5.6 Selective Colour Correction

Colour in Colour Correction

Selective colour correction was developed for high-end scanners, and consists of a changing colours within a colour. The colours red, green, blue, cyan, magenta and yellow as well as the 6 colours in between are corrected. The contaminating colour can be reduced and the current colour can be increased. The cast colour of red is cyan, of green is magenta, of blue is yellow.

The type of selective colour correction that is used in *SilverFast* can be called a sector correction, as it is correcting colours within a band of 60° or 30° angle – depending on which matrix is being used (read about further explanation of the colour model in the addendum).
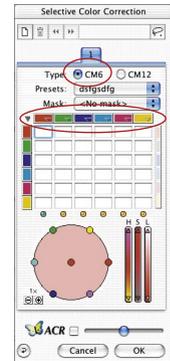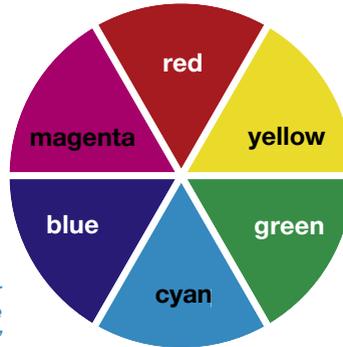
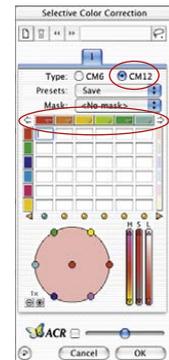*The 6 colour sectors while using the "Colour Matrix 6"*

The 12 colour sectors while using the "Colour Matrix 12"
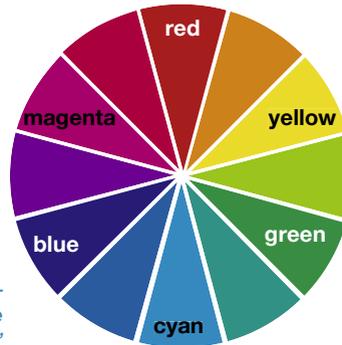
Overview

Activation of Selective Colour Correction

Button for opening dialogue window

Grey background indicating Colour correction is active

Administration of Layers

Add new layer

Delete active layer

Move layer in front of previous

Move layer behind following

Creating Masks
Changing mask tools: Click button and hold mouse depressed, when pop-up comes up change to tool desired.

Brush

Polygon

Lasso

Sector-Presets (triangles ▬)
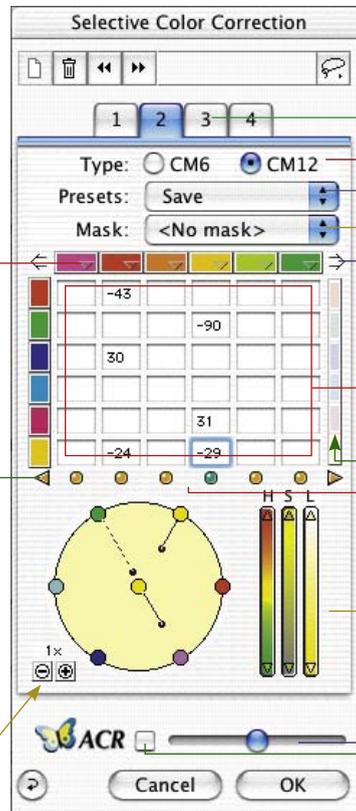Loading and saving settings only for the relevant sector

Indicator-Triangles (◁ ▷)
Green: Left / right there are other active sectors
Red: Left / right there are no other sectors active.

Colour Space Zoom
Increases / decreases the magnitude of change enabling bigger / finer corrections.

Layers
Single Layer panels

Type CM6 or CM12
Switch between 6-colours or 12-colours

Presets
Save or load settings

Mask
Save or load Masks

Overview Colour Sectors (arrows ⇦⇨)
Only with CM12 available! Showing other channels which are further right or left.

Colour Matrix
Colour table for all Colour sectors

Changing all Colours
When active, all colours of the selected sectors can be made brighter or darker by dragging with the mouse from the inside or outside of the colour wheel.

Active-Switch / Indicator (● ●)
Green: Sector is active
Red: Sector is not active

HSL Controls
Change by holding the small triangle at the top or button of the control depressed

ACR control

Switch ACR- On / Off

OK
Apply settings and close dialogue

Reset / Reset all
Reset Settings. By pressing the "Alt" key, all parameters are reset.

Cancel
Close dialogue and don't apply settings.

Objective of Selective Colour Correction

The object of the selective colour correction is to reduce the contaminating colour and enhance the primary colour, as much as necessary. In the upper row, all colours that are to be corrected are displayed horizontally. The colours which are displayed vertically are those colours with which the upper colours are to be corrected.
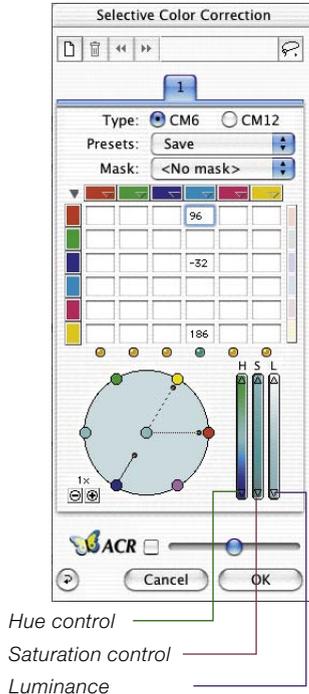
1. Colour matrix

In the upper row of the colour matrix, you will find the RGBCMY colours that can be corrected aligned horizontally - these can also be corrected by the vertically aligned colours. For example, the magenta part of the red can be increased by entering +10 in the respective field.

2. HSL controls

These controls change the hue (H), the saturation (S) and the luminance (L).

3. Colour circle

By means of the colour circle, colours can be altered by adding or subtracting colours.

