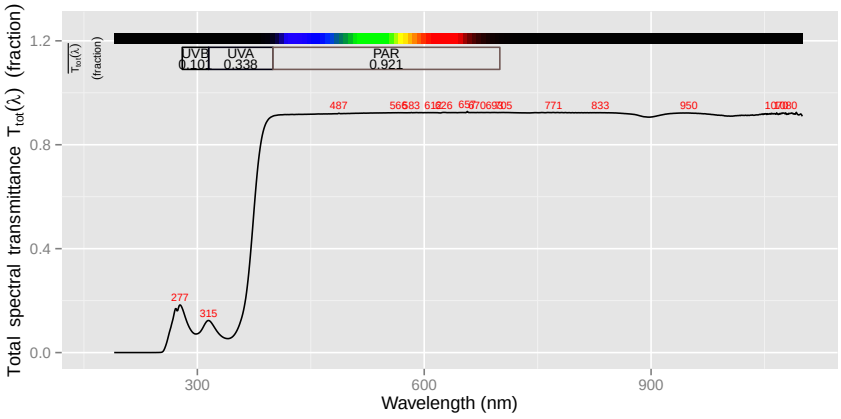
4.1 Plexiglas

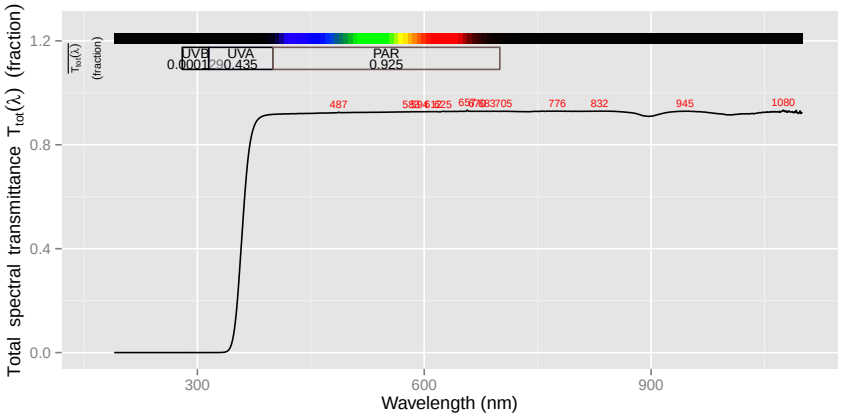
```
plot(PLX2458_GT.spct)
plot(PLX0A000_XT.spct)
plot(PLX0A570_GT.spct)
plot(PLX0F00_GT.spct)
plot(PLX0Z023_GT.spct)
```



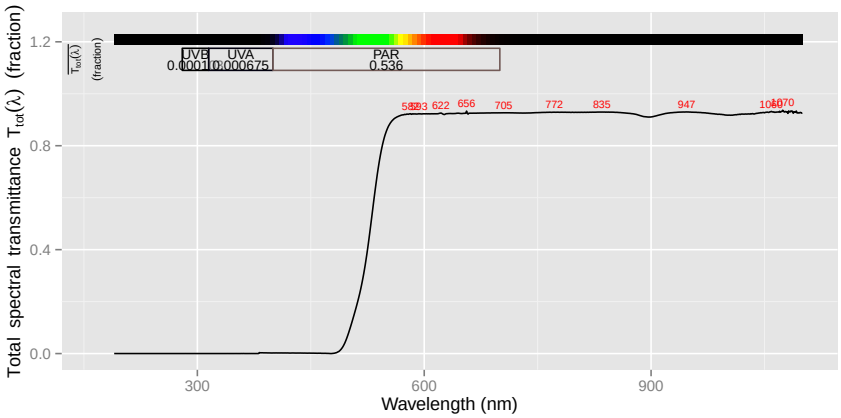




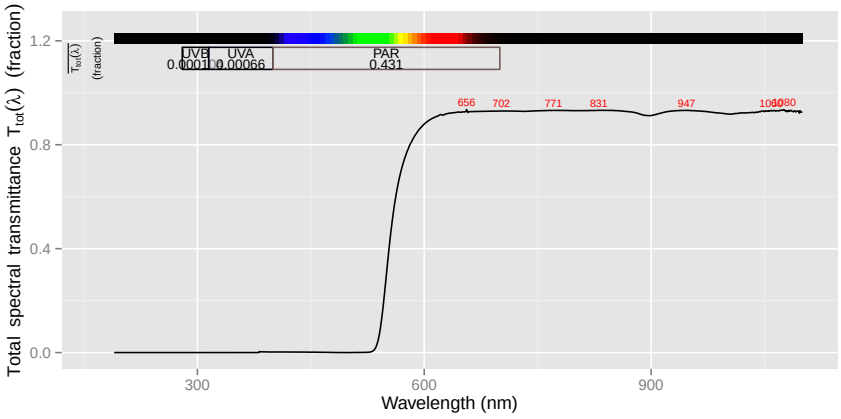




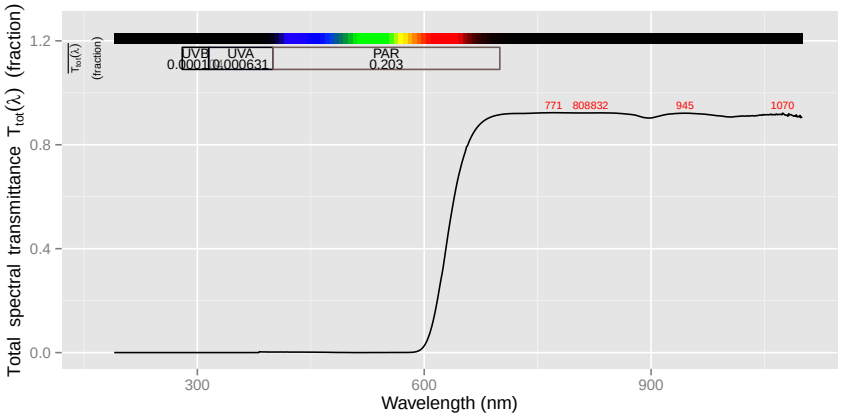

```
plot(PLX1C33_GT.spct)
plot(PLX2C04_GT.spct)
plot(PLX3C01_GT.spct)
plot(PLX5C01_GT.spct)
```



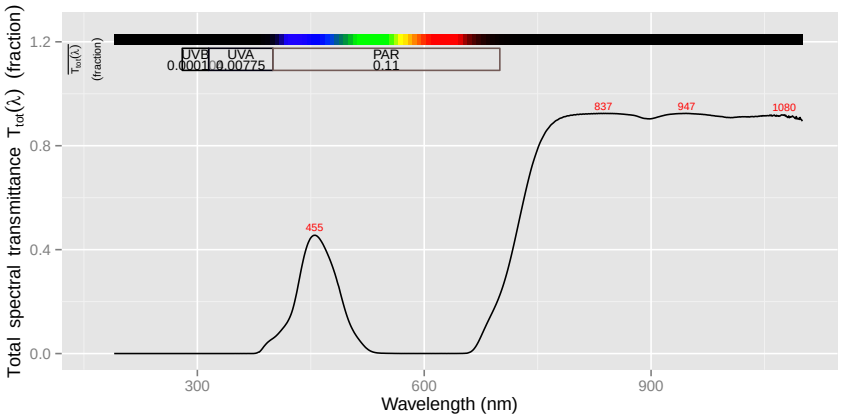
Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
Wavelength (nm)
UVB
UVA
PAR
0.536
622
656
705
772
835
947
1070



Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
Wavelength (nm)
UVB
UVA
PAR
0.431
656
702
771
831
947

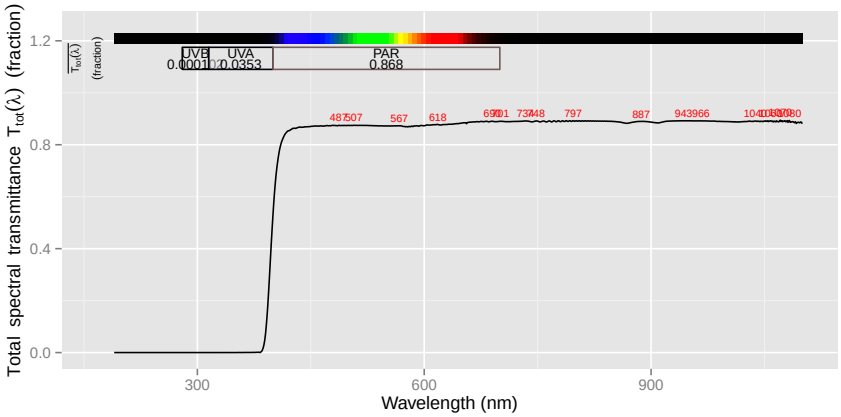


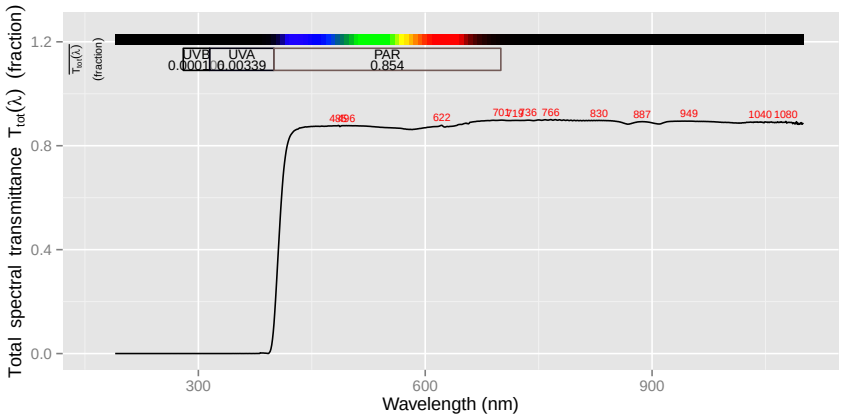
Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
Wavelength (nm)
UVB
UVA
PAR
0.203
771
808832
945
1070



