

Shape-Maker^{©Jm}

5.2.0

Manual

Brief abstract

Shape-Maker is a graphical user interface for the converter program conv3ds.exe of MSTs. This converter converts 3ds-files into s-files (shapes) for MSTs and Open Rails. A 3ds-file can be exported from 3dsmax for example.

As a DOS console program conv3ds.exe is relatively cumbersome to use. Shape-Maker makes the use of conv3ds.exe comfortable and help to create sd-files and bounding boxes.

A 3D model runs through the following stations:

3D-Modelling-Program → 3ds-file → Shape-Maker → conv3ds.exe → s-file

This manual does not describe how to create a 3D model in a 3D modelling program and export it as a 3ds-file. The existence of a 3ds-file is assumed. However, some tips which should be considered when modelling in 3dsmax are described under **What to consider in 3ds-max**.

Shape-Maker is freeware. You use Shape-Maker at your own risk. There is no liability accepted for any damage caused by the use of Shape-Maker.

Requirements

Required files

The working directory must contain the following files:

- **Shape-Maker_5.2.0.exe** (Versions digits 5.2.0 could differ in futur versions)
- all as LODs involved **3ds-files**
- all **ace-** or **dds-textures** used by the s-file

Where is the file conv3ds.exe expected on the PC?

In at least one of the three places listed here:

1. in the same directory as Shape-Maker or
2. in the directory corresponding to the MSTTS Windows registry entry or
3. in the MSTTS standard directory

In the case of 2. or 3. each in the subdirectory UTILS

Filenames of the 3ds-files as LODs

(LOD = **L**evel **O**f **D**istance)

The file naming convention is defined by conv3ds.exe. It says that just before the dot in the file name of 3ds-files a LOD number must be that determines the width of the visibility of the LOD. Example of four 3ds-files to produce a shape with 4 LODs:

Cubus200.3ds
Cubus300.3ds
Cubus1500.3ds
Cubus2000.3ds

In this case, Shape-Maker will propose the shape name **Cubus.s** and produce a s-file with 4 LODs (200m, 300m, 1500m and 2000m).

Another example:

BR17_Steamloco100.3ds
BR17_Steamloco300.3ds
BR17_Steamloco1500.3ds

In this case, Shape-Maker will propose the shape name **BR17_Steamloco.s** and a s-file with 3 LODs (100m, 300m and 1500m) will be produced.

The right naming of the Texture-files (ace- or dds-files)

3ds-files unfortunately only contain texture file names with a maximum length of 8 characters left side the dot, for example TEST01MA.BMP.

Incorrect material designation:

Two different texture names in the 3D model are named as

TestMaterial01.bmp and **TestMaterial02.bmp**

- In the 3ds-file there are then twice the same texture name **TESTMATE.BMP**
- conv3ds.exe creates in the s-file only one texture named **TestMate.ace**
- Shape-Maker cannot correct anything more

Correct material designation:

The two texture names in the 3D model differ in the first 8 characters

Test01Material.bmp and **Test02Material.bmp**

- In the 3ds-file there are then two texture names **TEST01MA.BMP** and **TEST02MA.BMP**
- conv3ds.exe creates two textures **TEST01MA.ACE** and **TEST02MA.ACE** in the s-file
- Shape-Maker can now distinguish the textures in the s-file and correct them to long ace names as follows:

TEST01MA.ACE → **Test01Material.ace**

TEST02MA.ACE → **Test02Material.ace**

Conclusion: With Shape-Maker, material names can be longer than 8 characters, but must still differ in the first 8 characters.

Handling of dds textures

Instead of ace textures, you can now also use dds textures for shapes in Open Rails. The dds textures are accepted by Shape-Maker from version 5.2.0 and are expected in the working directory instead of an ace texture.

A shape in Open Rails can even contain both texture formats (ace and dds) for different textures at the same time.

If a dds texture is contained in a shape, the shape will cause an error in MSTs!

If a dds file is available, this is preferably written into the shape. The following principle applies: dds dominates ace!