Hue control
Saturation control
Luminance

Selecting the Correction Colour

Often it is difficult to tell if a colour tone is red or magenta, blue or cyan. Simply click on the colour in the prescan window, and *SilverFast* shows the type of colour that is to be corrected, in the middle of the colour circle. The colour sector recognized will be the colour in the centre of the colour wheel. At the same time the corresponding column in the colour matrix will become active.
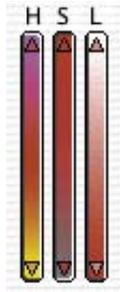
HSL Correction by Sliders

Hue (H): click on the small triangle located at the end of the Hue pillar until you reach the desired correction (Keep the "Shift" key pressed down in order to increase the correction speed).

**Saturation (S)**: Comfortable adjustment of saturation.

Luminance (L): Comfortable adjustment of luminance.
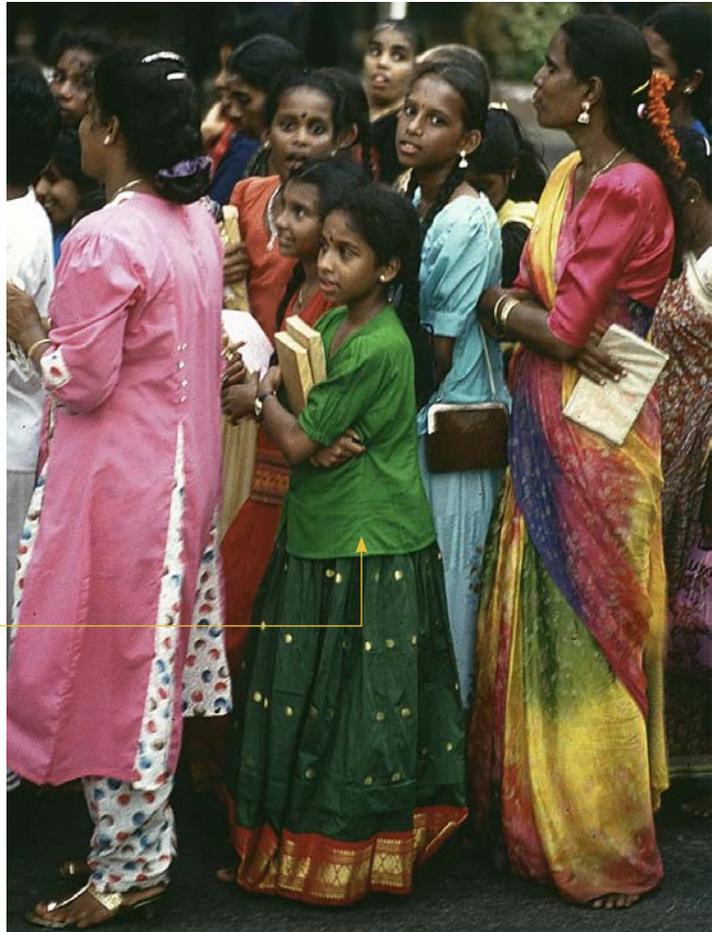
Correcting an Image Selectively

We will use an example to show how to selectively correct colour. Go by the following steps to correct the green colour of the blouse and sari selectively:

1. Click on the "Selective colour correction" icon in the *SilverFast* tool bar. The dialogue on the left appears.
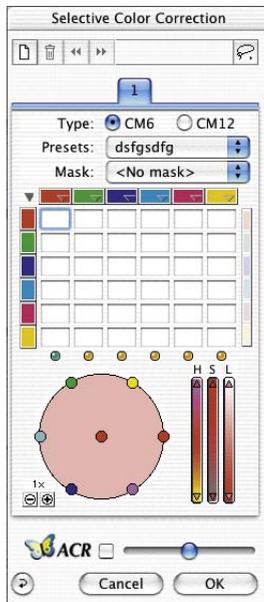
Green colour to be corrected

2. Click onto the green blouse of the woman in the centre. The colour circle and the HSL correction change to green.

3. Now move the cursor over green on the on the outer colour circle (the cursor turns into a hand cursor with a minus sign inside).

4. Press the mouse and drag towards the centre of the colour circle (a line is pulled out of the green spot and the green becomes weaker within the blouse and sari).
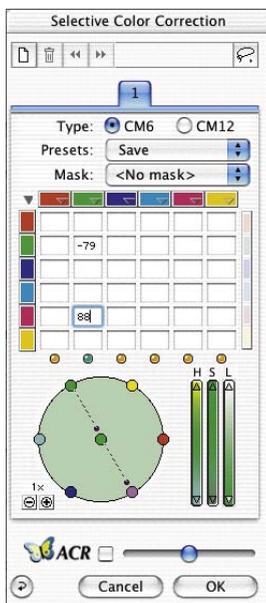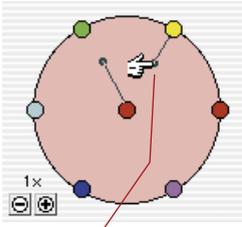