4.2 Polycarbonate

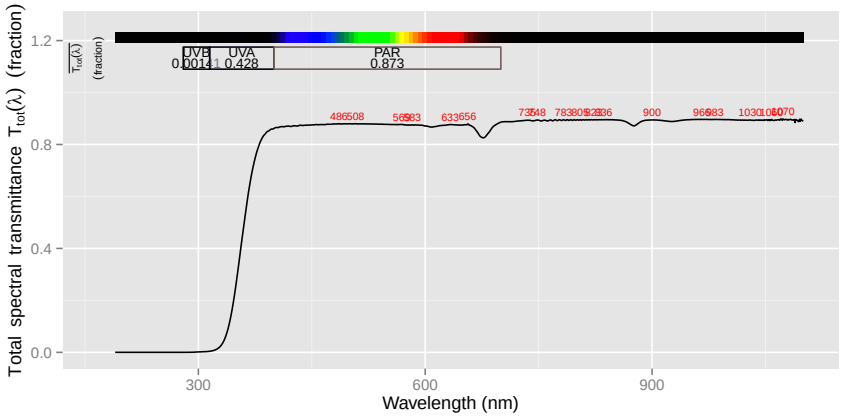
```
plot(PC.spct)
plot(PC_UV.spct)
```





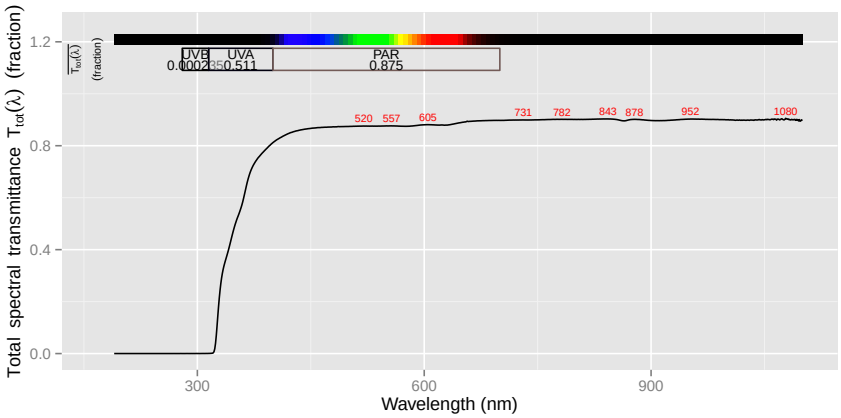
4.3 Polyestyrene

```
plot(PS.spct)
```



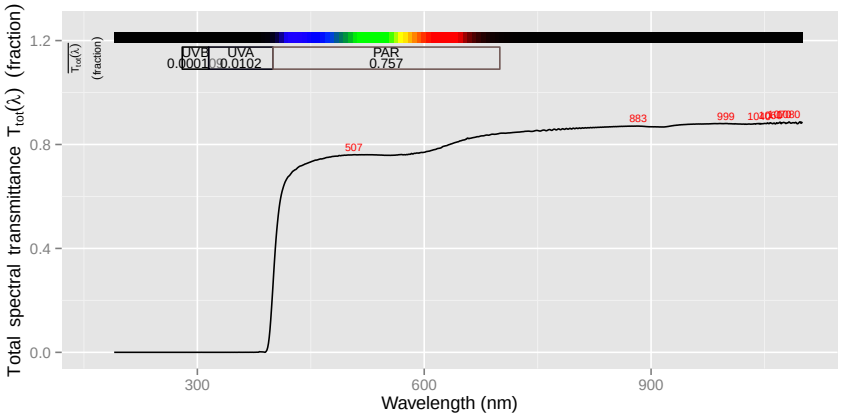
4.4 Polyester

```
plot(Pet_G.spct)
```



4.5 Polyvinilchloride

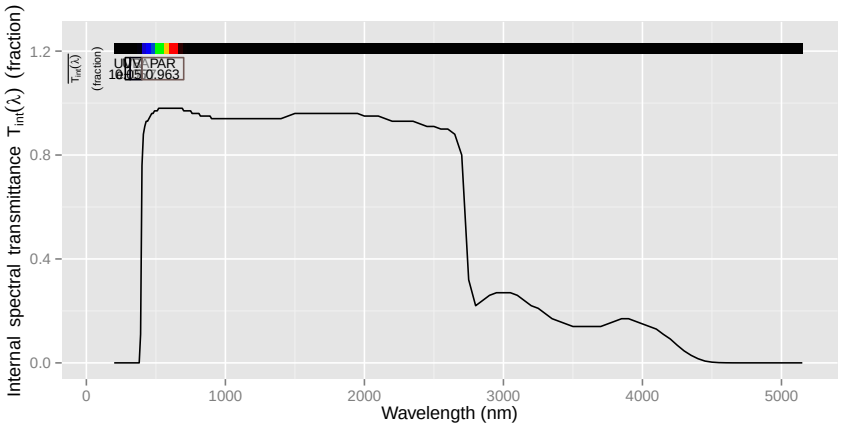
```
plot(PVC.spct)
```

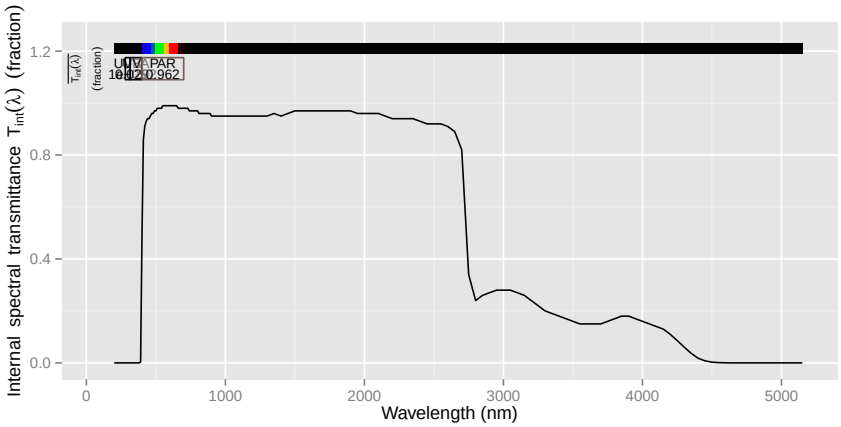


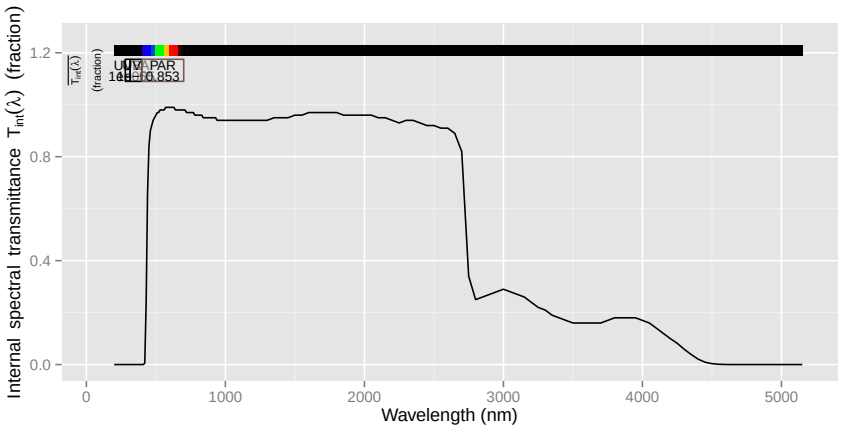
5 Optical glass filters

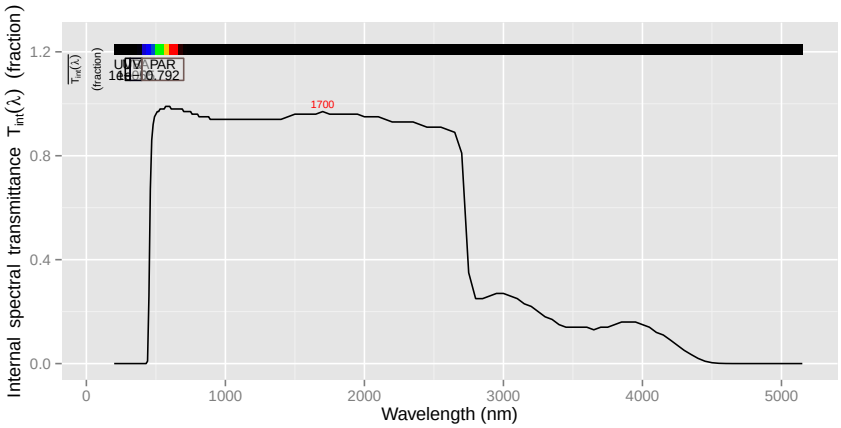
5.1 Schott long-pass filters

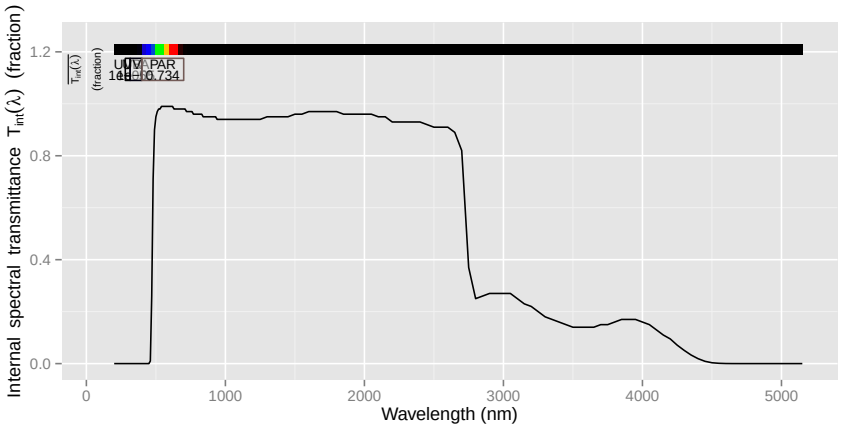
```
plot(gg395.spct)
plot(gg400.spct)
plot(gg435.spct)
plot(gg455.spct)
plot(gg475.spct)
plot(gg495.spct)
```

