

# Unfolding without restrictions

## SPI SheetMetalWorks

**Updating designs and modifying prototypes is one constant for the sheet metal designer. Let SPI help you save time and money! Now, here is a CAD solution that allows designers to control how a part is manufactured and helps eliminate the need for repetitive prototyping.**

### SPI SheetMetalWorks

is the link between design and manufacturing and therefore provides designers and manufacturers with dramatic improvements in the design process for ready to manufacture products.

### Ready-to-manufacture design

For your CAD model select the material that you would like to use during production to ensure that you consider material properties and bending behaviour for the unfold calculation.

### Precise unfolding...

SPI SheetMetalWorks delivers a 100 % correct unfolding, that can be used within the process chain without rework. Freeform surfaces, holes in bending areas and even surfaces which were produced by lofting are transferred to precise unfolding.

### ...even of imported models...

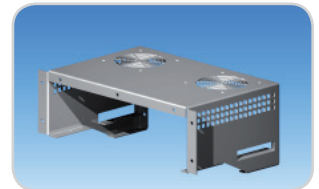
With SPI SheetMetalWorks you can assign material definitions to imported models (DWG, SAT, IGES). Imported data frequently exhibit inaccuracies or mathematically unfavourable representations of geometry. SPI SheetMetalWorks compensates this by different tolerance options, which refer themselves among other things to the plate thickness, parallelism of upper and lower surface and the angles, under which adjacent surfaces meet one on the other.

### ...and direct export of the unfolding geometry for punching, laser cutting and bending...

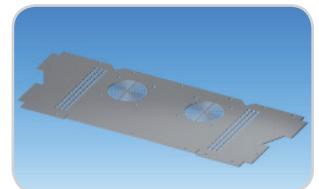
For instance as Tops-GEO-format. The SPI SheetMetalWorks TruTops Interface allows for the direct export of the unfolding geometry from SolidWorks to the ToPs-GEO file format. Different to the DXF transfer the once calculated GEO-files can directly be up-loaded to TruTops Laser and TruTops Punch modules for nesting, laser cutting etc. A time-consuming transformation with the help of the Tops drawing editor is void! For the bending simulation all information (bending radii, bending factors) is contained and thus is immediately available in TruTops Bend. For the further processing on Delem and Cybelec driven bending machines the unfolding supplies the necessary additional information also. You can use the geometry in arbitrary other numerical control programming systems.

### ...with borderless flexibility

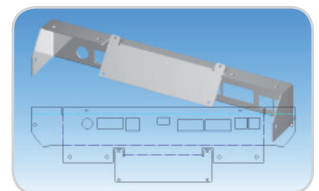
The data that are relevant for the process chain (machines, material and sheet metal thicknesses) are maintained in SPI's material management. As soon as you do not keep the defined parameters in the course of your construction, the software refers to a potential conflict. However, with the selection of the material you do not commit yourself: Of course you can assign another material to the work piece later on. The calculation of the shortening takes place according to DIN, formula or table. Shortening definitions (formulas or tables) can be adapted to your company standards, if the calculation of the unfolding does not refer to the DIN k factor. You can define them differently per bend.



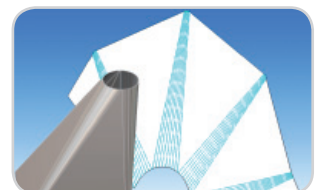
*Optimize your results and processes.*



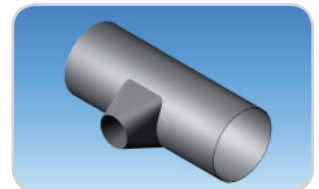
*Benefit from precise unfoldings...*



*even of imported parts...*



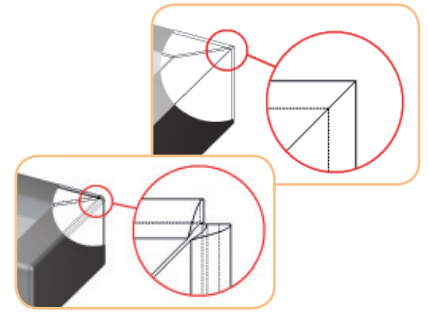
*arbitrary free from surfaces...*



*and pipe connections*

## Sharp cornered design

A special feature of SPI SheetMetalWorks is the „sharp cornered“ design. In that case bending zones are not filleted, notching is not necessary. By this the CAD model's size and the construction effort decreases enormously. SPI SheetMetalWorks takes over the calculation of the fillets and automatically creates the required reliefs. The Split Corner command allows for precise unfolding of closed boxes. You do not need to design slots but just add split attributes to the corner areas. In many cases this method is profitable. It even works with complex slant designs. Due to the fact that bending radii are contained as attributes, you can modify them without re-designing the solid. The file is very stable and is represented in a more clearly arranged way, the dimensioning is more comfortable. The figures on the right hand side show such effects.