Green colour changed to blue.
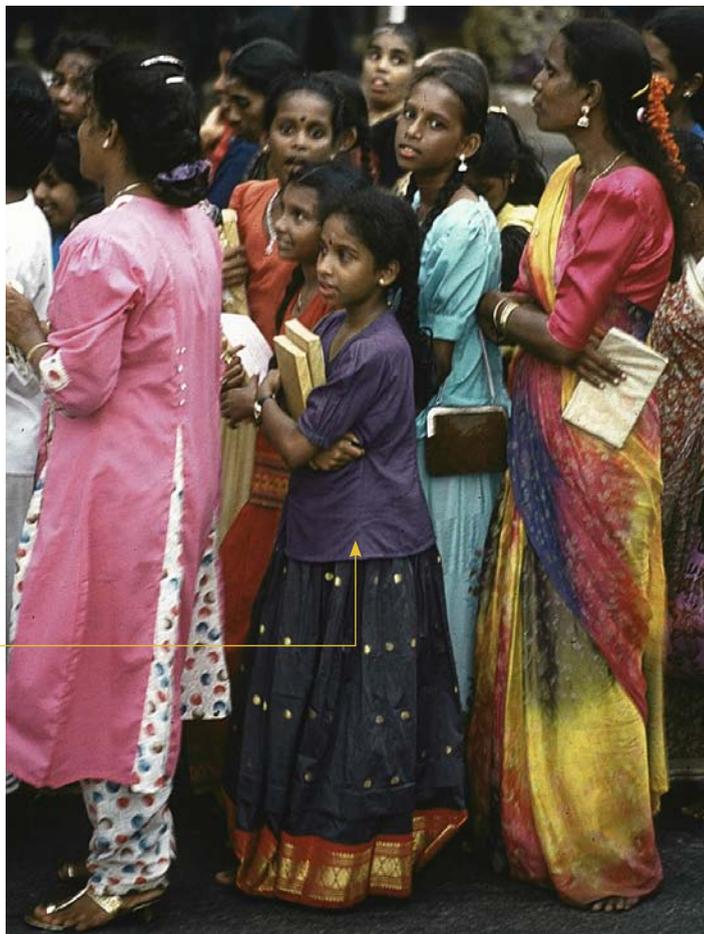
5. Move the cursor over the green spot in the centre of the colour circle and press and drag towards the Magenta spot on the outer circle (the blouse and sari colour now changes to blue).
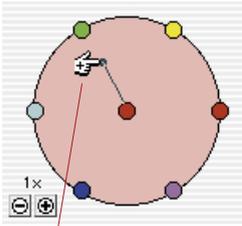
Plus correction (adding colour)

Minus correction (subtracting)

Colour Circle

In order to add one colour into another, move to the centre of the circle (the hand cursor symbol shows a "plus" sign) and drag it towards the colour that you wish to add (a line with a bullet is pulled out). In the case shown, the primary colour (red) is enhanced by adding red, so the red colour will become stronger More than one colour can be added to the chosen colour in the centre of the circle.

In order to subtract colour, move the cursor over a colour on the circuit of the circle (a "minus" sign appears on the hand cursor symbol). The colour chosen will now be subtracted from the colour to be corrected (in the middle). In the example shown, red is subtracted from red, so the red colour will become weaker.

The correction lines in the circle can be scaled by the small "plus/minus" buttons bottom left of the colour circle.

Selecting Colours

By pressing the "shift" key and simultaneously clicking on the LEDs or into the prescan, you can add another colour to the existing selection.
This way you can select and work with three or more neighbouring colours. This is especially useful when using the HSL controls while increasing the saturation of the selected colours.
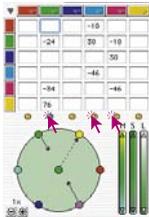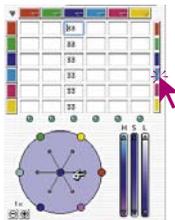

Selecting all colours with keyboard shortcut "Command + A" possible (PC: "Strg + A").

Right of the matrix you have a vertical colour bar, which can be used to couple all colours for subtracting or adding colours. This is only relevant when using the colour wheel for corrections. If for instance you would try to add yellow to red (with coupling activated) by dragging from the centre to the outside of the colour wheel, all colours will be added to red instead, making the red much darker.

Colour Correction Presets

Any desired number of presets can be saved in the selective colour correction under each of the six correction colours red, green, blue, cyan, magenta and yellow, and re-loaded later. Also, a combination of these presets can be saved accordingly (see next page).
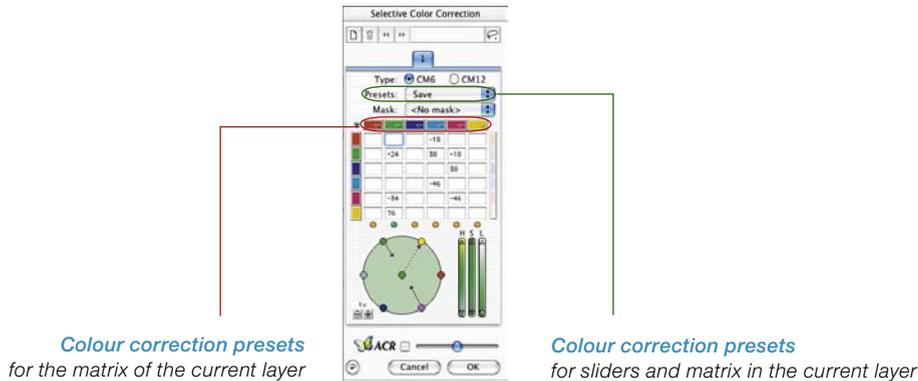
Colour correction presets for the matrix of the current layer

Colour correction presets for sliders and matrix in the current layer

Presets for the Colour Matrix

The small triangles indicate the presets in the colour matrix. For each single colour, several corrections can be made.
In order to delete a preset from the list, keep the "Alt" key (PC: "Shift" key) pressed down while dragging the mouse over it. Release the mouse button and the preset is removed.

Presets for Controls and Matrix Combinations

Using the button "Save" in the dialogue window you can save correction combinations of matrix presets and slider positions under the pull-down menu for the active layer.
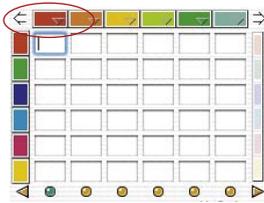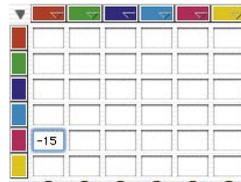
Working with Colour Correction Presets

Open the selective colour correction dialogue and click onto the preset symbol in "RED".

You will see a pull down menu with red presets. Choose a correction and release the mouse button.

The respective values will now be entered into the colour matrix automatically.

By the same method, each of the six correction colours can be loaded.

In order to delete a preset from the list, keep the "Alt" key (PC: "Shift" key) pressed while dragging the mouse over it. Release the mouse button and the preset is removed.

### Joining Presets for a Complete Correction

Any desired presets can be combined to a complete correction and saved under a specific name.

By means of the import function, saved parameters from other *SilverFast* products may be loaded and applied to the current version.