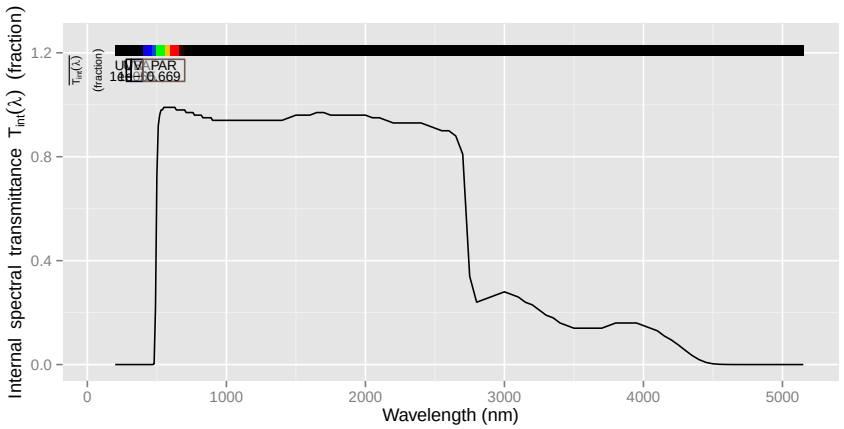




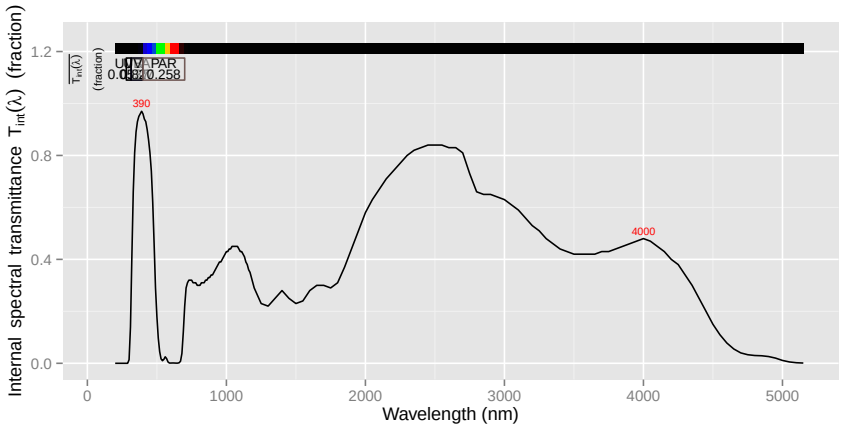

Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
1.2
0.8
0.4
0.0
0
1000
2000
3000
4000
5000
Wavelength (nm)
$\overline{T_{int}(\lambda)}$ (fraction)
UV
PAR
0.853

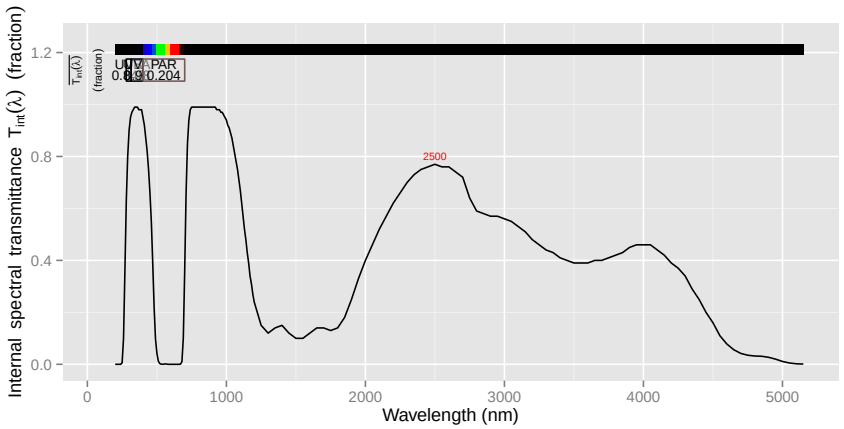

Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
1.2
0.8
0.4
0.0
0
1000
2000
3000
4000
5000
Wavelength (nm)
$\overline{T_{int}(\lambda)}$ (fraction)
UV
PAR
0.792
1700

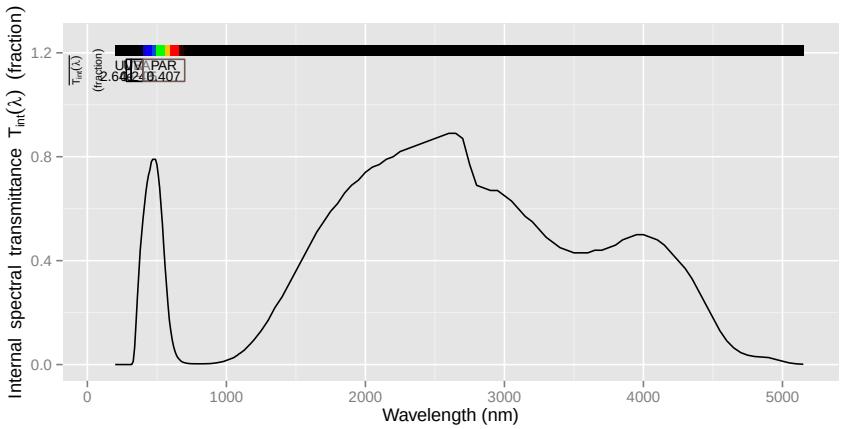

Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
1.2
0.8
0.4
0.0
0
1000
2000
3000
4000
5000
Wavelength (nm)
$\overline{T_{int}(\lambda)}$ (fraction)
UV
PAR
0.734



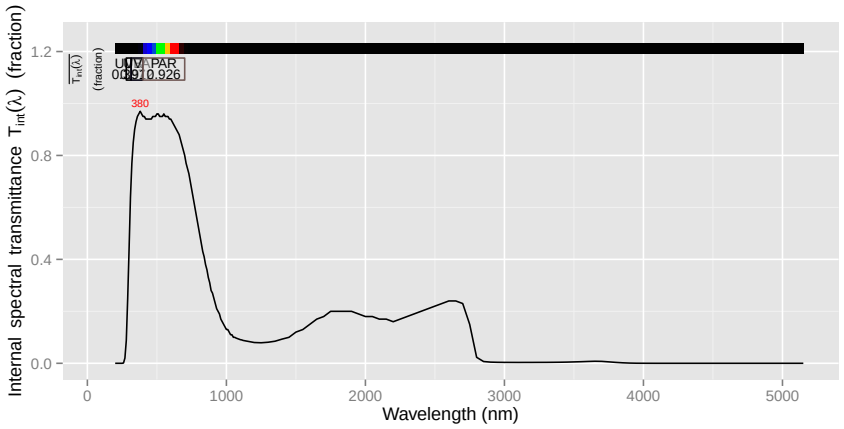

```
plot(bg25.spct)
plot(bg3.spct)
plot(bg7.spct)
```

