photobiologyFilters Version 0.2.0
Catalogue of filters

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Contents

1 Introduction

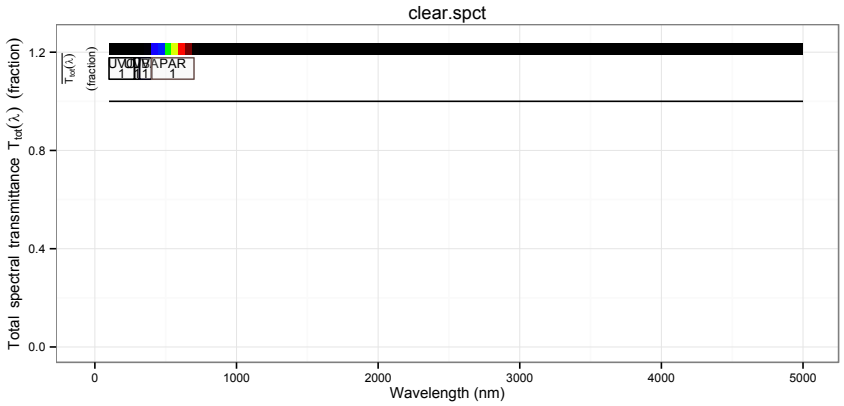
```
library(ggplot2)
library(photobiologyFilters)
library(photobiologygg)
```

```
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

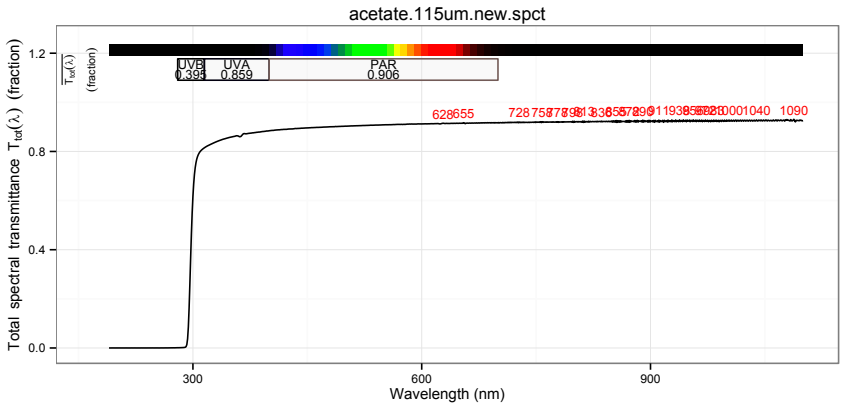
```
filter.plotter("clear")
```

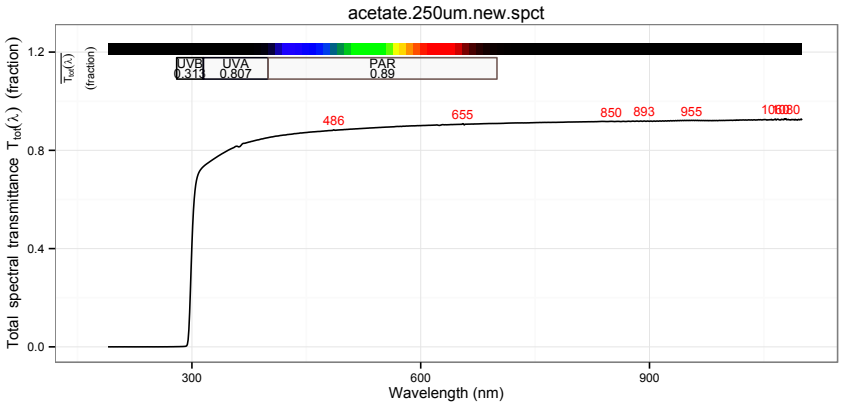


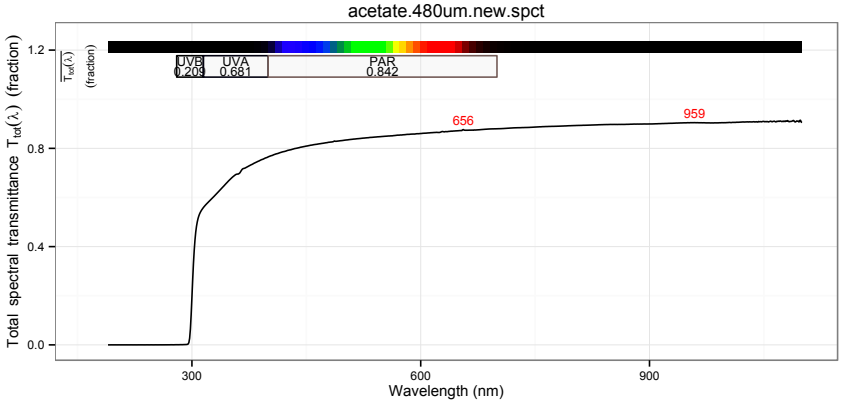
3 Plastic films

3.1 Cellulose diacetate

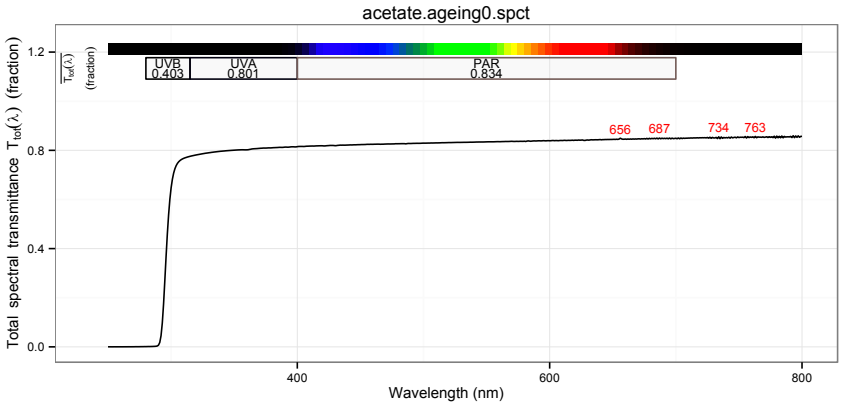
```
for (filter in c("acetate.115um.new", "acetate.250um.new", "acetate.480um.new")) {
  filter.plotter(filter)
}
```

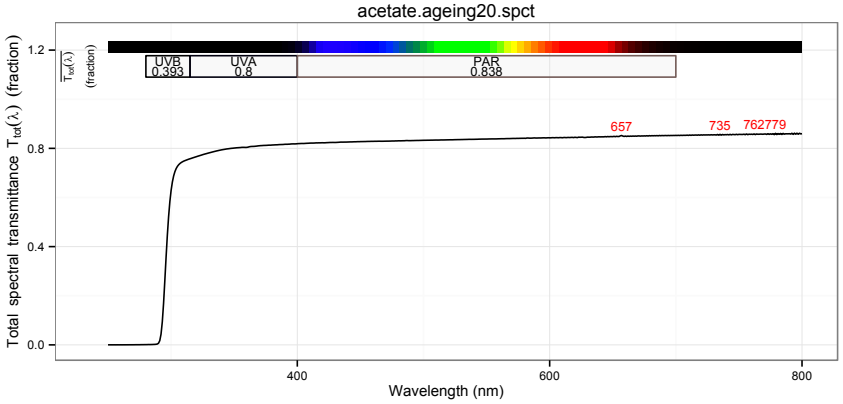


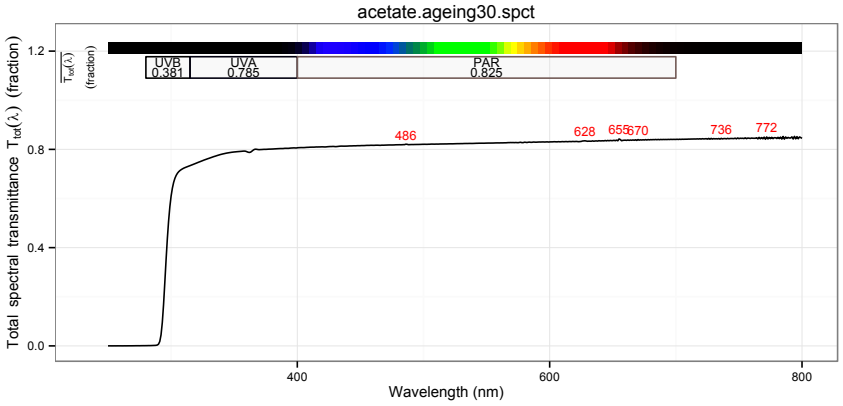


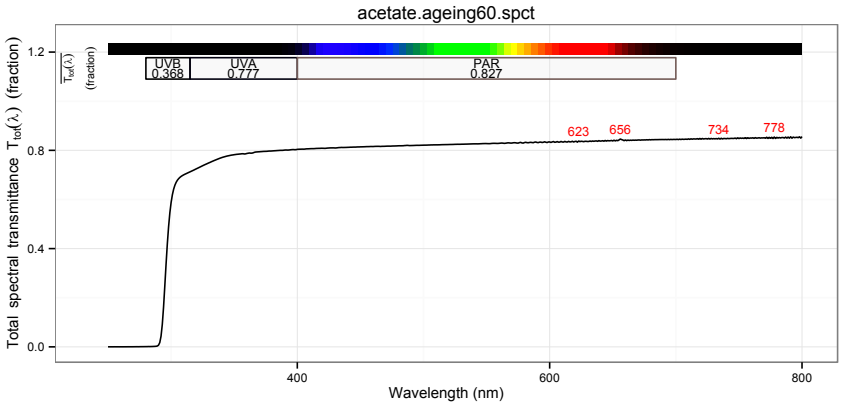


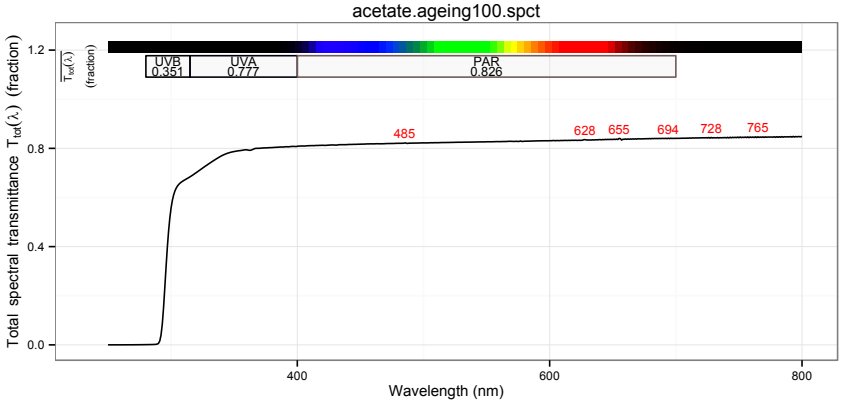

