

**LANITZ-PRENA FOLIEN FACTORY GmbH**

THE COVERING AUTHORITY  
**COVERING and FINISH**

**ORACOVER®**

**Product Information**

## Model Aircraft



## General Aviation



- Made in Germany -

## COMPANY STORY



The predecessor of **LANITZ-PRENA FOLIEN FACTORY GmbH**, LANITZ-MODELLBAU in Berlin, was founded in 1975. Initially LANITZ-MODELLBAU produced and marketed model aircraft kits and accessories.

Already in the late 1970s we distributed the first mass-produced ready-to-cover model airplanes, to be followed by the first ARFs. With the mass production of these ARF ranges the weak points of conventional covering films became obvious. In autumn 1984 the idea was born to develop a covering film that met our special requirements as manufacturers of ARFs, in order to be able to make top quality model aircraft. In 1985 the production of these covering films was launched under the name of **ORACOVER®**. Due to the world-wide growing demand for this product we decided to stop the production and distribution of model airplanes and accessories altogether and to concentrate on the production of **ORACOVER®**.



In 1992 the decision was made to considerably enlarge our product range, and Leipzig in East Germany was chosen as new location for the production. For this purpose LANITZ-MODELLBAU bought and privatized PRENA-Werk Leipzig GmbH, the former state-owned VEB ISOFOL factory and converted it into the new production centre.

Since 1993 our products have been manufactured in three shifts daily. At the same time the production of **ORACOVER®** films has been completely reworked and developed to the latest state-of-the-art production standards. The production technology newly developed in Leipzig by Mr. Lanitz has been patented world-wide.

In 1995 the decision was made in favour of a merger between LANITZ-MODELLBAU BERLIN and PRENA-WERK LEIPZIG GmbH, with the new company name LANITZ-PRENA FOLIEN FACTORY GmbH reflecting the new facts.

In 1998 our **EASYPLOT®** polyester films were tested and approved for the use in military aviation by the AIR ACADAMY ZHUKHOVSKY. In the same year we were granted permission for their use in civil aviation by the FEDERAL AVIATION SERVICE OF RUSSIA. This was the first step towards the use of our products in general aviation.

The second step followed in 2001: Our **ORATEX®** fabric covering was successfully used by Zurich University in Switzerland on a full-sized light aircraft. Spurred on by this success, we took on the challenge and developed **ORATEX® UL 600**, **ORATEX® 3000** and **ORATEX® 6000** designed specifically for use in general aviation. With this we established a unique, innovative path; these products are now patented worldwide.

Siegfried Lanitz is the sole proprietor, managing director and patent-holder of **ORACOVER®**, **ORATEX®** and related products. He discovered his love of the modelling hobby at the age of fourteen. Today he still looks at the development of a new product through modeller's eyes; and only if a new development fully convinces him as a private modeller, it will reach the stage of regular production. His philosophy: Only the very best is good enough for my customers' model aircraft. He also personally tests the products of our general aviation range for their suitability in daily use.



By the way, in case you have any questions concerning covering and finish: We are always at your service! Do not hesitate to contact us by e-mail or fax or simply call us.

**LANITZ-PRENA FOLIEN FACTORY GmbH**

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## ORACOVER®

**ORACOVER®** polyester thermal shrink film covering - code # 21 -

**ORACOVER®**, our leading product for covering RC model airplanes is patented worldwide.

The unique qualities of **ORACOVER®**:

Permits re-positioning without fear of colour-layer separation - the only covering film giving you a second chance, it is fuel-resistant, tolerates temperatures up to 250°C, can be painted and is highly adhesive.

Applied according to instructions there will be no bubbles and no sagging. Being made of genuine polyester **ORACOVER®** is extremely tough and gives your model airplane additional stability. The patented **ORACOVER®** polymerised multi-layer colour-bond is practically indestructible; e.g. there is no 'bleeding' at the edges when ironing over seams. **ORACOVER®** can be applied to foam parts without problem as the specially formulated adhesive is already activated at only 80°C.

Standard roll lengths: 2 m, 10 m, 20 m, 50 m, 100 m, 150 m, 250 m.

Width: 60 cm.



## ORASTICK®

**ORASTICK®** pressure-sensitive, heat-set, self-adhesive covering film - code # 25 -

**ORASTICK®** and **ORACOVER®** share the same unique qualities and can easily be applied together on the same model. The main difference is the adhesive: while the **ORACOVER®** adhesive is thermo-active, **ORASTICK®** is self-adhesive.

This difference calls for a different application technique: Being self-adhesive **ORASTICK®** can be applied much faster than **ORACOVER®**: Position **ORASTICK®** on the part to be covered, fix the edges with the help of a hobby covering iron, then use a heat-gun to shrink the film on. Then rub the heated film down with a soft cloth. Being self-adhesive **ORASTICK®** is ideal for covering foam.

With the exception of transparent colours **ORASTICK®** is available in all the colours of **ORACOVER®** range.

Standard roll lengths: 2 m, 10 m, 20 m, 50 m, 100 m, 150 m, 250 m.

Width: 60 cm.

## ORACOVER® / ORASTICK® standard colours

colour	ORACOVER®	ORACOVER®	ORASTICK®	ORASTICK®
	2m-rolls	10m-rolls	2m-rolls	10m-rolls
transparent	21-000-002	21-000-010	25-000-002	25-000-010
white	21-010-002	21-010-010	25-010-002	25-010-010
grey	21-011-002	21-011-010	25-011-002	25-011-010
cream	21-012-002	21-012-010	25-012-002	25-012-010
magenta fluor.	21-013-002	21-013-010	25-013-002	25-013-010
neon-pink fluor.	21-014-002	21-014-010	25-014-002	25-014-010
violet fluor.	21-015-002	21-015-010	25-015-002	25-015-010
pearl white	21-016-002	21-016-010	25-016-002	25-016-010
turquoise	21-017-002	21-017-010	25-017-002	25-017-010
olive drab	21-018-002	21-018-010	25-018-002	25-018-010
corsair blue	21-019-002	21-019-010	25-019-002	25-019-010
red	21-020-002	21-020-010	25-020-002	25-020-010
red fluor.	21-021-002	21-021-010	25-021-002	25-021-010
bright red	21-022-002	21-022-010	25-022-002	25-022-010
ferri red	21-023-002	21-023-010	25-023-002	25-023-010
pink	21-024-002	21-024-010	25-024-002	25-024-010
pink fluor.	21-025-002	21-025-010	25-025-002	25-025-010
pearl red	21-027-002	21-027-010	25-027-002	25-027-010
power pink	21-028-002	21-028-010	25-028-002	25-028-010
cub yellow	21-030-002	21-030-010	25-030-002	25-030-010
yellow fluor.	21-031-002	21-031-010	25-031-002	25-031-010
golden yellow	21-032-002	21-032-010	25-032-002	25-032-010
cadmium yellow	21-033-002	21-033-010	25-033-002	25-033-010
pearl yellow	21-036-002	21-036-010	25-036-002	25-036-010
pearl golden yellow	21-037-002	21-037-010	25-037-002	25-037-010
green	21-040-002	21-040-010	25-040-002	25-040-010
green fluor.	21-041-002	21-041-010	25-041-002	25-041-010
light green	21-042-002	21-042-010	25-042-002	25-042-010
may green	21-043-002	21-043-010	25-043-002	25-043-010
pearl green	21-047-002	21-047-010	25-047-002	25-047-010
blue	21-050-002	21-050-010	25-050-002	25-050-010
blue fluor.	21-051-002	21-051-010	25-051-002	25-051-010
dark blue	21-052-002	21-052-010	25-052-002	25-052-010
sky blue	21-053-002	21-053-010	25-053-002	25-053-010
violet	21-054-002	21-054-010	25-054-002	25-054-010
purple	21-055-002	21-055-010	25-055-002	25-055-010
pearl purple	21-056-002	21-056-010	25-056-002	25-056-010
pearl blue	21-057-002	21-057-010	25-057-002	25-057-010
orange	21-060-002	21-060-010	25-060-002	25-060-010
orange fluor.	21-064-002	21-064-010	25-064-002	25-064-010
signalorange fluor.	21-065-002	21-065-010	25-065-002	25-065-010
black	21-071-002	21-071-010	25-071-002	25-071-010
pearl charcoal	21-077-002	21-077-010	25-077-002	25-077-010
brown	21-081-002	21-081-010	25-081-002	25-081-010
chrome	21-090-002	21-090-010	25-090-002	25-090-010
silver	21-091-002	21-091-010	25-091-002	25-091-010
gold	21-092-002	21-092-010	25-092-002	25-092-010
chrome red	21-093-002	21-093-010	25-093-002	25-093-010
chrome yellow	21-094-002	21-094-010	25-094-002	25-094-010
chrome light green	21-095-002	21-095-010	25-095-002	25-095-010
chrome purple	21-096-002	21-096-010	25-096-002	25-096-010
chrome blue	21-097-002	21-097-010	25-097-002	25-097-010
chrome orange	21-098-002	21-098-010	25-098-002	25-098-010
chrome violet	21-100-002	21-100-010	25-100-002	25-100-010
chrome green	21-103-002	21-103-010	25-103-002	25-103-010
chrome magenta	21-104-002	21-104-010	25-104-002	25-104-010
bordeaux red	21-120-002	21-120-010	25-120-002	25-120-010

## ORACOVER® SCALE code # 22 ORASTICK® SCALE code # 23

**ORACOVER® SCALE** shares all the unique qualities of **ORACOVER®**. A special feature of **ORACOVER® SCALE**: ALL colours are 100 % opaque. No matter what colour or pattern the surface below is, it never, ever shows through. We guarantee it!

Like all **ORASTICK®** films **ORASTICK® SCALE** is self-adhesive. Use the same application technique as for **ORASTICK®**.



<b>ORACOVER® Scale colours</b>				
colour	<b>ORACOVER®</b>	<b>ORACOVER®</b>	<b>ORASTICK®</b>	<b>ORASTICK®</b>
	2m-rolls	10m-rolls	2m-rolls	10m-rolls
scale white	22-010-002	22-010-010	23-010-002	23-010-010
scale red	22-020-002	22-020-010	23-020-002	23-020-010
scale bright red	22-022-002	22-022-010	23-022-002	23-022-010
scale ferri red	22-023-002	22-023-010	23-023-002	23-023-010
scale cub yellow	22-030-002	22-030-010	23-030-002	23-030-010
scale golden yellow	22-032-002	22-032-010	23-032-002	23-032-010
scale yellow	22-033-002	22-033-010	23-033-002	23-033-010

## ORACOVER® ROYAL code # 28 ORASTICK® ROYAL code # 29

**ORACOVER® ROYAL** is an **ORACOVER®** colour range of particular brightness. **ORACOVER® ROYAL** shares all the qualities of **ORACOVER®**.

Like all **ORASTICK®** films **ORASTICK® ROYAL** is self-adhesive. Use the same application technique as for **ORASTICK®**.



Standard rolls lengths: 2 m, 10 m, 20 m, 50 m, 100 m, 150 m, 250 m.  
Width: 60 cm.

<b>ORACOVER® Royal colours</b>				
colour	<b>ORACOVER®</b>	<b>ORACOVER®</b>	<b>ORASTICK®</b>	<b>ORASTICK®</b>
	2m-rolls	10m-rolls	2m-rolls	10m-rolls
royal magenta	28-013-002	28-013-010	29-013-002	29-013-010
royal red	28-022-002	28-022-010	29-022-002	29-022-010
royal sun yellow	28-032-002	28-032-010	29-032-002	29-032-010
royal yellow	28-033-002	28-033-010	29-033-002	29-033-010
royal green	28-042-002	28-042-010	29-042-002	29-042-010
royal mint	28-043-002	28-043-010	29-043-002	29-043-010
royal purple	28-058-002	28-058-010	29-058-002	29-058-010
royal blue	28-059-002	28-059-010	29-059-002	29-059-010
royal violet	28-084-002	28-084-010	29-084-002	29-084-010

## ORACOVER® CARBON® + KEVLAR

**ORACOVER® CARBON** and **KEVLAR**, the ultimate covering design if you are looking for something very special! Also available as Trim.

