# Helium reports documentation

May 19, 2006

Creating and customizing Helium reports

Helium software allows to create reports based on templates in the MS Word rich-text format (RTF) and export report data to external files for processing by third-party software. Several report templates in RTF format are included with the installation kit of the Helium software. Files related to the report creation are placed in the «Report» subfolder of the folder where the Helium software was installed. Helium users may take these templates and customize them for their needs or create new templates.

## *Using RTF report templates*

The RTF file defines the appearance of the generated report. The main idea is that the RTF file is a template for the report. During report creation Helium software searches the RTF file for specific bookmarks and replaces them with parameter values. All «known» bookmarks will be replaced with the corresponding parameter values. All «unknown» bookmarks will be left intact. If some parameter value is not available, the corresponding bookmark will be left intact. If you don't want to see some parameter's value in the report, just remove the corresponding bookmark. For example, the text in the file marked with the bookmark «TOTAL_DEPTH_MM» will be replaced with the total height of the diamond in millimeters. Make sure that all bookmark names are written in capital letters. If it is necessary to put the same parameter's value several times in the report, you may use the following technique. RTF file can't contain two bookmarks with the same names, so add a «_COPY_N» suffix to the primary bookmark's name, for example, «TOTAL_DEPTH_MM_COPY_1». Thus, both bookmarks «TOTAL_DEPTH_MM» and «TOTAL_DEPTH_MM_COPY_1» will be replaced with the value of the same parameter – the total height of the diamond in millimeters.

To see the list of all available bookmarks in a file, to add and delete them you may use MS Word. Open RTF file in it and choose menu «Insert» - «Bookmark...».
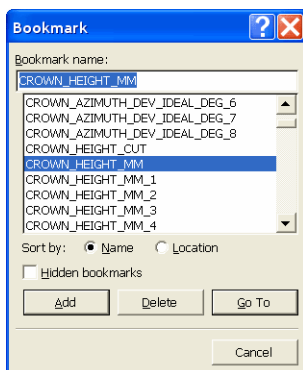
Word does not allow editing of bookmark names once they are defined. You may delete the existing bookmark and create new. If you try to add a second bookmark with the same name, the first will be

deleted. To add a bookmark select the text, which will be later replaced with the parameter's value and choose menu item «Insert» - «Bookmark...». Write bookmark name and click «Add» button. The bookmark will be added to the list. Choose menu item «Tools» - «Options», select «View» tab and check the «Bookmarks» option in the «Show» group.
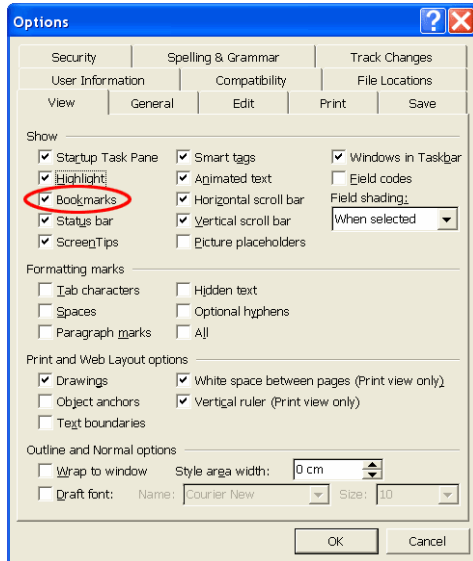
All existing bookmarks will be shown as square brackets right in the document. It is easier to edit the report template when all bookmarks are visible.

Make sure that you save the changed file again in RTF format.

Helium may generate a series of pictures for the report. In order to insert a picture in the report just add a corresponding bookmark to the desired place. It will be replaced by the picture during report creation. The size of picture in RTF report may be specified in MS Word. We usually create a table in the Word document and put the corresponding bookmark within its cell. Then disable the automatic resize of the table. «Table properties» menu, «Options» button, clear check box «Automatically resize to fit contents». Then specify the «Preferred width» for the column and «Specify height» for the row. Choose that the row height is exactly the desired value.

With these settings the picture will be automatically scaled by MS Word during the creation of report. If you allow automatic resize for the table or put the bookmark not in the table, the resulting picture will occupy the whole page.

Using initialization files

The RTF template files should be described in the corresponding initialization files. Initialization files are plain-text files with the INI extension in the following format. INI file consists of sections. A section in the initialization file must have the following form:

```
[Section Name]
Key1 Name=string value1
Key2 Name=string value2
...................................................
```

Reports for polished diamonds

All available reports for polished diamonds are listed in the «Report» menu of the «Scan polished diamond» window. This menu has the following submenus: «Print Report», «Open Report in MS Word», «Export Report Data». The content of these submenus is updated dynamically. It depends on available report templates and the current cutting of the built model.

Printing and viewing reports

Helium software searches the «Report» subfolder for the initialization (*.ini) files and looks through all such files. Initialization files related to printing reports for polished diamonds should have the following format.

```
[General]
ReportType=PolishRTF
VisibleName=<Submenu item name>
CuttingType=<Cutting type>

[FileNames]
TemplateRTF=<File name for the RTF template>

[Picture<N>]
PictureID=POLISH_MODEL_REPORT
Bookmark=<MS Word bookmark name>
X=<Angle of rotation around X axis in degrees>
Y=<Angle of rotation around Y axis in degrees>
Z=<Angle of rotation around Z axis in degrees>
InvisibleEdges=<The way of drawing invisible edges >
VisibleSidesInColor=<The way of coloring of visible sides>
VisibleEdgesColorR=<The color of visible edges in RGB>
VisibleEdgesColorG=<The color of visible edges in RGB>
VisibleEdgesColorB=<The color of visible edges in RGB>
InvisibleEdgesColorR=<The color of invisible edges in RGB>
InvisibleEdgesColorG=<The color of invisible edges in RGB>
InvisibleEdgesColorB=<The color of invisible edges in RGB>
AspectRatioX=<Desired proportions of the picture>
AspectRatioY=<Desired proportions of the picture>
……………………………………………

[Picture<N>]
PictureID=POLISH_ANGLES_REPORT
Bookmark=<MS Word bookmark name>
PavilionView=<Pavilion (1) or crown (0) view of the stone>
PictureType=<The way of drawing picture>
Colored=<0 or 1>
FontSize=<Font size in percents>
AspectRatioX=<Desired proportions of the picture>
AspectRatioY=<Desired proportions of the picture>
……………………………………………

[Picture<N>]
PictureID=POLISH_SIDES_REPORT
Bookmark=<MS Word bookmark name>
Colored=<0 or 1>
PavilionView=<Pavilion (1) or crown (0) view of the stone>
```

```
PictureType=<The way of drawing picture>
Precision=<Number of digits after decimal point>
FontSize=<Font size in percents>
AspectRatioX=<Desired proportions of the picture>
AspectRatioY=<Desired proportions of the picture>
......................................................

[Picture<N>]
PictureID=PROFILE_VIEW_REPORT
Bookmark=<MS Word bookmark name>
Colored=<0 or 1>
FontSize=<Font size in percents>
AspectRatioX=<Desired proportions of the picture>
AspectRatioY=<Desired proportions of the picture>
TitleLengthGirdleFacet=<Title for Length Girdle Facet>
TitleDepthGirdleFacet=<Title for Depth Girdle Facet>
......................................................
```