```
for (filter in c("acetate.ageing0", "acetate.ageing20", "acetate.ageing30",
                 "acetate.ageing60", "acetate.ageing100", "acetate.ageing180",
                 "acetate.ageing300")) {
  filter.plotter(filter)
}
```

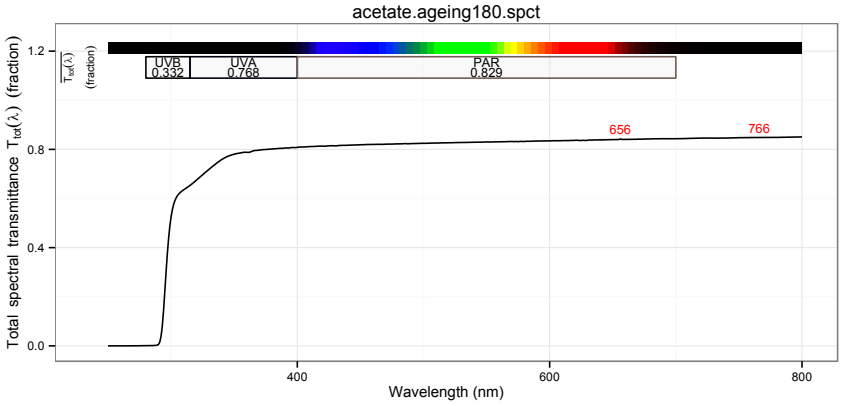

acetate.ageing0.spct
Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
$\overline{T_{tot}(\lambda)}$ (fraction)
UVB 0.403
UVA 0.801
PAR 0.834
656
687
734
763
1.2
0.8
0.4
0.0
400
600
800
Wavelength (nm)

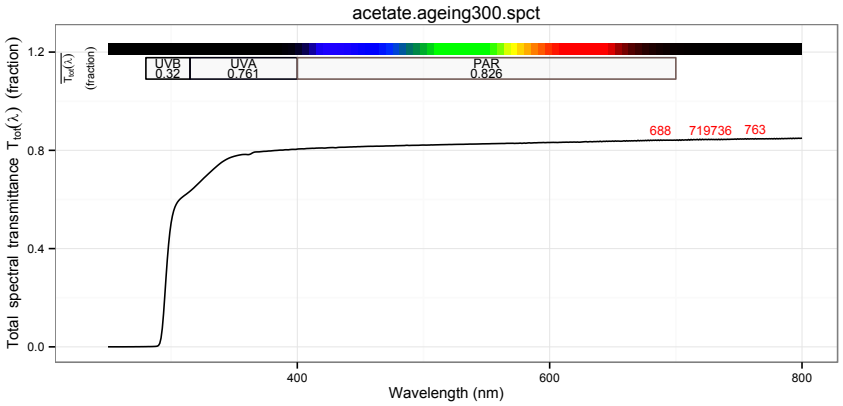

acetate.ageing20.spct
Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
$\overline{T_{tot}(\lambda)}$ (fraction)
UVB 0.393
UVA 0.8
PAR 0.838
657
735
762779
1.2
0.8
0.4
0.0
400
600
800
Wavelength (nm)


acetate.ageing30.spct
Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
$\overline{T_{tot}(\lambda)}$ (fraction)
UVB 0.381
UVA 0.785
PAR 0.825
486
628
655
670
736
772
1.2
0.8
0.4
0.0
400
600
800
Wavelength (nm)


acetate.ageing60.spct
Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
$\overline{T_{tot}(\lambda)}$ (fraction)
UVB 0.368
UVA 0.777
PAR 0.827
623
656
734
778
Wavelength (nm)

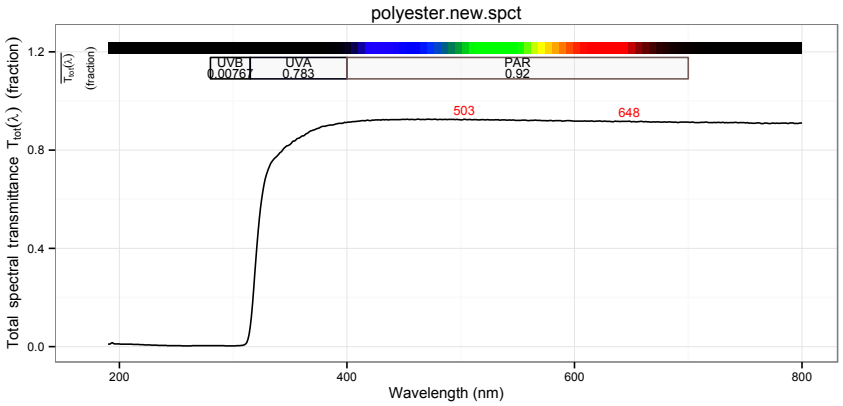

acetate.ageing100.spct
Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
$\overline{T_{tot}(\lambda)}$ (fraction)
UVB 0.351
UVA 0.777
PAR 0.826
485
628
655
694
728
765
Wavelength (nm)


acetate.ageing180.spct
Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
$\overline{T_{tot}(\lambda)}$ (fraction)
UVB 0.332
UVA 0.768
PAR 0.829
656
766
Wavelength (nm)



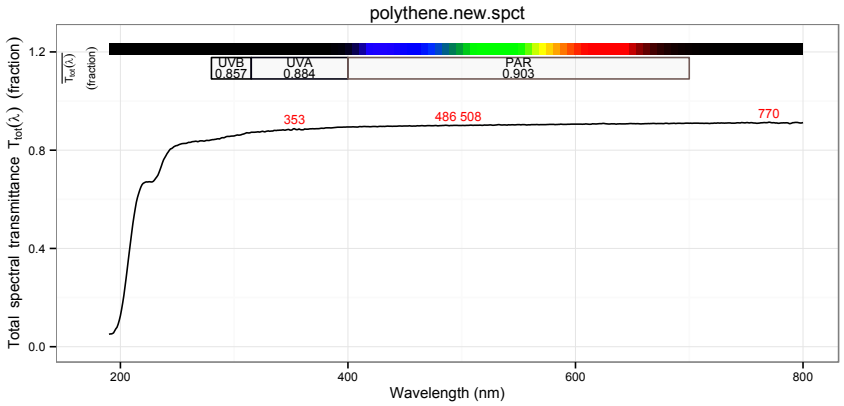
3.2 Polyester

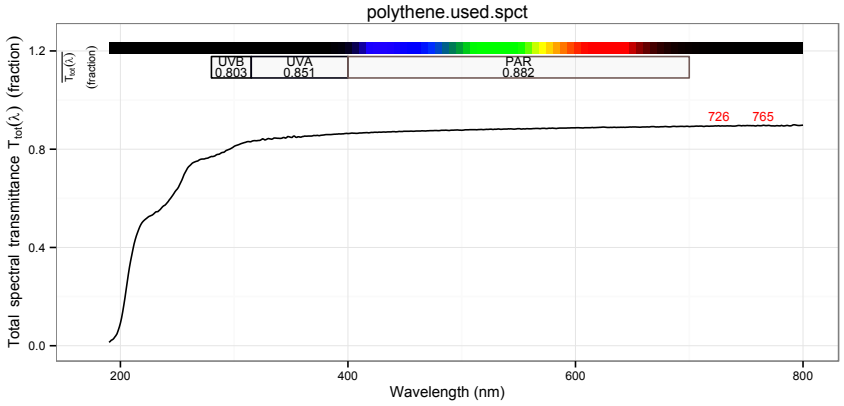
```
filter.plotter("polyester.new")
```



3.3 Polythene

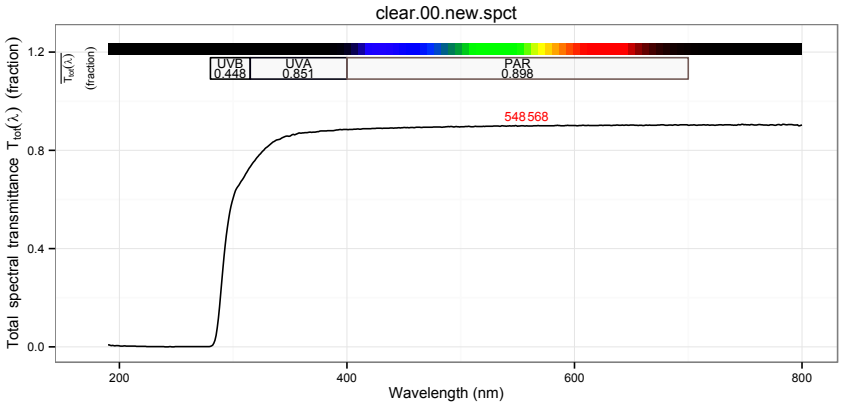
```
filter.plotter("polythene.new")
filter.plotter("polythene.used")
```

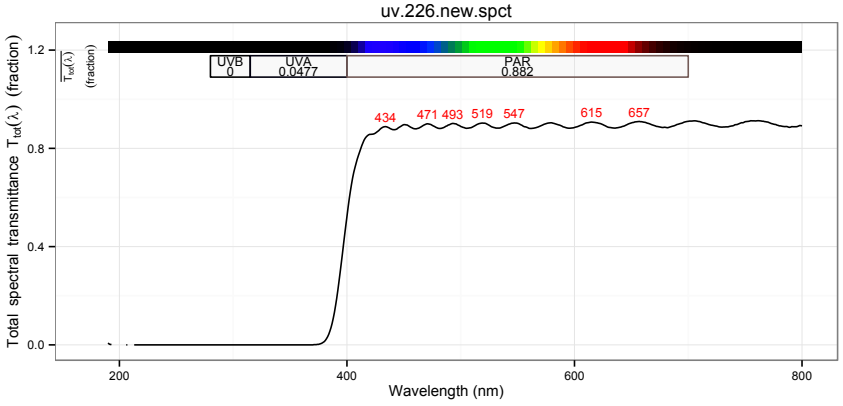


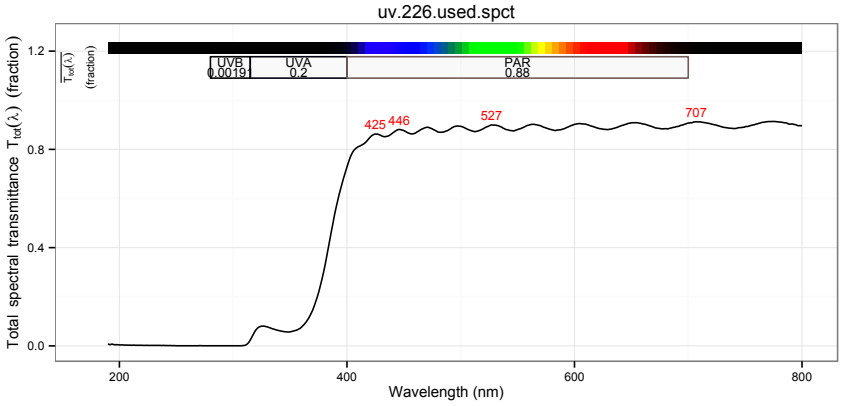


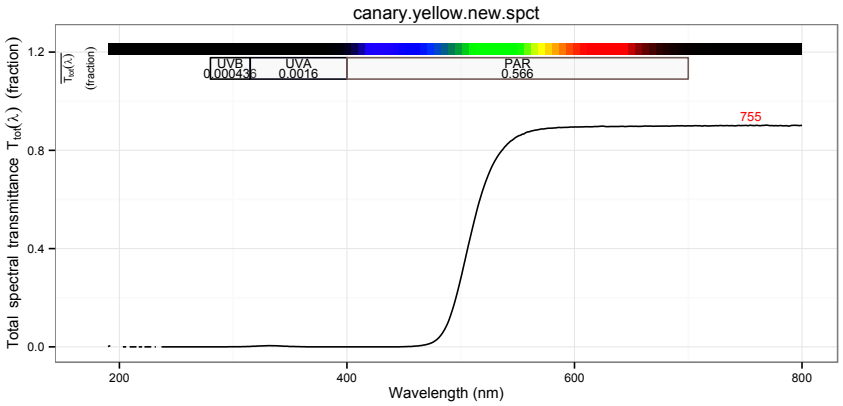
3.4 Rosco theatrical filters

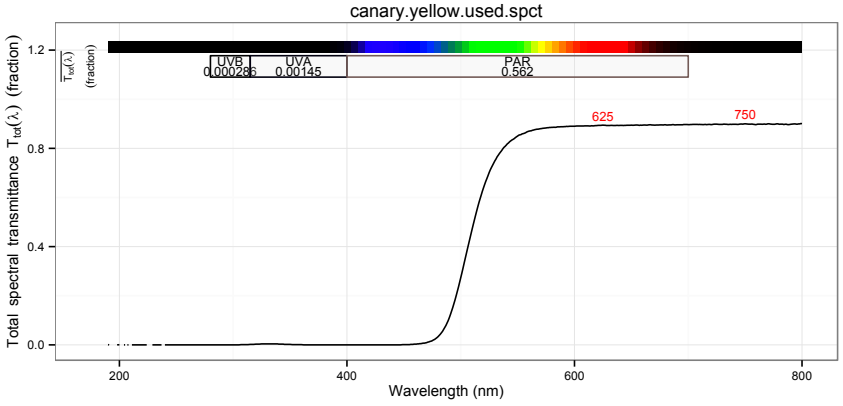
```
for (filter in c("clear.00.new", "uv.226.new", "uv.226.used", "canary.yellow.new",
                 "canary.yellow.used", "rose.pink.new", "neon.pink.used",
                 "moss.green.new", "moss.green.used")) {
  filter.plotter(filter)
}
```

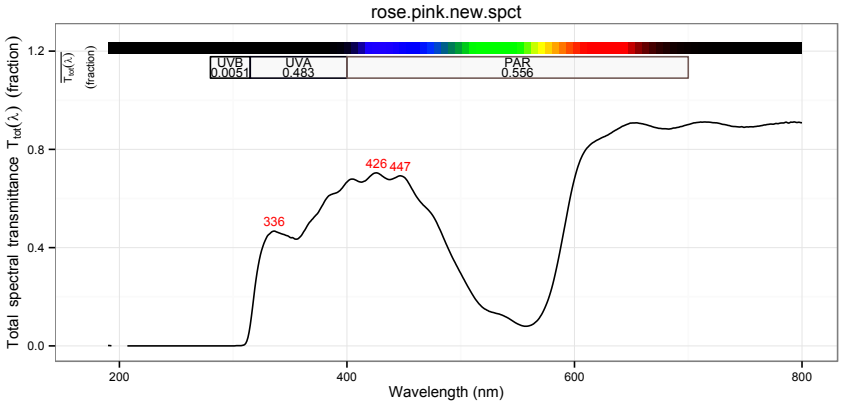

clear.00.new.spct
UVB
0.448
UVA
0.851
PAR
0.898
548 568
Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
Wavelength (nm)

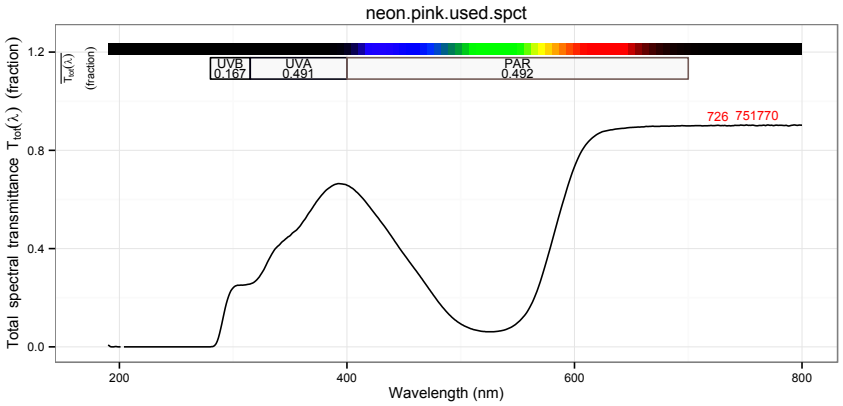

uv.226.new.spct
UVB
0
UVA
0.0477
PAR
0.882
434 471 493 519 547 615 657
Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
Wavelength (nm)

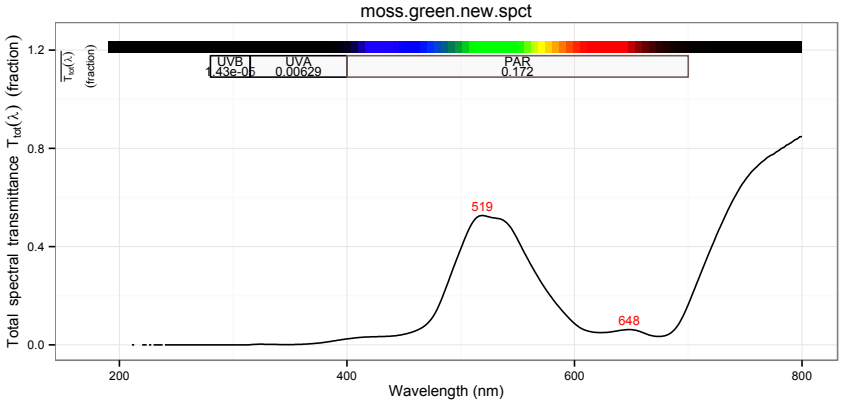

uv.226.used.spct
UVB
0.00191
UVA
0.2
PAR
0.88
425 446 527 707
Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
Wavelength (nm)

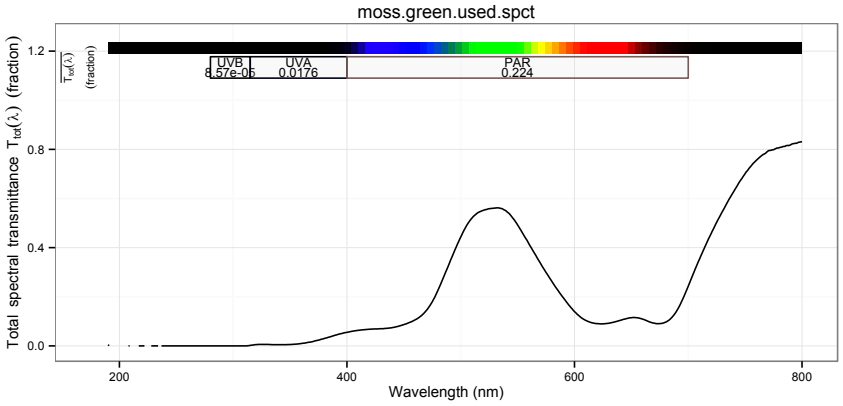

canary.yellow.new.spct
UVB
0.000436
UVA
0.0016
PAR
0.566
755
Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
Wavelength (nm)


canary.yellow.used.spct
UVB
0.000286
UVA
0.00145
PAR
0.562
625
750
Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
Wavelength (nm)


rose.pink.new.spct
UVB
0.0051
UVA
0.483
PAR
0.556
336
426
447
Total spectral transmittance $T_{tot}(\lambda)$ (fraction)
Wavelength (nm)

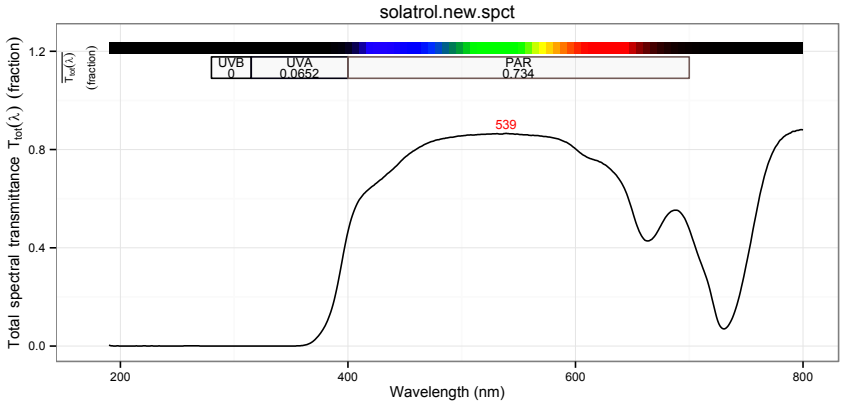


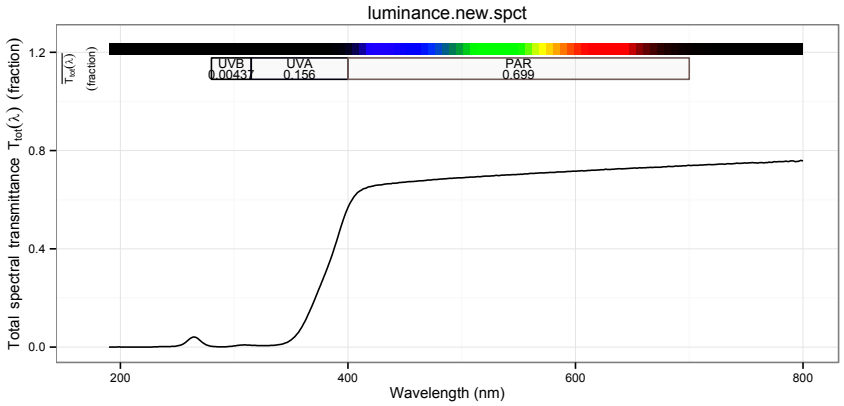




3.5 Commercial greenhouse films from BPI Agri Visqueen

