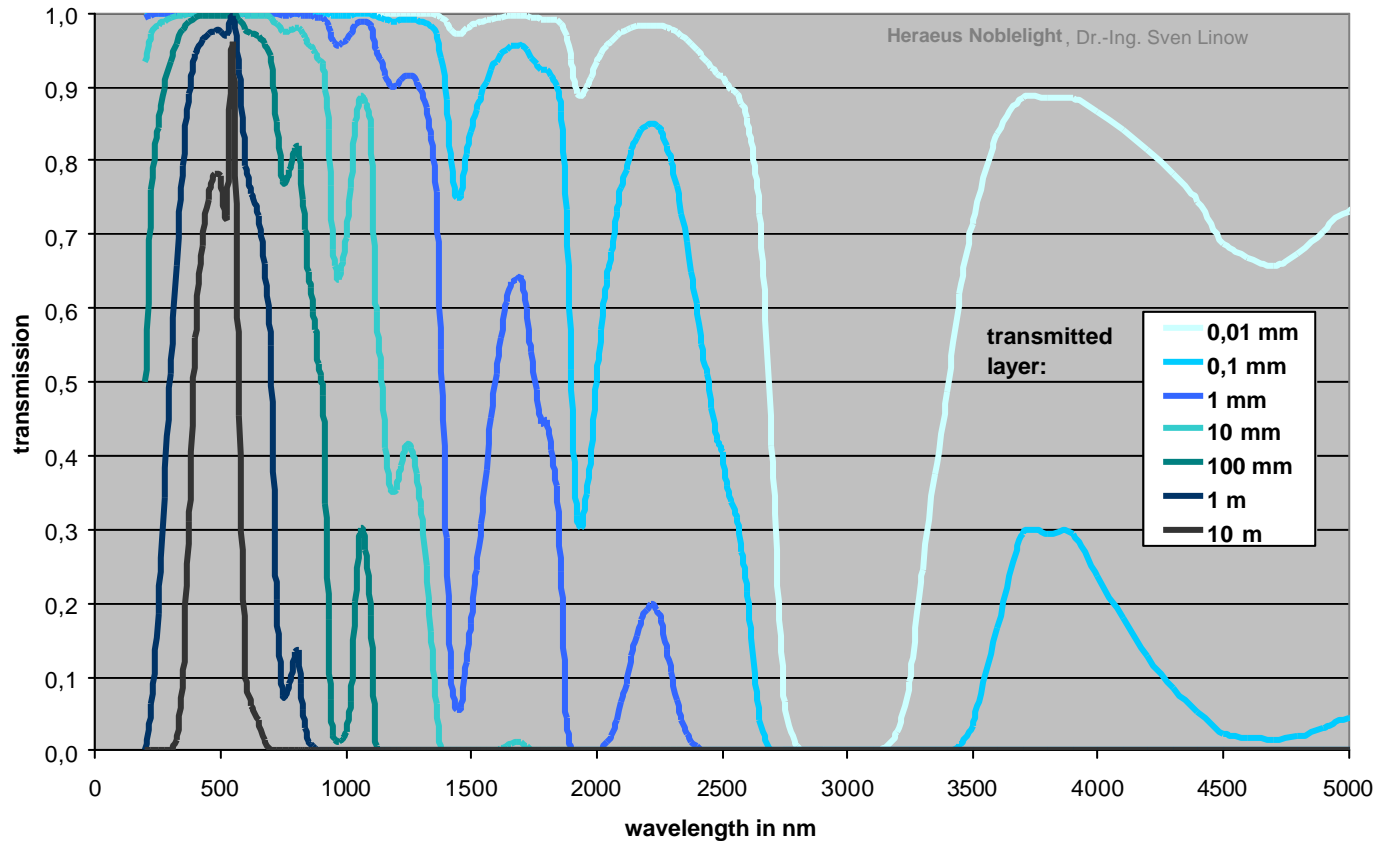
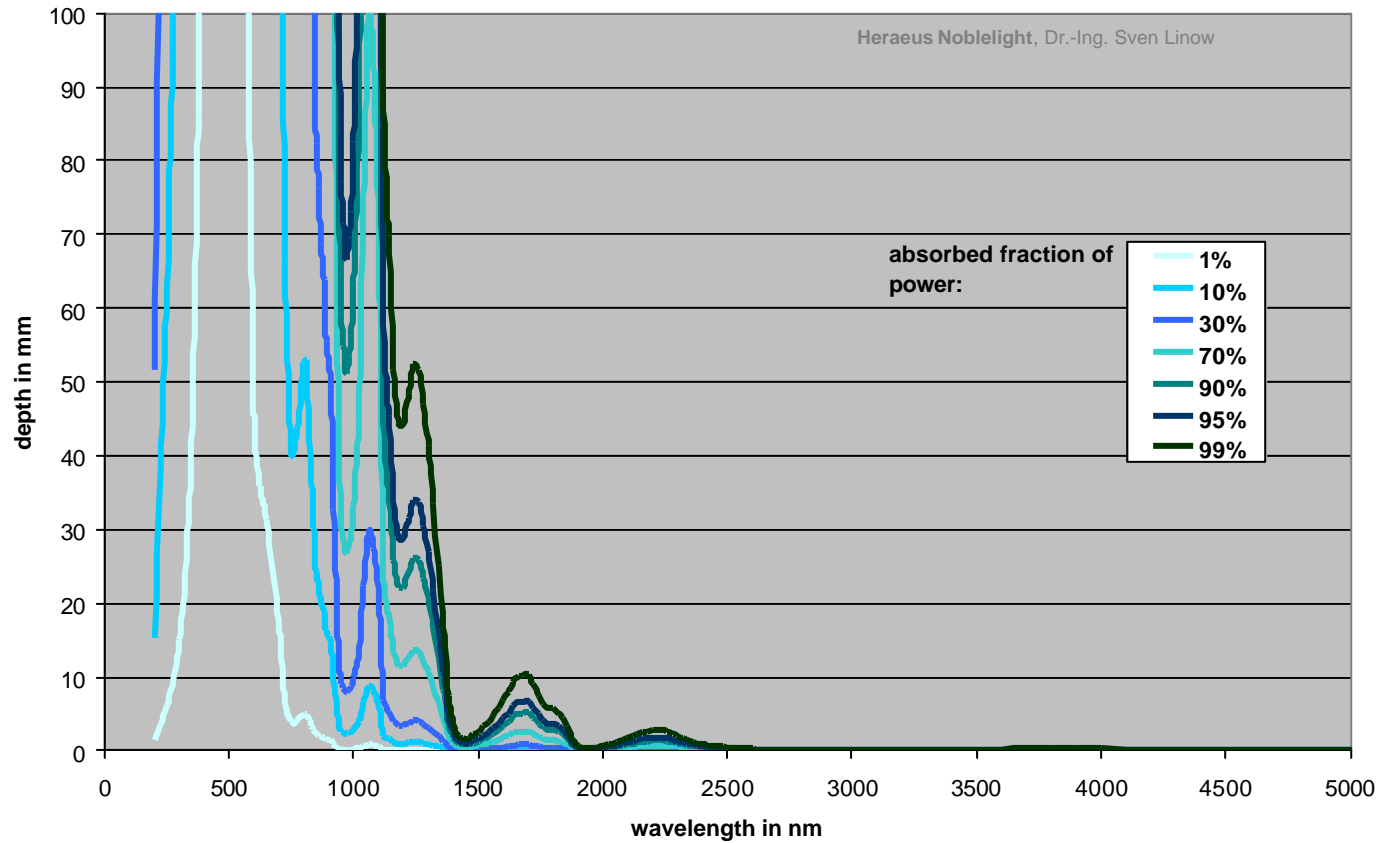


Heraeus Noblelight
DI water heater
-
Integrated system
electrical emitter and heat-transfer-
tube
-

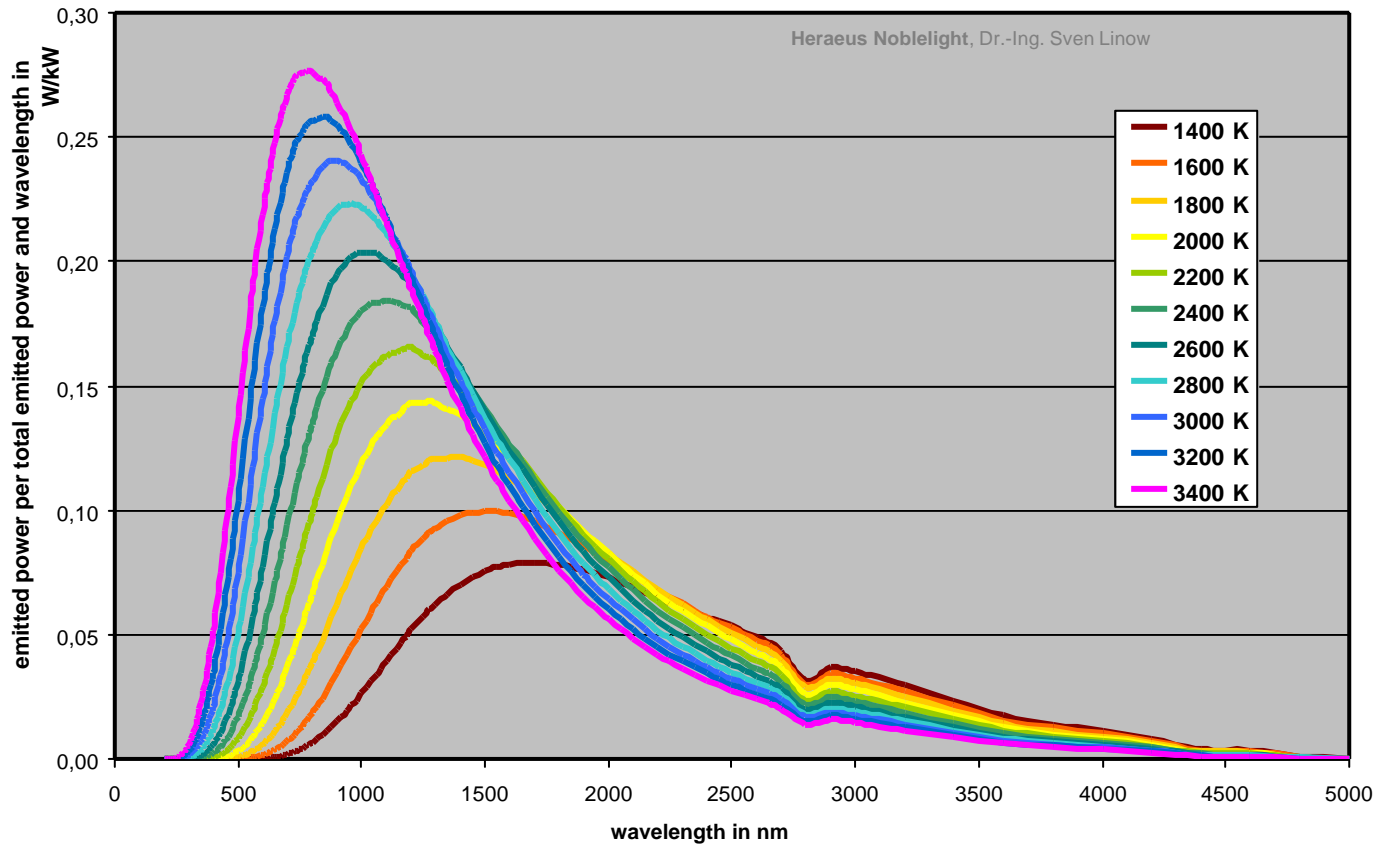