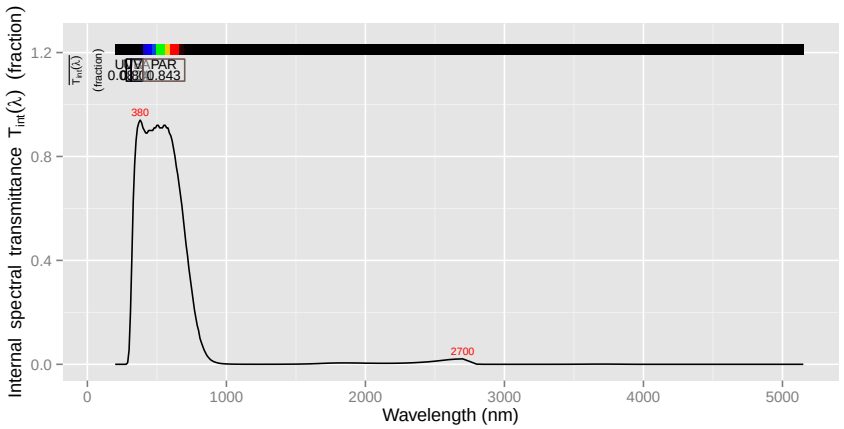


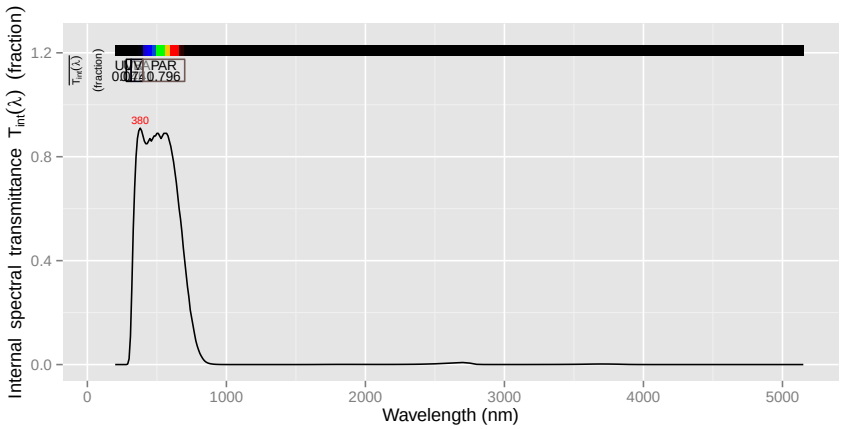




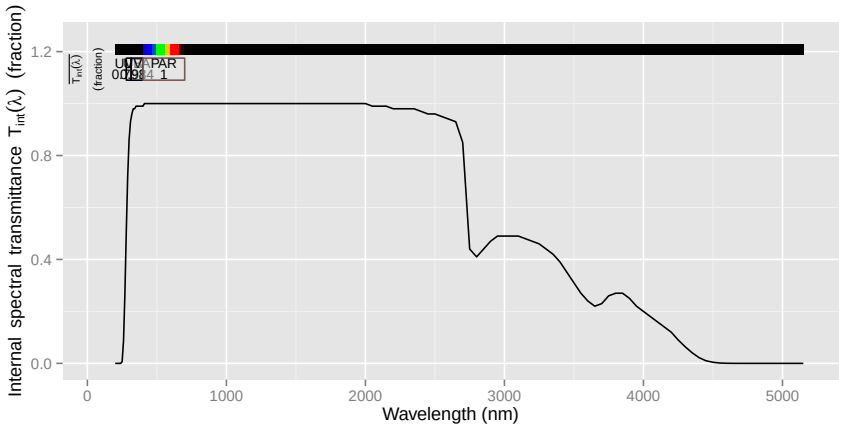

```
plot(kg2.spct)
plot(kg3.spct)
plot(kg5.spct)
```

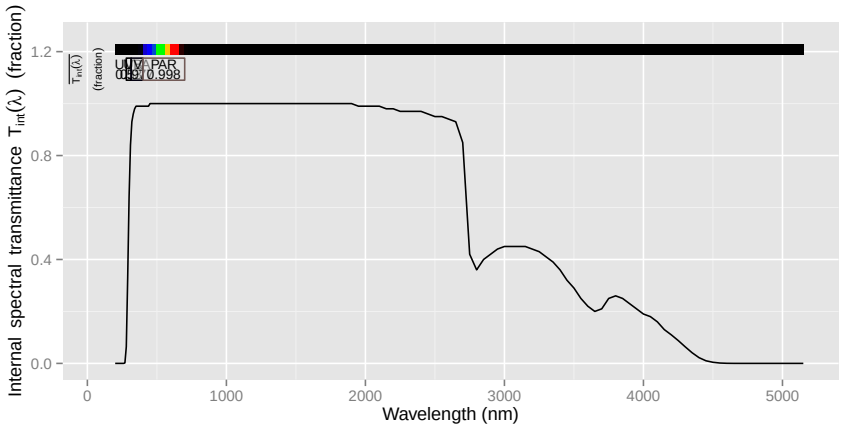


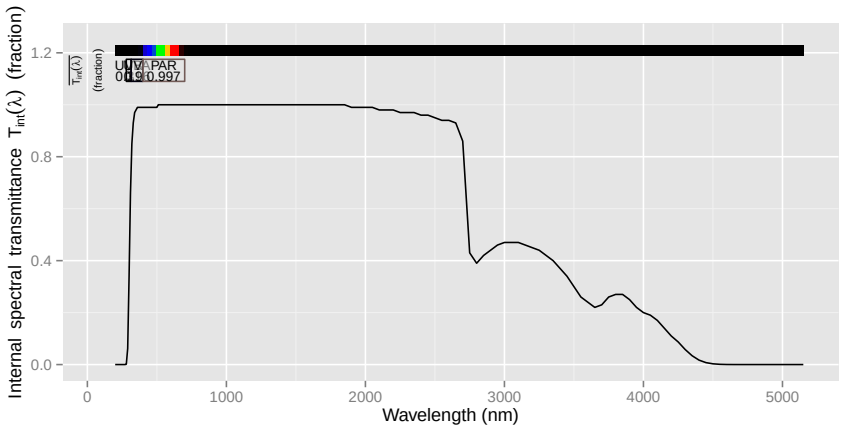


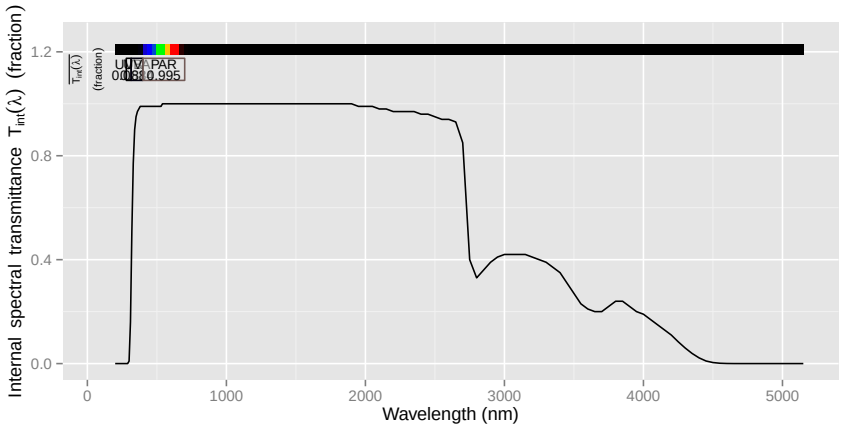



```
plot(n_wg280.spct)
plot(n_wg295.spct)
plot(n_wg305.spct)
plot(n_wg320.spct)
```