**ORACOVER® CARBON + KEVLAR**; code # 421

**ORASTICK® CARBON + KEVLAR**; code # 425



<b>ORACOVER® CARBON + KEVLAR</b>				
colour	<b>ORACOVER®</b>	<b>ORACOVER®</b>	<b>ORASTICK®</b>	<b>ORASTICK®</b>
	2m-rolls	10m-rolls	2m-rolls	10m-rolls
carbon	421-071-002	421-071-010	425-071-002	425-071-010
kevlar	421-036-002	421-036-010	425-036-002	425-036-010

## ORACOVER® FUN

## ORASTICK® FUN

**ORACOVER® FUN** and **ORASTICK® FUN** are a striking range of two-tone covering films. The design's polymerized colour-bond resists aggressive solvents and cleansing agents and all kinds of fuel. **ORACOVER® FUN** and **ORASTICK® FUN** share all the qualities of **ORACOVER®** and **ORASTICK®**.



Standard roll lengths:  
2 m, 10 m, 20 m, 50 m, 100 m, 150 m, 250 m.  
Width: 60 cm.

**FUN II ORACOVER® FUN I code # 41 / ORASTICK® FUN I code # 45**

**ORACOVER® FUN I** and **ORASTICK® FUN I** show a regular pattern of polka dots, each dot having a diameter of 16 mm. The design is available either with silver dots or black dots.

background colour	colour design	ORACOVER®		ORASTICK®	
		code # 41		code # 45	
		2m-rolls	10m-rolls	2m-rolls	10m-rolls
white	silver	41-010-091-002	41-010-091-010	45-010-091-002	45-010-091-010
neon-pink fluor.	silver	41-014-091-002	41-014-091-010	45-014-091-002	45-014-091-010
violet fluor.	silver	41-015-091-002	41-015-091-010	45-015-091-002	45-015-091-010
turquoise	silver	41-017-091-002	41-017-091-010	45-017-091-002	45-017-091-010
red fluor.	silver	41-021-091-002	41-021-091-010	45-021-091-002	45-021-091-010
bright red	silver	41-022-091-002	41-022-091-010	45-022-091-002	45-022-091-010
ferri red	silver	41-023-091-002	41-023-091-010	45-023-091-002	45-023-091-010
cub yellow	silver	41-030-091-002	41-030-091-010	45-030-091-002	45-030-091-010
yellow fluor.	silver	41-031-091-002	41-031-091-010	45-031-091-002	45-031-091-010
cadmium yellow	silver	41-033-091-002	41-033-091-010	45-033-091-002	45-033-091-010
green fluor.	silver	41-041-091-002	41-041-091-010	45-045-091-002	45-041-091-010
blue fluor.	silver	41-051-091-002	41-051-091-010	45-051-091-002	45-051-091-010
sky blue	silver	41-053-091-002	41-053-091-010	45-053-091-002	45-053-091-010
violet	silver	41-054-091-002	41-054-091-010	45-054-091-002	45-054-091-010
purple	silver	41-055-091-002	41-055-091-010	45-055-091-002	45-055-091-010
orange fluor.	silver	41-064-091-002	41-064-091-010	45-064-091-002	45-064-091-010
black	silver	41-071-091-002	41-071-091-010	45-071-091-002	45-071-091-010
white	black	41-010-071-002	41-010-071-010	45-010-071-002	45-010-071-010
neon-pink fluor.	black	41-014-071-002	41-014-071-010	45-014-071-002	45-014-071-010
violet fluor.	black	41-015-071-002	41-015-071-010	45-015-071-002	45-015-071-010
turquoise	black	41-017-071-002	41-017-071-010	45-017-071-002	45-017-071-010
red fluor.	black	41-021-071-002	41-021-071-010	45-021-071-002	45-021-071-010
bright red	black	41-022-071-002	41-022-071-010	45-022-071-002	45-022-071-010
ferri red	black	41-023-071-002	41-023-071-010	45-023-071-002	45-023-071-010
cub yellow	black	41-030-071-002	41-030-071-010	45-030-071-002	45-030-071-010
yellow fluor.	black	—	—	45-031-071-002	45-031-071-010
cadmium yellow	black	41-033-071-002	41-033-071-010	45-033-071-002	45-033-071-010
green fluor.	black	41-041-071-002	41-041-071-010	45-045-071-002	45-041-071-010
blue fluor.	black	41-051-071-002	41-051-071-010	45-051-071-002	45-051-071-010
sky blue	black	41-053-071-002	41-053-071-010	45-053-071-002	45-053-071-010
violet	black	41-054-071-002	41-054-071-010	45-054-071-002	45-054-071-010
purple	black	41-055-071-002	41-055-071-010	45-055-071-002	45-055-071-010
orange fluor.	black	41-064-071-002	41-064-071-010	45-064-071-002	45-064-071-010
silver	black	41-091-071-002	41-091-071-010	45-091-071-002	45-091-071-010

## FUN 3 ORACOVER® FUN 3 code # 43 / ORASTICK® FUN 3 code # 47

colour combination		ORACOVER®		ORASTICK®	
		code # 43		code # 47	
		2m-rolls	10m-rolls	2m-rolls	10m-rolls
yellow	red	43-033-023-002	43-033-023-010	47-033-023-002	47-033-023-010
white	red	43-010-023-002	43-010-023-010	47-010-023-002	47-010-023-010
white	dark blue	43-010-052-002	43-010-052-010	47-010-052-002	47-010-052-010
white	black	43-010-071-002	43-010-071-010	47-010-071-002	47-010-071-010
red	black	43-023-071-002	43-023-071-010	47-023-071-002	47-023-071-010
yellow	black	43-033-071-002	43-033-071-010	47-033-071-002	47-033-071-010
silver	black	43-091-071-002	43-091-071-010	47-091-071-002	47-091-071-010
pearl white	black	43-016-071-002	43-016-071-010	47-016-071-002	47-016-071-010
pearl red	black	43-027-071-002	43-027-071-010	47-027-071-002	47-027-071-010
pearl yellow	black	43-036-071-002	43-036-071-010	47-036-071-002	47-036-071-010
pearl golden yellow	black	43-037-071-002	43-037-071-010	47-037-071-002	47-037-071-010
pearl green	black	43-047-071-002	43-047-071-010	47-047-071-002	47-047-071-010
pearl purple	black	43-056-071-002	43-056-071-010	47-056-071-002	47-056-071-010
pearl blue	black	43-057-071-002	43-057-071-010	47-057-071-002	47-057-071-010
pearl charcoal	black	43-077-071-002	43-077-071-010	47-077-071-002	47-077-071-010

### FUN 3

Range FUN 3 shows a checkerboard pattern, the size of the squares being 25 mm each side.



### FUN 4

Checkered, size of squares: 12,5 mm each side.



## FUN 4 ORACOVER® FUN 4 code # 44 / ORASTICK® FUN 4 code # 48

colour combination		ORACOVER®		ORASTICK®	
		code # 44		code # 48	
		2m-rolls	10m-rolls	2m-rolls	10m-rolls
yellow	red	44-033-023-002	44-033-023-010	48-033-023-002	48-033-023-010
white	red	44-010-023-002	44-010-023-010	48-010-023-002	48-010-023-010
white	dark blue	44-010-052-002	44-010-052-010	48-010-052-002	48-010-052-010
white	black	44-010-071-002	44-010-071-010	48-010-071-002	48-010-071-010
turquoise	black	44-017-071-002	44-017-071-010	48-017-071-002	48-017-071-010
red	black	44-023-071-002	44-023-071-010	48-023-071-002	48-023-071-010
yellow	black	44-033-071-002	44-033-071-010	48-033-071-002	48-033-071-010
silver	black	44-091-071-002	44-091-071-010	48-091-071-002	48-091-071-010
pearl white	black	44-016-071-002	44-016-071-010	48-016-071-002	48-016-071-010
pearl red	black	44-027-071-002	44-027-071-010	48-027-071-002	48-027-071-010
pearl yellow	black	44-036-071-002	44-036-071-010	48-036-071-002	48-036-071-010
pearl golden yellow	black	44-037-071-002	44-037-071-010	48-037-071-002	48-037-071-010
pearl green	black	44-047-071-002	44-047-071-010	48-047-071-002	48-047-071-010
pearl purple	black	44-056-071-002	44-056-071-010	48-056-071-002	48-056-071-010
pearl blue	black	44-057-071-002	44-057-071-010	48-057-071-002	48-057-071-010
pearl charcoal	black	44-077-071-002	44-077-071-010	48-077-071-002	48-077-071-010





# LANITZ-PRENA FOLIEN FACTORY GmbH

## ORACOVER® FUN 5 code # 491

### FUN 5

Checkedered, size of squares: 52 mm each side.



## ORACOVER® FUN 6 code # 691

### FUN 6

Checkedered, size of squares: 104 mm each side.



colour combination		ORACOVER® FUN 5		ORACOVER® FUN 6	
		2m-rolls	10m-rolls	2m-rolls	10m-rolls
white	red	491-010-023-002	491-010-023-010	691-010-023-002	691-010-023-010
white	dark blue	491-010-052-002	491-010-052-010	691-010-052-002	691-010-052-010
white	black	491-010-071-002	491-010-071-010	691-010-071-002	691-010-071-010
red	black	491-023-071-002	491-023-071-010	691-023-071-002	691-023-071-010
yellow	red	491-033-023-002	491-033-023-010	691-033-023-002	691-033-023-010
yellow	black	491-033-071-002	491-033-071-010	691-033-071-002	691-033-071-010
silver	black	491-091-071-002	491-091-071-010	691-091-071-002	691-091-071-010

## ORACOVER® MAGIC

ORACOVER® MAGIC code # 521 / ORASTICK® MAGIC code # 525

ORACOVER® MAGIC is the ultimate product in high tech colour technology. The multi-tone colour changes due to the holographic technology in a vibrant shine.



colour	ORACOVER®		ORASTICK®	
	2m-rolls	10m-rolls	2m-rolls	10m-rolls
fantasy violet	521-101-002	521-101-010	525-101-002	525-101-010
red - gold	521-102-002	521-102-010	525-102-002	525-102-010
cyan - violet	521-103-002	521-103-010	525-103-002	525-103-010

## ORACOVER® TRANSPARENT

colour	ORACOVER®	ORACOVER®
	2m-rolls	10m-rolls
transparent	21-000-002	21-000-010
transp. fluor. red	21-026-002	21-026-010
transp. red	21-029-002	21-029-010
transp. yellow	21-035-002	21-035-010
transp. fluor. yellow	21-039-002	21-039-010
transp. light green	21-049-002	21-049-010
transp. purple	21-058-002	21-058-010
transp. blue	21-059-002	21-059-010
transp. orange	21-069-002	21-069-010
transp. magenta	21-073-002	21-073-010
transp. violet	21-074-002	21-074-010
transp. green	21-075-002	21-075-010



### ORACOVER® TRANSPARENT

For those who have nothing to hide... Optimum visibility of your model in the sky, due to translucency of the colours.

Technical data of:

**ORACOVER®/ORASTICK®: TRANSPARENT, FUN, ROYAL, SCALE, MAGIC, CARBON + KEVLAR**

**Material:** polyester film with colour layer and adhesive layer (can be thermoactivated) - **Material thickness total** (supporting film): approx. 45 - 65 µm (approx. 23 µm) - **Weight:** approx. 54 - 109 g/m<sup>2</sup> (depending on colour) - **Tensile strength** (lengthwise and crosswise): min. 283 N / 50 mm - **Breaking extension** (lengthwise and crosswise): min. 90% - **Adhesive power:** min. 10N / 25mm (**ORACOVER®**) - **Adhesive power:** min. 10N / 25mm (**ORASTICK®**) - **Shrinkage:** min. 5 % in both directions (reference temperature 150°C) - **Melting point:** 250 °C

## ORALIGHT® TRANSPARENT / CHROME / OPAQUE

### ORALIGHT® code #31

Weighing only 36 g/m<sup>2</sup> INCLUDING thermo-active adhesive **ORALIGHT®** is an absolute lightweight. **ORALIGHT®** is the ideal solution if you need to reduce the weight of your construction to a minimum. **ORALIGHT®** shares the superior qualities of **ORACOVER®**.

Standard roll lengths: 2 m, 10 m, 20 m, 50 m, 100 m, 150 m, 250 m.  
Width: 60 cm.