There are 3 possible cases for a texture file:

1. Texture only exists as an ace file -> the ace texture is used
2. Texture only exists as a dds file -> the dds texture is used
3. Texture exists as ace and dds file -> the dds texture is used

If a texture is available as a dds file, it will be used in the shape, regardless of whether there is also a version of the texture as an ace file.

Operation of Shape-Maker

Involved 3ds-files



The found 3ds-files are displayed as LODs. Optionally, **check** the box before the required 3ds-file. Each as checked marked 3ds-file is used for creating the s-file. The names of the 3ds-files should differ in a number before the point which the LOD (Level of Detail) of the 3ds-file says.

Name of the shape-file



Highlighted in green is the future name of the s-file. Shape-Maker suggests here always a name before. You can also enter a unique name.

The button **Default s-file name** will reset to Shape-Makers proposal.

Textures for daytime and seasons



Here you can select which textures you use for the shape. There are 4 choices:

- **...for day only** → 1 texture for all daytimes and seasons
- **...for day and snow** → 2 textures, one for snow
- **...for day, night and snow** → 3 textures, one for night, one for snow
- **...seasonal** → max. 7 textures, for seasons and precipitation

At the 5th option **... other ESD_Alternative_Texture (...)** you can enter an alternate Textur number manually, if another one is desired.

The value specified here for **ESD_Alternative_Texture** is entered in the sd-file belonging to the s-file.

For test purposes only

Shape should have only one texture

A screenshot of the 'For test cases only' settings panel in Shape-Maker. The panel has a title bar 'For test cases only' with a checked checkbox. Below it are three options: 's-file has only one texture' (checked), 's-file don't need any texture' (unchecked), and 's-file gets glassy textures (MSTS only/not Open Rails)' (unchecked). To the right of these options are two buttons: 'Validate values' and 'Calculate BoundingBox data of shape'.

Only one texture for the entire shape will be used. Shape-Maker use the alphabetically first texture. You can create this way a functioning shape for MSTS if the other textures of the shape bring MSTS to crash. Thus it can be analyzed whether you have an error in the geometry of the shapes or the textures make trouble.

Shape has no texture at all

A screenshot of the 'For test cases only' settings panel in Shape-Maker. The panel has a title bar 'For test cases only' with a checked checkbox. Below it are three options: 's-file has only one texture' (unchecked), 's-file don't need any texture' (checked), and 's-file gets glassy textures (MSTS only/not Open Rails)' (unchecked). To the right of these options are two buttons: 'Validate values' and 'Calculate BoundingBox data of shape'.

The shape is made entirely texture-independent. In MSTS, it is shown in white. You can create this way a functioning shape for MSTS if you have one of the textures in the suspicion that it bring MSTS to crash.

In addition, you can see in this way a quick preview of the model in MSTS without texturing it exactly. A kind of a fast in-game-preview to check whether the geometry of the shape is working in MSTS.

Glassy textures for Shape (only visible in MSTS)

A screenshot of the 'For test cases only' settings panel in Shape-Maker. The panel has a title bar 'For test cases only' with a checked checkbox. Below it are three options: 's-file has only one texture' (unchecked), 's-file don't need any texture' (unchecked), and 's-file gets glassy textures (MSTS only/not Open Rails)' (checked). To the right of these options are two buttons: 'Validate values' and 'Calculate BoundingBox data of shape'.

All textures of the shape are displayed in MSTS as semi-transparent. This effect is not visible in Open Rails and Shape Viewer. Among other things, this effect can be helpful for route designers in the MSTS Route Editor, if they want to see other shapes, which lie below or behind the shape, shining through. Also the terrain of a route remains semi-transparent visible under the shape.