The presets are loaded from the "prefs" folder of the *SilverFast* source version out of the file "SFApp".
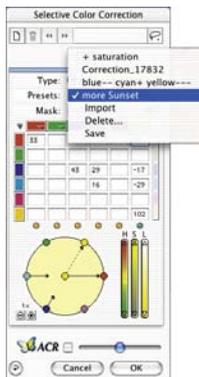
Working with Masks
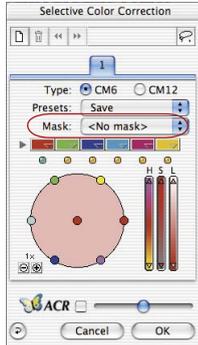
Normally all settings in the selective colour correction will effect the entire image (frame).

If you want to limit the correction to certain areas of the image, you have to apply masking.

The mask can be freely drawn with the mouse inside the preview window.

For assignment and containment of the current selection a "Lasso"-, a "Brush"- and a "Polygon"- tool have been implemented.

After drawing a mask the colour corrections are applied within the activated area. They are only visible if the active area also covers or touches some parts of the scan frame. Lasso- and polygon-tool are applicable in both the 6x and the 12x matrix.
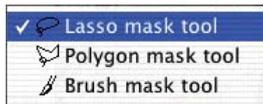
Selecting a Mask Tool

By clicking and holding the mouse over the lasso tool, you will get a pop-up with the other mask tools. Still holding the mouse, you can now change to one of the other mask tools and release the mouse.

The mask menu immediately switches to "New mask / extend mask" icon order to enable immediate drawing.
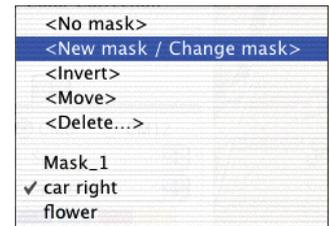
New Mask with Lasso Tool

The active region of the mask has to be drawn in one move while holding down the mouse button. Upon releasing the mouse button, the region of the mask designated in this manner will immediately be furnished with the already programmed selective colour correction, or the correction to be made will immediately be applied to the active surface area.

A "Save" dialogue will appear immediately after the symbol so the mask may be saved.

New Mask with Polygon Tool

The active mask area will be defined by subsequent single mouse clicks. A line is drawn from mouse-click to mouse-click. Completing the geometric area is achieved by clicking the start point of the Polygon again. The region of the mask designated in this manner will immediately be furnished with the already programmed selective colour correction, or the correction to be made will immediately be applied to the active surface area.

A "Save" dialogue will appear immediately after the symbol so the mask may be saved.

New Mask with Brush Tool

The brush tool creates a mask using small lines. Only these small areas will be effected by the selective colour correction.

A "Save" dialogue will appear immediately after the symbol so the mask may be saved.

Hard or Soft Mask Edges

The edges of the drawn masks are variable in their softness. The standard setting for the mask edge is defined as "hard". The crossover at the border is freely definable in its width.


Click on the "Options…" button on the "General" palette. Choose "General" in the popup window "Presets" and continue to the menu "Mask Edge Size".
The standard setting here is "0", which defines a hard mask edge.


Mask Edge Size = „0.00"

By changing the value and clicking onto the button "Apply", the effect can be monitored in the preview window. The influence, taken by the value typed in, depends on the currently used output resolution.

5.6
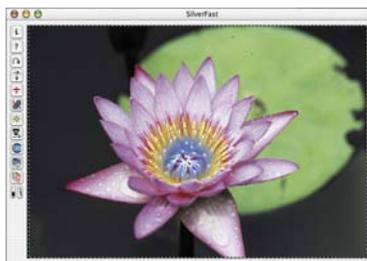
Mask Edge Size = „0.05"

If the result is satisfactory, close the "Options…" dialogue by clicking "OK".
The setting chosen here will then be valid for all mask edges.
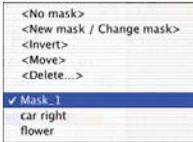
Changing of a Mask

The existent masks may be altered at any time. To do this, simply choose the desired mask in the mask menu.

Adding to Mask: Press "Shift" and draw desired addition. The mouse pointer will display a "plus" symbol.
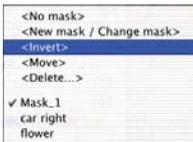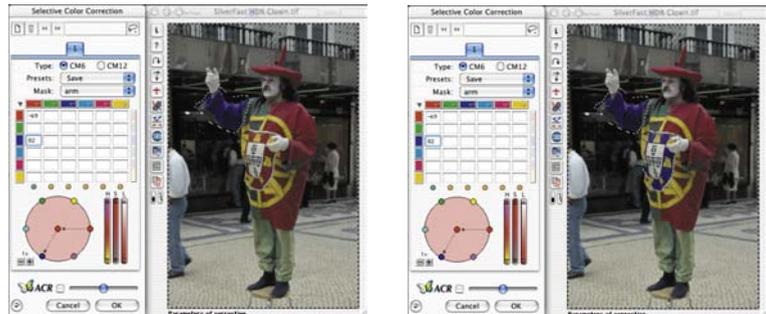
Subtracting from Mask: Press "Alt" and draw desired subtraction. The mouse pointer will display a "minus" symbol.

Changing a Mask
On layer 3 of the left picture on the left, only the sleeve has a mask "Arm". In the picture on the right the emblem has been added to the previous mask.

Belated Inversion of a Mask "inverse"

The menu "invert" is a switch. It allows switching between the previously active mask area and the previously inactive area.

Directly new Redraw of an Inverted Mask

Depressing the "Alt" key with any of the mask tools activated will invert the mask function. The mask will become kind of a negative mask. Now encircle the area with the mask tool you do not want get affected by the correction.
This function is similar to the invert mask function from the mask menu.