<b>ORALIGHT® TRANSPARENT / CHROME</b>		
colour	<b>ORALIGHT®</b>	<b>ORALIGHT®</b>
	2m-rolls	10m-rolls
light transparent	31-000-002	31-000-010
light transp. white	31-010-002	31-010-010
light transp. red	31-029-002	31-029-010
light transp. yellow	31-039-002	31-039-010
light transp. purple	31-058-002	31-058-010
light transp. blue	31-059-002	31-059-010
light chrome	31-090-002	31-090-010
light chrome red	31-093-002	31-093-010
light chrome yellow	31-094-002	31-094-010
light chrome violet	31-096-002	31-096-010
light chrome blue	31-097-002	31-097-010
light scale white	31-099-002	31-099-010



<b>ORALIGHT® OPAQUE</b>		
colour	<b>ORALIGHT®</b>	<b>ORALIGHT®</b>
	2m-rolls	10m-rolls
white	31-110-002	31-110-010
grey	31-011-002	31-011-010
cream	31-012-002	31-012-010
olive drab	31-018-002	31-018-010
corsair blue	31-019-002	31-019-010
red	31-020-002	31-020-010
bright red	31-022-002	31-022-010
ferri red	31-023-002	31-023-010
cub yellow	31-030-002	31-030-010
cadmium yellow	31-033-002	31-033-010
blue	31-050-002	31-050-010
dark blue	31-052-002	31-052-010
orange	31-060-002	31-060-010
black	31-071-002	31-071-010
brown	31-081-002	31-081-010
silver	31-091-002	31-091-010
effect silver	31-191-002	31-191-010

### Technical data of: **ORALIGHT®**

- **Material thickness total (supporting film):** approx. 22 µm (approx. 12 µm) - **Weight:** approx. 36 g/m<sup>2</sup> - **Tensile strength (lengthwise and crosswise):** mind. 150 N / 50 mm - **Breaking extension (lengthwise and crosswise):** mind. 90 %  
- **Adhesive power:** mind. 7 N / 25 mm - **Shrinkage:** mind. 5 % in both directions (reference temperature 150 °C) - **Melting point:** 250 °C

## ORATEX®

**ORATEX® code # 10 - ORATEX®**, an iron-on type polyester fabric covering, is ideal for all scale models, large scale models and historical models.

### **ORATEX®** has 5 points in its favour:

1. Easy application: due to its pliability and a shrinkage of 5 % in both directions **ORATEX®** is easy to apply round corners and edges. Creases can easily be removed with a heat-gun.
2. Excellent adhesion: the adhesive of **ORATEX®** is about double as strong as that of conventional fabric coverings.
3. Remarkable toughness and stability of the fabric.
4. Protective seal: the surface of **ORATEX®** has been treated to make it fuel resistant and oil resistant. You can paint or varnish it if you wish, but there is no need for it!
5. 8 attractive colours.

Standard roll lengths: 2 m, 10 m, 20 m, 50 m, 100 m, 150 m, 250 m.  
Width: 60 cm.



# LANITZ-PRENA FOLIEN FACTORY GmbH

colour	ORATEX®	ORATEX®
	2m-rolls	10m-rolls
natural white	10-000-002	10-000-010
white	10-010-002	10-010-010
antique	10-012-002	10-012-010
olive drab	10-018-002	10-018-010
corsair blue	10-019-002	10-019-010
fokker red	10-020-002	10-020-010
cub yellow	10-030-002	10-030-010
silver	10-091-002	10-091-010



## Specifications of: ORATEX®

- **Material thickness total:** approx. 100 µm - **Weight:** approx. 90 to 110 g/m<sup>2</sup> (depending on colour) - **Tensile strength (lengthwise and crosswise):** min. 380 N / 50 mm - **Breaking extension (lengthwise and crosswise):** approx. 25 % - **Tear propagation load (lengthwise and crosswise):** min. 6 N - **Adhesive power:** mind. 12 N / 25 mm - **Shrinkage:** min. 5 % in both directions (reference temperature 150 °C) - **Melting point:** 250 °C

## EASYCOAT®



### EASYCOAT® code # 40

**EASYCOAT®** is a low-cost polyester shrink-on covering film for model aircraft, to be ironed on or heat-gunned. What makes **EASYCOAT®** stand out are its excellent shrinking qualities and extremely easy application. **EASYCOAT®** consists of a special polyester basic material and a special, thermo-activated adhesive containing colour pigments. The symmetrical, excellent shrinkage of **EASYCOAT®** can be easily regulated with the help of a heat gun or a hobby covering iron. **EASYCOAT®** can be applied within a wide range of temperatures. Normally you will need approx. 80°-100°C. At this temperature **EASYCOAT®** will keep its dimensions relatively constant. If you raise the temperature the material will begin to shrink according to the rise of temperature. At 150°C there will be approx. 10% shrinkage lengthwise and crosswise. The melting point lies at approx. 250 °C. **EASYCOAT®** is environmentally friendly as it contains no heavy metals.

**EASYCOAT®** comes in 14 different colours. Standard roll lengths: 2 m, 10 m, 20 m, 50 m, 100 m, 150 m, 250 m. Width: 62 cm.

colour	EASYCOAT®	colour	EASYCOAT®	colour	EASYCOAT®
	10m-rolls		10m-rolls		10m-rolls
white	40-010-010	yellow	40-033-010	orange	40-060-010
dark red	40-020-010	dark green	40-040-010	black	40-071-010
bright red	40-022-010	light green	40-042-010	silver	40-091-010
red	40-023-010	dark blue	40-052-010	gold	40-092-010
golden yellow	40-032-010	sky blue	40-053-010		

## Technical data of: EASYCOAT®

- **Material thickness total (supporting film):** approx. 32 to 45 µm (approx. 19 µm) - **Weight:** approx. 49 to 62 g/m<sup>2</sup> (depending on colour) - **Tensile strength (lengthwise and crosswise):** min. 219 N / 50 mm - **Breaking extension (lengthwise and crosswise):** min. 90 % - **Adhesive power:** mind. 7 N / 25 mm - **Shrinkage:** min. 10 % in both directions (reference temperature 150 °C) - **Melting point:** 250 °C

## ORACOVER® AIR

### ORACOVER® AIR code # 300

The covering for light constructions. Wherever minimum weight is demanded, wherever weight has to be reduced to its limits, **ORACOVER® AIR** is the product to be applied. Whether indoor flyers, park flyers, blimps or airships are to be built, **ORACOVER® AIR** will do the covering job. In contrast to regular **ORACOVER®**, **ORACOVER® AIR** has no adhesive layer. The hotmelt adhesive is to be brushed onto the surface. **ORACOVER® AIR** is available in five different ranges of thickness and weight. Width: 60 cm.



<b>ORACOVER® AIR INDOOR</b>		
For extremely light aircraft		
colour	2m-rolls	10m-rolls
light transparent	331-000-002	331-000-010
light tr. white	331-010-002	331-010-010
light tr. red	331-029-002	331-029-010
light tr. yellow	331-039-002	331-039-010
light tr. purple	331-058-002	331-058-010
light tr. blue	331-059-002	331-059-010
<b>ORACOVER® AIR LIGHT</b>		
For light blimps up to 2 m length		
colour	2m-rolls	10m-rolls
light chrome	331-090-002	331-090-010
light chrome red	331-093-002	331-093-010
light chrome yellow	331-094-002	331-094-010
light chrome violet	331-096-002	331-096-010
light chrome blue	331-097-002	331-097-010
light scale white	331-099-002	331-099-010
<b>ORACOVER® AIR HEAVY DUTY</b>		
For blimps and airships over 4 m length		
colour	2m-rolls	10m-rolls
scale white	322-010-002	322-010-010
scale red	322-020-002	322-020-010
scale bright red	322-022-002	322-022-010
scale ferri red	322-023-002	322-023-010
scale cub yellow	322-030-002	322-030-010
scale golden yellow	322-032-002	322-032-010
scale yellow	322-033-002	322-033-010

<b>ORACOVER® AIR OUTDOOR</b>		
For more solid light aircraft, park flyers, etc.		
colour	2m-rolls	10m-rolls
transparent	321-000-002	321-000-010
transparent red	321-029-002	321-029-010
transparent yellow	321-039-002	321-039-010
transparent light green	321-049-002	321-049-010
transparent purple	321-058-002	321-058-010
transparent blue	321-059-002	321-059-010
transparent orange	321-069-002	321-069-010
transparent magenta	321-073-002	321-073-010
transparent violet	321-074-002	321-074-010
transparent green	321-075-002	321-075-010
<i>transparent - fluorescent</i>		
transp. fluor. red	321-026-002	321-026-010
transp. fluor. yellow	321-035-002	321-035-010
<b>ORACOVER® AIR MEDIUM</b>		
For blimps and airships up to 4 m length		
colour	2m-rolls	10m-rolls
chrome	321-090-002	321-090-010
chrome red	321-093-002	321-093-010
chrome yellow	321-094-002	321-094-010
chrome light green	321-095-002	321-095-010
chrome purple	321-096-002	321-096-010
chrome blue	321-097-002	321-097-010
chrome orange	321-098-002	321-098-010
chrome violet	321-100-002	321-100-010
chrome green	321-103-002	321-103-010
chrome magenta	321-104-002	321-104-010

### Technical data of: **ORACOVER® AIR**

Product	Tensile strength [N/50mm]	Breaking extension [%]	Weight [g/m <sup>2</sup> ]	Material thickness	Permeability [ml/m <sup>2</sup> /24h Mpa]
<b>INDOOR</b>	lengthw./crossw.: min. 150	lengthw./crossw.: 90	approx. 17	approx. 12 µm	He 4000 / H <sub>2</sub> 2200
<b>OUTDOOR</b>	lengthw./crossw.: min. 283	lengthw./crossw.: 90	approx. 33	approx. 23 µm	He 2000 / H <sub>2</sub> 1100
<b>LIGHT</b>	lengthw./crossw.: min. 150	lengthw./crossw.: 90	approx. 18	approx. 12 µm	He 400 / H <sub>2</sub> 220
<b>MEDIUM</b>	lengthw./crossw.: min. 283	lengthw./crossw.: 90	approx. 34	approx. 23 µm	He 200 / H <sub>2</sub> 110
<b>HEAVY DUTY</b>	lengthw./crossw.: min. 283	lengthw./crossw.: 90	approx. 56 - 70	approx. 34 - 44 µm	He 200 / H <sub>2</sub> 110

- Adhesive power: min. 7 N / 25 mm - Shrinkage: min. 5 % in both directions (reference temperature 150 °C) - Melting point: 250 °C

## ORACOVER® AIR examples of use

**ORACOVER® AIR INDOOR** and **OUTDOOR** has not only proved itself as covering film for model airplanes, but becomes more and more popular as base material for model sails. Our big colour range allows an individual design making them much easier to recognise, especially at regattas.

**ORACOVER® AIR INDOOR** and **OUTDOOR** sails can even help to increase the speed of your sailboat. Regatta boats equipped with **ORACOVER® AIR** sails tend to finish ahead of the competition.



**ORACOVER® AIR OUTDOOR**



**ORACOVER® AIR OUTDOOR**



**HAMMER SEEWOLF**, the covering of the hull of this faltboot was made of **ORATEX®** and painted with **ORACOLOR®**.

The kit is available from: Modellbautechnik R. Kuhlmann,  
Tel.: +49-5202-925743, +49-173-512262231,  
[www.faltboot-modell.de](http://www.faltboot-modell.de)



**ORACOVER® AIR INDOOR**

## ORATRIM®

### ORATRIM® code #27

ORATRIM®'s heat-shrinkable, self-adhesive strips are made from the same material as ORASTICK®. ORATRIM® shares the qualities and colour range of ORASTICK®.

### 3 different sizes of ORATRIM® are available:

- Roll length: 2 m, width 9,5 cm, in folding blister.
- Roll length: 5 m, width 9,5 cm, in folding blister.
- Roll length: 25 m, width: 12 cm. - For retail shops who sell the material off the roll.