If value of the «CuttingType» key corresponds to the cutting type of the built model, an item will be added to the «Print Report» and «Open Report in MS Word» submenus. The «Print Report» command generates the report using the selected template, fills it with report parameters and pictures and sends it to the default printer immediately. The generated report will not be shown on screen. The «Open Report in MS Word» command fills the report template and opens it in the MS Word. It is possible to print the document or save it to file. Both of these commands require MS Word installed.

Keys of the [General] and [FileNames] sections.
These sections are mandatory.

ReportType
This key is mandatory. It should have the «PolishRTF» string for this type of report.

VisibleName
This key is mandatory. The value of this key will be shown in the «Print Report» and «Open Report in MS Word» submenus.

CuttingType
This key is mandatory. It identifies the cutting for which this report template is made. Different cuttings may have different set of parameters and different meaning of the same parameters. That is why it may be necessary to make report templates for each type of the cutting. Helium supports the following cutting types: «Brilliant» – for brilliant cut, «FancyRound» – for rounded fancies (marquise, oval and pear).

TemplateRTF
This key is mandatory. It should have the name of the source template file in the RTF format.

[Picture<N>] section
These sections are optional and specify the attributes of report pictures that require additional attributes. The number in the section name does not have a special meaning. It just enumerates sections. Helium software supports up to 50 sections of this type.

PictureID
This key is mandatory. It should contain the tag of the picture **POLISH_MODEL_REPORT** or **POLISH_ANGLES_REPORT** or **POLISH_SIDES_REPORT** or **PROFILE_VIEW_REPORT** written in capital letters.

The picture with the **POLISH_MODEL_REPORT** tag contains a simple model of the polished diamond without inscriptions above it. Picture attributes allow to specify whether to draw invisible edges or not, orientation of the model, color and aspect ration of the picture.

The picture with the **POLISH_ANGLES_REPORT** tag contains a model of the polished diamond with facet angles inscribed above the model. Picture attributes allow to specify the orientation of the model, what angles to write, font size, aspect ratio and color of the picture.

The picture with the **POLISH_SIDES_REPORT** tag contains a model of the semi-polished diamond with information about all facets inscribed above the model. Picture attributes allow to specify the orientation of the model, what information to write (angles/heights), precision, font size, aspect ratio and color of the picture.

The picture with the **PROFILE_VIEW_REPORT** tag contains a side view of the model of the polished diamond with the values of basic parameters inscribed above the model. Picture attributes allow to specify the font size, aspect ratio and color of the picture.

Bookmark
This key is mandatory. It should contain the name of the MS Word bookmark in the RTF template for the picture. All bookmarks should be written in capital letters. During the report generation this bookmark will be replaced with the picture.

X, Y, Z
These keys are optional. If such key is not specified it is assumed to be zero. It is the angle of rotation of the 3D model around X, Y, Z axis in degrees before making the final image. This attribute allows to create various views of the same model.

InvisibleEdges
This key is optional. It specifies the way of drawing invisible edges of the 3D model. Possible values are: 0 – invisible edges are not drawn, 1 – invisible edges are drawn without refraction, 2 – invisible edges are drawn taking refraction of the light into consideration. If this key is not specified it is assumed to be equal to 1.

VisibleSidesInColor
This key is optional. It specifies the way of coloring of visible edges. Possible values are: 0 – black and white scheme (for example, extra facets will be drawn in gray color), 1 – color scheme (for example, extra facets will be drawn in blue color). If this key is not specified it is assumed to be equal to 0.

VisibleEdgesColorR, VisibleEdgesColorG, VisibleEdgesColorB
These keys are optional. If such key is not specified it is assumed to be zero. They specify the RGB color for drawing visible edges of the 3D model.

InvisibleEdgesColorR, InvisibleEdgesColorG, InvisibleEdgesColorB
These keys are optional. If such key is not specified it is assumed to be zero. They specify the RGB color for drawing invisible edges of the 3D model.

AspectRatioX, AspectRatioY

These keys are optional. If such key is not specified it is assumed to be zero. They specify the desired proportions of the generated picture. If the actual proportions of the picture differ from the specified, blank margins are added.

PavilionView

This key specifies the orientation of the model. Possible values are: 0 – crown view, 1 – pavilion view. If this key is not specified it is assumed to be equal to 1.

PictureType

This key specifies the way of drawing the picture.

If *PictureID* is **POLISH_ANGLES_REPORT** then possible values for this parameter are: 0 – invisible edges are drawn taking refraction into account, slope angles of main facets are written near facets; 1 – invisible edges are not drawn, slope angles of all facets are written; 2 - invisible edges are not drawn, azimuth angles of all facets are written; 3 - invisible edges are not drawn, deviation of slope angles from the average are written; 4 - invisible edges are not drawn, deviation of azimuth angles from ideal are written; 5 - invisible edges are not drawn, slope angles of main facets are written near facets together with the maximum inscribed circle and section of the model with the plane in which the circle lies; 6 - invisible edges are not drawn, slope angles of main facets are written above facets together with the maximum inscribed circle and section of the model with the plane in which the circle lies.

