HULINKS

Thin Film Design Software for Windows

TFCalc

Software for the Design and Manufacture of Optical Thin Film Coatings

The industry's leading software for designing and manufacturing optical thin film coatings that won't require you to take a class or hire an expert to use. It's simple, it's easy, and with our product TFCalc, you can design coatings for lenses, computer monitors, eyeglasses, window panes, light bulbs, hot and cold mirrors, x-rays mirrors all for an affordable price.

Summary of TFCalc Features

Thin Films

- Up to 5000 layers on both sides of the substrate
- Layers can be added manually or created with a stack formula, such as (HL)^5 1.2(HL)^5
- Layers may have a variable index
- Layers may consist of mixtures of two materials
- Layer thickness may be entered as physical or quarter-wave optical thickness
- Layer thicknesses may be constrained
- Thicknesses may be adjusted for angle
- A layer may be replaced by an equivalent (HLH)^p or (LHL)^p stack
- Layers may be grouped to preserve symmetry or to shift a sequence of layers
- Rugate coatings can be simulated
- Layers may consist of active and gain materials

Analysis

- Compute reflectance, transmittance, absorptance, optical density, loss, phase shift, psi, group delay (GD), group delay dispersion (GDD), TOD, and electric field intensity
- Compute reflected or transmitted color (CIE and LAB)
- Compute equivalent (Herpin) index of a sequence of layers
- Compute the sensitivity of reflectance, transmittance, absorptance, optical density, loss, phase shift, and color to normal manufacturing errors (thickness and index)
- Compute the layer sensitivity
- Compute cone-angle average (also called biconical) reflectance, transmittance, absorptance, density, and loss with user-defined radiation distributions
- Interactive analysis can be used to determine how changes to one or more parameters affect the performance
- Animations can be created using the interactive analysis feature
- Yield analysis allows the user to determine the manufacturability of a coating
- Either the Muller or Abeles phase shift convention may be selected
- Simulate the output of a light monitor
- Compute admittance

Optimization

- Three local methods: Variable Metric, Gradient, and Simplex
- Global Search may be used to find the best coating design
- Needle optimization (with tunneling) may be used to synthesize unusual designs
- Vary either thickness or index or both
- Layer thickness can be constrained during optimization
- Deviations are displayed during optimization
- Index profile may be displayed during optimization
- Flexible merit function
- Optimize front and back layers simultaneously
- Optimize group factors
- Sensitivity may be optimized
- Zero-thickness layers may be removed automatically during optimization
- An illuminant and a detector function may be entered, making it possible to optimize a coating for specific environments
- The product R*T can be optimized
- Performance from both sides of a coating can be optimized
- Cone-angle average may be optimized
- Ultra-fast quantities (GD, GDD, TOD) may be optimized
- Automatic design of bandpass filters using the prototype method

Optimization Targets

- Optimization targets can be reflectance, transmittance, absorptance, density, color, luminance, phase shift, group delay, group delay dispersion, TOD, and psi at any wavelength, polarization, and angle
- Targets can be either discrete (one wavelength), continuous (for a range of wavelengths), or cone-average (for a cone of angles)
- First, second, and third derivatives of these quantities maybe used as targets
- Targets can be entered manually, generated automatically, or read from files
- Generated targets may be distributed by wavelength, wave number, or logarithmically
- Target values can be inequalities
- Up to 5000 targets
- Targets for multiple environments
- Equal-ripple targets can be generated
- Target values can be entered in dB

Results

- Results may be displayed numerically or graphically
- All tables and graphs can be printed
- Results can be saved in a file for processing by other programs
- Results can be saved as an animation
- Results of up to 5 coating designs can be displayed simultaneously on a graph
- Two results, such as reflectance and transmittance, can be overlaid on one graph
- Screen plots have a cursor that enables the designer to read numbers from the plot
- Performance statistics may be computed for any result
- Save plots as GIF files

Optical Data

- Unlimited number of material, substrate, illuminant, detector, and radiation distribution data files
- Refractive index maybe entered as tables or dispersion formulas
- Internal transmittance can be read for substrates
- Missing N or K data can be filled in using interpolation
- Refractive index (N and K) can be computed from spectral or ellipsometric data
- Material and substrate data can be absorbing and dispersive
- The reflectance or transmittance of a coating can be saved as an illuminant
- Comments can be stored with each data file
- Data can be read from text files
- Blackbody illuminants may be created

Coating Files

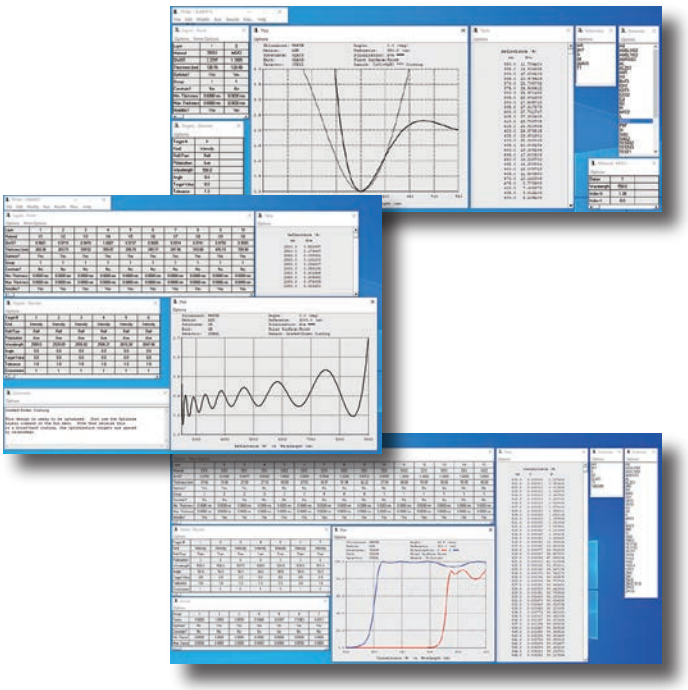
- Contain all information about a coating — layers, targets, comments, variable materials, etc.
- Easy to copy parts of one coating file to another
- Export coating designs to Code V and ZEMAX optical design software

Accurate and Fast

- All calculations are done in 16-digit floating-point arithmetic
- During optimization, TFCalc calculates up to 500,000 layers/second on top-of-the-line computers

User Interface

- Easy-to-use, standard Windows user interface
- Menus, dialogs, spreadsheet-like windows
- Very easy to edit and recompute



System Requirements > Windows 8 / 8.1 / 10

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