```
for (filter in c("solatrol.new", "luminance.new")) {
  filter.plotter(filter)
}
```

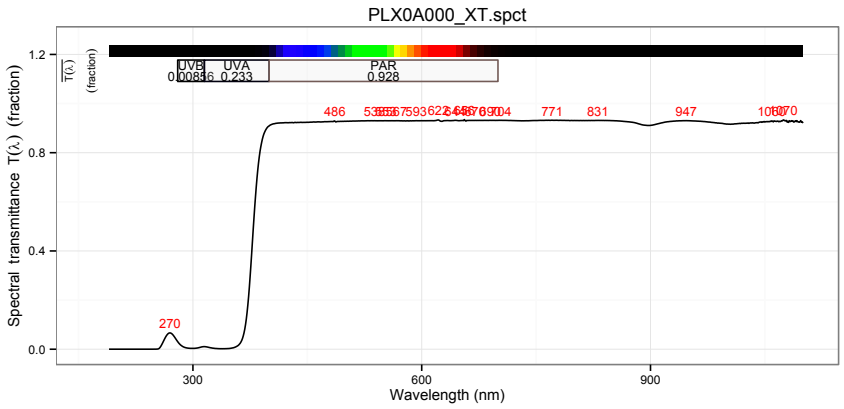


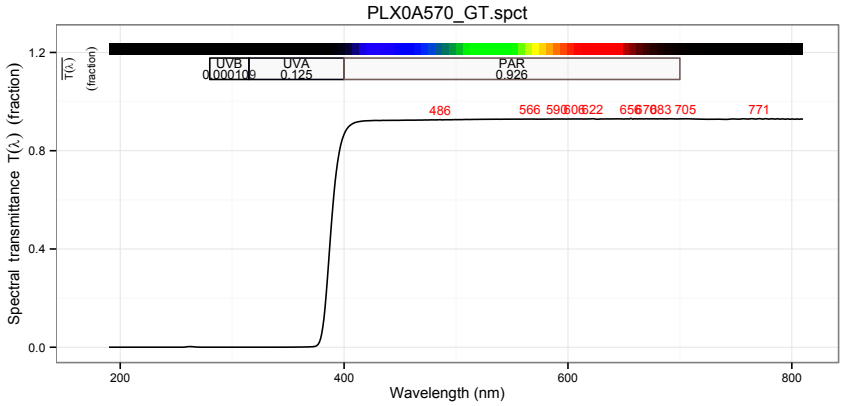


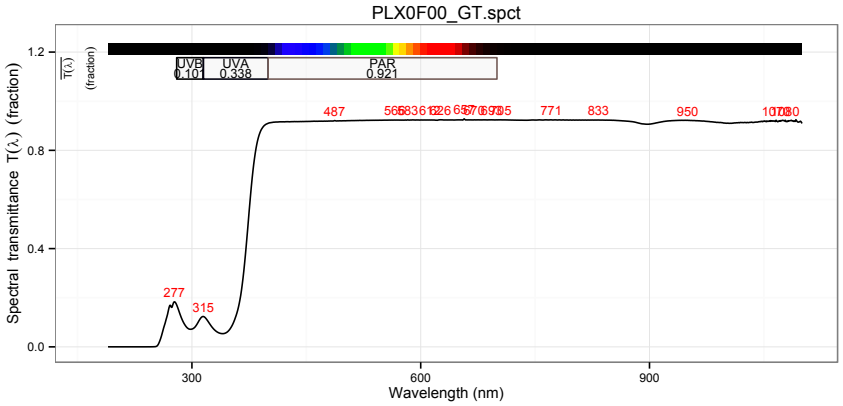
4 Plastic sheets

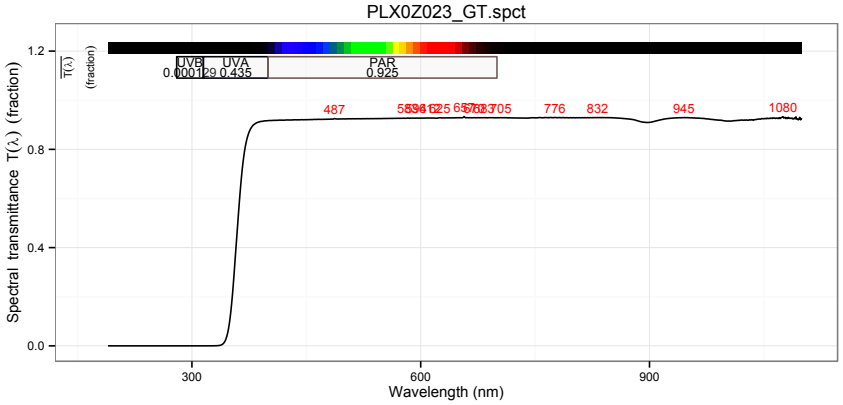
4.1 Plexiglas