If *PictureID* is **POLISH_SIDES_REPORT** then possible values for this parameter are: 0 – slope angles of all facets are drawn; 1- azimuth angles of all facets are drawn; 2 – heights in % of all facets are drawn; 3 - heights in mm of all facets are drawn.

Colored

This key is optional. Default value: 0. The program generates black and white pictures if it is 0 and colored otherwise.

FontSize

This key is optional. Default value: 100. This parameter adjusts the font height on the picture. It specifies the ratio between desired and default font size. For example, if FontSize=200, all text on the picture will be twice higher than default.

Precision

This key is optional. Default value: 2. This parameter is applicable to pictures with **PictureID=POLISH_SIDES_REPORT**. It specifies the number of decimal digits used when writing facet angles or heights.

TitleLengthGirdleFacet, TitleDepthGirdleFacet

These keys are optional. They specify the text that will be written on the picture above the corresponding parameter values. When the font size is large the default text may appear too big to fit the picture and you may want to change it.

Exporting report data

Helium software searches the «Report» subfolder for the initialization (*.ini) files and looks through all such files. Initialization files related to exporting report data for polished diamonds should have the following format.

```
[General]
ReportType=Export
VisibleName=<Submenu item name>
```

```
[FileNames]
Executable=<Full path to the third-party executable>
ParameterValues=<File name for the result>

[<Simple PictureID>]
FileNameEMF=<File name for the picture in the EMF format>
FileNameBMP=<File name for the picture in the BMP format>
FileNamePNG=<File name for the picture in the PNG format>
FileNameGIF=<File name for the picture in the GIF format>
Width=<Maximum raster picture width in pixels>
Height=<Maximum raster picture height in pixels>


…………………………………………………
…………………………………………………


[Picture<N>]
PictureID=POLISH_MODEL_REPORT
FileNameEMF=<File name for the picture in the EMF format>
FileNameBMP=<File name for the picture in the BMP format>
FileNamePNG=<File name for the picture in the PNG format>
FileNameGIF=<File name for the picture in the GIF format>
Width=<Maximum raster picture width in pixels>
Height=<Maximum raster picture height in pixels>
X=<Angle of rotation around X axis in degrees>
Y=<Angle of rotation around Y axis in degrees>
Z=<Angle of rotation around Z axis in degrees>
InvisibleEdges=<The way of drawing invisible edges >
VisibleSidesInColor=<The way of coloring of visible sides>
VisibleEdgesColorR=<The color of visible edges in RGB>
VisibleEdgesColorG=<The color of visible edges in RGB>
VisibleEdgesColorB=<The color of visible edges in RGB>
InvisibleEdgesColorR=<The color of invisible edges in RGB>
InvisibleEdgesColorG=<The color of invisible edges in RGB>
InvisibleEdgesColorB=<The color of invisible edges in RGB>
AspectRatioX=<Desired proportions of the picture>
AspectRatioY=<Desired proportions of the picture>
…………………………………………………

[Picture<N>]
PictureID=POLISH_ANGLES_REPORT
FileNameEMF=<File name for the picture in the EMF format>
FileNameBMP=<File name for the picture in the BMP format>
FileNamePNG=<File name for the picture in the PNG format>
FileNameGIF=<File name for the picture in the GIF format>
Width=<Maximum raster picture width in pixels>
Height=<Maximum raster picture height in pixels>
PavilionView=<Pavilion (1) or crown (0) view of the stone>
PictureType=<The way of drawing picture>
Colored=<0 or 1>
FontSize=<Font size in percents>
AspectRatioX=<Desired proportions of the picture>
AspectRatioY=<Desired proportions of the picture>
…………………………………………………
```

```
[Picture<N>]
PictureID=POLISH_SIDES_REPORT
FileNameEMF=<File name for the picture in the EMF format>
FileNameBMP=<File name for the picture in the BMP format>
FileNamePNG=<File name for the picture in the PNG format>
FileNameGIF=<File name for the picture in the GIF format>
Width=<Maximum raster picture width in pixels>
Height=<Maximum raster picture height in pixels>
Colored=<0 or 1>
PavilionView=<Pavilion (1) or crown (0) view of the stone>
PictureType=<The way of drawing picture>
Precision=<Number of digits after decimal point>
FontSize=<Font size in percents>
AspectRatioX=<Desired proportions of the picture>
AspectRatioY=<Desired proportions of the picture>
……………………………………………

[Picture<N>]
PictureID=PROFILE_VIEW_REPORT
FileNameEMF=<File name for the picture in the EMF format>
FileNameBMP=<File name for the picture in the BMP format>
FileNamePNG=<File name for the picture in the PNG format>
FileNameGIF=<File name for the picture in the GIF format>
Width=<Maximum raster picture width in pixels>
Height=<Maximum raster picture height in pixels>
Colored=<0 or 1>
FontSize=<Font size in percents>
AspectRatioX=<Desired proportions of the picture>
AspectRatioY=<Desired proportions of the picture>
TitleLengthGirdleFacet=<Title for Length Girdle Facet>
TitleDepthGirdleFacet=<Title for Depth Girdle Facet>
……………………………………………
```

Keys of the [General] and [FileNames] sections.

These sections are mandatory.

ReportType

This key is mandatory. It should have the «Export» string for this type of report.

VisibleName

This key is mandatory. The value of this key will be shown in the «Export Report Data» submenu.

Executable

This key is mandatory. It should have the fully qualified name of the third-party executable that will be launched after the generation of all files. This program may read the generated files and pass the report data from them into external report generation engines.

ParameterValues

This key is mandatory. It should have the name of the resulting text file. If the file name is not fully qualified, the resulting file will be created in the folder relative to the «Report» folder, where this INI file is placed. The resulting file will have the format of the Windows initialization file with the single section named **[NumericalParameters]**:

```
[NumericalParameters]
MODEL_NAME=Simple
WEIGHT_CT=0.27
TOTAL_DEPTH_MM=2.225
TOTAL_DEPTH_PC=59.92
DIAMETER_MM=4.611
TABLE_MM=2.934
CROWN_HEIGHT_PC=12.63
......................................................
```

Key names will be the tag names of report parameters. Key values will be the values of report parameters.