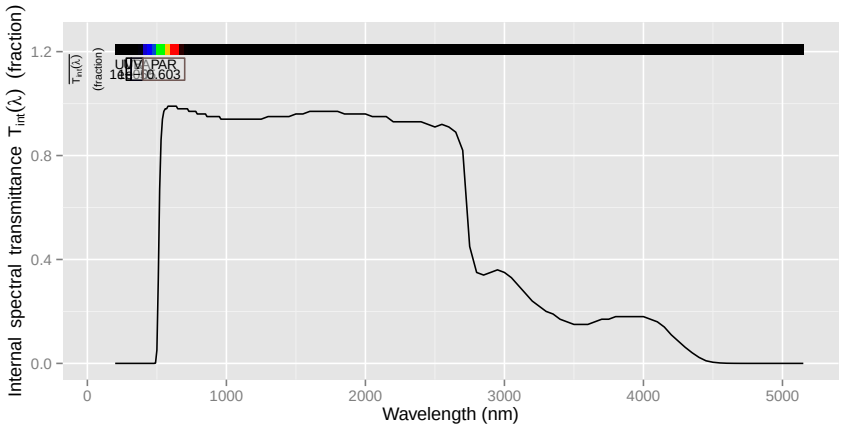


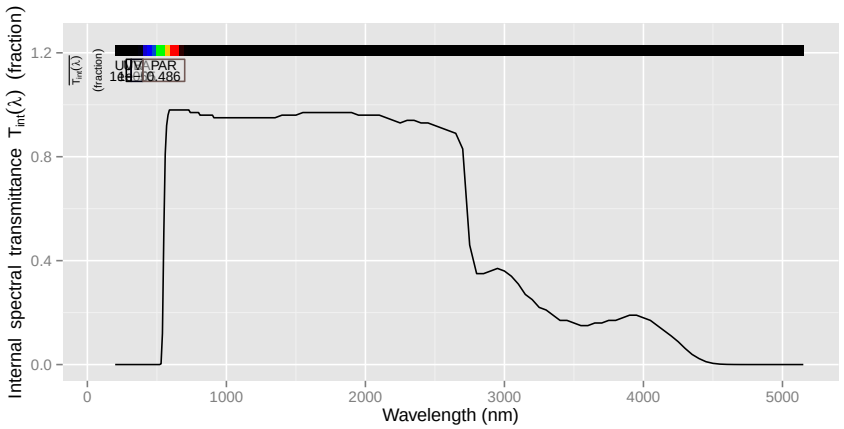


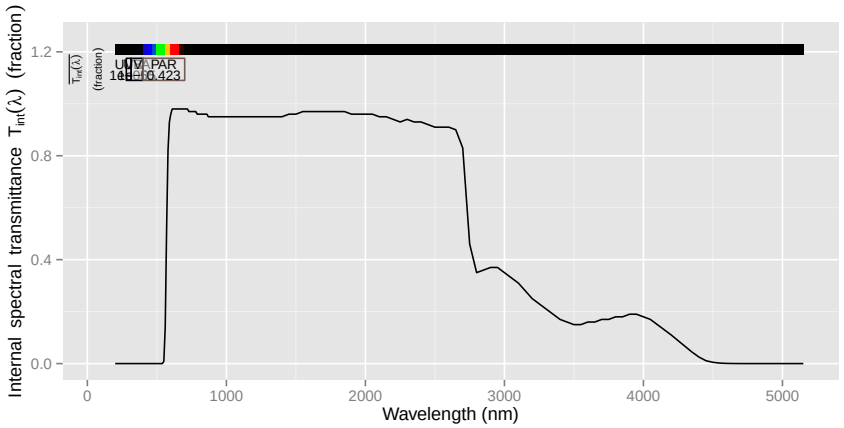


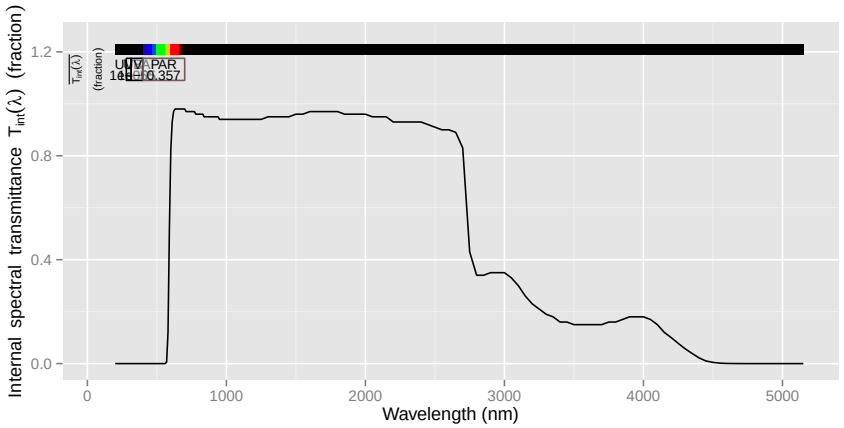



```
plot(og515.spct)
plot(og550.spct)
plot(og570.spct)
plot(og590.spct)
```