MipMap settings

A screenshot of the MipMap settings panel in Shape-Maker. The panel has a title bar 'MipMapping'. Below it are three radio buttons: 's-file has textures...' (selected), '...for day only' (unselected), and '...for day and snow' (unselected). To the right of these are three text boxes: '[ESD_Alternative_Texture (0)]', '[ESD_Alternative_Texture (1)]', and '[ESD_Alternative_Texture (257)]'. In the center is a dropdown menu showing '0' and a button with a question mark '?'. To the right of the dropdown are two buttons: 'Validate values' and 'Calculate BoundingBox data of shape'. Below these are two text boxes: 'Class' with the value 'Houses' and 'Description' with the value 'Cubus'.

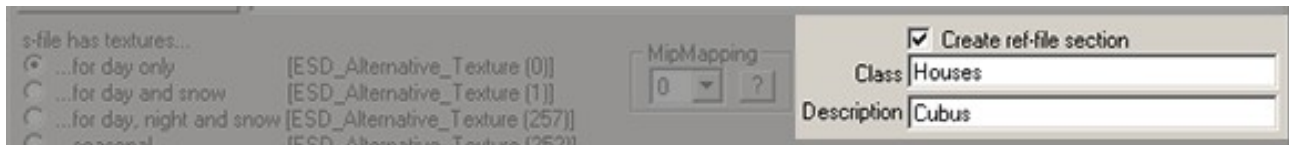
There are values from -6 to 2 selectable. Normally, 0 is set.

The more negative the value is selected, the sharper the textures are presented on the shape in the distance. This can often be desirable, for example, for platforms, but the value should not fall below -2. Because the focus in the distance can also lead to a visually unpleasant grainy crackle of textures. So usual values are between -2 and 0. Everyone has to try for themselves what suits him.

The more negative the values are selected here, the more the graphics card will need computing power, which under certain circumstances can be very pressing to the frame rate. Therefore, in particular, often built-up shapes, such as trees or shrubs, the mipmap value should not fall below 0.

For more help on the mipmap topic click on the '?' while Shape-Maker is running.

A Entry for the ref-file



A checkmark in the **Create ref-file section** causes that the file **AddToRef.txt** to be generated, which then contains the following section:

```
Static (
    Filename      ( "Cubus.s" )
    Class         ( "Houses" )
    Align         ( None )
    Description    ( "Cubus" )
)
```

You can specify the class and description. The section may be included in the ref file of a route so that you have the shape in the routes editor available to place it in the route.

Other paths, in which the shape is to be copied to



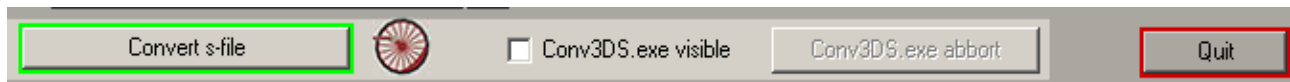
Here you have 3 options to specify paths, in which the shape and the associated sd-file should also be copied.

Please use this copy functions with care, since it may overwrite existing s-files named the same! Who wants to make sure they should not use it and copy the created shape manually by using Windows Explorer!

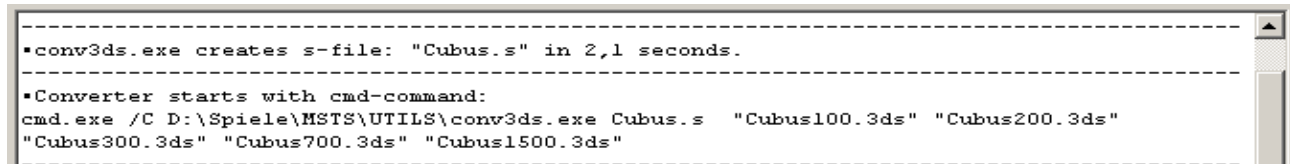
If it is a normal shape, like a house or a tree, you choose by clicking on the button **Copy s- and sd-file also to** the route in which you want to have the shape. Only the route directory is selected and not the SHAPE contained therein directory. If you want the shape being copied to another route at the same time, you can do this by using the second button **Copy s- and sd-file also to**.

The third button **Copy only s-file to** is specially designed for locomotive and wagon shapes. You can here select a vehicle directory in the Trainset folder of MSTs, in which then only the s-file is copied. So not the sd-file. This may be important because the generated sd-file by Shape-Maker may contain different a bounding box and therefore the possible already existing sd-file with a bounding box remains in the Trainset folder.