```
for (filter in c("PLX0A000_XT", "PLX0A570_GT", "PLX0F00_GT", "PLX0Z023_GT")) {
  filter.plotter(filter)
}
```

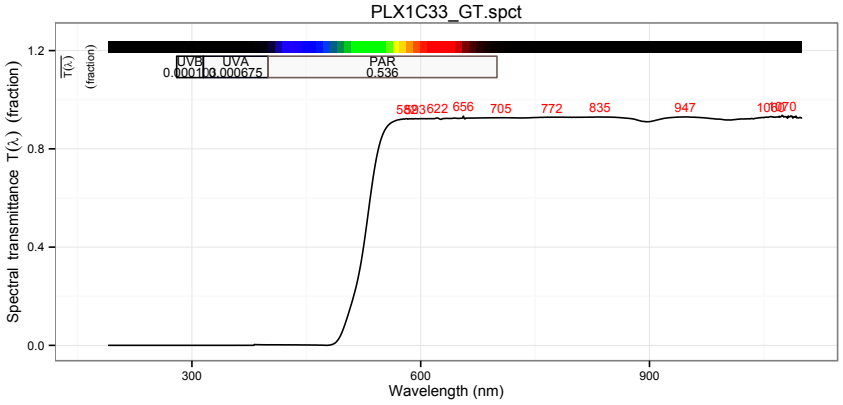


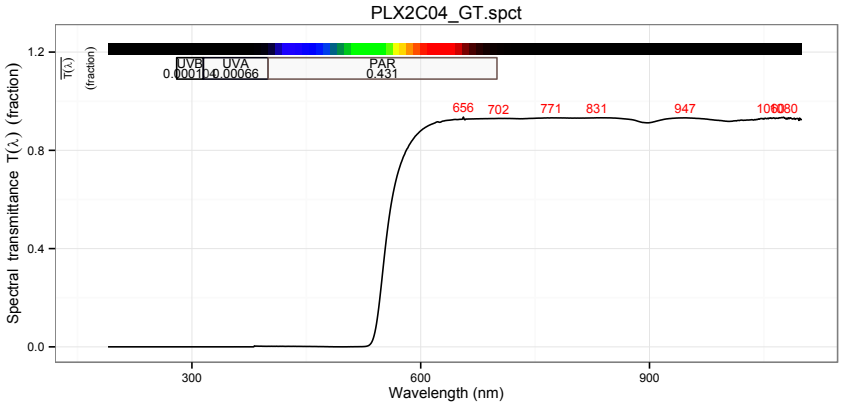


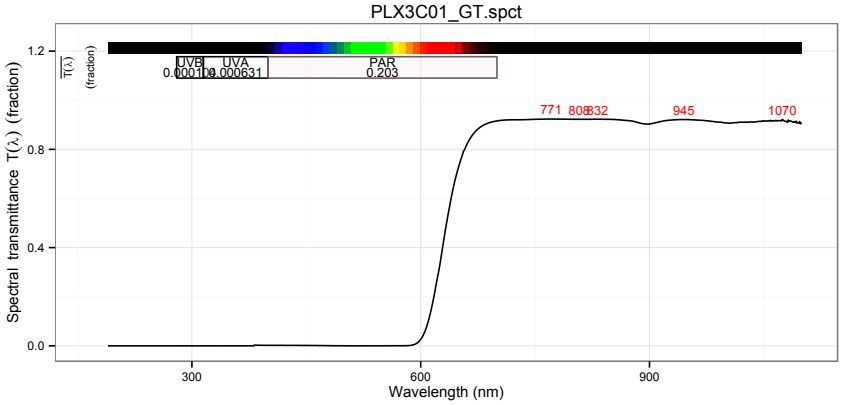


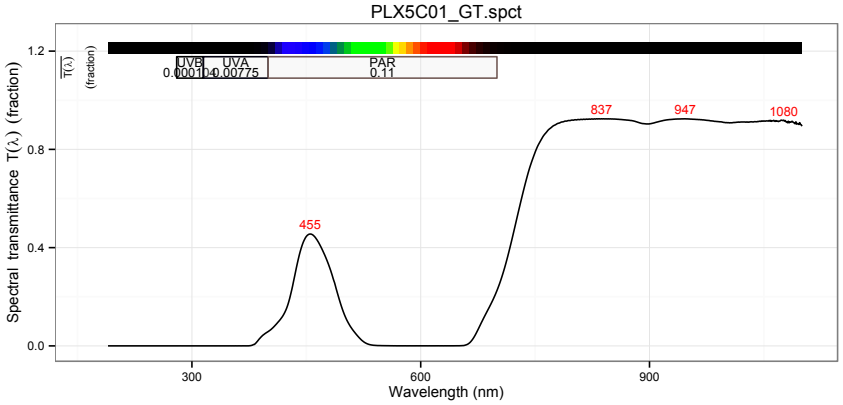



```
for (filter in c("PLX1C33_GT", "PLX2C04_GT", "PLX3C01_GT", "PLX5C01_GT")) {
  filter.plotter(filter)
}
```



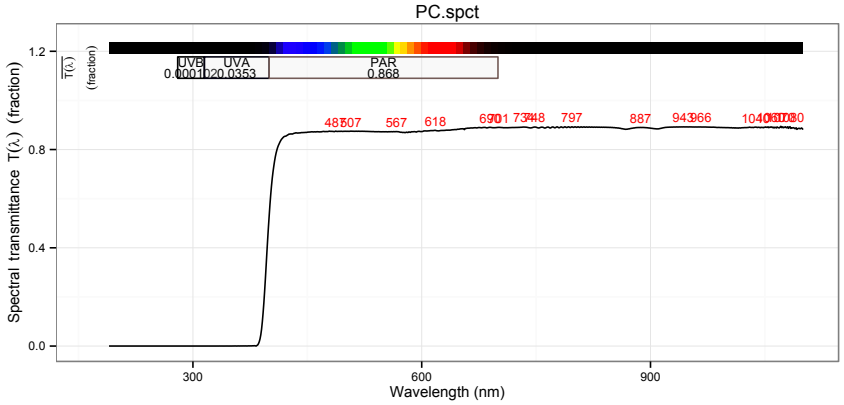


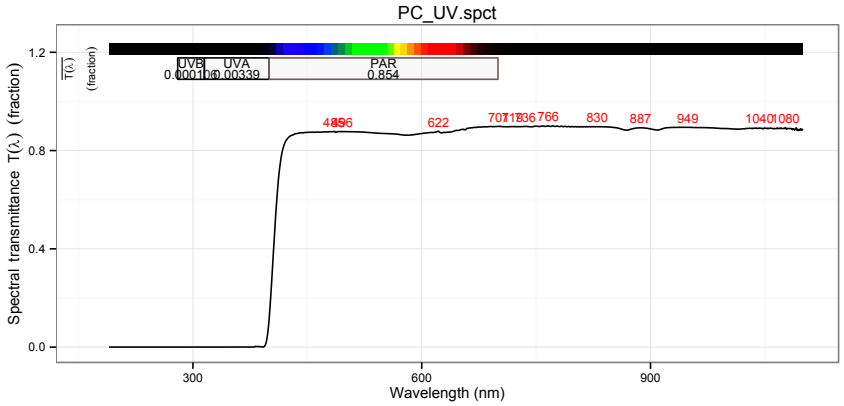




4.2 Polycarbonate

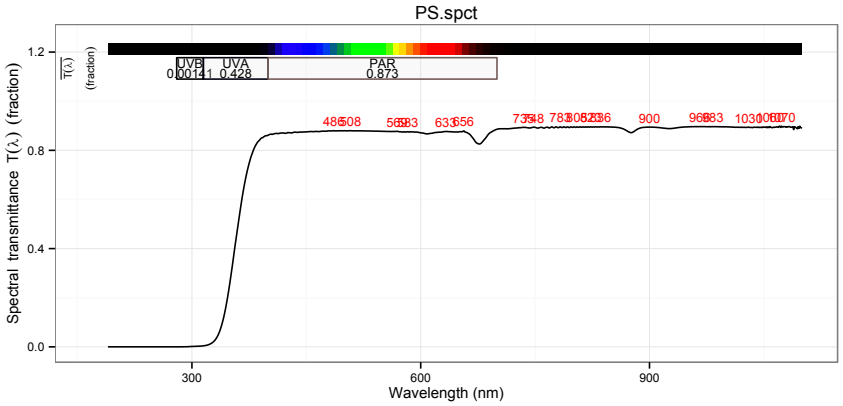
```
for (filter in c("PC", "PC_UV")) {
  filter.plotter(filter)
}
```





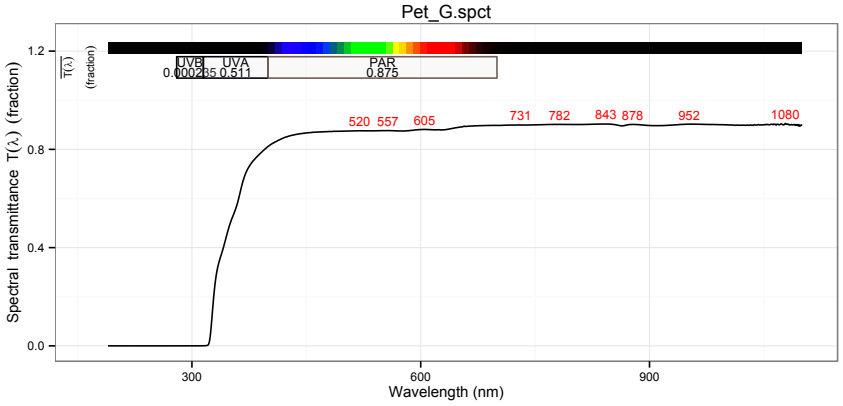
4.3 Polyestyrene