Changing a Mask

The menu "Masks" shows all previously created masks. Masks can be created and deleted here.
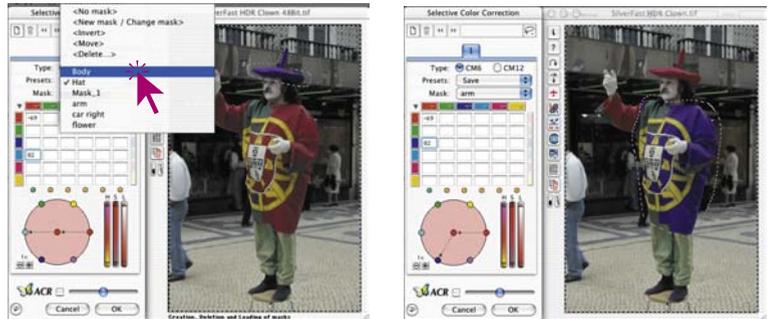
The mask currently active is highlighted by a check mark before the mask name.

Changing from one mask to another is accomplished by clicking onto the masks name.

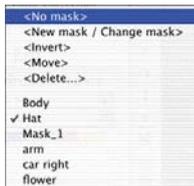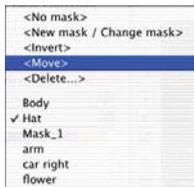The dialogue is closed and the preview window will be updated.

Changing the Position of a Mask "move"

By click-dragging, the active mask area can be shifted as a whole, within the prescan window i

De-activating a Mask "no mask"

By means of the menu entry "no mask", an existing mask for the active layer is de-activated.

The mask will not be deleted.

Displaying an Inactive Mask Area

If the selective colour correction dialogue window was closed with an "OK", the inactive mask area in the prescan window is displayed in dimmed form when pressing "Cmd" + "Alt" keys simultaneously ("Ctrl" + "Alt" for Windows).
The active mask areas are not dimmed.

Mac: ⌘ + ALT
Win: CONTROL + ALT
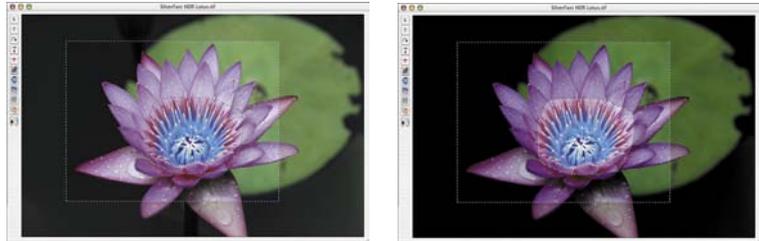
Removing a Mask <delete>

A dialogue window can be opened here where all previously saved masks are shown.

A single mask can be marked by clicking and deleted from the menu. By clicking while holding down the "Shift" key, several masks can be marked and deleted from the menu. By clicking while holding down the "Command," rows of masks can be marked and deleted from the menu.
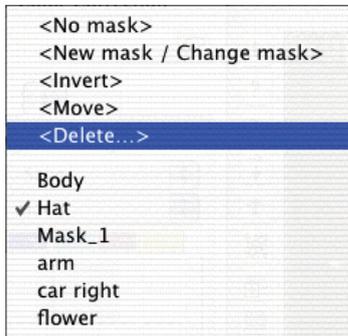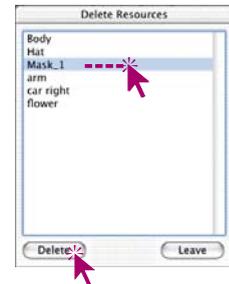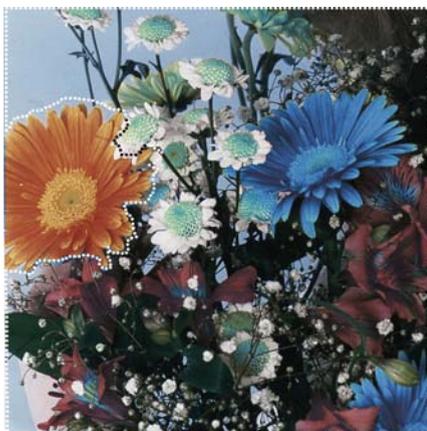
Example

Single Mask

Inverted Mask

Mask with several partial selections

Correction of 12 Colours

The second panel of die selective colour correction dialogue allows the correction of 12 colours. You can now correct half-tints like violet or orange. It can be used instead of the 6 colour matrix.

Because all of the input fields of the colour matrix cannot be shown at once there are two arrows on the top left and right to scroll the matrix horizontally.
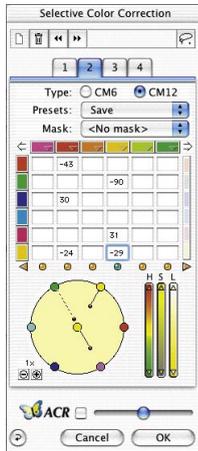
If you select a colour which is not visible by clicking on the preview the matrix scrolls automatically.

The arrows on the bottom left and right show that there are selected colours that are not in view which will be corrected.

Selective Colour Correction with
# Multi Layers and Masks

The new selective colour correction in *SilverFast* version 6 or higher now includes up to your layers. Each layer can have its own independent colour correction including masking. For example, four red apples can now each become a different colour. Most complex colour corrections can very comfortably be achieved.

Selective colour correction is one of the most significant functions of colour reproduction. The new selective colour correction increases the correction ability of the user, without making the workflow more complicated. A single click onto the object the user wants to change and *SilverFast* recognises its colour. Using the controls, it is now very easy to change the colour. By adding layers and masking objects, one colour can now be split into different colours.

The special function "Mask Edge Size" under the "General" panel in the "Options..." dialogue, can even define the degree of smooth edges of the masks.

