KURT KÜNG

# *The Preparation of an Indian Rhinoceros in the Museum of Natural History in Berne (Switzerland)*[1]

During recent years the newly developed synthetic resins have increasingly been used for scientific and technological purposes. However, their application in the taxidermical preparation of animals has only been very slow. Many taxidermists also seem to have had a rather reserved attitude towards the newly discovered techniques used in the treatment and tanning of hides and furs. Mr. Kurt Küng, chief-taxidermist of the Museum of Natural History in Berne, describes the various stages in the preparation of an Indian Rhinoceros; the animal is "Moola", a female rhino which died in the Zoological Gardens of Basle in 1973 and which is now on display in the new Asia-room of the Museum. The preparation of the animal took nine months.

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## 1. PREPARATORY WORKS

Already in October 1972 the Museum was notified by the administration of the zoo that the death of the 15 years old rhino could be expected within a short time since it was suffering from a lung disease. At that time it was also agreed that the Museum would acquire the body. During two visits to the zoo a comprehensive series of photographs was taken; special attention was paid to details and it was possible to take several measurements on the living animal. On January 4, 1973 the rhino's blood circulation started to fail and it had to be killed. It was skinned in the zoo on the same day by a team of specialists from the Museum, with the assistance of zoo personnel. Skin and bones were then transported to Berne, and all subsequent work was done in the Museum.

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[1] Reprint from "Jahrbuch des Naturhistorischen Museums der Stadt Bern, Vol. 6, 1975 1977". Published with provisional numbering in october 1976.

Since the thickness of the skin of an Indian rhino varies from layer to layer it is essential that accurate measurements be taken.

Exact drawings are made of details like head-, neck- and legfolds. Photographs are taken of the dead animal from different sides as a whole as well as in detail. The colour of eyes and skin are recorded in coloured drawings and colour photographs.

## 3. SKINNING

A rhino is skinned with ordinary skinning knives. 4 to 6 people are necessary to turn over the body and to hold the heavy skin; ropes and pulleys are used as well. The skin of a fully grown rhino weighs between 300 and 360 kg and is usually taken off in one piece; if necessary it can be divided into two parts, a front part including the head and the two fore legs, and a back part including trunk and hind legs. The two parts are separated by a cut under the shoulder crossfold. The skin is then washed, lips, eyelids and ears are cut open and all flesh and fat inside them is removed.

### *a) Treatment of the skin*

After an initial drying period (1)[2], the skin is soaked for 3 to 4 weeks in a solution of water, salt, alum and formic acid (2, 3). Because of the thickness of the skin the solution is absorbed only slowly and control cuts are made to show how far it has penetrated; pH-indicators are also used.

The thickness of the bated skin has now to be reduced from 3–4 cm to 4 mm and all subcutaneous tissue must be removed. This is a very laborious and painstaiking task. Various skin- and butcher knives are used. Special care is required when the raised horny parts of the skin are worked on since these parts of the skin are almost impossible to

[2] See "technical details" (appendix).

bend. This work takes from 2 to 3 months and the skin loses about 80% of its weight. It is now ready for the actual tanning process (4). A series of three different soakings is necessary: first, a preliminary one in a solution of water and Basynthan (5); second, the principal tanning in a solution of water, Quebracho and Mimosa (6). The rhino skin is left in this solution until it has been completely penetrated by the tanning agents (7). In the third bath the hide is treated with Eulan, an insecticide which keeps away moths. A synthetic oil is added to the bath.

Tanning has made the hide quite hard and stiff and in order to soften it the wet hide is frozen (8). Freezing stretches the fibers of the skin and makes it more pliable. The hide is then allowed to dry.

## 4. SMALL SCALE MODEL

A plasticine model (scale 1:6) shows the shape and posture of the rhino (Fig. 1). The life-size animal will be copied from it. It is also part of the small scale model of the whole diorama.

## 5. MOUNTING PATTERN

The measurements taken from the dead rhino and the drawings made of the details are now used to draw a life-size two dimensional pattern. This pattern shows the contours of the rhino and the exact size and position of the bones (Fig. 1). Superimposed on it are parts and position of the frame which will support the life-size model. The animal's actual bones are not used.