```
for (filter in c("PS")) {
  filter.plotter(filter)
}
```



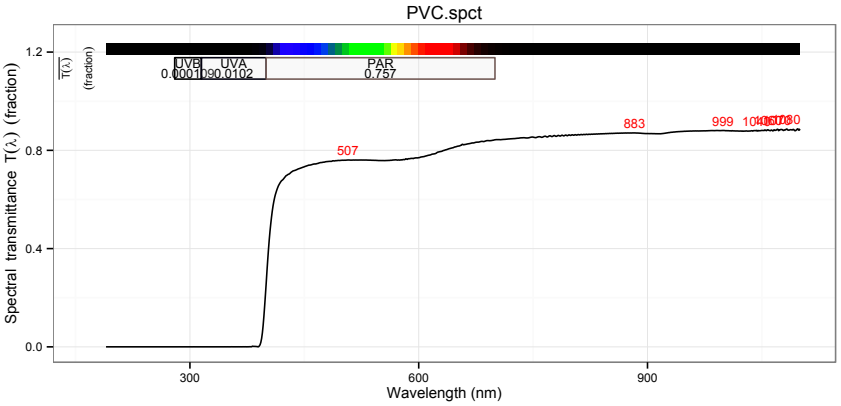
4.4 Polyester

```
for (filter in c("Pet_G")) {
  filter.plotter(filter)
}
```



4.5 Polyvinilchloride

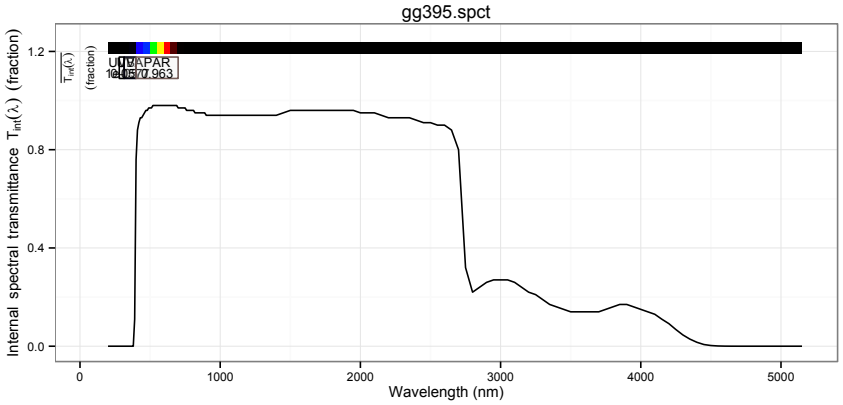
```
for (filter in c("PVC")) {
  filter.plotter(filter)
}
```

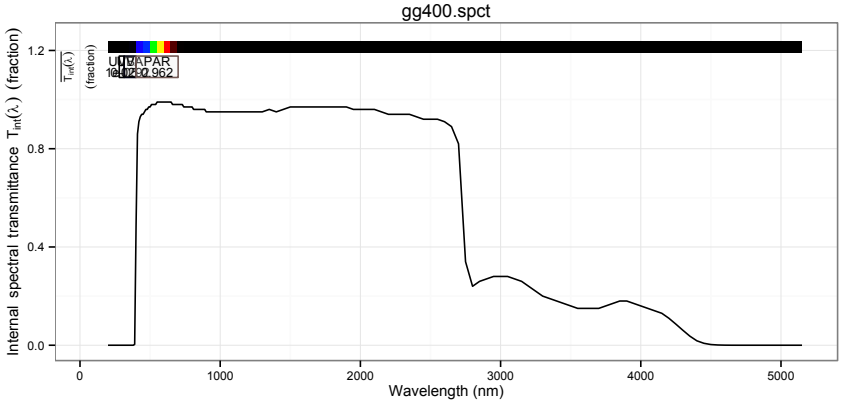

PVC.spct
Spectral transmittance T(λ) (fraction)
T(λ) (fraction)
UVB
UVA
PAR
0.757
507
883
999
Wavelength (nm)
0.0
0.4
0.8
1.2
300
600
900

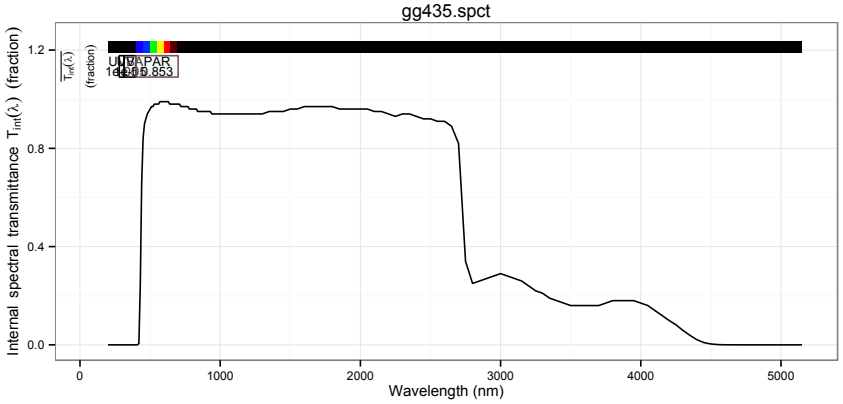
5 Optical glass filters

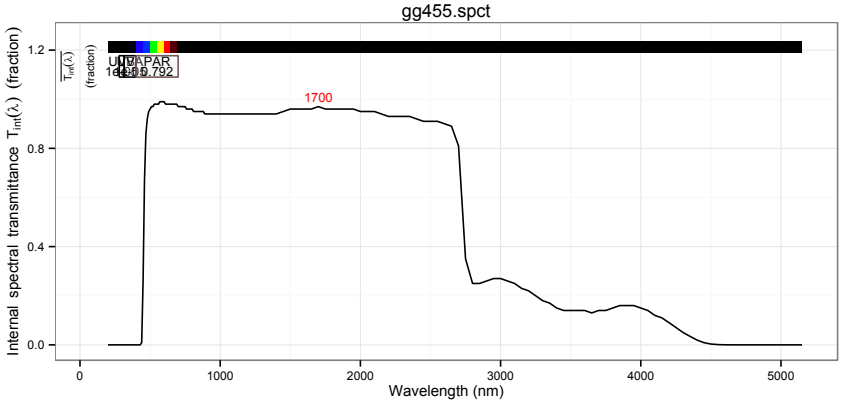
5.1 Schott long-pass filters

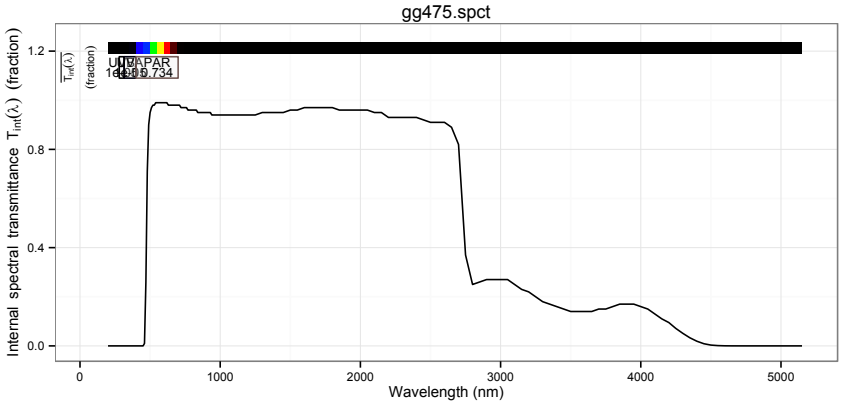
```
for (filter in c("gg395", "gg400", "gg435", "gg455", "gg475", "gg495")) {
  filter.plotter(filter)
}
```

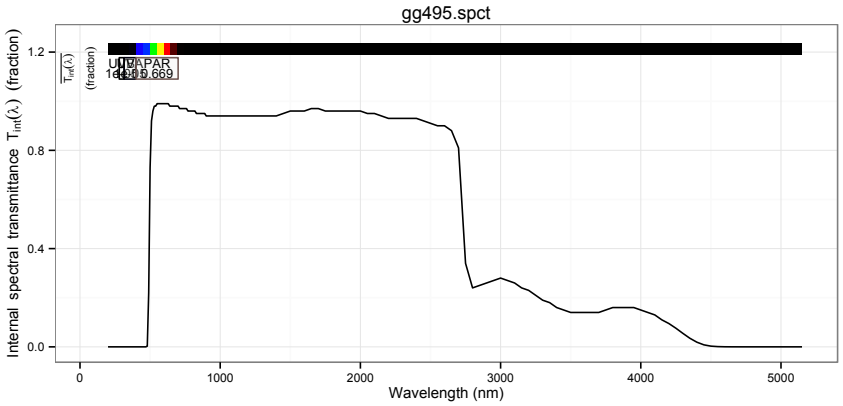




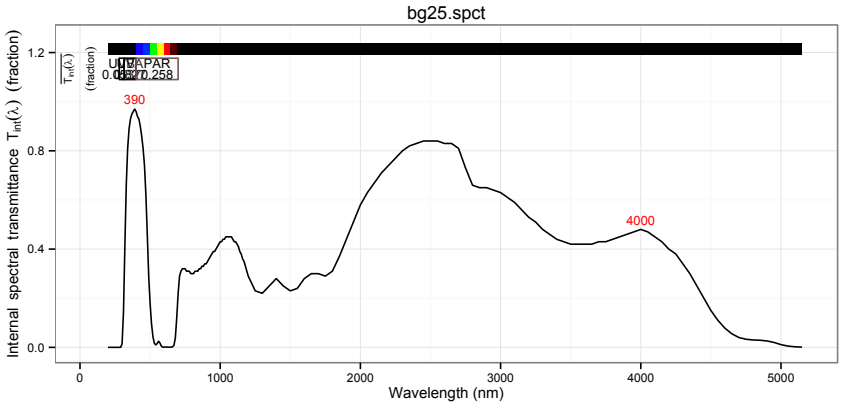

gg435.spct
Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
Wavelength (nm)
0.0
0.4
0.8
1.2
0
1000
2000
3000
4000
5000

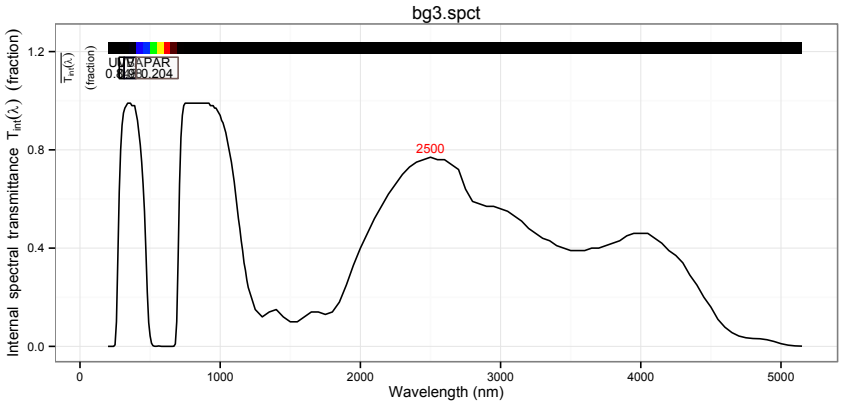

gg455.spct
Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
Wavelength (nm)
1700
0.0
0.4
0.8
1.2
0
1000
2000
3000
4000
5000

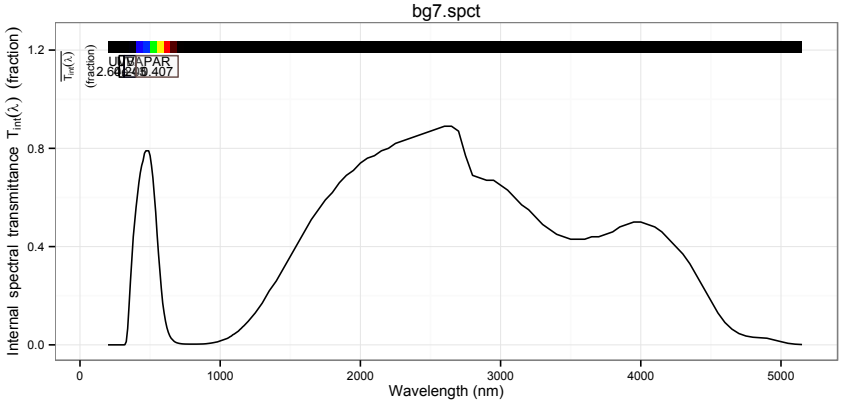

gg475.spct
Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
Wavelength (nm)
0.0
0.4
0.8
1.2
0
1000
2000
3000
4000
5000



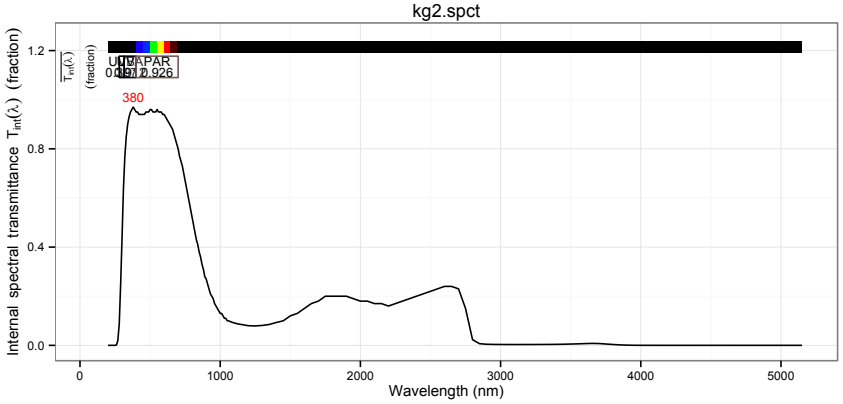