Absorption of water I: Transmissivity depending on thickness of layer



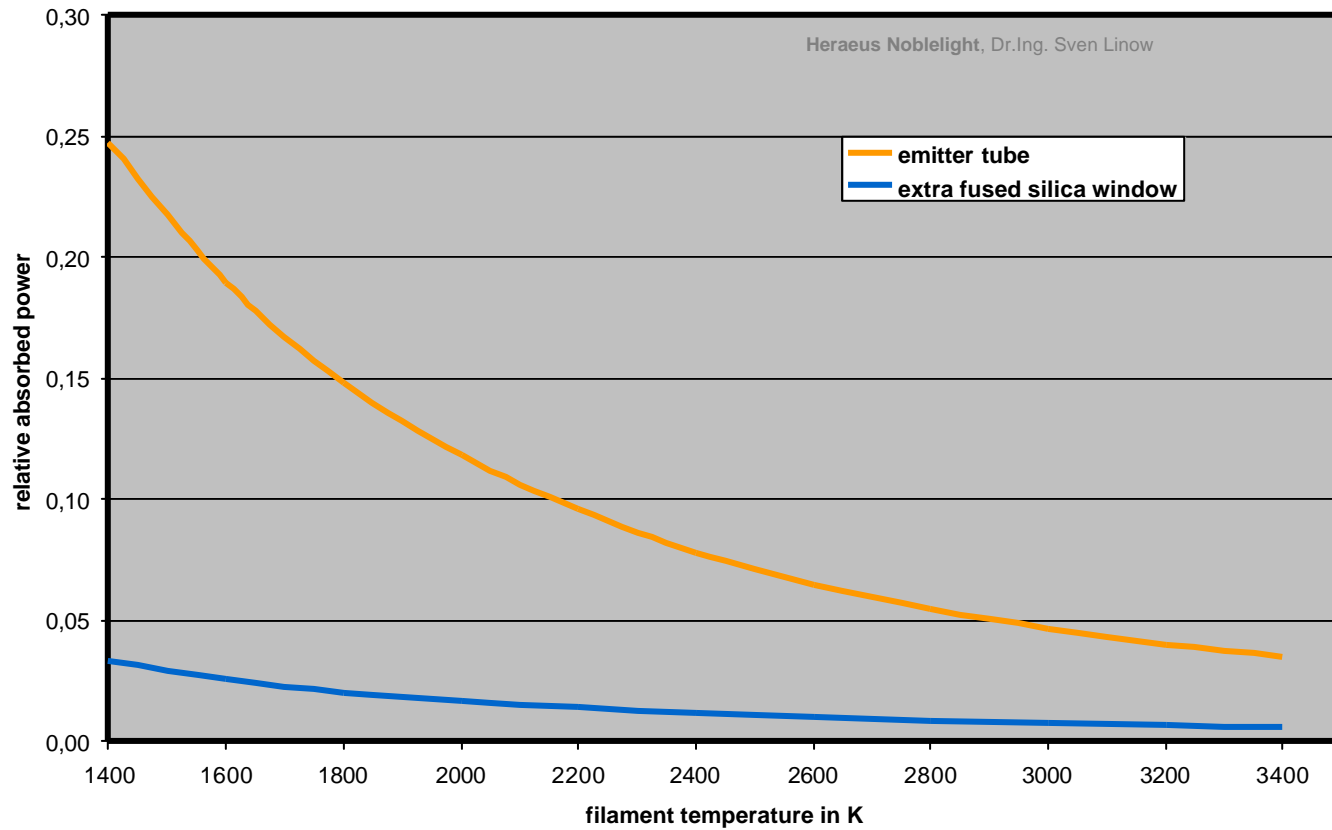
Absorption of water II: Transmissivity depending on thickness of layer



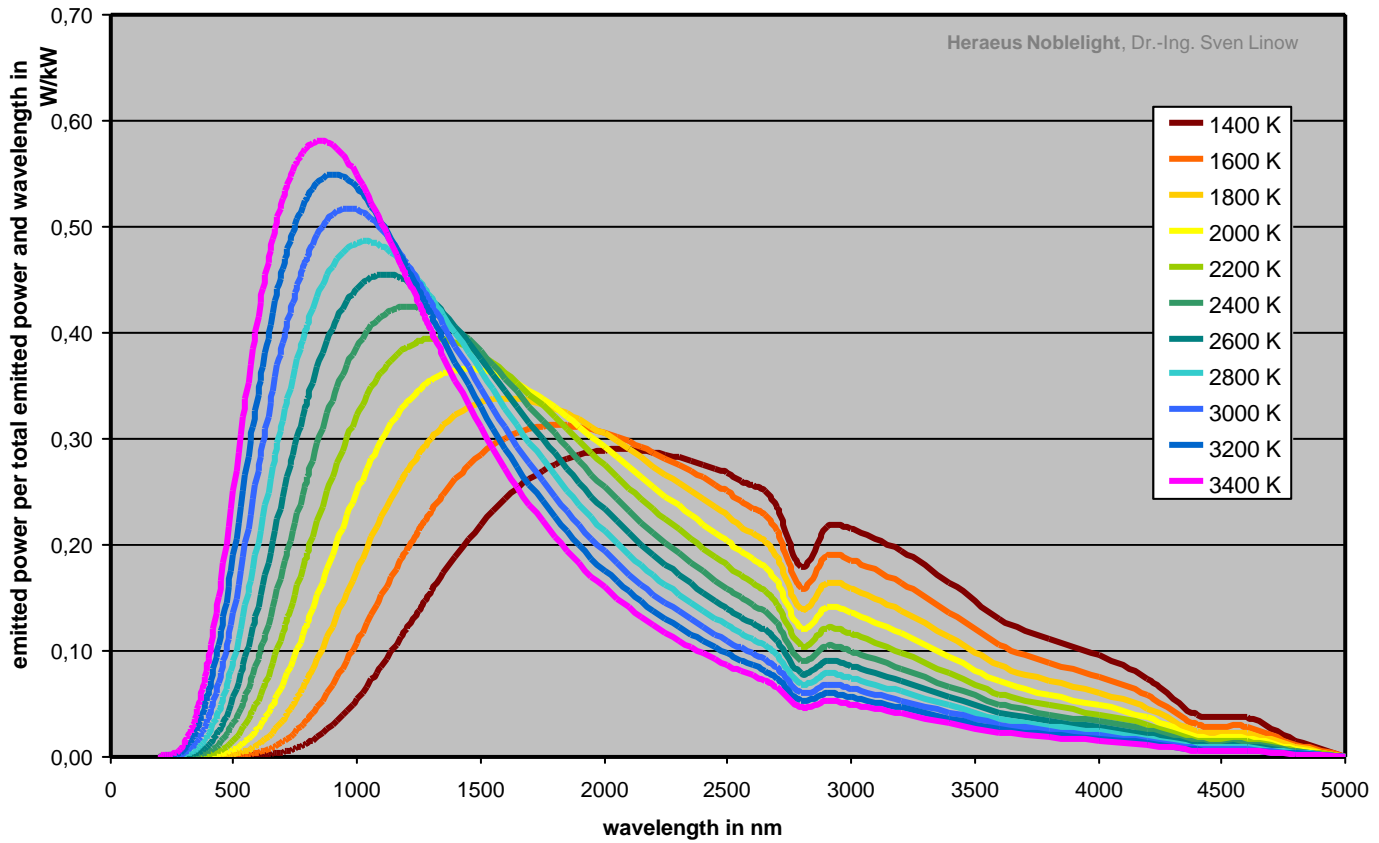