## 6. CONSTRUCTION OF THE LIFE-SIZE MODEL

The supporting frame consists of steel tubes and iron rods welded together. When it is finished the skin is tried on for the first time. At this stage it is still possible to correct small mistakes in the frame or to

covered with wire mesh which in turn supports the modelling clay forming the outermost part of the model (9). The modelling clay shell is shaped according to the anatomy of the dead animal (Fig. 1). All available information which was gathered before is again used and photos as well as drawings are consulted. From time to time the skin is tried on so that each crease and fold will be exactly in its place. The modelling process takes from 4 to 5 months.

### 7. NEGATIVE FORM

The completed model is separated into different parts by means of plastic strips, and a plaster cast is made of each part forming thus a negative form of the whole animal. Since the parts are very large and heavy they have to be reinforced with iron rods and layers of jute fabric. Plaster locks are incorporated into the different parts to facilitate the exact putting together of the whole shell (Fig. 2). After the hardening of the cast the clay model is taken out (Fig. 3), the shell is cleaned and put together to dry. Clay and iron of the model may be used again. The inside of the dry form is painted with shellack to waterproof it. A separating liquid (10) to facilitate the removing of the shell is also applied.

### 8. FIBERGLASS BODY

Each part of the form is covered with three layers of araldite and fiberglass (Fig. 4). The entire shell is then put together so that all parts of the body can be joined on the inside (Fig. 5). After hardening of the araldite the plaster negative can be removed and any seams are polished off. The fiberglass body of the rhino weighs about 70 to 80 kg.

### 9. MOUNTING OF THE SKIN

The skin is softened in warm water and glued onto the body with a special glue (11). Where it was cut on the belly and the inside of the

legs it is sewn together with an extra strong linen thread. Ears, eye lids and the folds of the mouth are filled with araldite putty so they can be shaped into their proper position. All depressions in the skin have to be nailed to the body (Fig. 6); the drying process has to be controlled constantly in case any part of the skin becomes loose and needs to be pressed back.

## 10. FINISHING TOUCHES

When the skin has dried completely bandages and nails are removed. Remaining holes and damaged parts of the skin are filled with a putty-like mixture of araldite and ground-leather and the whole rhino is painted true to nature.

The work which has taken eight or nine months is now finished. The most time consuming processes are the treatment of the skin (2 months) and the building-up of the model (4 to 5 months). The remaining one or two months are needed to make the small scale model, to prepare the drawings and stencils, to cast the negative, to line the cast with fiberglass and finally to mount the skin and add the finishing touches to the whole. The result is a comparatively light hollow model weighing about 70 kg, covered with the tanned original skin which also weighs about 70 kg. For the viewer the model should be a rendering of a rhino as true to nature as possible; however, it should not be a rendering of just any member of the species but an exact copy of "Moola".

A visit to "rhino-land" Kaziranga in Assam has shown that certain subsequent changes (e. g. horn, colour) are indispensable if the animal in a diorama is not to give the impression of being altogether a zoo animal.

*Präparation eines Panzernashorns im Naturhistorischen Museum Bern*

Anhand eines Indischen Panzernashorns (Rhinoceros unicornis) erläutert der Autor die verschiedenen Schritte bei der Präparation von Grosstieren.

Bereits am lebenden Tier im Zoologischen Garten wurden Masse genommen und Detail-Aufnahmen angefertigt, die durch solche vom frischtoten Tier ergänzt wurden. Dieses wurde sofort abgehäutet und die Knochen herauspräpariert. Die Behandlung der Haut erfordert rund zwei Monate Arbeitszeit (Beizen, Dünnschneiden, Gerben). Auf Grund eines Kleinmodells (1:6) und Masszeichnungen (Abb. 1) wurde das Eisen-Lehm-Modell konstruiert (Abb. 1), von diesem ein Negativ erstellt (Abb. 2 und 3) und dieses mit Araldit und Glasfasern ausgelegt (Abb. 4 und 5). Die bearbeitete Haut wurde mit einem Spezialleim auf den Kunststoffträger aufgeklebt (Abb. 6) und trocknen gelassen. Detailarbeiten schlossen die rund 9 Monate dauernde Präparationsarbeit ab.

## RÉSUMÉ

*Préparation d'un rhinocéros au Musée d'Histoire naturelle de Berne*

L'auteur explique les différentes phases de la préparation de grands animaux en prenant pour exemple le rhinocéros unicorne des Indes *(Rhinoceros unicornis)*.