Start converting



After you have made all the above settings, click on the green Button **Convert s-file** to convert the 3ds-files to a s-file. A time-counter should be visible in the lower white log area:



If the indicator shows about 20 seconds, finish the conversion by clicking on **Conv3ds.exe abort**.

Now put the check mark at **conv3ds.exe visible** and try again by clicking on **Convert s-file**. The DOS window of conv3ds.exe can now be seen during the conversion and will show you any error messages of conv3ds.exe. It is best to make it a habit to always check the box **conv3ds.exe visible** in order to see any error messages from conv3ds.exe in time.

Note: For shapes with many polygons and multiple LODs, such as locomotives, the conversion can take up to 1 minute and last longer. In this case, do not be impatient and wait until the seconds counter stops and "conv3ds.exe" completed the conversion.

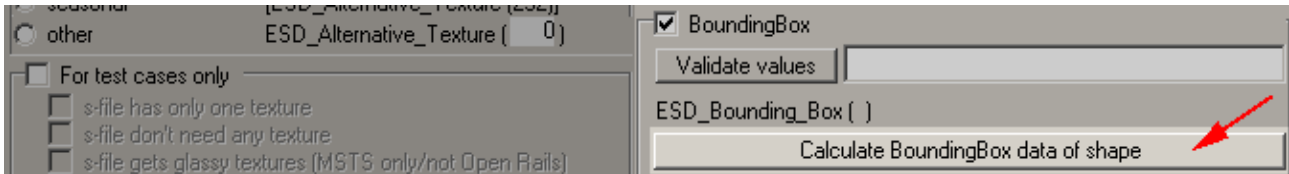
After successful conversion, the s-file and the associated sd-file is created in a directory named **SHAPES** exactly where Shape-Maker itself is located. In addition, a directory named **TEXTURES** is created which contains a copy of the needed ace-textures by the s-file.

Bounding Boxen

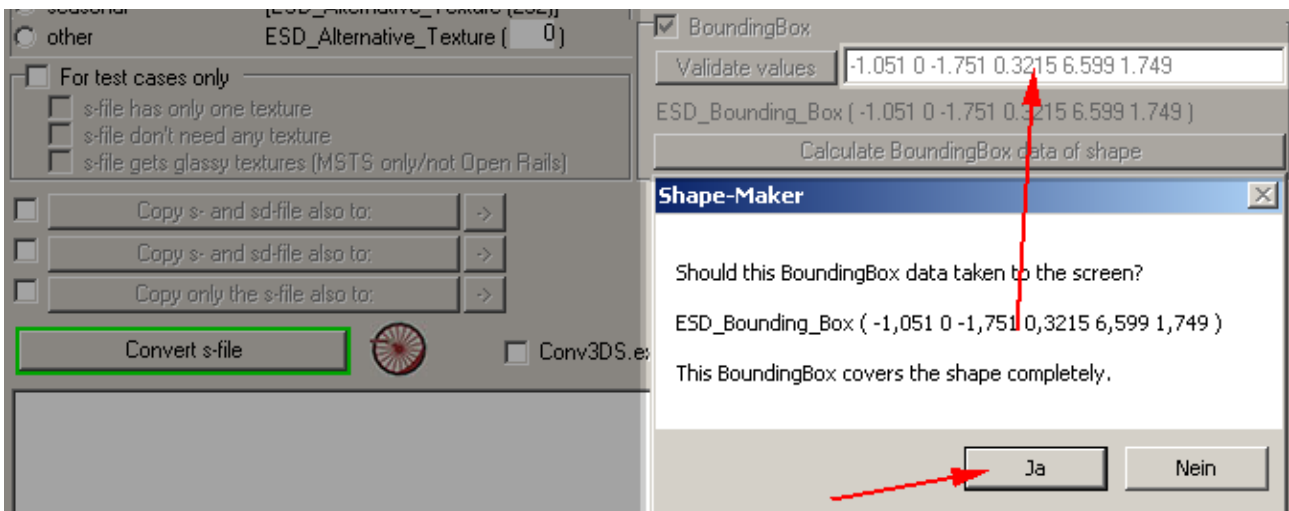
Shape-Maker can write an **ESD_Bounding_Box (x1 y1 z1 x2 y2 z2)** line with the min- and max-values for a BoundingBox in the sd-file. The 6 numerical values can either be entered manually or calculated by Shape-Maker.