This file will contain a list of all available report parameters. This list may vary depending on the type of the processed cutting and the shape of the 3D model. Please note, that different cuttings may have different set of parameters and stones of the same cutting may have different sets of parameters if some facets are absent. The Helium software does not erase this file before creating a new report, but updates only those keys in this file that have a corresponding parameter value. The values of other keys are left intact.

[<Simple PictureID>] sections

These sections are optional and specify the attributes of report pictures. Each picture in the report has its own tag (or ID in other words) that is specified in the section name. See the sample report templates for the list of available picture ID's. All tags should be written in capital letters. Most of the pictures may be generated using black-and-white or color scheme. Pictures in different color schemes have different IDs. This is useful for preparing the report for printing on black-and-white or color printer. Usually the picture looks more acceptable to the eye if it is printed on corresponding printer.

FileNameEMF
This key is optional. It should have the file name for the picture in the Windows Enhanced-Format Metafile. If this key is not specified, the corresponding EMF file will not be created or updated.

FileNameBMP, FileNamePNG, FileNameGIF
This key is optional. It should have the file name for the picture in the Windows Bitmap Format (BMP) or Portable Network Graphics Format (PNG) or Graphics Interchange Format (GIF). The Helium software creates uncompressed true-color BMP images, compressed true-color PNG images and compressed 8-bit color GIF images. If this key is not specified, the corresponding file will not be created or updated. If this key is specified, two more keys should be specified also: *Width*, *Height*.

Width, Height
These keys should be specified if the *FileNameBMP* or *FileNamePNG* or *FileNameGIF* key is present. They specify the maximum width and height of the raster image with the report picture in pixels. The actual picture will fit into the given dimensions preserving the aspect ratio.

[Picture<N>] sections

These sections are optional and specify the attributes of report pictures that require additional attributes relative to the [<Simple PictureID>] section. The number in the section name does not have a special meaning. It just enumerates sections. Helium software supports up to 50 sections of this type.

PictureID
This key is mandatory. It should contain the tag of the picture **POLISH_MODEL_REPORT** or **POLISH_ANGLES_REPORT** or **POLISH_SIDES_REPORT** or **PROFILE_VIEW_REPORT** written in capital letters.

The picture with the **POLISH_MODEL_REPORT** tag contains a simple model of the polished diamond without inscriptions above it. Picture attributes allow to specify whether to draw invisible edges or not, orientation of the model, color and aspect ration of the picture.

The picture with the **POLISH_ANGLES_REPORT** tag contains a model of the polished diamond with facet angles inscribed above the model. Picture attributes allow to specify the orientation of the model, what angles to write, font size, aspect ratio and color of the picture.

The picture with the **POLISH_SIDES_REPORT** tag contains a model of the semi-polished diamond with information about all facets inscribed above the model. Picture attributes allow to specify the orientation of the model, what information to write (angles/heights), precision, font size, aspect ratio and color of the picture.

The picture with the **PROFILE_VIEW_REPORT** tag contains a side view of the model of the polished diamond with the values of basic parameters inscribed above the model. Picture attributes allow to specify the font size, aspect ratio and color of the picture.

FileNameEMF
This key is optional. It should have the file name for the picture in the Windows Enhanced-Format Metafile. If this key is not specified, the corresponding EMF file will not be created or updated.

FileNameBMP
This key is optional. It should have the file name for the picture in the Windows Bitmap Format. The Helium software creates uncompressed true-color images. If this key is not specified, the corresponding BMP file will not be created or updated. If this key is specified, two more keys should be specified also: *Width*, *Height*.

Width, Height
These keys should be specified if the *FileNameBMP* key is present. They specify the maximum width and height of the BMP image with the report picture in pixels. The actual picture will fit into the given dimensions preserving the aspect ratio. These keys affect the generation of the BMP image only.

If both the *FileNameEMF* and the *FileNameBMP* keys are not specified, the picture will not be created.

X, Y, Z
These keys are optional. If such key is not specified it is assumed to be zero. It is the angle of rotation of the 3D model around X, Y, Z axis in degrees before making the final image. This attribute allows to create various views of the same model.

InvisibleEdges
This key is optional. It specifies the way of drawing invisible edges of the 3D model. Possible values are: 0 – invisible edges are not drawn, 1 – invisible edges are drawn without refraction, 2 – invisible edges are drawn taking refraction of the light into consideration. If this key is not specified it is assumed to be equal to 1.

VisibleSidesInColor

This key is optional. It specifies the way of coloring of visible edges. Possible values are: 0 – black and white scheme (for example, extra facets will be drawn in gray color), 1 – color scheme (for example, extra facets will be drawn in blue color). If this key is not specified it is assumed to be equal to 0.

VisibleEdgesColorR, VisibleEdgesColorG, VisibleEdgesColorB

These keys are optional. If such key is not specified it is assumed to be zero. They specify the RGB color for drawing visible edges of the 3D model.

InvisibleEdgesColorR, InvisibleEdgesColorG, InvisibleEdgesColorB

These keys are optional. If such key is not specified it is assumed to be zero. They specify the RGB color for drawing invisible edges of the 3D model.

AspectRatioX, AspectRatioY

These keys are optional. If such key is not specified it is assumed to be zero. They specify the desired proportions of the generated picture. If the actual proportions of the picture differ from the specified, blank margins are added.

PavilionView

This key specifies the orientation of the model. Possible values are: 0 – crown view, 1 – pavilion view. If this key is not specified it is assumed to be equal to 1.

PictureType

This key specifies the way of drawing the picture.

If *PictureID* is **POLISH_ANGLES_REPORT** then possible values for this parameter are: 0 – invisible edges are drawn taking refraction into account, slope angles of main facets are written near facets; 1 – invisible edges are not drawn, slope angles of all facets are written; 2 - invisible edges are not drawn, azimuth angles of all facets are written; 3 - invisible edges are not drawn, deviation of slope angles from the average are written; 4 - invisible edges are not drawn, deviation of azimuth angles from ideal are written; 5 - invisible edges are not drawn, slope angles of main facets are written near facets together with the maximum inscribed circle and section of the model with the plane in which the circle lies; 6 - invisible edges are not drawn, slope angles of main facets are written above facets together with the maximum inscribed circle and section of the model with the plane in which the circle lies.