Certaines mesures ainsi que des photographies de détail sont prises lorsque l'animal est encore vivant au jardin zoologique; des mensurations complémentaires sont effectuées aussitôt après sa mort. L'animal est dépouillé et les os sont extraits. Le traitement de la peau demande approximativement deux mois de travail et comprend l'écharnage, l'amincissement et le tannage. Une maquette grandeur nature (fig. 1) est construite (en terre glaise sur échafaudage de fer et de treillis) d'après un modèle réduit (1:6) et à l'aide de dessins (fig. 1) exécutés selon les mesures prises sur l'animal mort et sur son squelett. Puis on fait un moulage en plâtre de la maquette (figs. 2 et 3) que l'on enduit d'Araldit et de fibre de verre (figs. 4 et 5). Quand l'enduit est sec, le moule de plâtre est enlevé. La peau de l'animal est alors ajustée au moyen d'une colle spéciale sur la forme en fibre de verre qui est une réplique exacte de l'animal (fig. 6). Le finissage et les retouches inclus, l'opération dure environ 9 mois.

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## TECHNICAL DETAILS

1. For about 24 hours.
2. Eighteen to twenty percent.
3. pH 3,5, amount of liquid: 500 l. If a large tub is available it is advantageous to use twi amount of liquid.
4. As a result of tanning the proteins in the skin are stabilized and its molecular struct changed. The only visible change, however, is a slight change in colour.
5. 2,5 kg of Basynthan RM for every 100 l of liquid for a preliminary tanning process.
6. 5 kg for every 100 l.
7. Duration: about 14 days.
8. In a deep-freezer, for about three days at a time.
9. All in all some 150 kg of fine homogeneous clay (clinker) are needed.
10. Synthetic wax.
11. Placid (Geistlich).

Translation: Terry Funk
Drawings: Claude Kuhn-Klein
Photos: Peter Lüps

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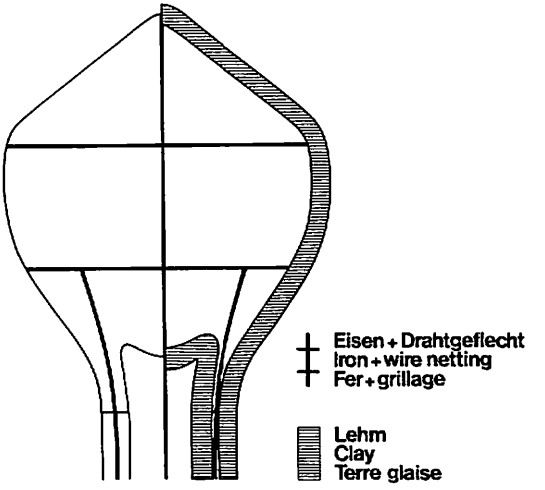



Fig. 1. Construction of the clay model. In front the 1:6 model, in the background drawir with the exact measurements. – Construction de la maquette en terre glaise. Au premier pl le modèle réduit (1:6), à l'arrière-plan, les dessins exécutés d'après les mensurations de l'anim – Aufbau des Lehm-Modells. Im Vordergrund das 1:6-Modell, im Hintergrund Masszeic nungen mit eingetragenen Daten.

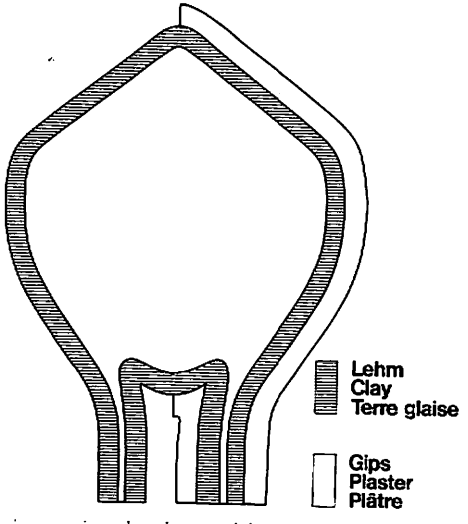



Fig. 2. The negative form is covering the clay model. – Le moule en plâtre recouvre la maquette. – Ein durch Eisen verstärktes Gips-Negativ umgibt den Lehm-Körper.