The user can also define the appearance of the selective colour dialogue. The whole colour matrix can be hidden (when not needed) by clicking onto the small triangle left of the colour channel indicators.
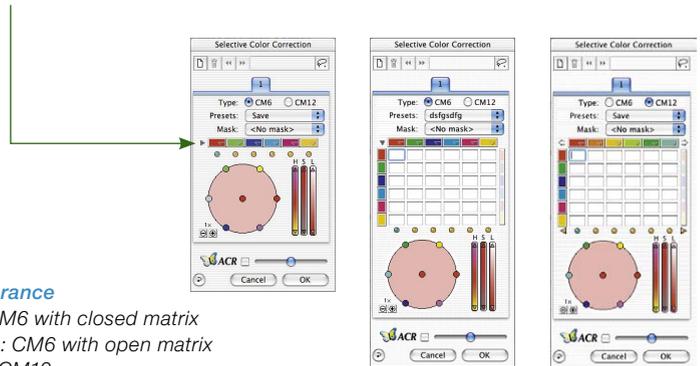

Appearance
Left: CM6 with closed matrix
Middle: CM6 with open matrix
Right: CM12

Creating new Layers

A new layer is created by clicking onto the layer button. Up to four layers can be created. Each new layer will start with default settings but will build upon the underlying layer. In case, as shown in the example below, red is turned into blue on the first layer, the second layer will not show red as red but as blue (since it has been changed in the first layer).
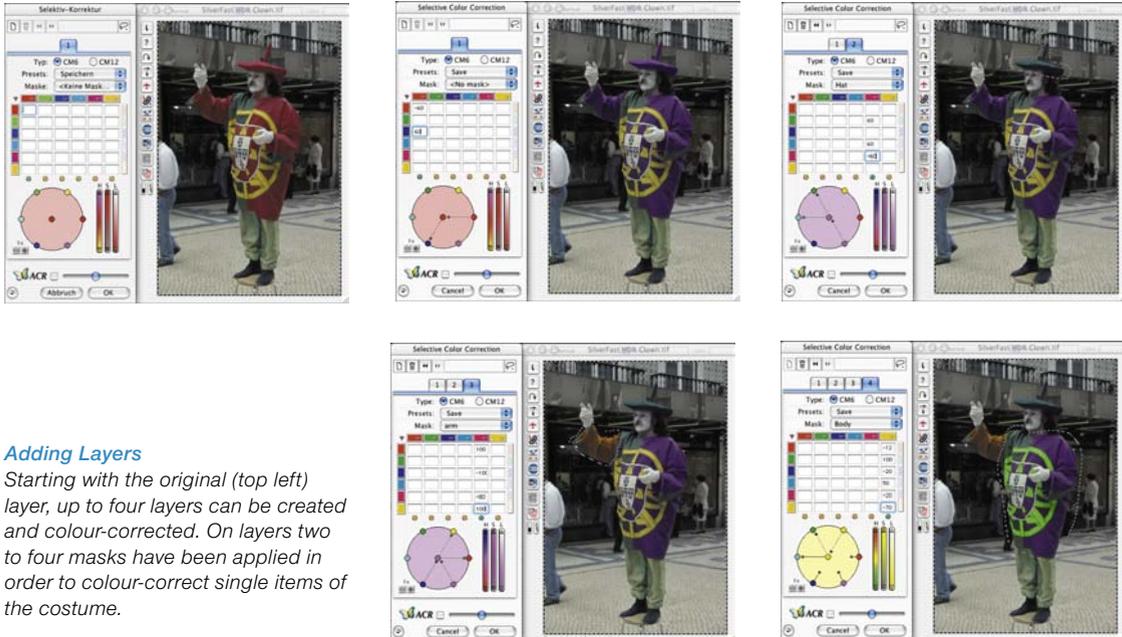
Adding Layers
Starting with the original (top left) layer, up to four layers can be created and colour-corrected. On layers two to four masks have been applied in order to colour-correct single items of the costume.

All settings within one layer are somewhat independent, but always built on the underlying layers with reference to its results. For this reason it is vital to understand the difference of the functions "Moving layers" and "Changing layers".

Changing Layers ("Switching")

By clicking onto the layer number you will switch to the desired layer with all its settings. You will also see the masking that is active on this layer. Masking marquees of other layers will be invisible.

The preview itself such as its colour representation will always stay the same when switching to other layers! The changes that you will see are only those with reference to masking appearing in different locations of the preview.
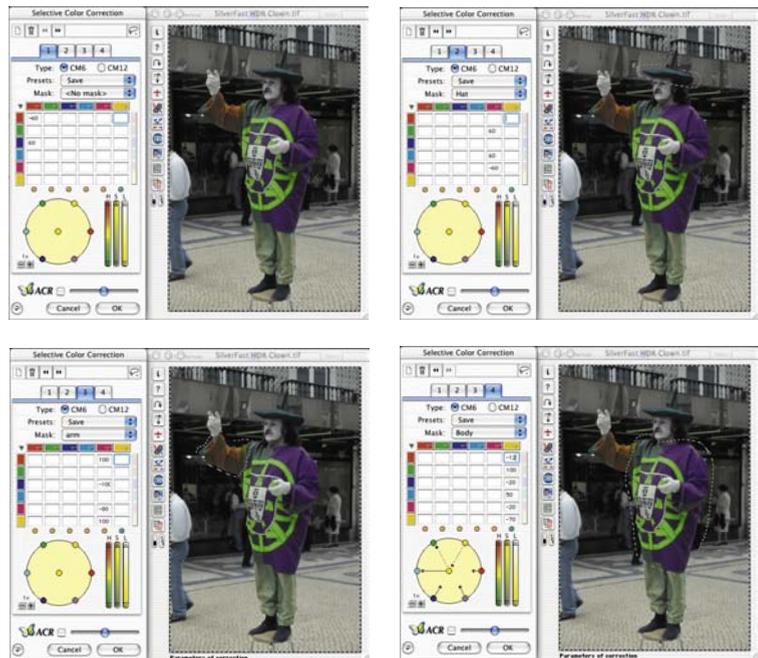
Turning Layers over
Starting with the original layer, all layers will be shown in turn once.

Deleting Layers

Each layer can be deleted by clicking onto the "Delete" button (trash).
One layer will always have to remain. The last remaining layer can not be deleted.


Moving of Layers ("Change order")

By clicking onto the double-arrow buttons the stapling order of the layers will be changed.

If you have e.g. four layers, you can move layer number 4 under layer number 3 by clicking onto the left pointing double-arrows. The layers will swap positions with each other.