The ideal emitter I: real emission spectra of tungsten



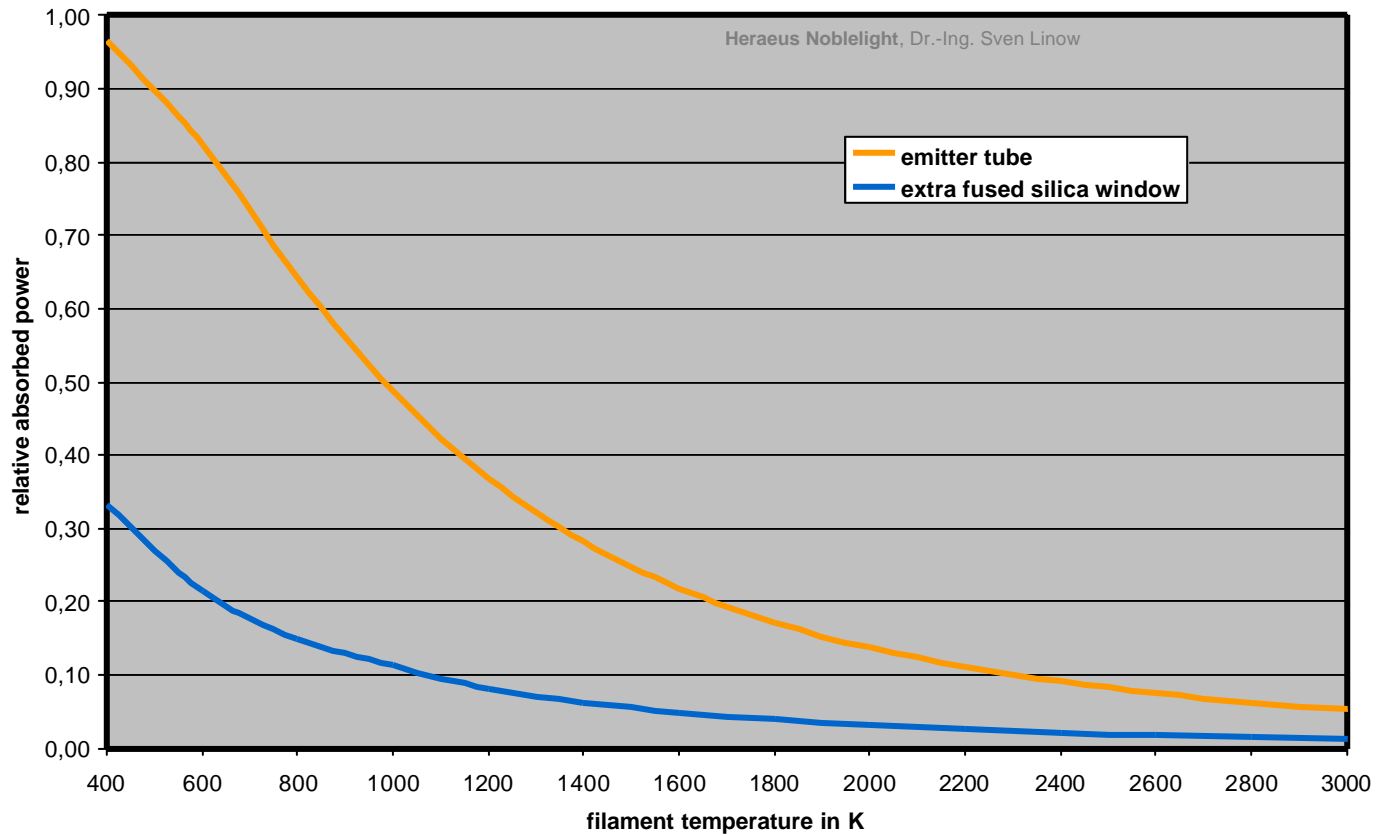
The ideal emitter II: heat losses in the emitter tube for tungsten emitters



The ideal emitter III: real emission spectra for Carbon emitters, 1700 K is technical max.



The ideal emitter IV: losses in the emitter tube for Carbon emitters



The ideal emitter V

- Max. heating of water by radiation
- Low heat transfer through the emitter tube (no boiling)
 - ⇒ maximum emission between 900 nm and 1400 nm
 - good transmissivity of water and sufficient absorption
 - ⇒ tungsten at 2000 °C filament temperature
 - sufficient power
 - optimum emission spectrum
 - low convective heat transfer
 - no wasted power at short wavelengths
 - ⇒ no halogen
 - halogen cycle breaks down at cold walls
 - halogen emitters waste power at short wavelengths
 - ⇒ gold coating
 - long path-lengths for short wavelengths
 - maximum IR reflectivity