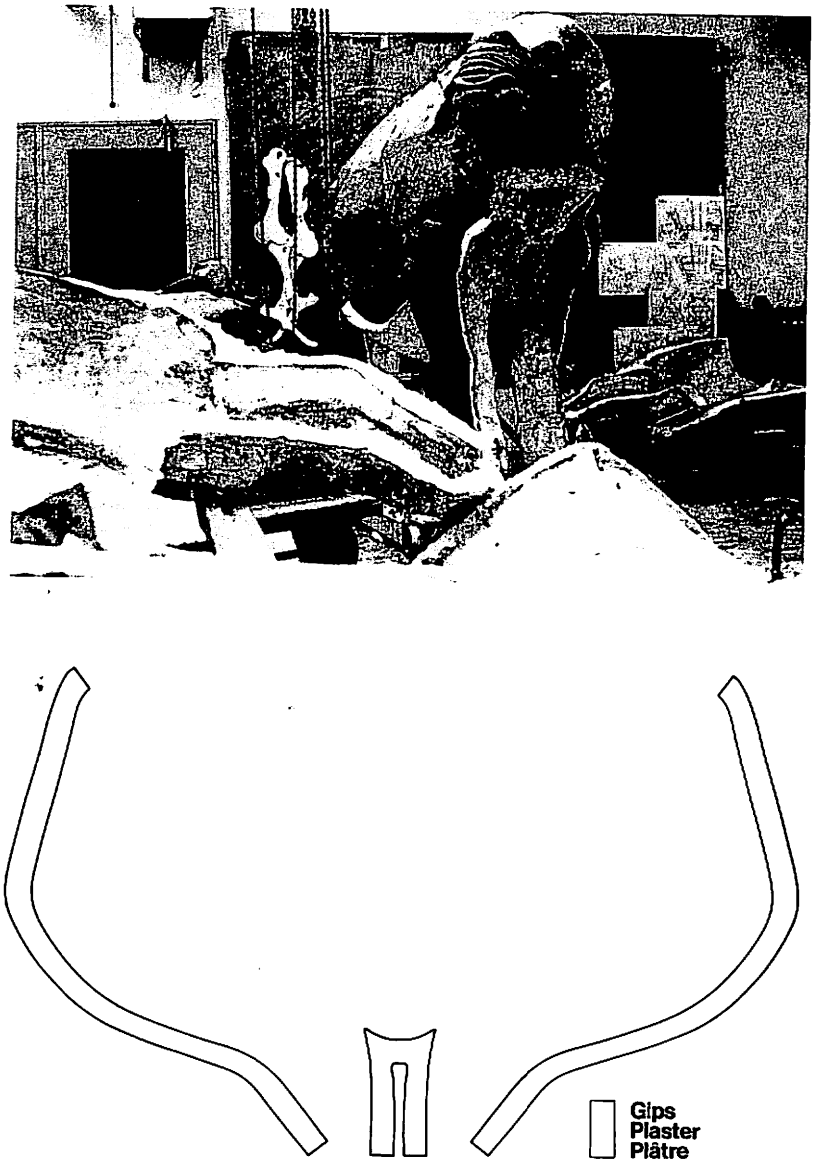



Fig. 3. The negative form in plaster is taken off from the clay model. – Le moule est découpé et retiré morceau par morceau. – Die Negativ-Form wird in Einzelteilen entfernt.