If the layers have masks, you may get unwanted effects when parts of the masks overlap in the two layers. Since the mask areas will be calculated over all layers, the result can be a totally different colour than expected. Mask areas not overlapping other masks will remain unchanged.
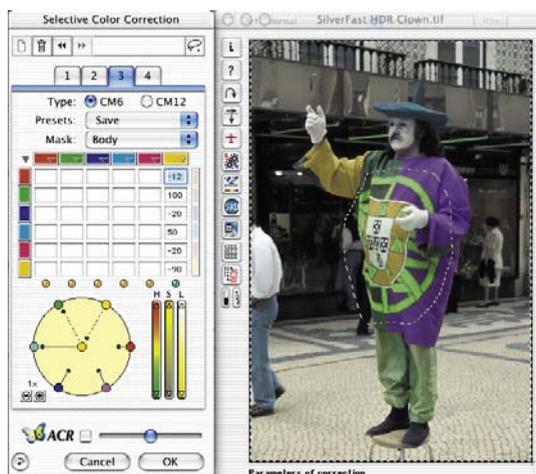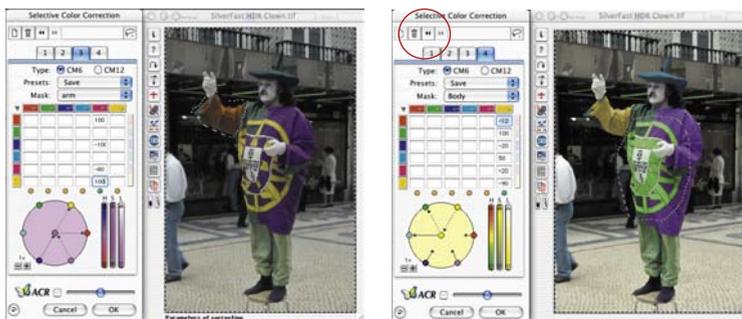
Moving Layers
Here layer 4 will be moved before layer 3. The masks which have been applied to both layers, overlap in the area of the emblem. By moving a layer, the emblem's colours get changed.

SilverFastACR® Adaptive Colour Restoration
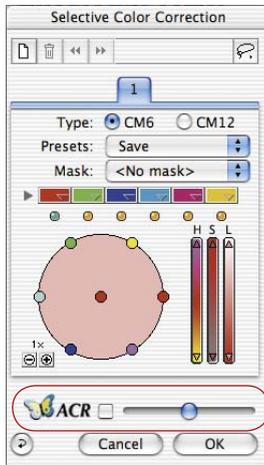
SilverFast ACR (*ACR* = Adaptive Colour Restoration) is part of the selective colour correction dialogue and can be switched on and off via a check mark.

This automatic function enables the user to restore faded out colours or normalise oversaturated colours. Using the slider, colour saturation can be increased or decreased.

ACR can be used in combination with the selective colour correction. All settings can be influenced when the user activates *ACR*. If e.g. more or less saturation is needed, the user only has to adjust the *ACR* slider. The relation between the colours that have previously been corrected in the selective colour correction, will be preserved.

If the dialogue box is closed, an activated *ACR* function is marked by a short "ACR" imprint below the vertical buttons, located to the left of the prescan window.
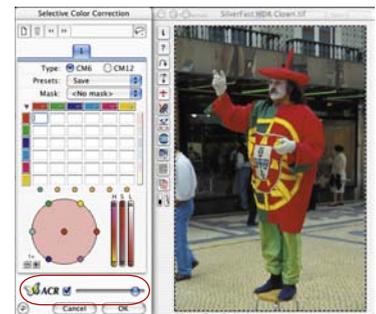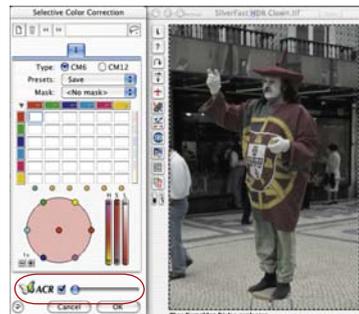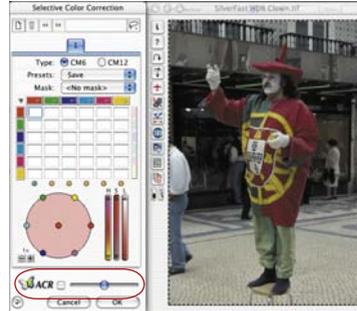
ACR-Slider
In middle position ACR does influence the image very little.
Moved to the left, the image will get desaturated.
Moved to the right, the image will get much more saturated.

### SilverFastSC2G® Selective Colour to Grey Conversion

SC2G (Selective Colour to Grey) is a unique function to control how colours of an image are converted to grey.
By directly controlling the conversion of primary and secondary colours into shades of grey, the user can enhance the distinction between adjacent areas of similar shades of grey.

Daily newspapers and magazines and other periodicals very often have black and white photographs with too little differentiation between the greys. The original colour image might have had good shade rendering, but in the conversion process differentiation between adjacent greys is often lost.

SilverFast's SC2G, can preserve or even enhance the differentiation between the shades by controlling the conversion process for all six colours (red, green, blue, cyan, magenta, yellow).
The user can define which shade of grey to convert a colour to. Since the whole process is interactively monitored (the final result is visible), the user can quickly achieve the desired result.
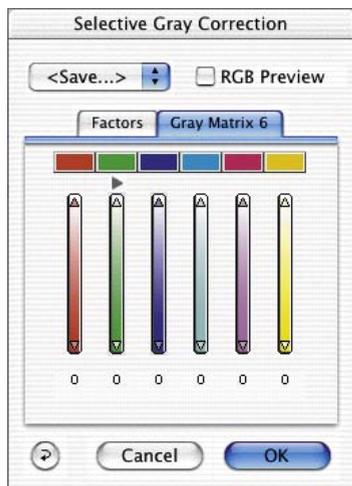
Activating *SC2G*

The first step is switching to grey-mode from colour-mode under "Image Mode". Clicking onto the selective colour correction button will bring up the *SC2G* dialogue.