ORATRIM® standard colours							
colour	ORATRIM®SB	ORATRIM®SB	ORATRIM®	colour	ORATRIM®SB	ORATRIM®SB	ORATRIM®
	5m-rolls	2m-rolls	25m-rolls		5m-rolls	2m-rolls	25m-rolls
transparent	27-000-005	27-000-002	27-000-025	pearl green	27-047-005	27-047-002	27-047-025
white	27-010-005	27-010-002	27-010-025	blue	27-050-005	27-050-002	27-050-025
grey	27-011-005	27-011-002	27-011-025	flour. blue	27-051-005	27-051-002	27-051-025
cream	27-012-005	27-012-002	27-012-025	dark blue	27-052-005	27-052-002	27-052-025
flour. magenta	27-013-005	27-013-002	27-013-025	sky blue	27-053-005	27-053-002	27-053-025
flour. neon-pink	27-014-005	27-014-002	27-014-025	violet	27-054-005	27-054-002	27-054-025
flour. violet	27-015-005	27-015-002	27-015-025	purple	27-055-005	27-055-002	27-055-025
pearl white	27-016-005	27-016-002	27-016-025	pearl purple	27-056-005	27-056-002	27-056-025
turquoise	27-017-005	27-017-002	27-017-025	pearl blue	27-057-005	27-057-002	27-057-025
olive drab	27-018-005	27-018-002	27-018-025	orange	27-060-005	27-060-002	27-060-025
corsair blue	27-019-005	27-019-002	27-019-025	flour. orange	27-064-005	27-064-002	27-064-025
red	27-020-005	27-020-002	27-020-025	flour. signalorange	27-065-005	27-065-002	27-065-025
flour. red	27-021-005	27-021-002	27-021-025	black	27-071-005	27-071-002	27-071-025
bright red	27-022-005	27-022-002	27-022-025	pearl charcoal	27-077-005	27-077-002	27-077-025
ferri red	27-023-005	27-023-002	27-023-025	brown	27-081-005	27-081-002	27-081-025
pink	27-024-005	27-024-002	27-024-025	chrome	27-090-005	27-090-002	27-090-025
flour. pink	27-025-005	27-025-002	27-025-025	silver	27-091-005	27-091-002	27-091-025
pearl red	27-027-005	27-027-002	27-027-025	gold	27-092-005	27-092-002	27-092-025
power pink	27-028-005	27-028-002	27-028-025	chrome red	27-093-005	27-093-002	27-093-025
cub yellow	27-030-005	27-030-002	27-030-025	chrome yellow	27-094-005	27-094-002	27-094-025
flour. yellow	27-031-005	27-031-002	27-031-025	chrome light green	27-095-005	27-095-002	27-095-025
golden yellow	27-032-005	27-032-002	27-032-025	chrome purple	27-096-005	27-096-002	27-096-025
cadmium yellow	27-033-005	27-033-002	27-033-025	chrome blue	27-097-005	27-097-002	27-097-025
pearl yellow	27-036-005	27-036-002	27-036-025	chrome orange	27-098-005	27-098-002	27-098-025
pearl golden yellow	27-037-005	27-037-002	27-037-025	chrome violet	27-100-005	27-100-002	27-100-025
green	27-040-005	27-040-002	27-040-025	chrome green	27-103-005	27-103-002	27-103-025
flour. green	27-041-005	27-041-002	27-041-025	chrome magenta	27-104-005	27-104-002	27-104-025
light green	27-042-005	27-042-002	27-042-025	bordeaux red	27-120-005	27-120-002	27-120-025
may green	27-043-005	27-043-002	27-043-025				

ORATRIM® Scale / CARBON + KEVLAR				ORATRIM® Royal			
colour	ORATRIM®SB	ORATRIM®SB	ORATRIM®	colour	ORATRIM®SB	ORATRIM®SB	ORATRIM®
	5m-rolls	2m-rolls	25m-rolls		5m-rolls	2m-rolls	25m-rolls
scale white	27-210-005	27-210-002	27-210-025	royal magenta	27-313-005	27-313-002	27-313-025
scale red	27-220-005	27-220-002	27-220-025	royal red	27-322-005	27-322-002	27-322-025
scale bright red	27-222-005	27-222-002	27-222-025	royal sun yellow	27-332-005	27-332-002	27-332-025
scale ferri red	27-223-005	27-223-002	27-223-025	royal yellow	27-333-005	27-333-002	27-333-025
scale cub yellow	27-230-005	27-230-002	27-230-025	royal green	27-342-005	27-342-002	27-342-025
scale golden yellow	27-232-005	27-232-002	27-232-025	royal mint	27-343-005	27-343-002	27-343-025
scale yellow	27-233-005	27-233-002	27-233-025	royal purple	27-358-005	27-358-002	27-358-025
carbon	27-425-071-005	27-425-071-002	27-425-071-025	royal blue	27-359-005	27-359-002	27-359-025
kevlar	27-425-036-005	27-425-036-002	27-425-036-025	royal violet	27-384-005	27-384-002	27-384-025

## ORALINE®

### ORALINE® code #26

**ORALINE®** trim stripes pep up your model and give it an individual touch. Moreover they can also be used on motorbikes, bicycles, cars, boats or in your home. **ORALINE®** trim stripes share the qualities and colour range of **ORASTICK®**. **ORALINE®** is packed in self-service blister cards.



Roll length: 15 m.

Standard widths: 1 mm, 2 mm, 3 mm, 4 mm, 5 mm, 6 mm.

Customised widths on request.

colour	ORALINE®	ORALINE®	ORALINE®	ORALINE®	ORALINE®	ORALINE®
	15m-rolls width: 1 mm	15m-rolls width: 2 mm	15m-rolls width: 3 mm	15m-rolls width: 4 mm	15m-rolls width: 5 mm	15m-rolls width: 6 mm
white	26-010-001	26-010-002	26-010-003	26-010-004	26-010-005	26-010-006
grey	26-011-001	26-011-002	26-011-003	26-011-004	26-011-005	26-011-006
cream	26-012-001	26-012-002	26-012-003	26-012-004	26-012-005	26-012-006
flour. magenta	26-013-001	26-013-002	26-013-003	26-013-004	26-013-005	26-013-006
flour. neon-pink	26-014-001	26-014-002	26-014-003	26-014-004	26-014-005	26-014-006
flour. violet	26-015-001	26-015-002	26-015-003	26-015-004	26-015-005	26-015-006
pearl white	26-016-001	26-016-002	26-016-003	26-016-004	26-016-005	26-016-006
turquoise	26-017-001	26-017-002	26-017-003	26-017-004	26-017-005	26-017-006
olive drab	26-018-001	26-018-002	26-018-003	26-018-004	26-018-005	26-018-006
corsair blue	26-019-001	26-019-002	26-019-003	26-019-004	26-019-005	26-019-006
red	26-020-001	26-020-002	26-020-003	26-020-004	26-020-005	26-020-006
flour. red	26-021-001	26-021-002	26-021-003	26-021-004	26-021-005	26-021-006
bright red	26-022-001	26-022-002	26-022-003	26-022-004	26-022-005	26-022-006
ferri red	26-023-001	26-023-002	26-023-003	26-023-004	26-023-005	26-023-006
pink	26-024-001	26-024-002	26-024-003	26-024-004	26-024-005	26-024-006
flour. pink	26-025-001	26-025-002	26-025-003	26-025-004	26-025-005	26-025-006
pearl red	26-027-001	26-027-002	26-027-003	26-027-004	26-027-005	26-027-006
power pink	26-028-001	26-028-002	26-028-003	26-028-004	26-028-005	26-028-006
cub yellow	26-030-001	26-030-002	26-030-003	26-030-004	26-030-005	26-030-006
flour. yellow	26-031-001	26-031-002	26-031-003	26-031-004	26-031-005	26-031-006
golden yellow	26-032-001	26-032-002	26-032-003	26-032-004	26-032-005	26-032-006
cadmium yellow	26-033-001	26-033-002	26-033-003	26-033-004	26-033-005	26-033-006
pearl yellow	26-036-001	26-036-002	26-036-003	26-036-004	26-036-005	26-036-006
pearl golden yellow	26-037-001	26-037-002	26-037-003	26-037-004	26-037-005	26-037-006
green	26-040-001	26-040-002	26-040-003	26-040-004	26-040-005	26-040-006
flour. green	26-041-001	26-041-002	26-041-003	26-041-004	26-041-005	26-041-006
light green	26-042-001	26-042-002	26-042-003	26-042-004	26-042-005	26-042-006
may green	26-043-001	26-043-002	26-043-003	26-043-004	26-043-005	26-043-006
pearl green	26-047-001	26-047-002	26-047-003	26-047-004	26-047-005	26-047-006
blue	26-050-001	26-050-002	26-050-003	26-050-004	26-050-005	26-050-006
flour. blue	26-051-001	26-051-002	26-051-003	26-051-004	26-051-005	26-051-006
dark blue	26-052-001	26-052-002	26-052-003	26-052-004	26-052-005	26-052-006
sky blue	26-053-001	26-053-002	26-053-003	26-053-004	26-053-005	26-053-006
violet	26-054-001	26-054-002	26-054-003	26-054-004	26-054-005	26-054-006
purple	26-055-001	26-055-002	26-055-003	26-055-004	26-055-005	26-055-006
pearl purple	26-056-001	26-056-002	26-056-003	26-056-004	26-056-005	26-056-006
pearl blue	26-057-001	26-057-002	26-057-003	26-057-004	26-057-005	26-057-006
orange	26-060-001	26-060-002	26-060-003	26-060-004	26-060-005	26-060-006
flour. orange	26-064-001	26-064-002	26-064-003	26-064-004	26-064-005	26-064-006
flour. signalorange	26-065-001	26-065-002	26-065-003	26-065-004	26-065-005	26-065-006
black	26-071-001	26-071-002	26-071-003	26-071-004	26-071-005	26-071-006
pearl charcoal	26-077-001	26-077-002	26-077-003	26-077-004	26-077-005	26-077-006
brown	26-081-001	26-081-002	26-081-003	26-081-004	26-081-005	26-081-006

colour	ORALINE®	ORALINE®	ORALINE®	ORALINE®	ORALINE®	ORALINE®
	15m-rolls	15m-rolls	15m-rolls	15m-rolls	15m-rolls	15m-rolls
	width: 1 mm	width: 2 mm	width: 3 mm	width: 4 mm	width: 5 mm	width: 6 mm
chrome	26-090-001	26-090-002	26-090-003	26-090-004	26-090-005	26-090-006
silver	26-091-001	26-091-002	26-091-003	26-091-004	26-091-005	26-091-006
gold	26-092-001	26-092-002	26-092-003	26-092-004	26-092-005	26-092-006
chrome red	26-093-001	26-093-002	26-093-003	26-093-004	26-093-005	26-093-006
chrome yellow	26-094-001	26-094-002	26-094-003	26-094-004	26-094-005	26-094-006
chrome light green	26-095-001	26-095-002	26-095-003	26-095-004	26-095-005	26-095-006
chrome purple	26-096-001	26-096-002	26-096-003	26-096-004	26-096-005	26-096-006
chrome blue	26-097-001	26-097-002	26-097-003	26-097-004	26-097-005	26-097-006
chrome orange	26-098-001	26-098-002	26-098-003	26-098-004	26-098-005	26-098-006
chrome violet	26-100-001	26-100-002	26-100-003	26-100-004	26-100-005	26-100-006
chrome green	26-103-001	26-103-002	26-103-003	26-103-004	26-103-005	26-103-006
chrome magenta	26-104-001	26-104-002	26-104-003	26-104-004	26-104-005	26-104-006
bordeaux red	26-120-001	26-120-002	26-120-003	26-120-004	26-120-005	26-120-006

colour	ORALINE®	ORALINE®	ORALINE®	ORALINE®	ORALINE®	ORALINE®
	15m-rolls	15m-rolls	15m-rolls	15m-rolls	15m-rolls	15m-rolls
	width: 1 mm	width: 2 mm	width: 3 mm	width: 4 mm	width: 5 mm	width: 6 mm
<b>Scale colours - 100% opaque -</b>						
scale white	26-210-001	26-210-002	26-210-003	26-210-004	26-210-005	26-210-006
scale red	26-220-001	26-220-002	26-220-003	26-220-004	26-220-005	26-220-006
scale bright red	26-222-001	26-222-002	26-222-003	26-222-004	26-222-005	26-222-006
scale ferri red	26-223-001	26-223-002	26-223-003	26-223-004	26-223-005	26-223-006
scale cub yellow	26-230-001	26-230-002	26-230-003	26-230-004	26-230-005	26-230-006
scale golden yellow	26-232-001	26-232-002	26-232-003	26-232-004	26-232-005	26-232-006
scale yellow	26-233-001	26-233-002	26-233-003	26-233-004	26-233-005	26-233-006
<b>Royal colours</b>						
royal magenta	26-313-001	26-313-002	26-313-003	26-313-004	26-313-005	26-313-006
royal red	26-322-001	26-322-002	26-322-003	26-322-004	26-322-005	26-322-006
royal sun yellow	26-332-001	26-332-002	26-332-003	26-332-004	26-332-005	26-332-006
royal yellow	26-333-001	26-333-002	26-333-003	26-333-004	26-333-005	26-333-006
royal green	26-342-001	26-342-002	26-342-003	26-342-004	26-342-005	26-342-006
royal mint	26-343-001	26-343-002	26-343-003	26-343-004	26-343-005	26-343-006
royal purple	26-358-001	26-358-002	26-358-003	26-358-004	26-358-005	26-358-006
royal blue	26-359-001	26-359-002	26-359-003	26-359-004	26-359-005	26-359-006
royal violet	26-384-001	26-384-002	26-384-003	26-384-004	26-384-005	26-384-006

## - ADHESIVE -

We produce a suitable adhesive for every field of application, for instance to prepare wooden surfaces for easy ironing: The liquid adhesives soak into the wood, gluing unstable fibres closely and permanently to the surface. This prevents the fibres from tearing off under stress and the covering coming off, which is the usual cause of wrinkles. Torn-off fibres will stay glued to the adhesive layer of the covering film, thus preventing proper adhesion of the film to the surface. Also additional ironing does not really solve the problem: the covering film shrinks all right, but the glue layer which has become mixed with torn-off fibres can no longer properly adhere to the surface.