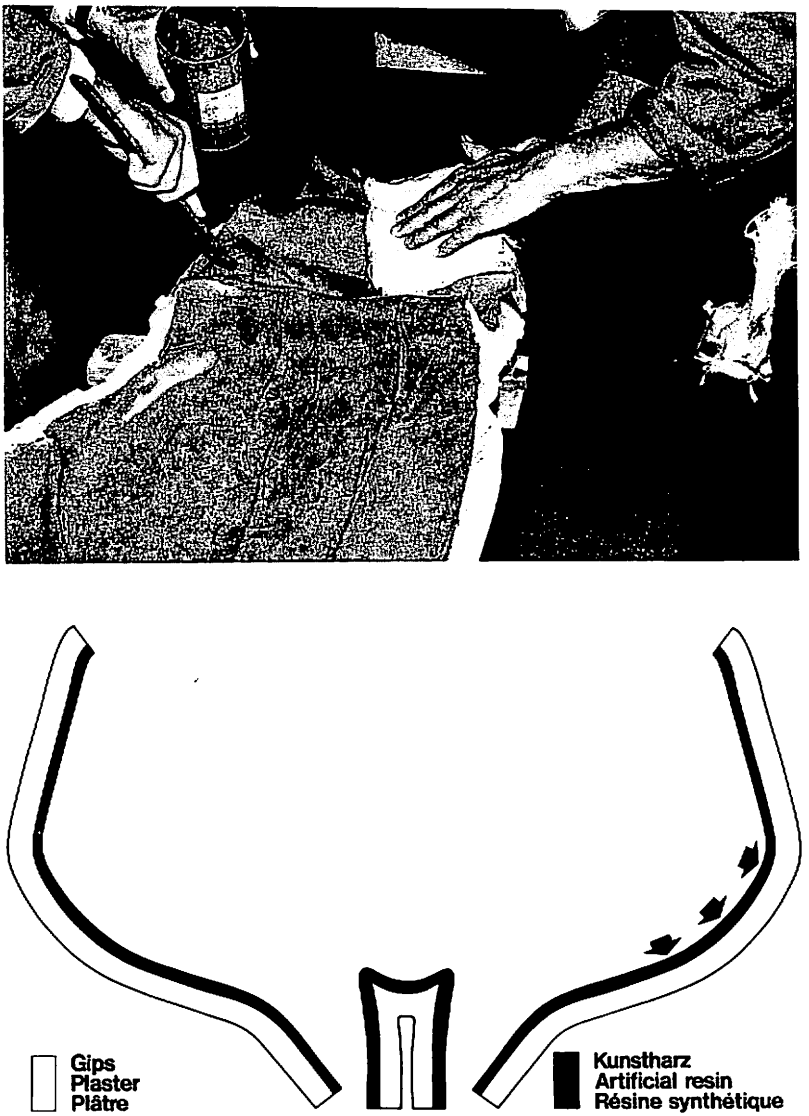
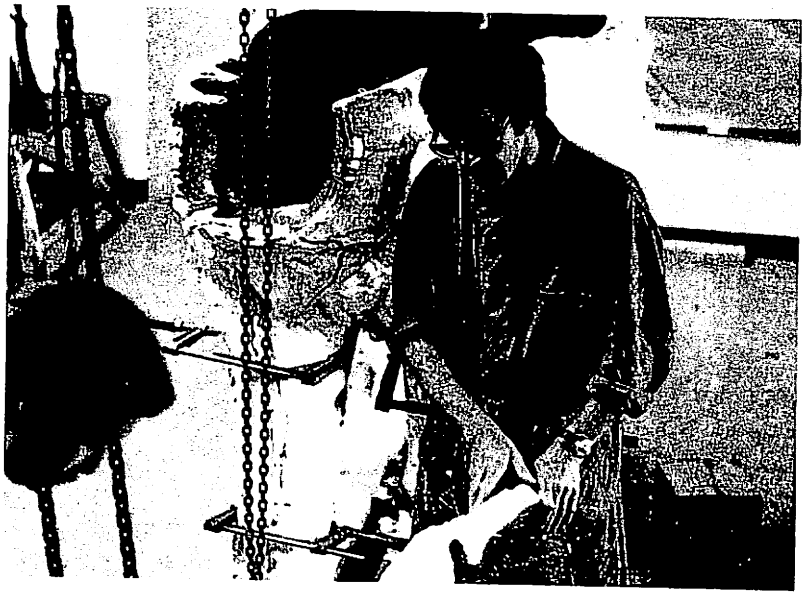



Fig. 4. Each part of the negative form is filled out with three layers of araldite and fiberglass. – Chaque morceau du moule est enduit d'Araldit et de fibre de verre à l'intérieur. – Jedes Einzelstück der Negativ-Form wird mit Araldit und Glasfasern ausgekleidet.