If *PictureID* is **POLISH_SIDES_REPORT** then possible values for this parameter are: 0 – slope angles of all facets are drawn; 1- azimuth angles of all facets are drawn; 2 – heights in % of all facets are drawn; 3 - heights in mm of all facets are drawn.

Colored

This key is optional. Default value: 0. The program generates black and white pictures if it is 0 and colored otherwise.

FontSize

This key is optional. Default value: 100. This parameter adjusts the font height on the picture. It specifies the ratio between desired and default font size. For example, if FontSize=200, all text on the picture will be twice higher than default.

Precision

This key is optional. Default value: 2. This parameter is applicable to pictures with *PictureID*=**POLISH_SIDES_REPORT**. It specifies the number of decimal digits used when writing facet angles or heights.

TitleLengthGirdleFacet, TitleDepthGirdleFacet

These keys are optional. They specify the text that will be written on the picture above the corresponding parameter values. When the font size is large the default text may appear too big to fit the picture and you may want to change it.

Reports for rough diamonds

All available reports for rough diamonds are listed in the «View», «Print» and «Export» menus of the «Report preview» window. The content of these menus is updated dynamically. It depends on available report templates. The «Report preview» window is invoked by the «Rough report» command from the system menu of the «Marking-out» window. Make sure to select one of the solutions in the list on the «Marking» tab before opening the «Report preview» window.

Printing and viewing reports

Helium software searches the «Report» subfolder for the initialization (*.ini) files and looks through all such files. Initialization files related to viewing and printing reports for rough diamonds should have the following format.

```
[General]
ReportType=<Report type>
VisibleName=<Submenu item name>

[FileNames]
TemplateRTF=<File name for the RTF template>

[DefaultPictureParameters]
RoughVisibleEdgesColorR=<The default color in RGB>
RoughVisibleEdgesColorG=<The default color in RGB>
RoughVisibleEdgesColorB=<The default color in RGB>
ModelVisibleEdgesColorR=<The default color in RGB>
ModelVisibleEdgesColorG=<The default color in RGB>
ModelVisibleEdgesColorB=<The default color in RGB>
SawColorR=<The default color in RGB>
SawColorG=<The default color in RGB>
SawColorB=<The default color in RGB>
InclusionColorR=<The default color in RGB>
InclusionColorG=<The default color in RGB>
InclusionColorB=<The default color in RGB>
RoughOutline=<Default type of the rough model outline>
ReflectionCount=<Default number of inclusion reflections>
InclusionSize=<Default scale of inclusions>

[Picture<N>]
PictureID=ROUGH_REPORT_MODEL
Bookmark=<MS Word bookmark name>
X=<Angle of rotation around X axis in degrees>
Y=<Angle of rotation around Y axis in degrees>
Z=<Angle of rotation around Z axis in degrees>
RoughVisibleEdgesColorR=<The color in RGB>
RoughVisibleEdgesColorG=<The color in RGB>
RoughVisibleEdgesColorB=<The color in RGB>
ModelVisibleEdgesColorR=<The color in RGB>
ModelVisibleEdgesColorG=<The color in RGB>
ModelVisibleEdgesColorB=<The color in RGB>
```

```
SawColorR=<The color in RGB>
SawColorG=<The color in RGB>
SawColorB=<The color in RGB>
InclusionColorR=<The color in RGB>
InclusionColorG=<The color in RGB>
InclusionColorB=<The color in RGB>
RoughOutline=<Type of the rough model outline>
ReflectionCount=<The number of inclusion reflections>
InclusionSize=<Scale of inclusions>
ModelIncrease=<Scale of diamonds>
…………………………………………………

[Picture<N>]
PictureID=PIECE_REPORT_MODEL
Bookmark=<MS Word bookmark name>
PieceNumber=<Number of the piece>
X=<Angle of rotation around X axis in degrees>
Y=<Angle of rotation around Y axis in degrees>
Z=<Angle of rotation around Z axis in degrees>
RoughVisibleEdgesColorR=<The color in RGB>
RoughVisibleEdgesColorG=<The color in RGB>
RoughVisibleEdgesColorB=<The color in RGB>
ModelVisibleEdgesColorR=<The color in RGB>
ModelVisibleEdgesColorG=<The color in RGB>
ModelVisibleEdgesColorB=<The color in RGB>
SawColorR=<The color in RGB>
SawColorG=<The color in RGB>
SawColorB=<The color in RGB>
InclusionColorR=<The color in RGB>
InclusionColorG=<The color in RGB>
InclusionColorB=<The color in RGB>
RoughOutline=<Type of the rough model outline>
ReflectionCount=<The number of inclusion reflections>
InclusionSize=<Scale of inclusions>
…………………………………………………

[Picture<N>]
PictureID=DIAMOND_REPORT_MODEL
Bookmark=<MS Word bookmark name>
DiamondNumber=<Number of the diamond>
X=<Angle of rotation around X axis in degrees>
Y=<Angle of rotation around Y axis in degrees>
Z=<Angle of rotation around Z axis in degrees>
ModelVisibleEdgesColorR=<The color in RGB>
ModelVisibleEdgesColorG=<The color in RGB>
ModelVisibleEdgesColorB=<The color in RGB>
InclusionColorR=<The color in RGB>
InclusionColorG=<The color in RGB>
InclusionColorB=<The color in RGB>
ReflectionCount=<The number of inclusion reflections>
InclusionSize=<Scale of inclusions>

[Picture<N>]
PictureID=DIAMOND_PIECE_REPORT_MODEL
```

```
        Bookmark=<MS Word bookmark name>
        DiamondNumber=<Number of the diamond>
        X=<Angle of rotation around X axis in degrees>
        Y=<Angle of rotation around Y axis in degrees>
        Z=<Angle of rotation around Z axis in degrees>
        RoughVisibleEdgesColorR=<The color in RGB>
        RoughVisibleEdgesColorG=<The color in RGB>
        RoughVisibleEdgesColorB=<The color in RGB>
        ModelVisibleEdgesColorR=<The color in RGB>
        ModelVisibleEdgesColorG=<The color in RGB>
        ModelVisibleEdgesColorB=<The color in RGB>
        SawColorR=<The color in RGB>
        SawColorG=<The color in RGB>
        SawColorB=<The color in RGB>
        InclusionColorR=<The color in RGB>
        InclusionColorG=<The color in RGB>
        InclusionColorB=<The color in RGB>
        RoughOutline=<Type of the rough model outline>
        ReflectionCount=<The number of inclusion reflections>
        InclusionSize=<Scale of inclusions>
        .......................................................
```

Keys of the [General] and [FileNames] sections

These sections are mandatory.