Our liquid adhesives are an exact match to the adhesives used for our covering films. Accordingly, always choose the adhesive appropriate for the covering film you are using. The consumption of adhesive is approx. 20g/sqm, relating to dry matter. It is important to let the adhesive dry completely before covering, to prevent incompletely evaporated solvents to evaporate during ironing, thereby causing bubbles. In case our adhesives have dried out a bit in an opened tin, you can restore the original viscosity by adding the appropriate thinner.

### **ORACOVER® IRON-ON ADHESIVE + SPECIAL THINNER**

Our adhesive for all **ORACOVER®** films.

### **ORASTICK® BONDING EMULSION + SPECIAL THINNER**

Ideally suitable for our **ORASTICK®** films.





## ORATEX® HOTMELT ADHESIVE + Thinner

Hotmelt Adhesive can be used to improve adhesion of iron-on products, as well as being an adhesive for **ORATEX®**. Depending on the surface, 1-2 layers should be applied. Before ironing on **ORATEX®**, the adhesive has to dry thoroughly.

Ideal quantity to be applied (dry): 30 g/m<sup>2</sup>. Not suitable for surfaces which are not solvent proof.



## ORACOVER® FOAM ADHESIVE for Styrofoam® / Depron®

For covering foam models with our **ORACOVER®** products we offer two special adhesives which guarantee an optimum bond to such materials. Models made of Styrofoam® / Depron® are coated with **ORACOVER® Foam Adhesive**, in the areas to be covered. Before coating make sure the surface is as smooth as possible, as any faults or roughness will show later on.

For coating we recommend using a brush made of artificial fibres, to prevent the brush soaking up water from the adhesive and the adhesive forming little lumps when drying. Let dry thoroughly before covering.



## ORACOVER® EPP ADHESIVE (Expanded PolyPropylene)

Models made of EPP are coated with our special **ORACOVER® EPP Adhesive**, in the areas to be covered. Before coating make sure the surface is as smooth as possible, as any faults and roughness will show later on. Let dry thoroughly before covering.



## ORACOVER® AIR ADHESIVE

**ORACOVER® AIR Adhesive** has been specially developed for best bonding of lengths of film, for making blimps and airships. It has to be applied THINLY onto both sides of the seam area, to be ironed at approx. 70°C - 80°C, after drying.



ADHESIVE + THINNER		
product	quantity	ref. no
<b>ORACOVER®</b> IRON-ON ADHESIVE	100 ml	0960
<b>ORASTICK®</b> BONDING EMULSION	100 ml	0970
<b>ORACOVER® AIR</b> ADHESIVE	100 ml	0961
<b>ORACOVER®</b> EPP ADHESIVE	100 ml	0982
<b>ORACOVER®</b> FOAM ADHESIVE for STYROFOAM® / DEPRON®	50 ml	0981
<b>ORACOVER®</b> SPECIAL THINNER for IRON-ON ADHESIVE	250 ml	0980
<b>ORASTICK®</b> SPECIAL THINNER for BONDING EMULSION	250 ml	0990
<b>ORACOVER® AIR</b> SPECIAL THINNER for IRON-ON ADHESIVE	250 ml	0962
<b>ORACOVER®</b> SPECIAL THINNER for EPP ADHESIVE	250 ml	0963
<b>ORATEX®</b> HOTMELT ADHESIVE	100 ml	0965
<b>ORATEX®</b> HOTMELT ADHESIVE	1 litre	0966
<b>ORATEX®</b> SPECIAL THINNER	250 ml	0969
<b>ORATEX®</b> SPECIAL THINNER	1 litre	0973

## TENOPOR®



**TENOPOR®** is a self-adhesive sealing strip made of Polyethylene foam (Cell Polyethylen).

**TENOPOR®** sealing strips are used to achieve a cushioning or sealing effect.

There are a multitude of applications: as heat-insulation for leaking windows and doors, as vibration damper for speakers, as barrier against sound and heat conduction in steel constructions, as seating tape for model aircraft wings, as padding for battery and receiver in radio control models, as a sound barrier for pipes in pipe clips, and for damping vibration generally.

### Standard dimensions:

ref. no.	thickness	width	length / roll	quantity / pack
94-009-05	4 mm	9 mm	10 m	5 pcs.
94-009-10	4 mm	9 mm	10 m	10 pcs.
96-009-05	6 mm	9 mm	10 m	5 pcs.
96-009-10	6 mm	9 mm	10 m	10 pcs.

Customised dimensions (width / length) available on request.

## ORACOLOR®



**ORACOLOR®** is the new developed MATCHING paint system for all **ORACOVER®** and **ORATEX®** products. **ORACOLOR®** paint is a highly concentrated 2-component paint. Depending on the intended application technique, **ORACOLOR®** can be either mixed with the HARDENER FOR SPRAYING or the HARDENER FOR BRUSHING.

The mixing ratio is 2 parts of paint to 1 part hardener for spraying or hardener for brushing respectively.

By adding the hardener you automatically achieve the correct viscosity of the paint for spraying or brushing.

**ORACOLOR®** paints are an exact colour match to all **ORACOVER®** and **ORATEX®** products.

Completely cured, **ORACOLOR®** is FUEL PROOF and CAN BE IRONED ON.

Not suitable for surfaces not resistant to organic solvents.

Contents: 100 ml



<b>ORACOLOR®</b> 100 ml		<b>ORACOLOR®</b> 100 ml		<b>ORACOLOR®</b> 100 ml	
colour	ref. no	colour	ref. no	colour	ref. no
transparent	121-000	purple	121-055	<b>Scale - 100 % opaque -</b>	
white	121-010	pearl purple	121-056	scale white	122-010
grey	121-011	pearl blue	121-057	scale red	122-020
cream	121-012	orange	121-060	scale bright red	122-022
pearl white	121-016	black	121-071	scale ferri red	122-023
turquoise	121-017	pearl charcoal	121-077	scale cub yellow	122-030
olive drab	121-018	brown	121-081	scale golden yellow	122-032
corsair blue	121-019	silver	121-091	scale yellow	122-033
red	121-020	gold	121-092	<b>Royal</b>	
bright red	121-022	bordeaux red	121-120	royal magenta	128-013
ferri red	121-023			royal red	128-022
pink	121-024			royal sun yellow	128-032
pearl red	121-027			royal yellow	128-033
cub yellow	121-030	<b>Fluorescent</b>	<b>160 ml</b>	royal green	128-042
golden yellow	121-032	magenta fluorescent	121-013	royal mint	128-043
cadmium yellow	121-033	neon-pink fluorescent	121-014	royal purple	128-058
pearl yellow	121-036	violet fluorescent	121-015	royal blue	128-059
pearl golden yellow	121-037	red fluorescent	121-021	royal violet	128-084
green	121-040	pink fluorescent	121-025	<b>ORATEX®</b>	
light green	121-042	power pink	121-028	white	110-010
may green	121-043	yellow fluorescent	121-031	antique	110-012
pearl green	121-047	green fluorescent	121-041	olive drab	110-018
blue	121-050	blue fluorescent	121-051	corsair blue	110-019
dark blue	121-052	orange fluorescent	121-064	fokker red	110-020
sky blue	121-053	signal orange fluorescent	121-065	cub yellow	110-030
violet	121-054	UV protection paint - 100 ml -	121-001	silver	110-091

## ACCESSORIES

To achieve the correct viscosity of **ORACOLOR®** paints either for spraying or brushing, we offer special thinners and hardeners, to be added to the paint.

Always mix two parts paint with one part hardener. To prepare the surface, also a white **ORACOLOR®** FILLER is available.



### **ORACOLOR®** HARDENER FOR BRUSHING 50 ml ref. no.: 100-998

For applying **ORACOLOR®** as a 2-component paint with a brush, **ORACOLOR®** HARDENER FOR BRUSHING is added to the base coat. Mixing ratio (paint: hardener): 2:1.



### **ORACOLOR®** HARDENER FOR SPRAYING 50 ml ref. no.: 100-997

For applying **ORACOLOR®** 2-component paint with a spray gun / airbrush, **ORACOLOR®** HARDENER FOR SPRAYING is added to the base coat. Mixing ratio (paint: hardener): 2:1.



### **ORACOLOR®** FILLER 100 ml ref. no.: 100-999

A single component product for the preparation of the surface to achieve a good finish. Not suitable for surfaces which are not solvent proof.



### **ORACOLOR®** THINNER 250 ml ref. no.: 100-996

This special thinner is used to adjust the viscosity of **ORACOLOR®** paint. It can also be used to clean brushes, airguns, tools. Not suitable for surfaces which are not solvent proof.



### **ORACOLOR®** MATT-FINISHING AGENT 50 ml ref. no.: 100-995

In order to get a matt-finished surface, simply add our MATT-FINISHING AGENT to the **ORACOLOR®** paint system. The level of matting can be adjusted by the dose added. **PLEASE NOTE:** The matt finishing agent slightly changes the colour of the paint!

## ORACOLOR® APPLICATION INSTRUCTIONS



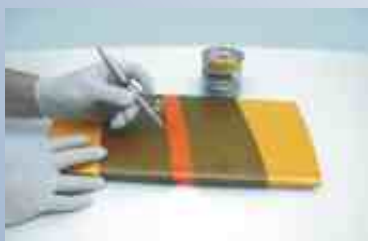
**ORACOVER®** can be buffed with 000 grade steel wool.



Before painting/spraying clean with **ORACOLOR®** thinner.



Apply the **EASYPLOT®** masking film with the help of the **ORACOVER®** felt blade (ref. no. 0915), avoid bubbles.



Remove the **EASYPLOT®** masking film immediately after you finished painting.

Preparation of paint: Mixing ratio: 2 : 1.

Hardener for spraying: Ref. No. 100-997, viscosity for spraying: 16-25 s., DIN 4 - flow cup.

Hardener for brushing: Ref. No. 100-998, viscosity for brushing: 30-60 s, Din 4 - flow cup.

Application time: 30-60 min. (depending on room temperature and application).

Application temperature: 5°-35 °C (relative air moisture c. 70% - 80%).

Thinner: for brushing 3-10%, for spraying up to 30%, depending on spraying system and nozzle type.

Spraying / Airbrush:

By reservoir cup and airgun (e.g. Evolution, Sata...).

Injection pressure: 2,0-3,0 bar (depending on consistency and colour).

Spraying runs: depending pm surface, colour and dilution.

Nozzle: 0.2-1.6 mm, distance c. 20-60 cm, with an angle of 40° - 60°.

Work steps: 2-3 (depending on surface, colour and consistency).

Brushing: by brush

Worksteps: 2-3 (depending on surface, colour and consistency).

Drying:

Airing time: 10-20 min. (temperature of object and surroundings 21°C).