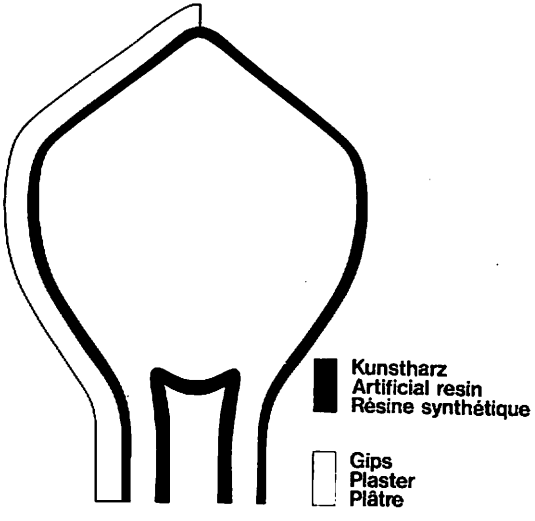



Fig. 5. The entire shell is put together. So that all parts of the body can be joined on the inside. – Les morceaux du moule sont assemblés et fixés les uns aux autres par l'intérieur. – Die Einzelstücke werden wieder zusammengefügt und von innen her verbunden.

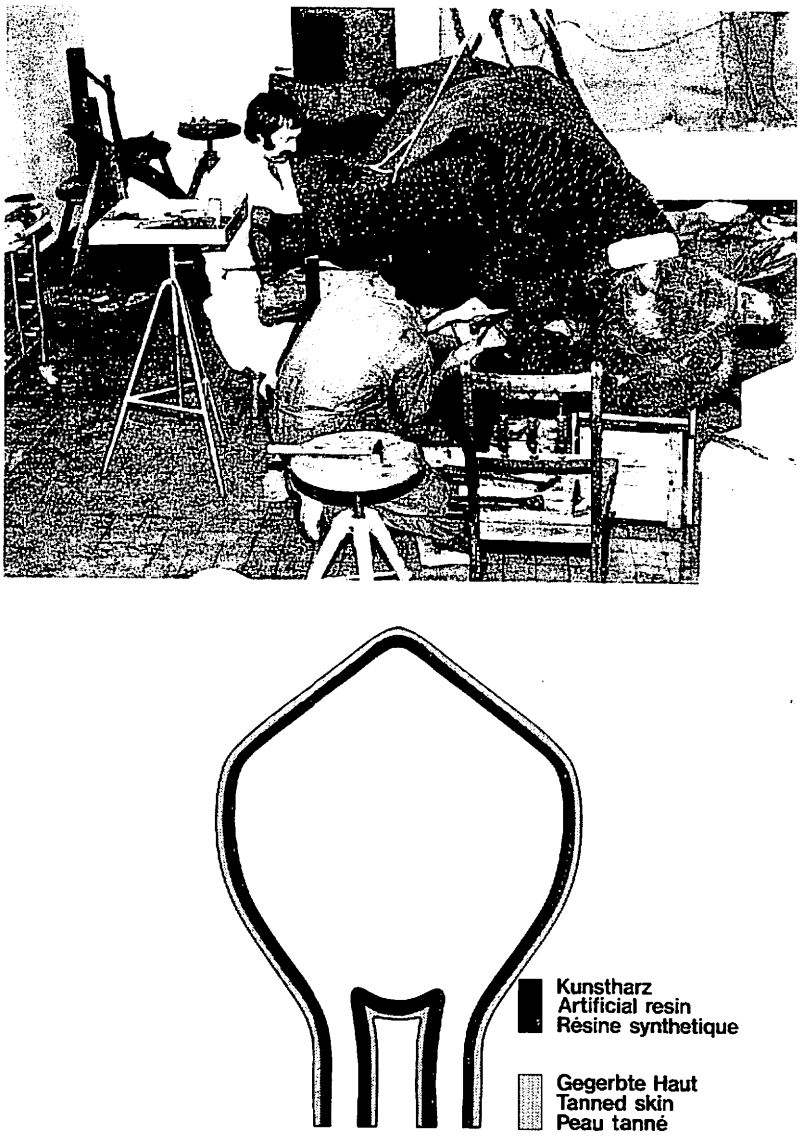



Fig. 6. The skin is glued onto the body and nailed to the araldite body. – La peau de l'animal est ajustée et collée sur le moulage en fibre de verre et fixée au moyen de clous en acier. – Die Haut wird auf das Kunststoff-Tier aufgezogen und mit Stahlstiften fixiert.