Sharp-cornered construction often saves complicated designs

## More than a simple flat pattern development

You can visualize the borders of the bending zones beneath the bending lines. Free form surfaces as well as conical or cylindrical surfaces with large radii can be treated with a sequence of ready-to-manufacture bending lines for successive bending. The amount of facets for a freeform surface depends on the settings of the parameters or of the possibly attached facet attribute. At the middle of each facet line (bend line) the inclusive angle is displayed. To simplify the identification of bending lines on the blank you can let calculate bending marks. Thus the worker at the bending machine has a better orientation and will position the sheet metal even more effectively. The optionally created bending line table delivers all the information needed for the bending process (e.g. angles and radii). Line type, colours and layers of the contours can be customized to NC program standards. The unfolding is available within the existing drawing, another part document or directly into a DXF- or GEO-file \*. The processed NC data are according to DELEM, CYBELEC or TRUMPF TruTops and others.

## Identification of punching tools

The designer can use diverse punching features from the library while modeling. The unfolding algorithm identifies the punching features and transfers the corresponding manufacturing information (tool type, position and orientation) to the GEO file, which will then be transferred to the machines via TRUMPF TruTops. \*

## Allocation of Z-bends

The Z-bends can now directly be allocated to Z-bending tools of the TRUMPF-TruTops data base. \*

## New flexible forms of laser cuttings

The definition of reliefs has been expanded by two new forms of laser cuttings. Variant 1 defines a simple linear cut. Variant 2 is a very flexible form that can be used for any cutting constellation and also allows for controlling the width of the resulting spacing.

## Unfolding of 3D-drafts to visualize engravings and labels

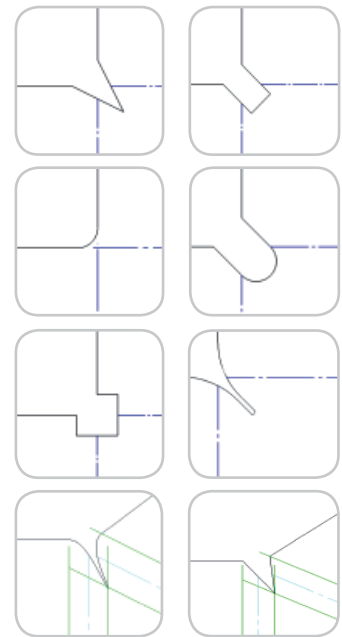
Engravings and labels are often assigned to 3D drafts when using imported parts. Due to that not only 2D drafts but also 3D drafts will be allocated to plain sheet surfaces and are thus visible in the flat pattern development.

\* with option SPI TruTops Interface



We supply solutions, which meet your requirements. With our project-oriented, competent and independent analysis we will professionally support you. Our offer ranges from CAD systems and applications up to own developments. Our service covers installation, adjustments, training courses and resuming support.

- Unfolding according to DIN 6935 standards
- Unfolding of imported files - tolerances allow unfolding also if inaccuracies appear
- Calculation of the unfolding depending on table, k-factor, formula or TruTops standards \*
- Additional information for bending programs of Delem and Cybelec
- GEO Export with all the bending line information for TruTops\*
- Unfolding considers production radius depending on the bending angle per bend
- Detailed log file with references to the solid model
- Alignment of used design radii and real production radii
- Unfolding without reliefs at corners and flanges
- Optional setting of reliefs during the unfolding process
- Arbitrary corner stamps (square, circle, rhomb, laser edge) available
- Arbitrary definition of the length of polygon edges to enable nibbling
- Spline or polygon curve representation
- Customizable colours, linestyles and line-weights for contour elements, bending lines and other parts of the flat pattern
- Unfolding of freeform surfaces (e.g. lofted parts) or such that had been imported
- Bending lines and bending zones, bending line table
- Bend marks
- Unfolding of freeform surfaces with creation of bend lines for successive bending
- Unfolding of cylindrical and conical faces with large diameters with an arbitrary number of bends (facets)
- Unfolding of single faces even of solids
- Unfolding in a view of a new drawing, in a sketch of a new part or in selected open document
- 2D sketch available in SolidWorks without restrictions
- Update of the unfolding after modification of the model is possible
- Library of punching tools
- SPI Component manager included



Corner reliefs



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