ReportType

This key is mandatory. It should have the «RoughRTFView» or «RoughRTFPrint» string for this type of report. Depending on this type there will be added and item to the «View» or «Print» menu of the «Report preview» window. The «Print» command generates the report using the selected template, fills it with report parameters and picture and sends it to the default printer immediately. The generated report will not be shown on screen. The «View» command fills the report template and opens it in the MS Word. It is possible to print the document or save it to file. Both of these commands require MS Word installed.

VisibleName

This key is mandatory. The value of this key will be shown in the «Print» or «View» menu.

TemplateRTF

This key is mandatory. It should have the name of the source template file in the RTF format.

Keys of the [DefaultPictureParameters] section.

This section is optional. It contains default values of picture parameters for all pictures. Each picture may redefine any parameter in its own section. If the picture's section doesn't have some parameter, its value is taken from this section. For the detailed description of parameters see the **[Picture<N>]** section.

[Picture<N>] sections

These sections are optional and specify the attributes of report pictures that require additional attributes. The number in the section name does not have a special meaning. It just enumerates sections. Helium software supports up to 100 sections of this type.

PictureID
This key is mandatory. It should contain the tag of the picture **ROUGH_REPORT_MODEL** or **PIECE_REPORT_MODEL** or **DIAMOND_REPORT_MODEL** or **DIAMOND_PIECE_REPORT_MODEL** written in capital letters.

The picture with the **ROUGH_REPORT_MODEL** tag contains a model of the rough diamond with all inscribed diamonds in it and all sawing planes and all inclusions.

The picture with the **PIECE_REPORT_MODEL** tag contains a model of a piece of the rough diamond cut by the sawing plane with diamonds that were inscribed in that piece and inclusions that are located within that piece if any. Helium software sorts rough pieces by the weight of the diamonds inscribed into the piece. At first goes the piece with the largest inscribed diamond.

The picture with the **DIAMOND_PIECE_REPORT_MODEL** tag contains a model of a piece of the rough diamond cut by the sawing plane with diamonds that were inscribed in that piece and inclusions that are located within that piece if any. But in this case rough pieces are sorted in the same order as diamonds.

The picture with the **DIAMOND_REPORT_MODEL** tag contains a model of the inscribed diamond and inclusions that are located within that diamond if any.

Bookmark
This key is mandatory. It should contain the name of the MS Word bookmark in the RTF template for the picture. All bookmarks should be written in capital letters. During the report generation this bookmark will be replaced with the picture.

PieceNumber
This key is mandatory if the ***PictureID*** key is equal to **PIECE_REPORT_MODEL**. It specifies the number of the piece of the rough diamond to be drawn on the picture.

DiamondNumber
This key is mandatory if the ***PictureID*** key is equal to **DIAMOND_REPORT_MODEL** or **DIAMOND_PIECE_REPORT_MODEL**. It specifies the number of the diamond to be drawn on the picture. If the ***PictureID*=DIAMOND_PIECE_REPORT_MODEL** the program searches for the rough piece that has the given diamond inside and draws the found rough piece with the given diamond inside.

X, Y, Z
These keys are optional. If the key is not specified it is assumed to be zero. It is the angle of rotation of the 3D model around X, Y, Z axis in degrees before making the final image. This attribute allows to create various views of the same model.

RoughVisibleEdgesColorR, RoughVisibleEdgesColorG, RoughVisibleEdgesColorB
These keys are optional. If the key is not specified it is assumed to be zero. They specify the RGB color for drawing visible edges of the 3D model of the rough diamond.

ModelVisibleEdgesColorR, ModelVisibleEdgesColorG, ModelVisibleEdgesColorB
These keys are optional. If the key is not specified it is assumed to be zero. They specify the RGB color for drawing visible edges of 3D models of diamonds inscribed into the rough diamond.

SawColorR, SawColorG, SawColorB
These keys are optional. If the key is not specified it is assumed to be zero. They specify the RGB color for drawing the sawing plane over the 3D model of the rough diamond.

InclusionColorR, InclusionColorG, InclusionColorB
These keys are optional. If the key is not specified it is assumed to be zero. They specify the RGB color for drawing inclusions on pictures.

RoughOutline
This key is optional. If this key is not specified it is assumed to be zero. It specifies the way of drawing rough models. If this key is zero, all visible edges of the model will be drawn, if this key is not zero, only the outline of the model will be drawn.

ReflectionCount
This key is optional. If this key is not specified it is assumed to be zero. It specified the way of drawing inclusions on pictures. If this key is equal to -1, inclusions are not drawn. If this key is equal to 0, inclusions will be drawn without any distortions caused by light refraction or reflection. If this key is equal to 1, each inclusion is drawn taking refraction of the light into account. If this key is equal to 2 or more, each inclusion is drawn taking into account light refraction and light reflections (1 or more accordingly).

InclusionSize
This key is optional. If this key is not specified it is assumed to be equal to 100. It specified the scale for drawing inclusions. The default value of 100 (percents) may be increased or decreased to produce the most appropriate size of inclusions on the picture. For example, the value 200 will make inclusions drawn two times larger than default.

ModelIncrease
This key is optional. If this key is specified it defines the scale for drawing diamonds inside the rough model. All diamonds are magnified according to this setting and intersected with the rough model. It allows to highlight areas on the diamond that come close to the rough model surface. For example, if ModelIncrease=102, diamonds are magnified in 1.02 times.