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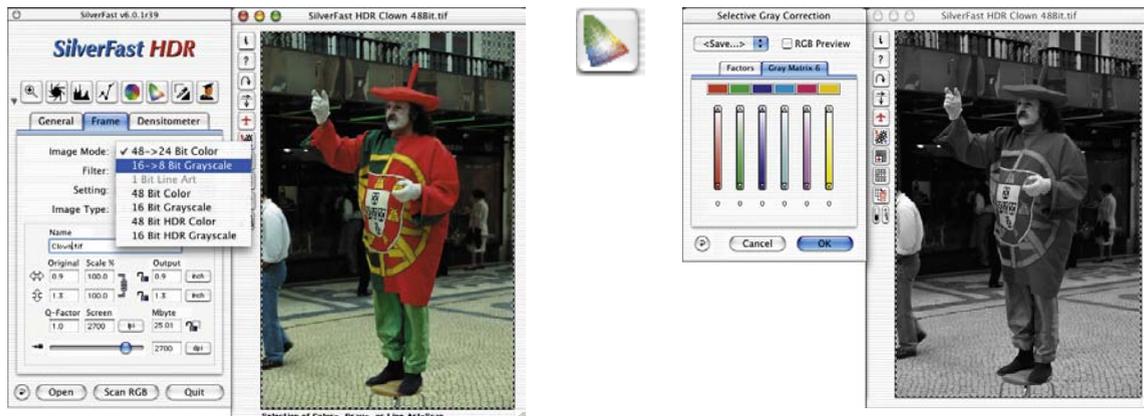
Changing a Colour Image to Grey

Click onto an area where you need to adjust the grey and *SC2G* will recognise which colour this grey is originated from. Above the relevant colour sector you will see a small right pointing triangle indicating that *SC2G* has recognised the original colour.
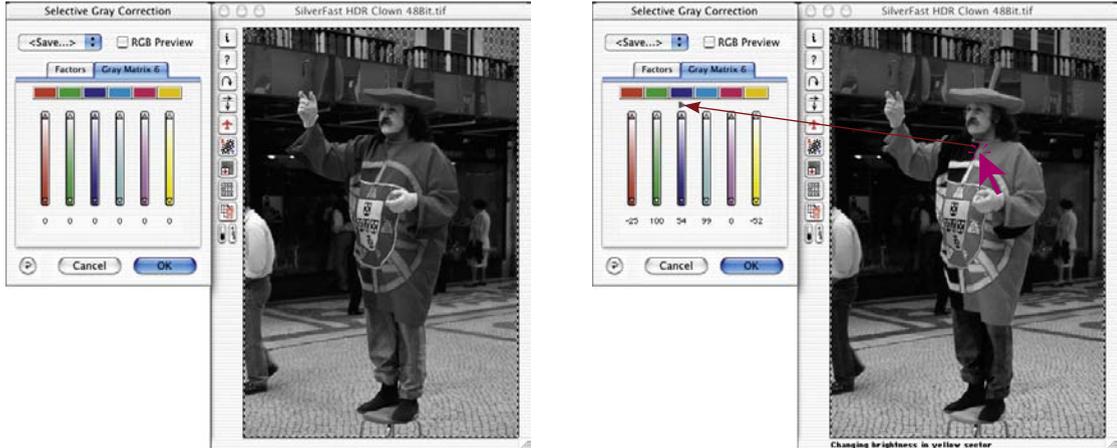

You can now begin your selective grey correction. Clicking and holding the mouse on the small triangle at the top of the control will raise the brightness for the grey selected. The bottom triangle will decrease the grey brightness. You will see the number below the control increasing or decreasing accordingly as well as the image gets updated once you release the mouse.

By clicking onto "RGB Preview" you can cross-check which original colour your are effecting.
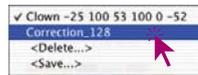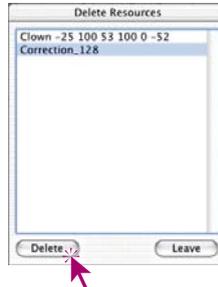
Saving / Loading / Deleting *SC2G* Settings

Settings can be saved and reloaded just like other settings in *SilverFast.*
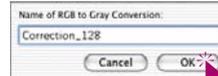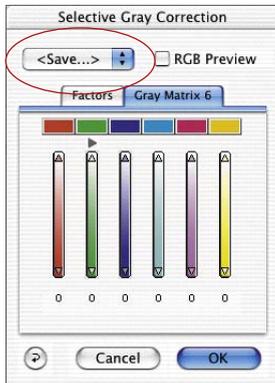
To switch between different *SC2G* settings, you only have to switch from one setting (name) to another.

Settings that are not needed any more can easily be deleted.

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Changing the Conversion Factors

The *SC2G* dialogue has another alternative method for colour to grey conversion named: "Factors". Here you can define, how the original RGB values of an image are converted into shades of grey.

The upper part of the dialogue shows the primary colours with their current percentage relationship. The lower part shows a colour bar with the relation of the three primary colours. The sum of all colours is always 100%. The larger the part of one colour, the brighter the grey shade converted from that colour.

According to the example on the left, the colour brightness from the Red-channel will be used at 30%, that from the Green-channel at 59% and that from the Blue-channel only at 11% for the grey conversion. That means, green colour tones will become brighter than red tones (the increase of brightness with reference to the existing colour brightness). In this example blue colour tones appear to become the darkest with this setting.

With the mouse you can grab the colour border in the colour bar and move the border (red / green and green / blue) accordingly to get the desired result.
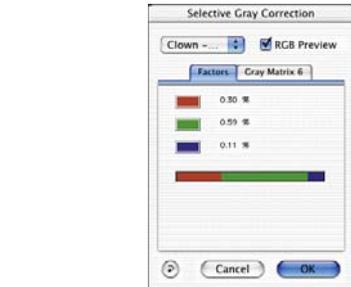
With Standard-Settings the colours of the clown's outfit are converted to nearly similar grey tones. The example clearly shows how significant the image changes with the red (middle image) or green (right image).