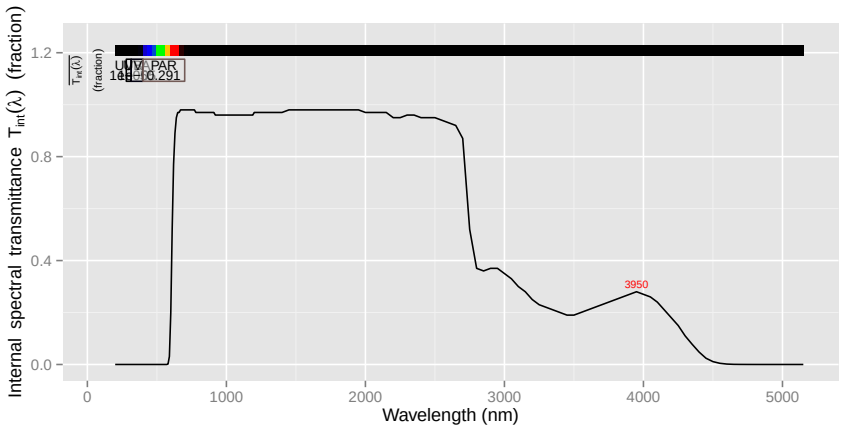


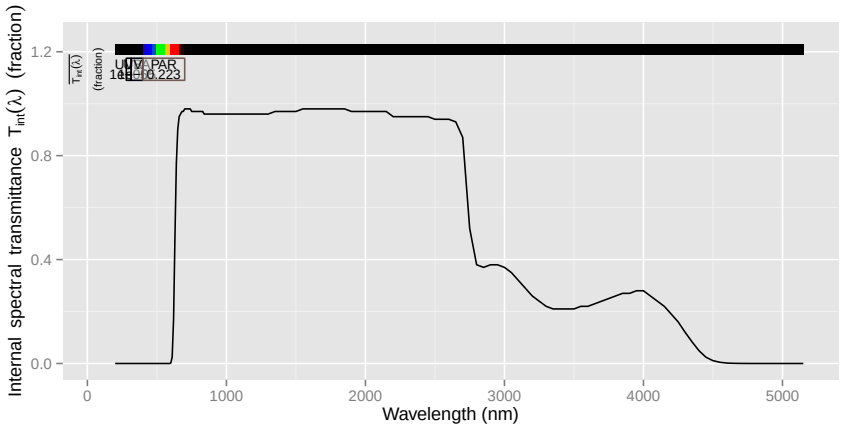


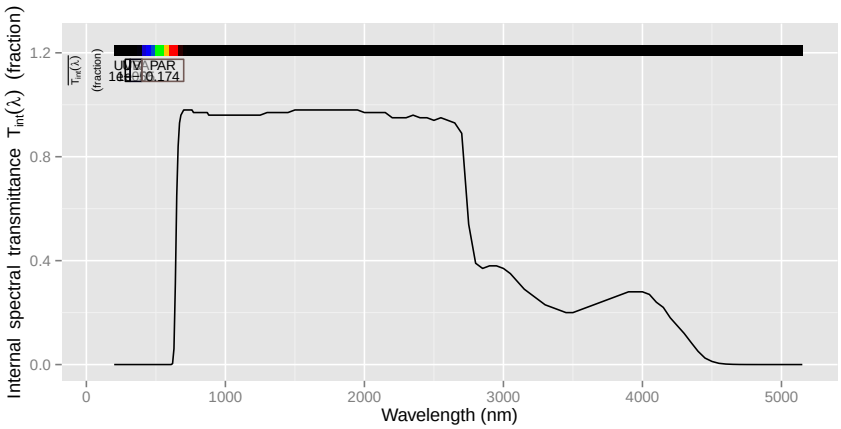


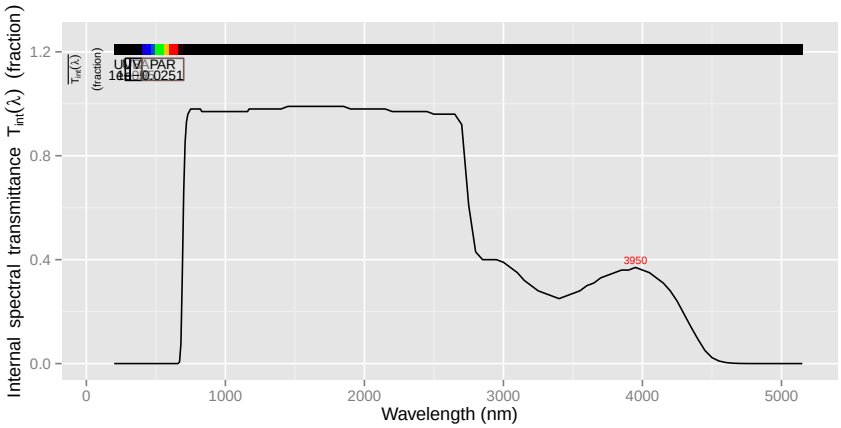

```
plot(rg610.spct)
plot(rg630.spct)
plot(rg645.spct)
plot(rg695.spct)
```

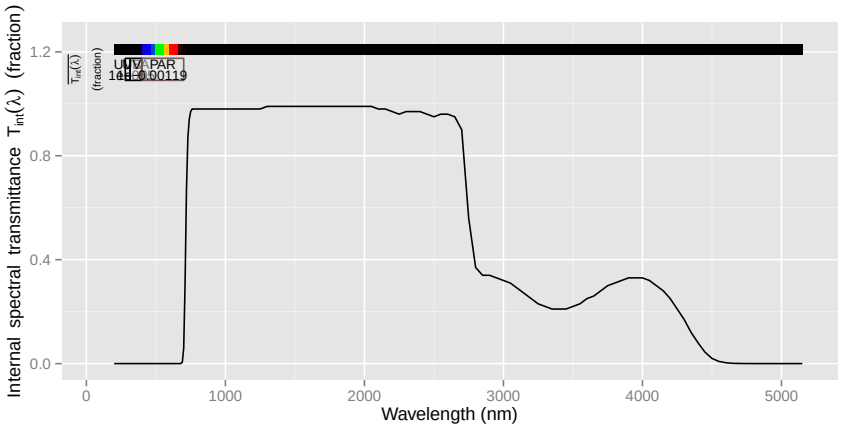
```
plot(rg715.spct)
plot(rg780.spct)
plot(rg830.spct)
plot(rg850.spct)
plot(rg9.spct)
```

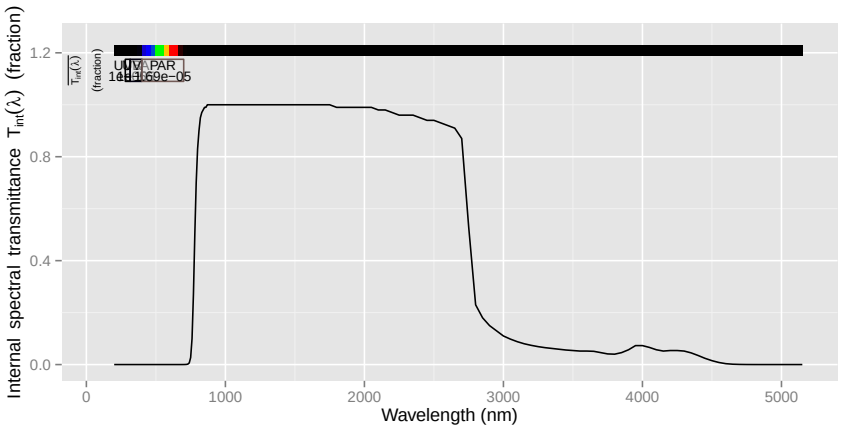


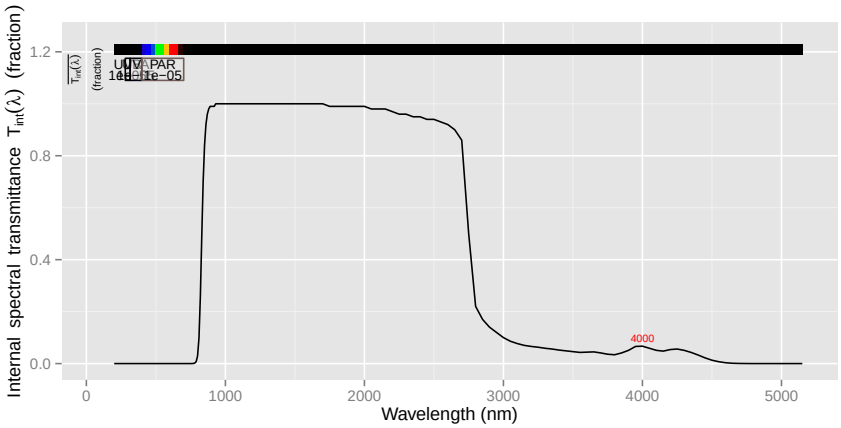


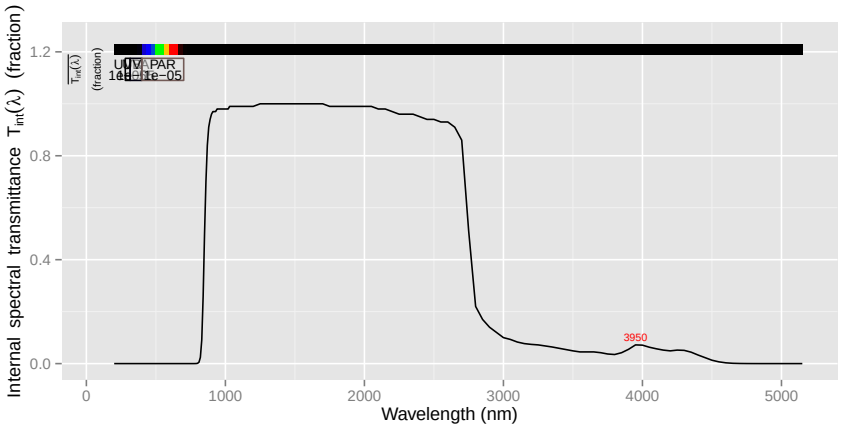

Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
1.2
0.8
0.4
0.0
0
1000
2000
3000
4000
5000
Wavelength (nm)
UV
PAR
0.174