Non-adhesive: 3 h. Sprayable: 16 h (depending on colour and gloss level)

Grindable: 24 h.

Consumption:

Depending on surface, consistency, application and desired colour shade: c. 120-130 ml/sqm.

Storage:

Approx. 1 year in closed container. Keep cool and dry.

Cleaning of tools:

Clean with **ORACOLOR®** thinner immediately after use.

Safety Provisions:

- Do not inhale atomised spray, use suitable protection (gloves, face masks o.s.)
- Avoid contact with eyes and skin
- In case of accidental swallowing see a doctor immediately.
- Must be used only in well-aired rooms.

General Advice:

For best results the surface of the object to be painted has to be suitably prepared if necessary, and on the other hand the paint has to be adjusted to the surface regarding specific film qualities like colour gradient, grip etc. You can easily check this by dropping a drop of paint onto the surface to be painted. The drop must show a good gradient and filming, i.e. it must not contract or diverge in bubbles. Otherwise prepare the surface accordingly (sand, degrease, clean etc.).

Paint applied too thickly or a wrong paint consistency (too thin or too thick), as well as a too short distance lead to bad results (stripes, bubbles). Generally all surfaces must be clean, dry, grease free and stable. Uneven surfaces can be levelled with **ORACOLOR®** filler (ref. No. 100-999).

### Spraying

For multiple layers spray in intervals of 15 min. When spraying **ORATEX®** fabric covering spray in several steps, with atomised spray. For best results take care to use the right nozzle for the paint consistency and the spray pressure. We recommend to test first.

### Brushing

For several layers brush in intervals of 60 min. Also in this case test first. The first layer should be very thin (thin by up to 10%). When painting wood we recommend to lightly sand upright fibres after the first layer has been applied.

### Weight table

colour	ref. no.	<b>ORACOVER®</b> Iron-on film weight in g/m <sup>2</sup>	<b>ORASTICK®</b> Self-adhesive film weight in g/m <sup>2</sup>
<b>Standard colours / Pearl colours / Chrome colours</b>			
transparent	00	54	57
white	10	89	92
grey	11	74	77
cream	12	77	80
flour. magenta	13	102	105
flour. neon-pink	14	102	105
flour. violet	15	102	105
pearl white	16	69	72
turquoise	17	68	71
olive drab	18	69	72
corsair blue	19	69	72
red	20	77	80
flour. red	21	103	105
bright red	22	77	80
ferri red	23	74	77
bordeaux red	120	77	80
pink	24	77	80
flour. pink	25	102	105
pearl red	27	94	97
flour. power pink	28	77	80
cub yellow	30	82	85
flour. yellow	31	102	105
golden yellow	32	82	85
cadm. yellow	33	82	85
pearl yellow	36	94	97
pearl golden yellow	37	94	97
green	40	72	75
flour. green	41	103	105
light green	42	72	75
may green	43	78	81
pearl green	47	94	97
blue	50	72	75
flour. blue	51	106	109
dark blue	52	69	72
sky blue	53	71	74
violet	54	75	77
purple	55	69	72
pearl purple	56	94	97
pearl blue	57	98	101
orange	60	77	80
flour. orange	64	102	105
flour. sign. orange	65	101	104
black	71	65	68
pearl charcoal	77	68	71
brown	81	68	71
chrome	90	55	58
silver	91	64	67
gold	92	69	72
chrome red	93	55	58
chrome yellow	94	55	58
chrome light green	95	55	58
chrome purple	96	55	58
chrome blue	97	55	58
chrome orange	98	55	58
chrome violet	100	55	58
chrome green	103	55	58
chrome magenta	104	55	58

colour	ref. no.	<b>ORACOVER®</b> Iron-on film weight in g/m <sup>2</sup>	<b>ORASTICK®</b> Self-adhesive film weight in g/m <sup>2</sup>
<b>Scale colours -100% opaque-</b>			
scale white	22-010	89	92
scale red	22-020	77	80
scale bright red	22-022	77	80
scale ferri red	22-023	74	77
scale cub yellow	22-030	82	85
cale golden yellow	22-032	82	85
scale yellow	22-033	82	85

<b>Royal colours -high luminosity-</b>			
royal magenta	28-013	89	92
royal red	28-022	89	92
royal sun yellow	28-032	89	92
royal yellow	28-033	89	92
royal green	28-042	89	92
royal mint	28-043	89	92
royal purple	28-058	89	92
royal blue	28-059	89	92
royal orange	28-060	89	92
royal violet	28-084	89	92

<b>Transparent colours</b>		
transparent red	21-029	54
transparent yellow	21-039	54
transparent light green	21-049	54
transparent purple	21-058	54
transparent blue	21-059	54
transparent orange	21-069	54
transparent magenta	21-073	54
transparent violet	21-074	54
transparent green	21-075	54

<b>ORATEX®</b>		
natural white	10-000	100
white	10-010	102
antique	10-012	99
olive drab	10-018	110
corsair blue	10-019	95
fokker red	10-020	100
cub yellow	10-030	102
silver	10-091	110

<b>ORALIGHT® OPAQUE</b>		<b>ORALIGHT® - only 36g/m<sup>2</sup>-</b>			
white	31-110	46	light transparent	31-000	36
grey	31-011	47	light transp. white	31-010	36
cream	31-012	44	light transp. red	31-029	36
olive drab	31-018	46	light transp. yellow	31-039	36
corsair blue	31-019	44	light transp. purple	31-058	36
red	31-020	46	light transp. blue	31-059	36
bright red	31-022	45	light chrome	31-090	36
ferri red	31-023	44	light chrome red	31-093	36
cub yellow	31-030	47	light chrome yellow	31-094	36
cadm. yellow	31-033	45	light chrome violet	31-096	36
blue	31-050	42	light chrome blue	31-097	36
dark blue	31-052	45	light scale white	31-099	36
orange	31-060	44			
black	31-071	43			
brown	31-081	45			
silver	31-091	46			
effect silver	31-191	48			

## Certifications

Our top products **ORACOVER®** and **EASYPLOT®** are not only internationally patented but also underwent the strict tests of the TÜV Product Service. Once the special qualities of our products had been tested and certified, they are newly tested every year. This means quality control and product safety on the highest level.



**CAN BE  
IRONED ON AND OFF**

## Display Furniture: **ORACOVER**® Finishing Center

For the ideal presentation of **ORACOVER**® and related products in retail shops we have introduced 2 different types of the **ORACOVER**® Finishing Center (display rack):

**Type 1** holds up to 50 rolls of 10 m length each of **ORACOVER**® or **ORASTICK**®. For easy handling it has been equipped with a cutting device and a counting meter (metric system) tested and approved by a German Federal technical institution.



**Type 2** (for self service) has 52 shelves, each of which holds 12 rolls of 2 m length each.

Both types of the **ORACOVER**® Finishing Center are made of sturdy metal and take only very little room: 70 cm (width) : 45 cm (depth) : 200 cm (height).

For displaying the **ORALINE**® and the **ORATRIM**® range the basic units of the **ORACOVER**® Finishing Center (type 1 as well as type 2) can be supplemented by a special display system. It consists of 2 units (metal panels) which can easily be hung on to the side of the **ORACOVER**® display rack. One **ORALINE**® display unit holds 49 stacks of **ORALINE**® blister cards, 2 units hold 98 stacks. Unit (panel) I is the top unit, unit II the bottom unit, both with according fixings.

The **ORALINE**® units (panels) can also be used for displaying **ORATRIM**® blister packs.



**ORACOVER**® Finishing Center for 50 rolls 10 m each: ref. no. 0901

**ORACOVER**® Finishing Center without cutting device: ref. no. 0902

Cutting device ref. no. 0903

Spare blades for cutting device (2 pcs.) ref. no. 0904

Metrical counting meter for cutting device ref. no. 0905

**ORACOVER**® Finishing Center for 2m-rolls (self-service): ref. no. 0911

**ORALINE**®/**ORATRIM**® display unit I: ref. no. 0907

**ORALINE**®/**ORATRIM**® display unit II: ref. no. 0908

**ORALINE**®/**ORATRIM**® display unit I + II: ref. no. 0909



### **ORACOLOR**®

counter display for the ideal presentation of our paint system and adhesive range:

**ORACOLOR**® counter display with 3 trays ref. 0995

**ORACOLOR**® counter display with 4 trays ref. 0996

**ORACOLOR**® counter display with 5 trays ref. 0997

Diameter: 40 cm, height incl. products max.:

3-tray display: 43 cm, 4-tray display: 53 cm, 5-tray display: 66 cm

#### Capacity per tray:

20 cans of **ORACOLOR**® or 36 cans of thinner or 36 cans of adhesive or 65 bottles of hardener / adhesive

The **ORACOLOR**® - finishing units are an ideal and space-saving way of presenting our whole range of **ORACOLOR**® and adhesives. These units can simply be hung onto the **ORACOVER**® - Finishing Center.

**ORACOLOR**® - Finishing Unit I (7 shelves) ref. 0991

**ORACOLOR**® - Finishing Unit II (7 shelves) ref. 0992

**ORACOLOR**® - Finishing Unit I+II (14 shelves) ref. 0993

**ORACOLOR**® shelf (separate) ref. 0994

The shelves can also be hooked into your **ORACOVER**® Finishing Units Type 1 and 2. Capacity per shelf (measurements: 24 cm x 75 cm):

30 cans of **ORACOLOR**® or 52 cans of thinner or

52 cans of adhesive or 85 bottles of hardener / adhesive

All **ORACOLOR**® Finishing Units come with shelves and hooks, so that you can also display **ORALINE**® and **ORATRIM**® stripes on the Finishing Units.



## EASYPLOT®

Free of PVC



**EASYPLOT®** polyester cutting-film is *the* alternative product to conventional PVC films. The excellent qualities of **EASYPLOT®** are internationally patented. **EASYPLOT®** has a high-gloss surface and tempts with an attractive range of brilliant and unusual colours. It is thinner than PVC films (23 micron only), of high dimensional stability, heat resistant, fuel resistant and can easily be painted with any modern paints. The outstanding qualities of **EASYPLOT®** are among others: contains no heavy metals, no plasticizer, no PVC; it is long-lived when used outside and of almost indefinite durability when used inside.

All our products are first developed in our laboratories, then undergo application technology tests and after this undergo hard and extensive tests for durability and performance in everyday use. Due to this emphasis on everyday use in tests and application technology we are able to advise our customers on all details, answer specialised questions and always find the best solution for any application problem.

All various types of **EASYPLOT®**

- **EASYPLOT®**
- **EASYPLOT® FUN**
- **EASYPLOT® CARBON**
- **EASYPLOT® KEVLAR**
- **EASYPLOT® MAGIC**
- **EASYGLOW®**



**EASYPLOT®** display unit ref.no.: 0910  
The mobile **EASYPLOT®** metal arm display holds up to 42 rolls of **EASYPLOT®** cutting-film of 60 cm width each. The dimensions of this very compact display furniture: 57cm:101cm:174cm (height).

## EASYPLOT® MAGIC

**EASYPLOT® MAGIC** is the ultimate product in high tech colour technology. The multi-tone colour changes due to the holographic technology in a vibrant shine.

The **EASYPLOT® MAGIC** range is available in the following colours:

- fantasy violet*
- red - gold*
- cyan - violet*



## EASYGLOW® AFTERGLOW FILM

**EASYGLOW®** is a self-adhesive afterglow film, for universal use with cutting machines. After a 5 minute charge with 1000 lux, **EASYGLOW®** meets the DIN 67 510 and the US Coast Guard standards. After an initial luminous intensity of 396.5 mcd/m<sup>2</sup>, the luminous intensity is still 42 mcd/m<sup>2</sup> after 10 minutes, and still 12.4 mcd/m<sup>2</sup> after 30 minutes. Thanks to the excellent values of luminous intensity, **EASYGLOW®** is the perfect product for all safety sensitive areas. **EASYGLOW®** is ideal to make signs for emergency exits, escape ways, safety markings, warning signs, etc. If you do not want to stand in the dark when the lights fail, be prepared with **EASYGLOW®**. **EASYGLOW®** is *free from radioactive additives or phosphorus compounds*.

As all our products, **EASYGLOW®** is made of real polyester. The thickness without adhesive is only 62µ. Total weight: 147 g/m<sup>2</sup>.