```
for (filter in c("bg25", "bg3", "bg7")) {
  filter.plotter(filter)
}
```

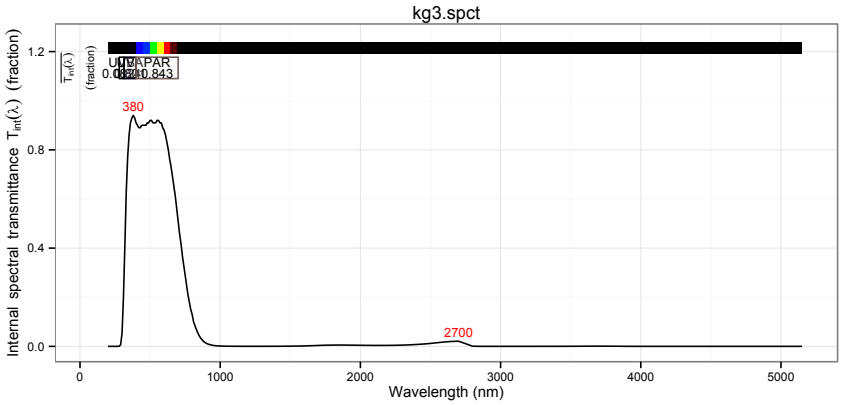


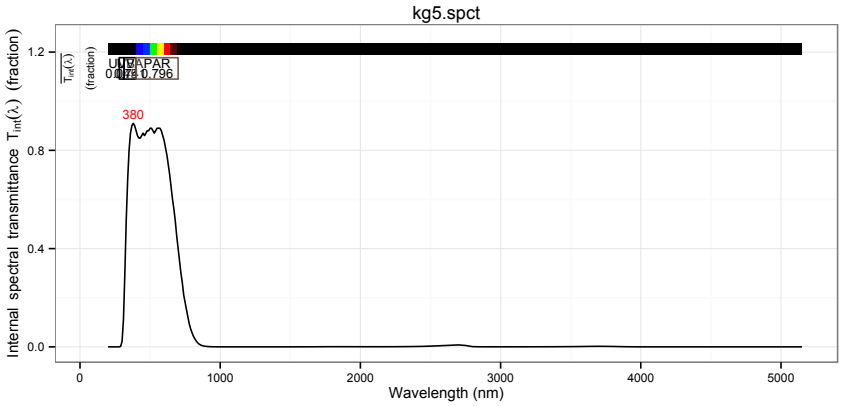




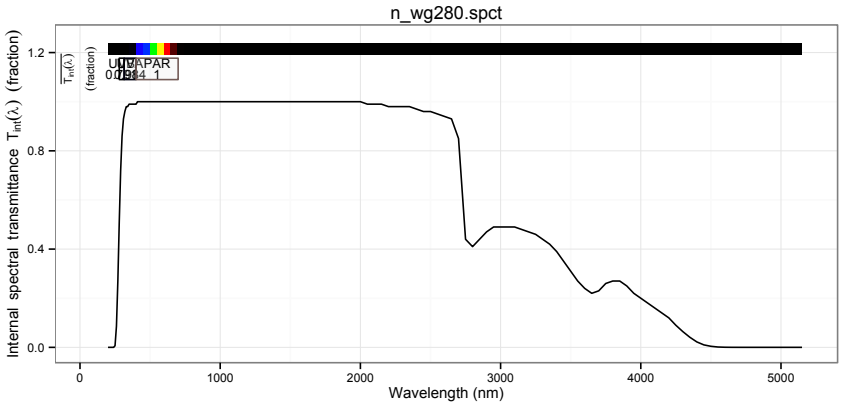

```
for (filter in c("kg2", "kg3", "kg5")) {
  filter.plotter(filter)
}
```

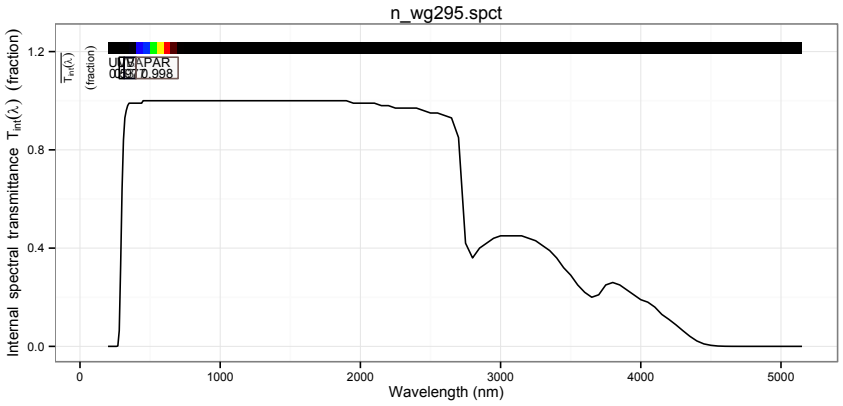


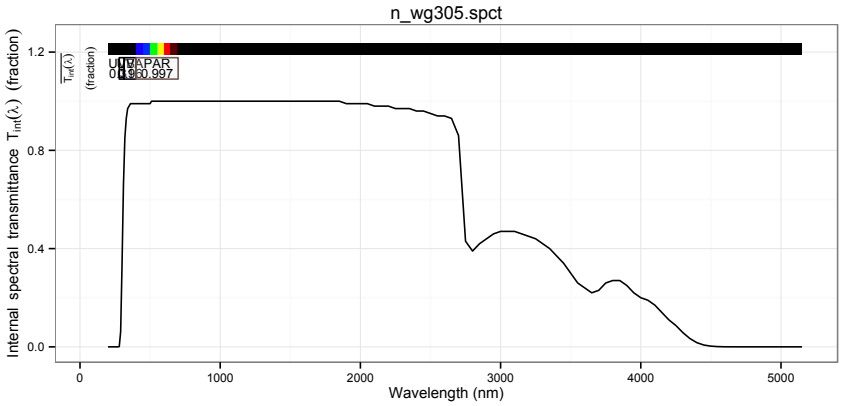


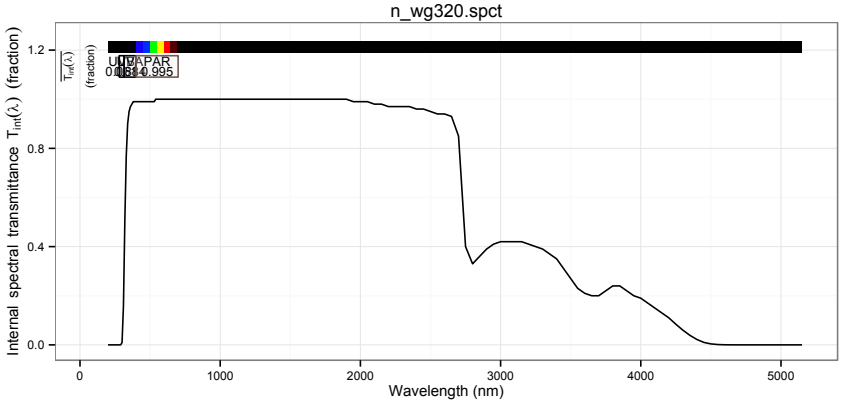