Exporting report data

Helium software searches the «Report» subfolder for the initialization (*.ini) files and looks through all such files. Initialization files related to exporting report data for rough diamonds should have the following format.

```
[General]
ReportType= RoughExport
VisibleName=<Submenu item name>

[FileNames]
Executable=<Full path to the third-party executable>
ParameterValues=<File name for the result>

[DefaultPictureParameters]
RoughVisibleEdgesColorR=<The default color in RGB>
RoughVisibleEdgesColorG=<The default color in RGB>
RoughVisibleEdgesColorB=<The default color in RGB>
ModelVisibleEdgesColorR=<The default color in RGB>
ModelVisibleEdgesColorG=<The default color in RGB>
ModelVisibleEdgesColorB=<The default color in RGB>
SawColorR=<The default color in RGB>
SawColorG=<The default color in RGB>
SawColorB=<The default color in RGB>
InclusionColorR=<The default color in RGB>
InclusionColorG=<The default color in RGB>
```

```
InclusionColorB=<The default color in RGB>
RoughOutline=<Default type of the rough model outline>
ReflectionCount=<Default number of inclusion reflections>
InclusionSize=<Default scale of inclusions>


[Picture<N>]
PictureID= ROUGH_REPORT_MODEL
FileNameEMF=<File name for the picture in the EMF format>
FileNameBMP=<File name for the picture in the BMP format>
FileNamePNG=<File name for the picture in the PNG format>
FileNameGIF=<File name for the picture in the GIF format>
Width=<Maximum raster picture width in pixels>
Height=<Maximum raster picture height in pixels>
X=<Angle of rotation around X axis in degrees>
Y=<Angle of rotation around Y axis in degrees>
Z=<Angle of rotation around Z axis in degrees>
RoughVisibleEdgesColorR=<The color in RGB>
RoughVisibleEdgesColorG=<The color in RGB>
RoughVisibleEdgesColorB=<The color in RGB>
ModelVisibleEdgesColorR=<The color in RGB>
ModelVisibleEdgesColorG=<The color in RGB>
ModelVisibleEdgesColorB=<The color in RGB>
SawColorR=<The color in RGB>
SawColorG=<The color in RGB>
SawColorB=<The color in RGB>
InclusionColorR=<The color in RGB>
InclusionColorG=<The color in RGB>
InclusionColorB=<The color in RGB>
RoughOutline=<Type of the rough model outline>
ReflectionCount=<The number of inclusion reflections>
InclusionSize=<Scale of inclusions>
ModelIncrease=<Scale of diamonds>
……………………………………………………

[Picture<N>]
PictureID=PIECE_REPORT_MODEL
PieceNumber=<Number of the piece>
FileNameEMF=<File name for the picture in the EMF format>
FileNameBMP=<File name for the picture in the BMP format>
FileNamePNG=<File name for the picture in the PNG format>
FileNameGIF=<File name for the picture in the GIF format>
Width=<Maximum raster picture width in pixels>
Height=<Maximum raster picture height in pixels>
X=<Angle of rotation around X axis in degrees>
Y=<Angle of rotation around Y axis in degrees>
Z=<Angle of rotation around Z axis in degrees>
RoughVisibleEdgesColorR=<The color in RGB>
RoughVisibleEdgesColorG=<The color in RGB>
RoughVisibleEdgesColorB=<The color in RGB>
ModelVisibleEdgesColorR=<The color in RGB>
ModelVisibleEdgesColorG=<The color in RGB>
ModelVisibleEdgesColorB=<The color in RGB>
SawColorR=<The color in RGB>
SawColorG=<The color in RGB>
```

```
SawColorB=<The color in RGB>
InclusionColorR=<The color in RGB>
InclusionColorG=<The color in RGB>
InclusionColorB=<The color in RGB>
RoughOutline=<Type of the rough model outline>
ReflectionCount=<The number of inclusion reflections>
InclusionSize=<Scale of inclusions>
…………………………………………………

[Picture<N>]
PictureID=DIAMOND_REPORT_MODEL
DiamondNumber=<Number of the diamond>
FileNameEMF=<File name for the picture in the EMF format>
FileNameBMP=<File name for the picture in the BMP format>
FileNamePNG=<File name for the picture in the PNG format>
FileNameGIF=<File name for the picture in the GIF format>
Width=<Maximum raster picture width in pixels>
Height=<Maximum raster picture height in pixels>
X=<Angle of rotation around X axis in degrees>
Y=<Angle of rotation around Y axis in degrees>
Z=<Angle of rotation around Z axis in degrees>
ModelVisibleEdgesColorR=<The color in RGB>
ModelVisibleEdgesColorG=<The color in RGB>
ModelVisibleEdgesColorB=<The color in RGB>
InclusionColorR=<The color in RGB>
InclusionColorG=<The color in RGB>
InclusionColorB=<The color in RGB>
ReflectionCount=<The number of inclusion reflections>
InclusionSize=<Scale of inclusions>

[Picture<N>]
PictureID=DIAMOND_PIECE_REPORT_MODEL
DiamondNumber=<Number of the diamond>
FileNameEMF=<File name for the picture in the EMF format>
FileNameBMP=<File name for the picture in the BMP format>
FileNamePNG=<File name for the picture in the PNG format>
FileNameGIF=<File name for the picture in the GIF format>
Width=<Maximum raster picture width in pixels>
Height=<Maximum raster picture height in pixels>
X=<Angle of rotation around X axis in degrees>
Y=<Angle of rotation around Y axis in degrees>
Z=<Angle of rotation around Z axis in degrees>
RoughVisibleEdgesColorR=<The color in RGB>
RoughVisibleEdgesColorG=<The color in RGB>
RoughVisibleEdgesColorB=<The color in RGB>
ModelVisibleEdgesColorR=<The color in RGB>
ModelVisibleEdgesColorG=<The color in RGB>
ModelVisibleEdgesColorB=<The color in RGB>
SawColorR=<The color in RGB>
SawColorG=<The color in RGB>
SawColorB=<The color in RGB>
InclusionColorR=<The color in RGB>
InclusionColorG=<The color in RGB>
InclusionColorB=<The color in RGB>
```

```
RoughOutline=<Type of the rough model outline>
ReflectionCount=<The number of inclusion reflections>
InclusionSize=<Scale of inclusions>
.....................................................
```

Keys of the [General] and [FileNames] sections.

These sections are mandatory.