A BoundingBox calculated by Shape-Maker always encloses the model completely, which often requires manual value corrections. For example, locomotives, wagons or even bridges should not have completely enclosing BoundingBoxes. However, the calculated BoundingBox can provide the base values for manual fine tuning.

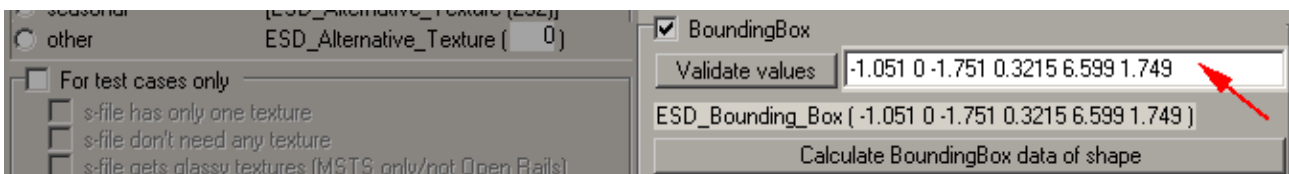
Recommended procedure when creating a BoundingBox entry:



By clicking the button **Calculate BoundingBox data of shape** the completely enclosing BoundingBox values of the s-file are determined. With large s-files this can take a few seconds.



Afterwards a window appears asking for the calculated BoundingBox values to be transferred to the white text line on the screen. After clicking 'Yes' the calculated values are transferred to the white line and can be edited there.



Below the white line you can see the complete ESD_Bounding_Box entry for the sd-file (you can select it and copy it from there).



A (renewed) click on the green button **Convert s-file** will then write the BoundingBox entry into the sd-file.

What to consider in 3ds-max?

1. Names of material

conv3ds.exe error message:

Material name '01 - Standard' not in recognised format.

A material name does not meet the expectations of **conv3ds.exe**.

There are certain material names expected. These include **Solidnorm**, **Alphnorm**, **Transnorm** etc. The complete list of material names can be found in the file **Conversion of Shapes and Textures 1.01.doc** in the MSTS directory **TechDoc** quoted below:

Material Name	Description
SolidBright	Solid texture, fully lit, very bright.
TransBright	Transparent texture, fully lit, very bright.
AlphBright-	Alpha texture, fully lit, very bright, lowest priority in relation to other alpha.
AlphBright	Alpha texture, fully lit, very bright, middle priority in relation to other alpha.
AlphBright+	Alpha texture, fully lit, very bright, highest priority in relation to other alpha.
SolidHlfBrt	Solid texture, half lit, half bright.
TransHlfBrt	Transparent texture, half lit, half bright.
AlphHlfBrt-	Alpha texture, half lit, half bright, lowest priority in relation to other alpha.
AlphHlfBrt	Alpha texture, half lit, half bright, middle priority in relation to other alpha.
AlphHlfBrt+	Alpha texture, half lit, half bright, highest priority in relation to other alpha.
SolidNorm	Solid texture, no specularity.
TransNorm	Transparent texture, no specularity.
AlphNorm-	Alpha texture, no specularity, lowest priority in relation to other alpha.
AlphNorm	Alpha texture, no specularity, middle priority in relation to other alpha.
AlphNorm+	Alpha texture, no specularity, highest priority in relation to other alpha.
SolidLoShine	Solid texture, low specularity.
TransLoShine	Transparent texture, low specularity.
AlphLoShine-	Alpha texture, low specularity, lowest priority in relation to other alpha.
AlphLoShine	Alpha texture, low specularity, middle priority in relation to other alpha.
AlphLoShine+	Alpha texture, low specularity, highest priority in relation to other alpha.
SolidHiShine	Solid texture, high specularity.
TransHiShine	Transparent texture, high specularity.
AlphHiShine-	Alpha texture, high specularity, lowest priority in relation to other alpha.
AlphHiShine	Alpha texture, high specularity, middle priority in relation to other alpha.
AlphHiShine+	Alpha texture, high specularity, highest priority in relation to other alpha.
SolidCrcfrm	Solid cruciform texture.
TransCrcfrm	Transparent cruciform texture.
AlphCrcfrm-	Alpha cruciform texture, lowest priority in relation to other alpha.
AlphCrcfrm	Alpha cruciform texture, middle priority in relation to other alpha.
AlphCrcfrm+	Alpha cruciform texture, highest priority in relation to other alpha.
SolidDrkShd	Solid texture, dark shading.
TransDrkShd	Transparent texture, dark shading.
AlphDrkShd-	Alpha texture, dark shading, lowest priority in relation to other alpha.
AlphDrkShd	Alpha texture, dark shading, middle priority in relation to other alpha.
AlphDrkShd+	Alpha texture, dark shading, highest priority in relation to other alpha.
Gloss	Gloss texture. (geht bicht in 3dsmax)