```
for (filter in c("n_wg280", "n_wg295", "n_wg305", "n_wg320")) {
  filter.plotter(filter)
}
```

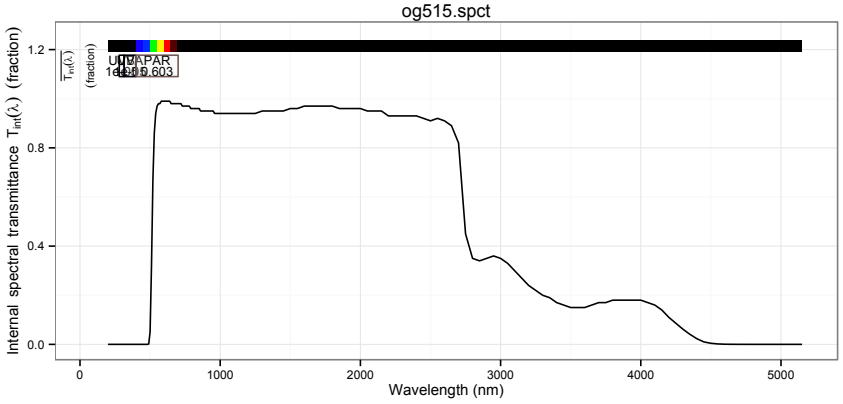


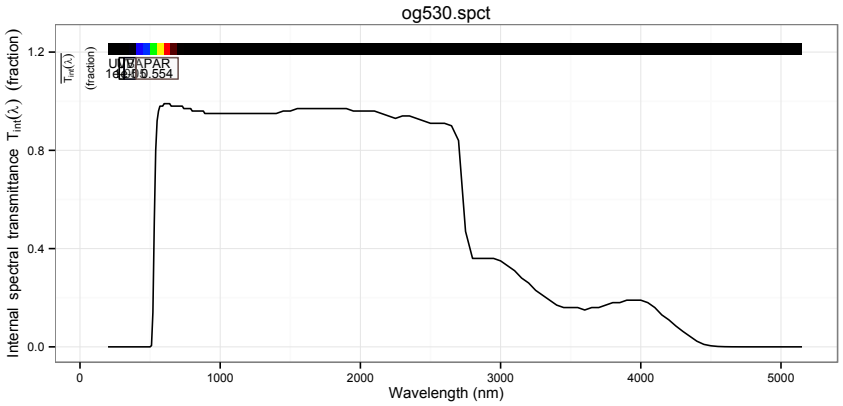


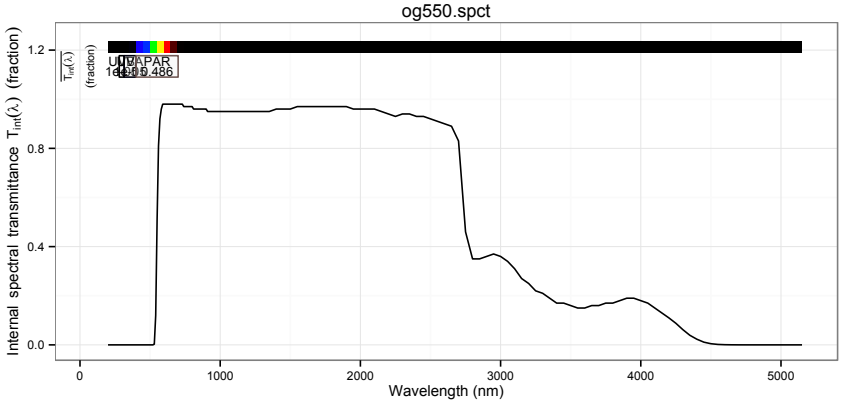


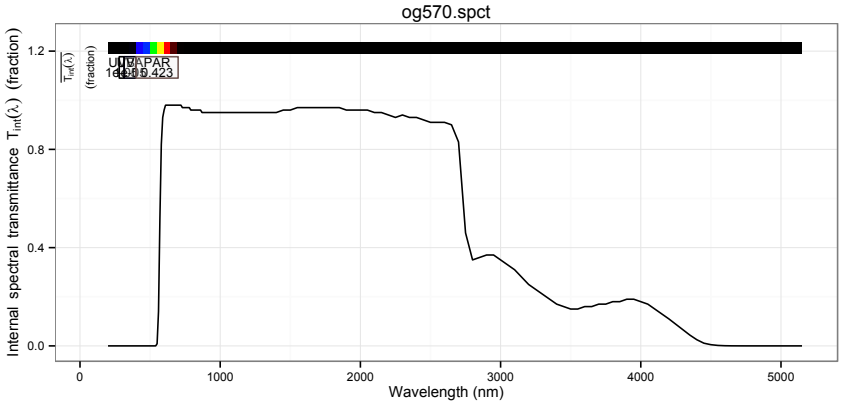


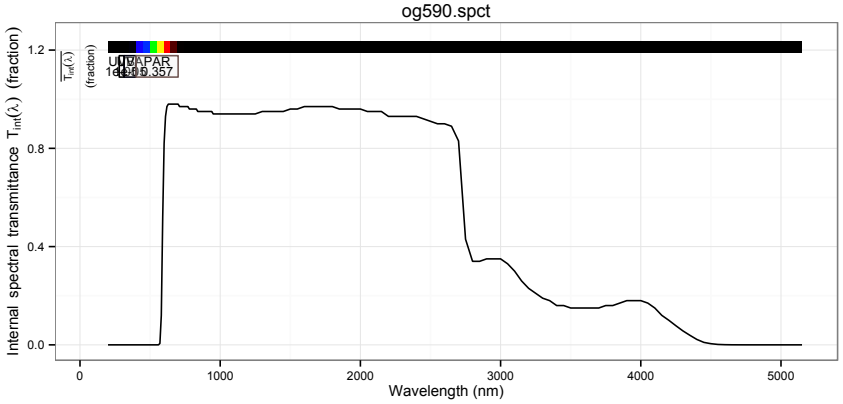

```
for (filter in c("og515", "og530", "og550", "og570", "og590")) {
  filter.plotter(filter)
}
```



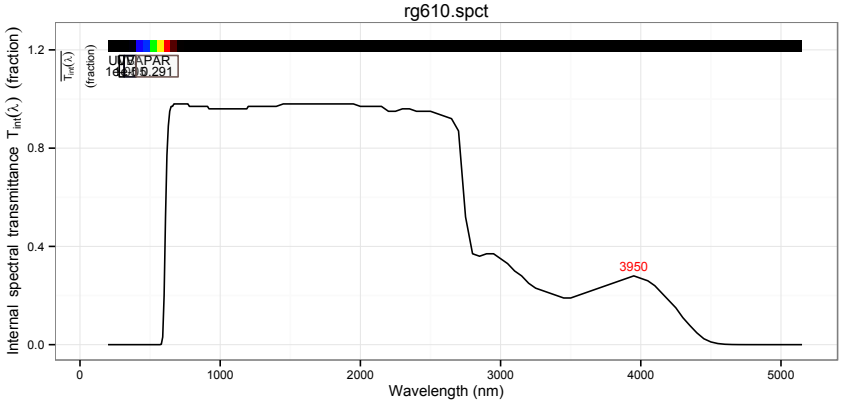

og530.spct
Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
$\overline{T_{int}(\lambda)}$ (fraction)
UVAPAR
0.554
0.0
0.4
0.8
1.2
0
1000
2000
3000
4000
5000
Wavelength (nm)

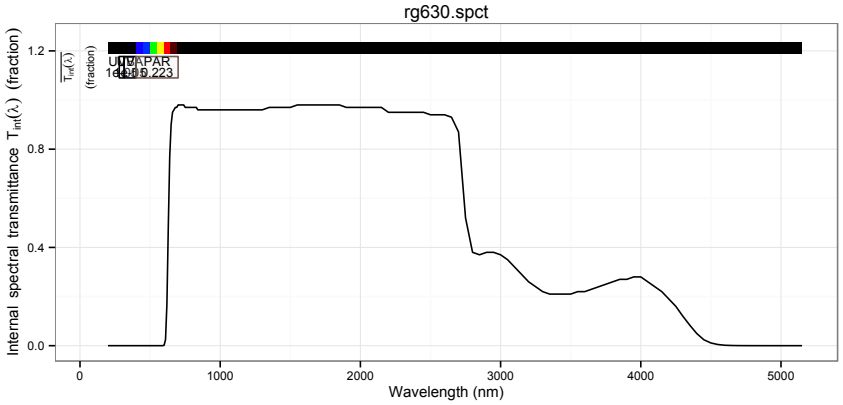

og550.spct
Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
$\overline{T_{int}(\lambda)}$ (fraction)
UVAPAR
0.486
0.0
0.4
0.8
1.2
0
1000
2000
3000
4000
5000
Wavelength (nm)

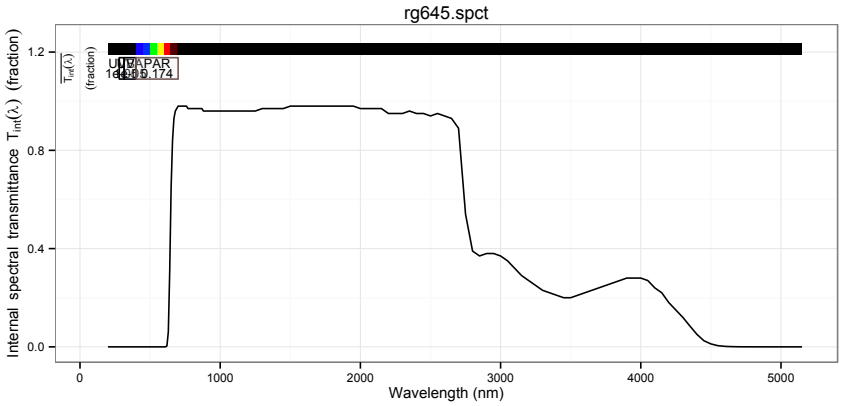

og570.spct
Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
$\overline{T_{int}(\lambda)}$ (fraction)
UVAPAR
0.423
0.0
0.4
0.8
1.2
0
1000
2000
3000
4000
5000
Wavelength (nm)

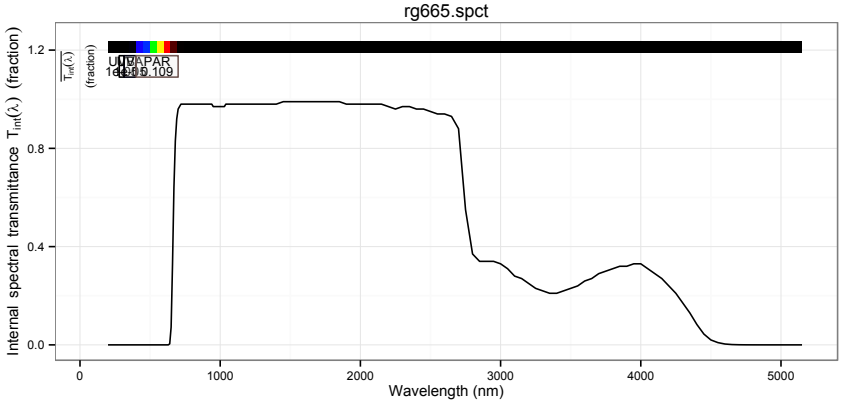


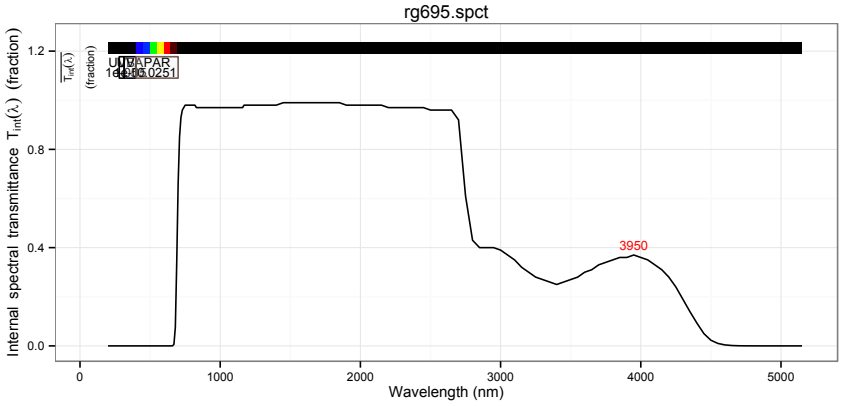