## EASYPLOT®

colour	EASYPLOT®			
	width: 20 cm	width: 30 cm	width: 38 cm	width: 60 cm
	for SV-8	for SV-12	for SV-15	for GX-24
ref. no.	ref. no.	ref. no.	ref. no.	
<b>Standard colours</b>				
white	52-010	53-010	54-010	50-010
grey	52-011	53-011	54-011	50-011
cream	52-012	53-012	54-012	50-012
turquoise	52-017	53-017	54-017	50-017
olive drab	52-018	53-018	54-018	50-018
corsair blue	52-019	53-019	54-019	50-019
red	52-020	53-020	54-020	50-020
bright red	52-022	53-022	54-022	50-022
ferri red	52-023	53-023	54-023	50-023
pink	52-024	53-024	54-024	50-024
cub yellow	52-030	53-030	54-030	50-030
golden yellow	52-032	53-032	54-032	50-032
cadmium yellow	52-033	53-033	54-033	50-033
green	52-040	53-040	54-040	50-040
light green	52-042	53-042	54-042	50-042
may green	52-043	53-043	54-043	50-043
blue	52-050	53-050	54-050	50-050
dark blue	52-052	53-052	54-052	50-052
sky blue	52-053	53-053	54-053	50-053
violet	52-054	53-054	54-054	50-054
purple	52-055	53-055	54-055	50-055
orange	52-060	53-060	54-060	50-060
black	52-071	53-071	54-071	50-071
brown	52-081	53-081	54-081	50-081
silver	52-091	53-091	54-091	50-091
gold	52-092	53-092	54-092	50-092
bordeaux red	52-120	53-120	54-120	50-120
<b>Fluorescent colours</b>				
fluor. magenta	52-013	53-013	54-013	50-013
fluor. neon-pink	52-014	53-014	54-014	50-014
fluor. violet	52-015	53-015	54-015	50-015
fluor. red	52-021	53-021	54-021	50-021
fluor. pink	52-025	53-025	54-025	50-025
fluor. power pink	52-028	53-028	54-028	50-028
fluor. yellow	52-031	53-031	54-031	50-031
fluor. green	52-041	53-041	54-041	50-041
fluor. blue	52-051	53-051	54-051	50-051
fluor. orange	52-064	53-064	54-064	50-064
fluor. signal orange	52-065	53-065	54-065	50-065
<b>Pearl colours</b>				
pearl white	52-016	53-016	54-016	50-016
pearl red	52-027	53-027	54-027	50-027
pearl yellow	52-036	53-036	54-036	50-036
pearl golden yellow	52-037	53-037	54-037	50-037
pearl green	52-047	53-047	54-047	50-047
pearl purple	52-056	53-056	54-056	50-056
pearl blue	52-057	53-057	54-057	50-057
pearl charcoal	52-077	53-077	54-077	50-077

colour	EASYPLOT®			
	width: 20 cm	width: 30 cm	width: 38 cm	width: 60 cm
	for SV-8	for SV-12	for SV-15	for GX-24
ref. no.	ref. no.	ref. no.	ref. no.	
<b>Chrome colours</b>				
chrome	52-090	53-090	54-090	50-090
chrome red	52-093	53-093	54-093	50-093
chrome yellow	52-094	53-094	54-094	50-094
chrome light green	52-095	53-095	54-095	50-095
chrome purple	52-096	53-096	54-096	50-096
chrome blue	52-097	53-097	54-097	50-097
chrome orange	52-098	53-098	54-098	50-098
chrome violet	52-100	53-100	54-100	50-100
chrome green	52-103	53-103	54-103	50-103
chrome magenta	52-104	53-104	54-104	50-104
<b>Scale colours - 100 % opaque -</b>				
scale white	62-010	63-010	64-010	60-010
scale red	62-020	63-020	64-020	60-020
scale bright red	62-022	63-022	64-022	60-022
scale ferri red	62-023	63-023	64-023	60-023
scale cub yellow	62-030	63-030	64-030	60-030
scale golden yellow	62-032	63-032	64-032	60-032
scale yellow	62-033	63-033	64-033	60-033
<b>Royal colours</b>				
royal magenta	72-013	73-013	74-013	70-013
royal red	72-022	73-022	74-022	70-022
royal sun yellow	72-032	73-032	74-032	70-032
royal yellow	72-033	73-033	74-033	70-033
royal green	72-042	73-042	74-042	70-042
royal mint	72-043	73-043	74-043	70-043
royal purple	72-058	73-058	74-058	70-058
royal blue	72-059	73-059	74-059	70-059
royal violet	72-084	73-084	74-084	70-084
<b>Transparent colours</b>				
transparent	82-000	83-000	84-000	80-000
transp. fluor. red	82-026	83-026	84-026	80-026
transparent red	82-029	83-029	84-029	80-029
transp. fluor. yellow	82-035	83-035	84-035	80-035
transparent yellow	82-039	83-039	84-039	80-039
transp. light green	82-049	83-049	84-049	80-049
transparent purple	82-058	83-058	84-058	80-058
transparent blue	82-059	83-059	84-059	80-059
transparent orange	82-069	83-069	84-069	80-069
transparent magenta	82-073	83-073	84-073	80-073
transparent violet	82-074	83-074	84-074	80-074
transparent green	82-075	83-075	84-075	80-075

colour	EASYGLOW® Afterglow safety film			
	EASYGLOW®			
	width: 20 cm	width: 30 cm	width: 38 cm	width: 60 cm
ref. no.	ref. no.	ref. no.	ref. no.	
EASYGLOW green	552-001	553-001	554-001	550-001

## EASYPLOT® FUN II (diamtre of dots: approx. 16 mm)

colour combination		EASYPLOT®			
		width: 20 cm	width: 30 cm	width: 38 cm	width: 60 cm
background colour	colour	for SV-8	for SV-12	for SV-15	for GX-24
	of design	ref. no.	ref. no.	ref. no.	ref. no.
white	silver	92-010-091	93-010-091	91-010-091	90-010-091
fluor. neon-pink	silver	92-014-091	93-014-091	91-014-091	90-014-091
fluor. violet	silver	92-015-091	93-015-091	91-015-091	90-015-091
turquoise	silver	92-017-091	93-017-091	91-017-091	90-017-091
fluor. red	silver	92-021-091	93-021-091	91-021-091	90-021-091
bright red	silver	92-022-091	93-022-091	91-022-091	90-022-091
ferri red	silver	92-023-091	93-023-091	91-023-091	90-023-091
cubyellow	silver	92-030-091	93-030-091	91-030-091	90-030-091
fluor. yellow	silver	92-031-091	93-031-091	91-031-091	90-031-091
cadmium yellow	silver	92-033-091	93-033-091	91-033-091	90-033-091
fluor. green	silver	92-041-091	93-041-091	91-041-091	90-041-091
fluor. blue	silver	92-051-091	93-051-091	91-051-091	90-051-091
sky blue	silver	92-053-091	93-053-091	91-053-091	90-053-091
violet	silver	92-054-091	93-054-091	91-054-091	90-054-091
purple	silver	92-055-091	93-055-091	91-055-091	90-055-091
fluor. orange	silver	92-064-091	93-064-091	91-064-091	90-064-091
black	silver	92-071-091	93-071-091	91-071-091	90-071-091

## EASYPLOT® FUN 4 (size of squares: 12,5 mm)

yellow	red	97-033-023	98-033-023	99-033-023	95-033-023
white	red	97-010-023	98-010-023	99-010-023	95-010-023
white	dark blue	97-010-052	98-010-052	99-010-052	95-033-052
white	black	97-010-071	98-010-071	99-010-071	95-010-071
turquoise	black	97-017-071	98-017-071	99-017-071	95-017-071
red	black	97-023-071	98-023-071	99-023-071	95-023-071
yellow	black	97-033-071	98-033-071	99-033-071	95-033-071
silver	black	97-091-071	98-091-071	99-091-071	95-091-071
pearl white	black	97-016-071	98-016-071	99-016-071	95-016-071
pearl red	black	97-027-071	98-027-071	99-027-071	95-027-071
pearl yellow	black	97-036-071	98-036-071	99-036-071	95-036-071
pearl golden yellow	black	97-037-071	98-037-071	99-037-071	95-037-071
pearl green	black	97-047-071	98-047-071	99-047-071	95-047-071
pearl purple	black	97-056-071	98-056-071	99-056-071	95-056-071
pearl blue	black	97-057-071	98-057-071	99-057-071	95-057-071
pearl charcoal	black	97-077-071	98-077-071	99-077-071	95-077-071

## EASYPLOT® FUN 3 # 5 # 6

colour combination		FUN 3	FUN 5	FUN 6
		26 mm squares width: 60 cm	52 mm squares width: 60 cm	104 mm squares width: 60 cm
background colour	colour	- for GX-24 -	- for GX-24 -	- for GX-24 -
	of design	ref. no.	ref. no.	ref. no.
white	red	87-010-023	88-010-023	89-010-023
yellow	red	87-033-023	88-033-023	89-033-023
white	dark blue	87-010-052	88-010-052	89-010-052
white	black	87-010-071	88-010-071	89-010-071
red	black	87-023-071	88-023-071	89-023-071
yellow	black	87-033-071	88-033-071	89-033-071
silver	black	87-091-071	88-091-071	89-091-071
pearl white	black	87-016-071	88-016-071	89-016-071
pearl red	black	87-027-071	88-027-071	89-027-071
pearl yellow	black	87-036-071	88-036-071	89-036-071
pearl golden yellow	black	87-037-071	88-037-071	89-037-071
pearl green	black	87-047-071	88-047-071	89-047-071
pearl purple	black	87-056-071	88-056-071	89-056-071
pearl blue	black	87-057-071	88-057-071	89-057-071
pearl charcoal	black	87-077-071	88-077-071	89-077-071

## EASYPLOT® CARBON® + KEVLAR

	EASYPLOT®			
width:	20 cm	30 cm	38 cm	60 cm
for cutting machine:	SV-8	SV-12 / SV-15	SV-15	GX-24
colour	ref. no.	ref. no.	ref. no.	ref. no.
carbon	452-071	453-071	454-071	450-071
kevlar	452-036	453-036	454-036	450-036

## EASYPLOT® MAGIC

width:	20 cm	30 cm	38 cm	60 cm
for cutting machine:	SV-8	SV-12 / SV-15	SV-15	GX-24
colour	ref. no.	ref. no.	ref. no.	ref. no.
fantasy violet	552-101	553-101	554-101	550-101
red - gold	552-102	553-102	554-102	550-102
cyan - violet	552-103	553-103	554-103	550-103

## ACCESSORIES

product	for SV-8	for SV-12 / SV-15	for CAMM 1 GX-24
	20 cm	30 cm	60 cm
	ref. no.	ref. no.	ref. no.
Transfer paper 91.5 m	0930	0933	0936
Transfer film 100 m	0931	0934	0937
Masking film 50 m	0932	0935	0939
Designer's scalpel (with spare blades)	0914		
Felt blade	0915		
Cutting knife	0916		



## Cutting machines

### CAMM-1 SERVOGX-24

ref. no.: 0928

#### Features:

- Achieves a maximum cutting speed of 20" per second, - Delivers up to 250g blade force, - Achieves a mechanical resolution of 0.0005", - Offers a maximum cutting width of 23", - Supports a range of materials including vinyl, paint mask, reflective vinyls, twill, heat transfer, and sandblast resist, - Features optical registration sensor for print-and-cut workflow, - Includes CutStudio, easy-to-use design software, - CutStudio functions as plug-in software for Windows Adobe Illustrator 9/10/CS and CorelDRAW 10/11/12, - Includes Windows driver, - Stores up to eight settings for commonly used blade and media combinations, - Features a newly-designed tilted blue LCD panel for easy viewing and navigation, - serial and USB interfaces for easy PC connection.

#### The CAMM-1 GX-24 package comprises:

GX-24 cutting machine, mains (AC) lead, driver for Windows, cutting software, manual, blade holder, blade, cable for printer, 3 different sample rolls 1 m each of **EASYPLOT®** polyester cutting film, transfer paper felt blade, designer's scalpel with spare blades, **EASYPLOT®** colour chart, telephone service to help you if any difficulties should arise, free of service charge (but no free-phone).