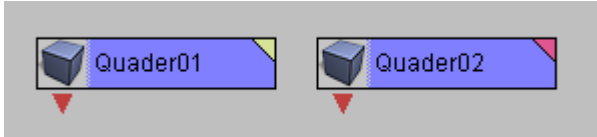
2. Hierarchy of shape sub-objects

conv3ds.exe error message:

Animation hierarchy contains multiple root nodes

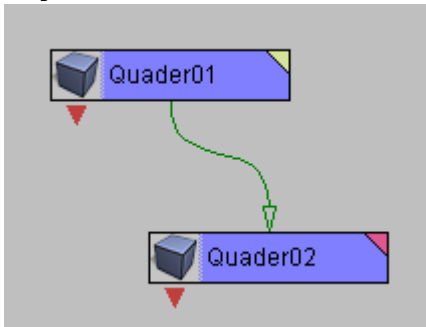
The object hierarchy has more than one root object. There are at least two objects that claim to be the root.

wrong:



If you use multiple objects, they must have a hierarchy. Only one object can be the root object.

right:



In principle, several sub-objects are allowed.

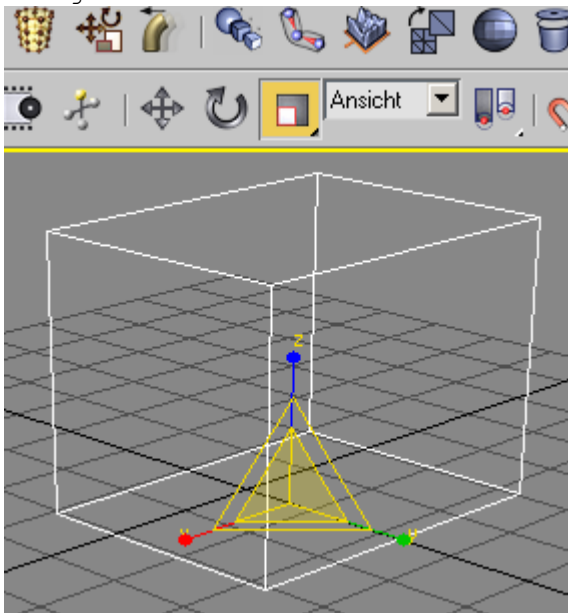
With all the possibilities to build 3D models with multiple objects, one should not forget that MSTs (and certainly Open Rails) shapes can represent the easiest with only one object, i.e. a high frame rate is been secured. The graphics cards are relieved more so the less objects are used in a shape. **It is ideal to use only 1 object per Shape.** For certain shapes, e.g. speed signs, which MSTs automatically places in the "world" depending on the activity, **only one object is even allowed in such shape.** Otherwise the sign will not be visible.