```
for (filter in c("rg610", "rg630", "rg645", "rg665", "rg695", "rg715",
                 "rg780", "rg830", "rg850", "rg9")) {
  filter.plotter(filter)
}
```

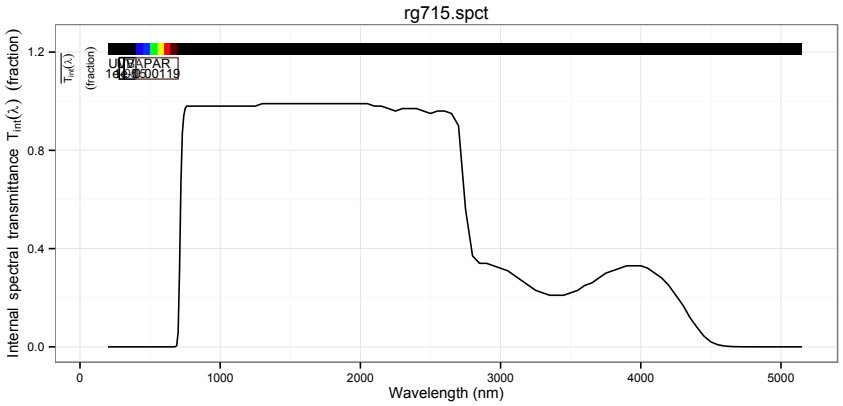


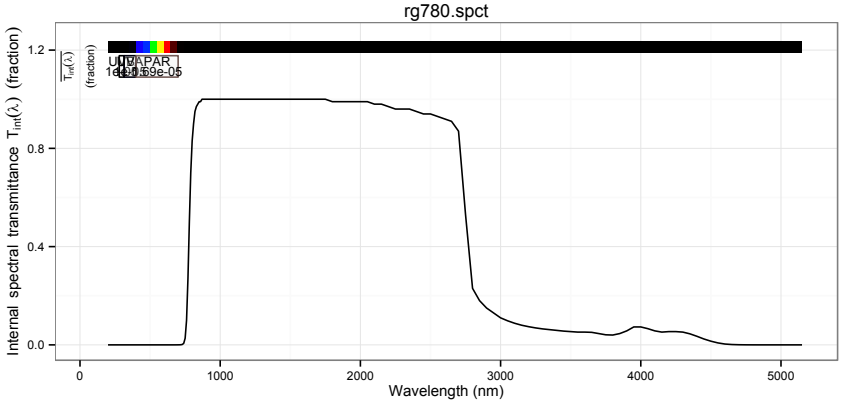


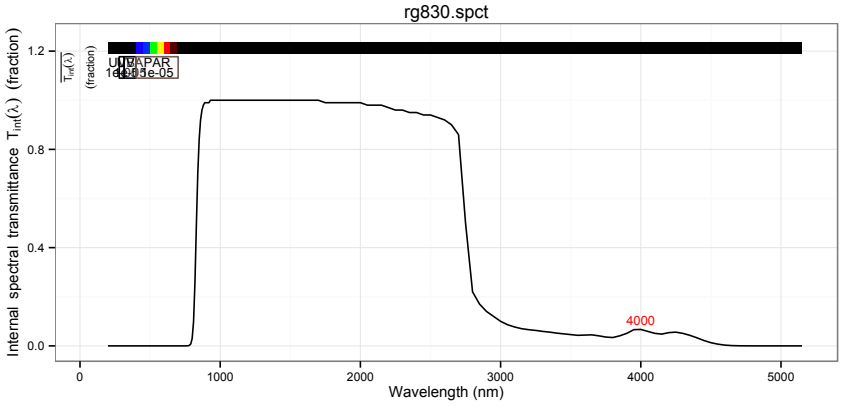

rg645.spct
Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
$\overline{T_{int}(\lambda)}$ (fraction)
UV
APAR
0.174
0.0
0.4
0.8
1.2
0
1000
2000
3000
4000
5000
Wavelength (nm)

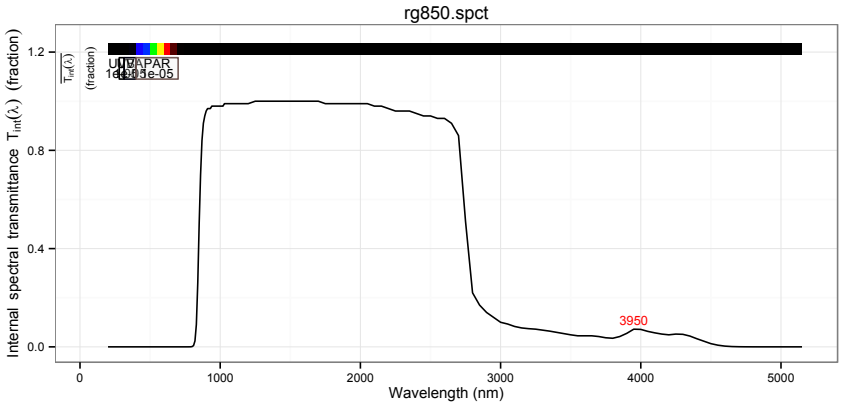

rg665.spct
Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
$\overline{T_{int}(\lambda)}$ (fraction)
UV
APAR
0.109
0.0
0.4
0.8
1.2
0
1000
2000
3000
4000
5000
Wavelength (nm)

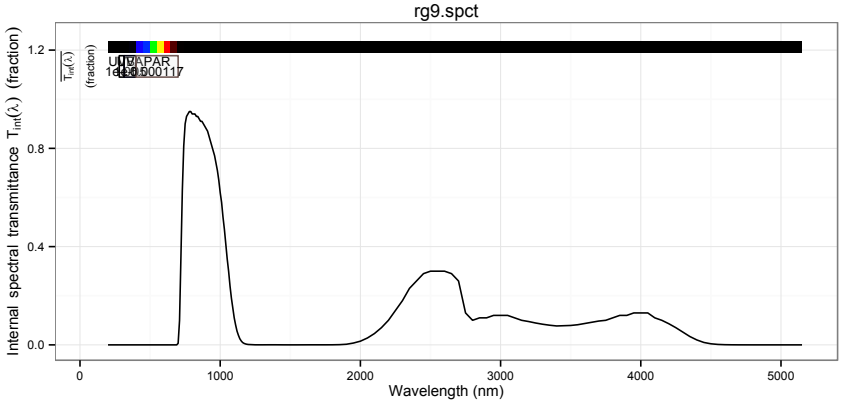

rg695.spct
Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
$\overline{T_{int}(\lambda)}$ (fraction)
UV
APAR
0.0251
3950
0.0
0.4
0.8
1.2
0
1000
2000
3000
4000
5000
Wavelength (nm)


rg715.spct
Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
$\overline{T_{int}(\lambda)}$ (fraction)
UV
APAR
0.00119
0.0
0.4
0.8
1.2
0
1000
2000
3000
4000
5000
Wavelength (nm)


rg780.spct
Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
$\overline{T_{int}(\lambda)}$ (fraction)
UV
APAR
0.0
0.4
0.8
1.2
0
1000
2000
3000
4000
5000
Wavelength (nm)

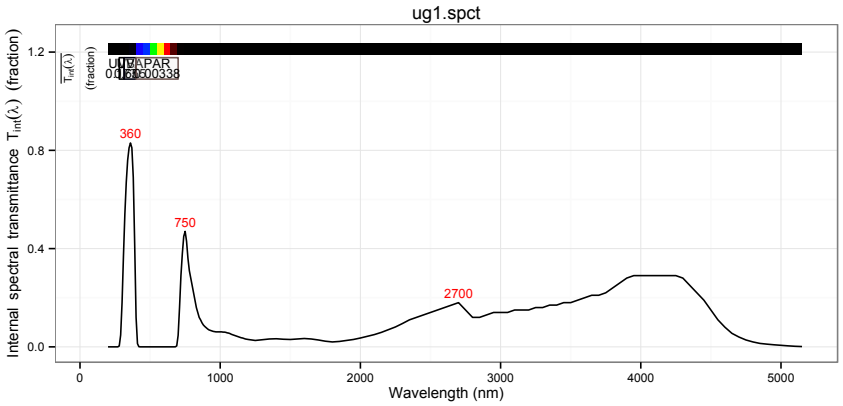

rg830.spct
Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
$\overline{T_{int}(\lambda)}$ (fraction)
UV
APAR
0.0
0.4
0.8
1.2
4000
0
1000
2000
3000
4000
5000
Wavelength (nm)

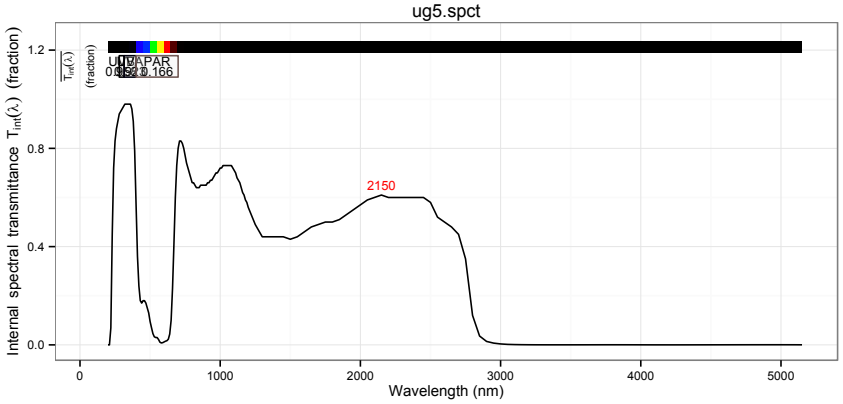


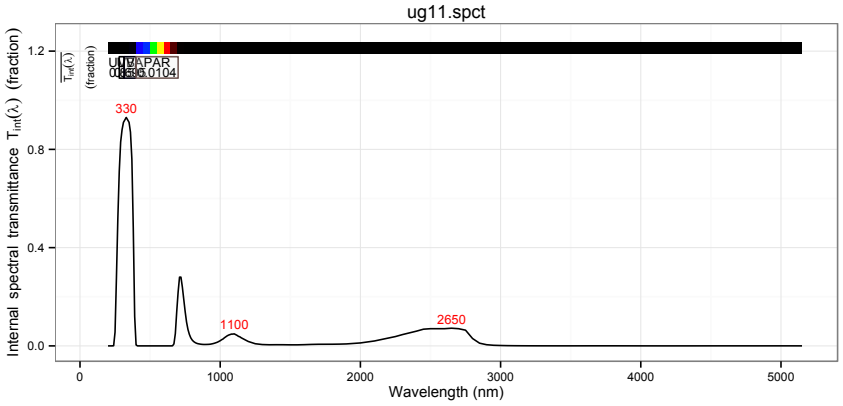


5.2 Schott band-pass filters

```
for (filter in c("ug1", "ug5", "ug11")) {
  filter.plotter(filter)
}
```


ug1.spct
Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
Wavelength (nm)
360
750
2700


ug5.spct
Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
Wavelength (nm)
2150


ug11.spct
Internal spectral transmittance $T_{int}(\lambda)$ (fraction)
Wavelength (nm)
330
1100
2650