

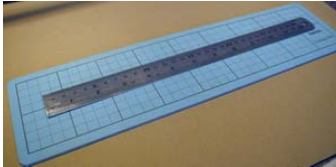
general konstruktion manual

tools for cardboard model making

The following basic tools are needed for precise cardboard model making:



For the thick-featured cutting-out of several parts, you can use miscellaneous scissors. To do the cutting on the model parts, please use sharp cutter knives, scalpels or similar tools.



The steel or aluminium ruler has to be used to guide the knives. As a pad, please take a cutting mat or also a cardboard mat. Do not use a glass plate, because the cutter knives can get damaged.



For the assembly, please utilize tweezers or pliers, as well as clamps to stabilize the model during gluing. One way syringes with an according cannula guarantee a clean and economic working with glue, grease and oil.



Felt pens in different colours should be used for cutting edge treatment afterwards.



working with glue

As glue we usually use wood glue, f. e. the UHU coll. Cold glues for gluing wood are transparent after solidification. Therefore, they are universal applicable for the cardboard model making and it's landscaping, f. e. to gravel the rail tracks and to amount the landscape mats. Cold glues for gluing wood can also be taken, if polystyrene is used, f. e. for the construction of the landscape. Solvent- containing glues, f. e. all- purpose glues decompose the polystyrene and are not applicable. All- purpose glues



can be used, if different materials shall be bonded. Sometimes, for certain materials special glues are required. To bond large surfaces, glues, which do not harden too fast, have been approved.

Please, only use superglues in special cases, because if you use it for cardboard, in most cases the fingers get bonded instead of the cardboard.

However, experiences of the model makers are very important. Not everything works out the first time. Different glues can be purchased, which may be perfect for several works, so each model maker will choose his own favored glues.

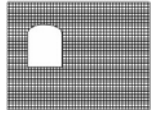
For applying the glue one way syringes with an according cannula have been approved. They guarantee a clean and economic working.

reinforcement of templates

We have decided to use glue laps on our models, especially on outside walls and smaller parts, f. e. chimneys. Those parts are printed on cardboard with 160 g per m²: The cutting out of recesses, windows and doors will be much easier.

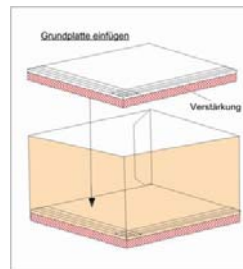


Additionally, we provide reinforcing plates on cardboard with 250 g per m² for larger side parts. Those reinforcing plates have to be adapted by cutting. While using larger surfaces, especially for TT or H0, those parts should be additionally reinforced before inserting in the model.



At home you will always find all types of materials, f. e. packing material, such as shoe boxes or the cardboard at the back of an writing pad. Most materials can be used and it saves you the purchase of cardboard. Important is only the suitable thickness.

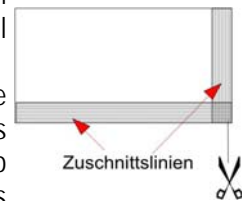
To glue large templates you can use spray- on glue, but also other glues that do not harden too fast. All parts that do not have any glue laps will be usually printed on cardboard with 250 g per m². That especially applies to base plates, roofs, undersurfaces, connecting elements and such parts, that are mounted at the outside of the model, f. e. doors and gateways.



Base plates should be reinforced to stabilize the complete building. There, where a reinforcement of the base plates is not expedient due to optic reasons, f. e. at open doors, cut angles for gluing can be used. Those are also necessary for the gluing in of connecting elements, which shall ensure a certain stability.

On base plates and connecting elements you will find cutting lines, which comply with the different material thicknesses.

Again, an information regarding the reinforcement. Especially, with the sizes above N (from TT upwards) you need to do reinforcements. To highlight structures optically, it is necessary to reinforce certain parts in a way that they will stick out, respectively to reach a depth effect on windows and doors, which are placed inwards. That is quite important for buildings with thick outside walls, such as churches.