ReportType

This key is mandatory. It should have the «RoughExport» string for this type of report.

VisibleName

This key is mandatory. The value of this key will be shown in the «Export» menu of the «Report preview» window.

Executable

This key is mandatory. It should have the fully qualified name of the third-party executable that will be launched after the generation of all files. This program may read the generated files and pass the report data from them into external report generation engines.

ParameterValues

This key is mandatory. It should have the name of the resulting text file. If the file name is not fully qualified, the resulting file will be created in the folder relative to the «Report» folder, where this INI file is placed. The resulting file will have the format of the Windows initialization file with the single section named **[NumericalParameters]**:

```
[NumericalParameters]
DIAMOND_PRICE_TOTAL=18109.60
YIELD_TOTAL_PC=43.96
SAW_WEIGHT_TOTAL_PC=2.83
DIAMOND_QUANTITY=2
SAW_PLANE_QUANTITY=1
PIECE_QUANTITY=2
.....................................................
```

Key names will be the tag names of report parameters. Key values will be the values of report parameters.

This file will contain a list of all available report parameters. This list may vary depending on the quantity of diamonds inscribed into the rough. Please note, that different rough diamonds may produce different set of parameters. The Helium software does not erase this file before creating a new report, but updates only those keys in this file that have a corresponding parameter value. The values of other keys are left intact.

Keys of the [DefaultPictureParameters] section.

This section is optional. It contains default values of picture parameters for all pictures. Each picture may redefine any parameter in its own section. If the picture's section doesn't have some parameter, its value is taken from this section. For the detailed description of parameters see the **[Picture<N>]** section.

[Picture<N>] sections

These sections are optional and specify the attributes of report pictures that require additional attributes. The number in the section name does not have a special meaning. It just enumerates sections. Helium software supports up to 100 sections of this type.

PictureID
This key is mandatory. It should contain the tag of the picture **ROUGH_REPORT_MODEL** or **PIECE_REPORT_MODEL** or **DIAMOND_REPORT_MODEL** written in capital letters. The picture with the **ROUGH_REPORT_MODEL** tag contains a model of the rough diamond with all inscribed diamonds in it and all sawing planes and all inclusions. The picture with the **PIECE_REPORT_MODEL** tag contains a model of a piece of the rough diamond cut by the sawing plane with diamonds that were inscribed in that piece and inclusions that are located within that piece if any. Helium software sorts rough pieces by the weight of the diamonds inscribed into the piece. At first goes the piece with the largest inscribed diamond. The picture with the **DIAMOND_REPORT_MODEL** tag contains a model of the inscribed diamond and inclusions that are located within that diamond if any.

FileNameEMF
This key is optional. It should have the file name for the picture in the Windows Enhanced-Format Metafile. If this key is not specified, the corresponding EMF file will not be created or updated.

FileNameBMP, FileNamePNG, FileNameGIF
This key is optional. It should have the file name for the picture in the Windows Bitmap Format (BMP) or Portable Network Graphics Format (PNG) or Graphics Interchange Format (GIF). The Helium software creates uncompressed true-color BMP images, compressed true-color PNG images and compressed 8-bit color GIF images. If this key is not specified, the corresponding file will not be created or updated. If this key is specified, two more keys should be specified also: *Width*, *Height*.

Width, Height
These keys should be specified if the *FileNameBMP* or *FileNamePNG* or *FileNameGIF* key is present. They specify the maximum width and height of the raster image with the report picture in pixels. The actual picture will fit into the given dimensions preserving the aspect ratio.

PieceNumber
This key is mandatory if the *PictureID* key is equal to **PIECE_REPORT_MODEL**. It specifies the number of the piece of the rough diamond to be drawn on the picture.

DiamondNumber
This key is mandatory if the *PictureID* key is equal to **DIAMOND_REPORT_MODEL**. It specifies the number of the diamond to be drawn on the picture.

X, Y, Z
These keys are optional. If the key is not specified it is assumed to be zero. It is the angle of rotation of the 3D model around X, Y, Z axis in degrees before making the final image. This attribute allows to create various views of the same model.

RoughVisibleEdgesColorR, RoughVisibleEdgesColorG, RoughVisibleEdgesColorB
These keys are optional. If the key is not specified it is assumed to be zero. They specify the RGB color for drawing visible edges of the 3D model of the rough diamond.

ModelVisibleEdgesColorR, ModelVisibleEdgesColorG, ModelVisibleEdgesColorB
These keys are optional. If the key is not specified it is assumed to be zero. They specify the RGB color for drawing visible edges of 3D models of diamonds inscribed into the rough diamond.

SawColorR, SawColorG, SawColorB
These keys are optional. If the key is not specified it is assumed to be zero. They specify the RGB color for drawing the sawing plane over the 3D model of the rough diamond.

InclusionColorR, InclusionColorG, InclusionColorB

These keys are optional. If the key is not specified it is assumed to be zero. They specify the RGB color for drawing inclusions on pictures.

RoughOutline

This key is optional. If this key is not specified it is assumed to be zero. It specifies the way of drawing rough models. If this key is zero, all visible edges of the model will be drawn, if this key is not zero, only the outline of the model will be drawn.

ReflectionCount

This key is optional. If this key is not specified it is assumed to be zero. It specified the way of drawing inclusions on pictures. If this key is equal to -1, inclusions are not drawn. If this key is equal to 0, inclusions will be drawn without any distortions caused by light refraction or reflection. If this key is equal to 1, each inclusion is drawn taking refraction of the light into account. If this key is equal to 2 or more, each inclusion is drawn taking into account light refraction and light reflections (1 or more accordingly).

InclusionSize

This key is optional. If this key is not specified it is assumed to be equal to 100. It specified the scale for drawing inclusions. The default value of 100 (percents) may be increased or decreased to produce the most appropriate size of inclusions on the picture. For example, the value 200 will make inclusions drawn two times larger than default.

ModelIncrease

This key is optional. If this key is specified it defines the scale for drawing diamonds inside the rough model. All diamonds are magnified according to this setting and intersected with the rough model. It allows to highlight areas on the diamond that come close to the rough model surface. For example, if ModelIncrease=102, diamonds are magnified in 1.02 times.