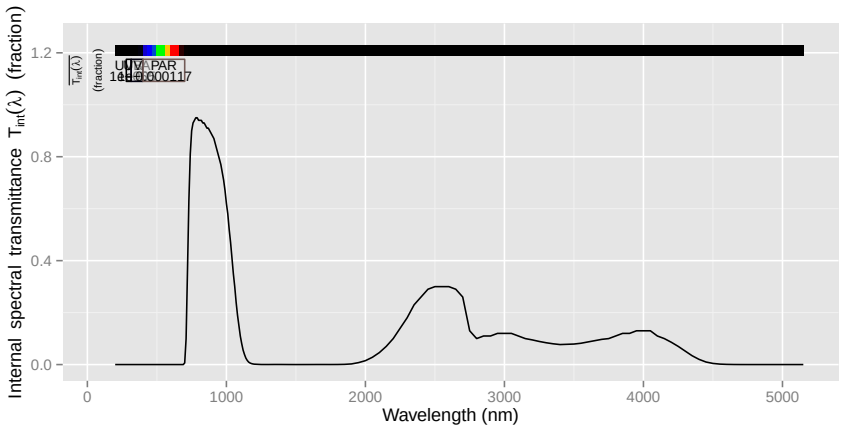

Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
1.2
0.8
0.4
0.0
0
1000
2000
3000
4000
5000
Wavelength (nm)
UV
PAR
0.0251
3950


Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
1.2
0.8
0.4
0.0
0
1000
2000
3000
4000
5000
Wavelength (nm)
UV
PAR
0.00119


Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
1.2
0.8
0.4
0.0
0
1000
2000
3000
4000
5000
Wavelength (nm)
UV
PAR

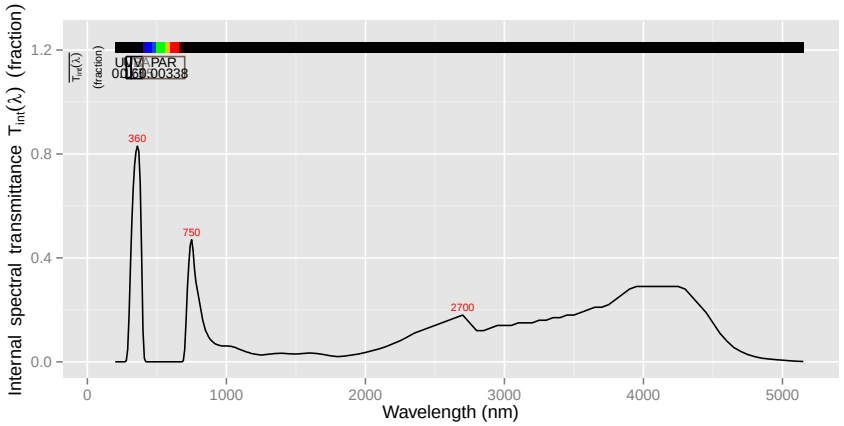

Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
1.2
0.8
0.4
0.0
0
1000
2000
3000
4000
5000
Wavelength (nm)
UV
PAR
4000

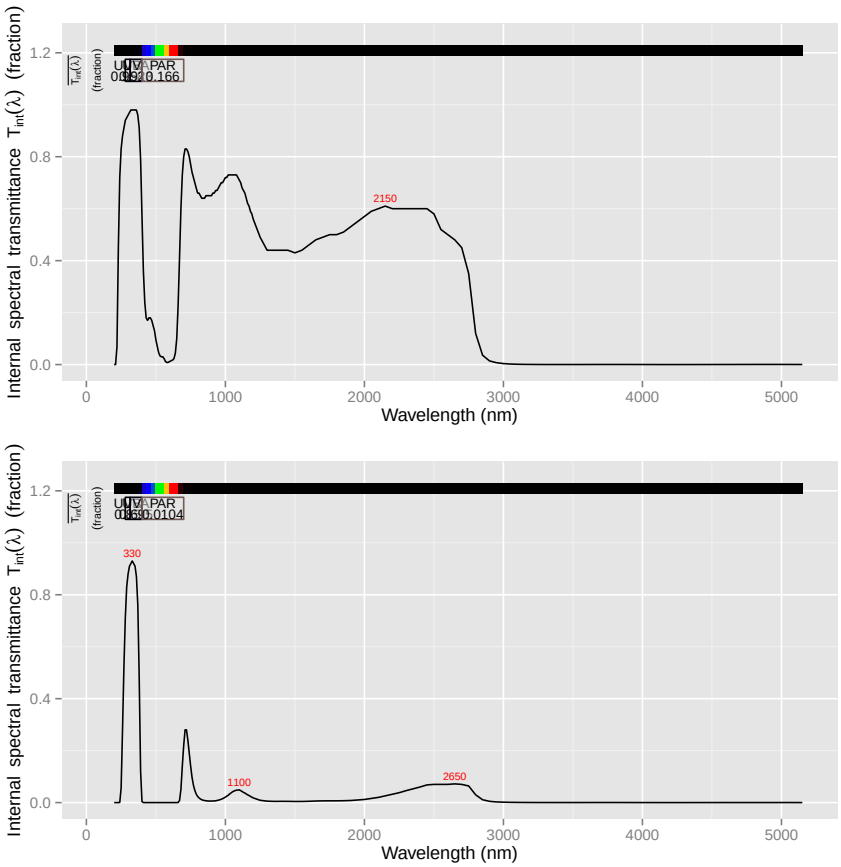

Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
1.2
0.8
0.4
0.0
0
1000
2000
3000
4000
5000
Wavelength (nm)
UV
PAR
3950



5.2 Schott band-pass filters

```
plot(ug1.spct)
plot(ug5.spct)
plot(ug11.spct)
```




Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
1.2
0.8
0.4
0.0
0
1000
2000
3000
4000
5000
Wavelength (nm)
$\overline{T_{int}(\lambda)}$ (fraction)
UV
PAR
0.166
2150
Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
1.2
0.8
0.4
0.0
0
1000
2000
3000
4000
5000
Wavelength (nm)
$\overline{T_{int}(\lambda)}$ (fraction)
UV
PAR
0.0104
330
1100
2650