A very good solution for reinforcement are KAPA plates (sandwich plates). That are PUR high- resistance foam plates, which are coated with cardboard on both sides and can easily be cut by cutter knives. Plates with the following thickness are available: 3, 5, 10 and 15 mm. From 5 mm upwards you will also find those plates additionally coated with metal foil (underneath the cardboard) on both sides (dimensionally stable after gluing and painting).

Such plates are also quite suitable for the construction of loading platforms and similar parts of large sizes. **Further, you can use it for the construction of roads, cargo quays, train platforms and track substructures.**

Using those plates, it is easier to build recesses, such as drainage channels.

Further information and products you will receive at:

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dyeing of cutting edges



It is necessary to dye the cutting edges of the parts before gluing. Usually, you can achieve good results with felt pens. Attention: The cutting edges are very absorbent. If the worst comes to the worst the model could be damaged. Therefore, please try on residual material, first. Further, it is very important to check the character of each felt pen. Using a gray felt pen on a cutting edge may show a range of colours from light gray to black, even though it will show a gray colour on a flat sheet of paper. Therefore, please use a usual paint-box. However, using such a paint- box experiences are important. We also propose to dye larger surfaces with a paint brush and colours out of a pant- box.

illumination of the models

To illuminate the models, the windows have to be cut out. Afterwards, enclosed windows on paper will be glued behind the cut out windows of the model. Please notice the details under point "plastic effect of the models" . On models, which consist of unreinforced outside walls, we propose to dye the interior sides with a black colour, because otherwise it is possible that the light will shine through the card board. To do that, please use colour or black paper.

plastic effect of the models

Using a simple card board model (four walls, a base plate, a roof) the plastic effect will be the same as a gingerbread house. However, you will already achieve a better optic look in cutting out and gluing on the enclosed additional doors. Those additional doors look like the doors, which are drawn on the wall parts and have to be glued directly onto those. Usually, that applies to all doors, which can be opened outwards. At brickwork walls the doors and windows are normally placed inwards. Therefore, those elements have to be cut out of the outside walls (including the reinforced parts) and the appropriate parts on paper have to be glued behind the cut out spot. Generally, the reinforced parts should be additionally reinforced in a way that the windows and doors are placed inwards approximately 1 mm (H0 / TT), respectively 0,5 mm (N / Z). Then the models will also be suited for illumination. On timber frame and wood work constructions the windows are almost planar with the outside walls. There are also some examples, where the windows overlap the outside walls a little bit. To still achieve a certain sterical effect, the windows of the outside walls have to be cut out and the paper windows have to be glued behind those. Only after that you should glue in the reinforced parts to guarantee the stability. Windows that are intended for being illuminated also have to be cut out on reinforced parts. Also on timber frame constructions all doors that will be opened inwards are also placed inwards (approximately 12 - 14 cm on originals). You can reach the adequate depth in using reinforced parts with the accordant thickness, but it is also possible to add a cardboard frame at the inside of the door cutout, also with

<i>Signs and Symbol</i>	
<u>Halle</u>	component
<u>Dach</u>	structural element
<u>V</u>	combosite panel
-----	fold line
	Backing
	filling
o	upside
u	underside
v	front
h	pack side

the accordant thickness. For illuminated models, please glue additional cardboard behind doors, which are not out of glass, just to avoid that the light will shine through.

roof gutters and downspouts

Roof gutters and downspouts are not included in our construction set. To use those on places, where it seems to be necessary, you can choose from different solutions. You may use commercially available accessories (f. e. from Auhagen), which have to be adapted accordingly. Another possibility is to use dried stalks of adequate grasses, which you will find in nature, at the florist or at an art and craft shop. To create roof gutters the stalks have to be splitted longitudinal. For downspouts, we propose to use wire, it is available in different diameters. Plastic isolated wire out of telecommunication cable may already have the required colour.

For building the models I wish you all the best.

Please write a letter or send an e-mail, if you are confronted with a problem, which doesn't seem to be able to be solved. We will find a solution together.

Best regards,
Frank Kühnel