3. Scaling of objects

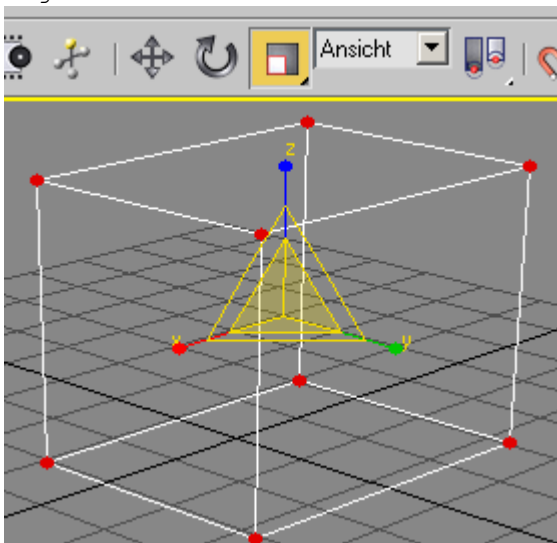
conv3ds.exe error message:

Node 'Quader01' has a scale or reflection in it, these are not supported.

An object should never be scaled as a whole by using the scaling tool!
wrong:

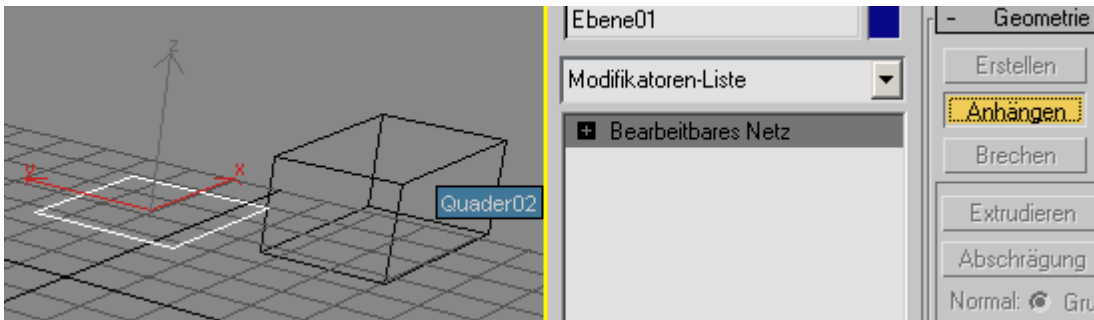


Instead only scale the vertices of an object.
right:



So if you want to scale the whole object, you should first select all vertices and then work with the Scaling tool.

There is a trick, how to make an already scaled as a whole object reusable for conv3ds.exe. Do this, create a new object, such as a simple plane object and append the scaled object to the new plane object with the modifier **Append**:



The plane is selected and after you click on **Append**, the scaled quader object will be merged to the plane object as one complete object. In this case the scaling factor of the quader object "disappears" and after you now delete the polygons of the plane the original quader object is left. Now it is without scaling and can be converted by conv3ds.exe in a s-file.

4. Material Alphnorm with +1s parameter

There is a tricky problem when you have an ALPHNORM material with a **+1s** parameter and more than one LOD files.

Alphnorm materials are useful for models with glas you want look through. In most of the models with glasses there are more than one glasses. So a kind of a look-through-hierarchy should be defined among the glasses. For that pupose you need the parameter **+1s**. The **s** may be stands for **sorting**.

The problem now is:

If you use in the first LOD the material name **ALPHNORM +1s** then you must(!) use in the further LODs the materialname **ALPHNORM +1**. Than means you have to leave off the **s**.

Otherwise conv3ds.exe crashes while converting.

5. Faulty animations in 3ds-files

It happens that 3ds max writes faulty animations into the 3ds file. This may be different for the different versions of 3ds max, maybe it is also due to the 3ds format itself.

In any case, conv3ds.exe cannot correct such faulty animations. Therefore the animation will be forwarded into the s-file incorrectly.