#### Specifications:

**Drive:** Digital powered servo motor  
**Dimensions:** 855 (W) x 315 (D) x 240 (H)  
**Weight:** 16 kg  
**Max. cutting width:** 584 mm  
**Max. cutting length:** 25 m  
**Applicable width of cutting-film:** 50 - 700 mm

**Max. Speed:** 500 mm / sec.  
**Pressure:** 30 - 250 g / in steps of 10 g  
**Memory:** 800 KB  
**Port:** USB and serial  
**Power:** Power supply, AC 100-240 V, 50/60 Hz, 1,7 A  
**Noise level:** 70 dB (A) acc. to ISO 7779  
**Operating system:** Windows 98 SE / ME / 2000 / XP

### For Cutting machine SV-8 / SV-12 / SV-15 / CAMM-1 GX-24

product	ref. no.
Spare blade holder for SV-8 / SV-12 / SV-15 / GX-24	0927
Spare blade SV-8 / SV-12 / SV-15 / GX-24	0925
Felt pen, water based - black	0951
Felt pen, water based - red	0952
Ball pen, oil based - black	0953



## Cutting machines



### STIKA SV-8 (former SX-8)

ref. no.: 0945

The STIKA SV-8 is the most compact cutting-machine in our range. It can cut letters, logos and designs of max. 160 mm height and a length of max. 1000 mm.

The STIKA SV-8 package comprises: SV-8 cutting-machine, mains adaptor, cutting program CutStudio Design, STIKA driver for Windows and Mac, USB cable, blade holder, blade, 5 sample rolls **EASYPLOT**® polyester cutting-film 1 m each in various colours, transfer paper, felt blade, cutter, **EASYPLOT**® colour chart, operation instructions. Additionally, we offer a telephone service helping you if difficulties should arise, free of service charge (but no free-phone!).

The STIKA SV-8 is easy to use. It is to be connected to your computer by the USB port, just like a printer. The provided high performance CutStudio software enables you via its tiling feature to produce larger signs of up to 64 tiles (8 tiles horizontally and 8 tiles vertically). The new CutStudio software enables you to print the contours of a design to be cut (proof) on a standard desktop printer before cutting. The STIKA Navi On-Screen Operation Panel ensures correct media positioning for quality production.



### STIKA SV-12 (former SX-12)

ref. no.: 0946

The SV-12 cutting-machine is ideal for cutting bigger lettering and designs. Allowing a maximum height of 250 mm and a maximum length of 1000 mm for designs and logos this machine offers undreamed-of possibilities to the creative user.

The STIKA SV-12 package comprises: SV-12 cutting machine, mains adaptor, cutting program CutStudio Design, STIKA driver for Windows and Mac, USB cable, blade holder, blade, 3 sample rolls **EASYPLOT**® polyester cutting-film 1 m each in various colours, transfer paper, felt blade, cutter, **EASYPLOT**® colour chart, operation instructions. Additionally, we offer a telephone service helping you if difficulties should arise, free of service charge (but no free-phone!).

The STIKA SV-12 is easy to use. It is to be connected to your computer by the USB port, just like a printer. The provided high performance CutStudio software enables you via its tiling feature to produce larger signs of up to 64 tiles (8 tiles horizontally and 8 tiles vertically). The new CutStudio software enables you to print the contours of a design to be cut (proof) on a standard desktop printer before cutting. The STIKA Navi On-Screen Operation Panel ensures correct media positioning for quality production.



### STIKA SV-15 (former SX-15)

ref. no.: 0947

The SV-15 is the ideal cutting-machine to cut alternatively smaller and larger letters and graphics. With its adjustable pressure roller, the SV-15 is able to use cutting film from 280 mm to 300 mm width, as well as from 360 mm to 380 mm width. This feature minimizes the consumption of cutting film. With a maximum cutting height of 340 mm and a cutting length of 1000 mm, the SV-15 represents the maxi-class of the STIKA cutting-machines.

The STIKA SV-15 package comprises: SV-15 cutting machine, mains adaptor, cutting program CutStudio Design, STIKA driver for Windows and Mac, USB cable, blade holder, blade, 3 sample rolls **EASYPLOT**® polyester cutting-film 1 m each in various colours, transfer paper, felt blade, cutter, **EASYPLOT**® colour chart, operation instructions. Additionally, we offer a telephone service helping you if difficulties should arise, free of service charge (but no free-phone!).

The STIKA SV-15 is easy to use. It is to be connected to your computer by the USB port, just like a printer. The provided high performance CutStudio software enables you via its tiling feature to produce larger signs of up to 64 tiles (8 tiles horizontally and 8 tiles vertically). The new CutStudio software enables you to print the contours of a design to be cut (proof) on a standard desktop printer before cutting. The STIKA Navi On-Screen Operation Panel ensures correct media positioning for quality production.

Specifications:	SV-8	SV-12	SV-15
Max. dim. of cutting-surface*:	width 160 mm, length 1000 mm	width 250 mm, length 1000 mm	width 340 mm, length 1000 mm
Suitable roll width:	195 mm - 215 mm	280 mm - 305 mm	optionally: 360 mm - 380 mm 280 mm - 305 mm
Speed:	12 - 40 mm/sec	12 - 40 mm/sec	12 - 100 mm/sec
Operating elements:	Navi on-screen Operation Panel	Navi on-screen Operation Panel	Navi on-screen Operation Panel
Port:	USB interface	USB interface	USB interface
Noise level:	60 dB(A) acc. to ISO 7779	60 dB(A) acc. to ISO 7779	60 dB(A) acc. to ISO 7779
Operating system:	Windows 98 / ME / NT / 2000 / XP	Windows 98 / ME / NT / 2000 / XP	Windows 98 / ME / NT / 2000 / XP

\* When material having a length of 500mm or more is used, then depending on the type of material, it may become misaligned.

MADE IN GERMANY

# ORACOVER®

## APPLICATION INSTRUCTIONS



CAN BE IRONED ON AND OFF

### The polyester model aircraft covering material

**ORACOVER®** is patented WORLDWIDE. It is the easy-to-use, high-tech polyester covering with legendary strength and astonishing puncture resistance making it suitable for all model aircraft from trainers right through to huge 1/3 scale models. When attached correctly it will not wrinkle, sag or delaminate. **ORACOVER®** can be painted, too.

Its polymerized colour-bonded layer tolerates higher temperatures for smooth compound-curve coverage and permits film re-positioning without fear of colour layer separation. Its wide application heat range makes for easy, temperature-uncritical covering jobs - with or without the use of a thermometer. **ORACOVER®**'s colours are completely fade-free, and its rich gloss is designed to give your model the last word in professional model covering.



Fig. 1 Recommended tools



Fig. 2 Sand surfaces smooth



Fig. 3A Temperature test at approx. 90°C



Fig. 3C Temperature test at approx 150°C

### 1. TOOLS YOU'LL NEED (Fig. 1)

- Hobby covering iron
- Cutter bar / ruler / scissors
- ORACOLOR®** - filler (ref. no. 0999)
- ORACOVER®** - felt blade (ref. no. 0915)
- Soft cloth / kitchen roll
- Hobby heat gun or paint-stripping gun
- Scalpel (ref. no. 0914) or cutting knife (ref. no. 0916)
- ORACOVER®** - iron-on adhesive (ref. no. 0960)
- ORACOVER®** - special solvent (ref. no. 0980)

### 2. SURFACE PREPARATION (Fig. 2)

Take time to sand your model completely. Fill gaps and dents with filler. Finish sanding with 320 grade sandpaper, always using a sanding block. Completely vacuum and then wipe the structure free of all dust. If the surface is suitable to take a finish, treatment of the surface is not necessary. If the surface is NOT suitable to take a finish we recommend you apply **ORACOVER®** - iron-on adhesive (ref. no. 0960) first. You can test the suitability by sticking some adhesive tape on the surface. If you can pull the tape off easily and the adhesive tape is covered with fine wood particles, prepare the surface as recommended above.

### 3. SETTING THE TEMPERATURE OF YOUR SEALING IRON

Correct iron temperature is the key to easy covering with **ORACOVER®**. Use a pocket or oven thermometer to measure temperature. If you don't have a thermometer, use the following simple checks to adjust your iron:

- A** Low Range (90 °C) - Adhesive (duller) side will begin to stick to balsa (see fig. 3A)
- B** Medium Range (130 °C) - midway between high and low range
- C** High Range (150 °C) - at this temperature a scrap of **ORACOVER®** dropped on the iron (dull side up, see fig. 3C) will wrinkle and distort.
- D** Foam test - An easy and reliable way to find the 90 °C setting on your iron is to test the warm iron on a piece of foam. If the foam "squeaks", but

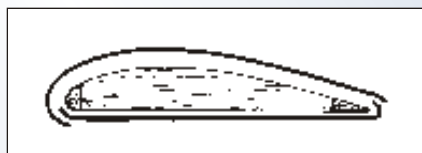


Fig. 4 Wing - do bottom first



Fig. 5a



Fig. 5b



Fig. 5c

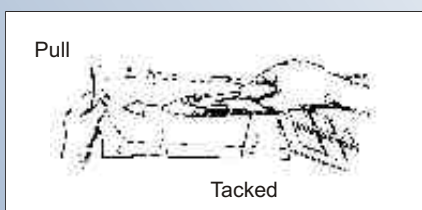


Fig. 6

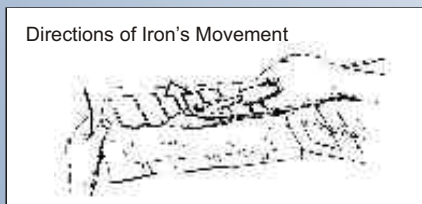


Fig. 7



Fig. 8

does not melt when the iron only slides over it, the iron has a temperature of 90 - 95 °C. Depending on the type of foam the melting point is between 95 °C and 105 °C.

**Note:** For especially difficult curves, you can increase the iron temperature from 150 to 200 °C. At 180 °C you can stretch **ORACOVER**<sup>®</sup>. Bear in mind that **ORACOVER**<sup>®</sup> starts to melt at approximately 250 °C!

#### 4. APPLICATION OVER OPEN FRAMEWORKS: WING (Fig. 4, 5, 7)

Cut a piece of **ORACOVER**<sup>®</sup> at least 2 cm oversize (Fig. 5a) all around for the under surface of the wing, and 15 cm oversize around the wing tip. Discard the backing paper if you are using opaque **ORACOVER**<sup>®</sup> or the clear protective film if you are using transparent **ORACOVER**<sup>®</sup> or **ORALIGHT**<sup>®</sup>. We recommend sticking a strip of adhesive tape to both an upper and lower edge of the covering - let the strips of tape overlap. When you then pull off the overlapping ends of the tape, you can easily separate the covering from the paper backing or the protective film respectively (Fig. 5b). When discarding the film, always put the covering with the upside on a flat surface (table). Always separate the backing from the covering and not the other way to avoid kinks or wrinkles in the covering (Fig. 5c). Lay **ORACOVER**<sup>®</sup> in position with as few wrinkles as possible (Fig. 4). Note: Place it adhesive side (dull side) down and double-check positioning. Set the sealing iron to a low temperature (90 °C). Using the tip of the iron, tack the **ORACOVER**<sup>®</sup> to the root-rib and then to the main spar (see Fig. 6). Slightly tension the **ORACOVER**<sup>®</sup> at the wing tip to make sure it lies flat on the surface. Move the sealing iron along the main spar (or wing high point) applying gentle pressure.

For the next step (see Fig. 7) bond **ORACOVER**<sup>®</sup> onto the surface of the wing between the main spar and the leading edge. Hold the shoe of the iron parallel to the wing's leading edge. Press the full surface of the iron against the already tacked strip and move the iron in the direction of the leading edge, starting from the wing root and moving in the direction of the wing tip. **DO NOT** tack the **ORACOVER**<sup>®</sup> around the leading edge yet.

The tacking method is then applied to the rear two-thirds of the wing. Remember to hold your iron parallel to the main spar and move the iron in the direction of the trailing edge as you did in Fig. 7. Always try to run your iron over 2 ribs at a time for best results.

DO NOT seal the **ORACOVER**<sup>®</sup> around the trailing edge yet.

#### 5. COVERING SHEETED SURFACES - OPEN FRAMEWORK STRUCTURES (Fig. 9a, 9b)

Repeat the procedure described for wings above but with one exception: Set your covering iron to low (90 °C) tacking the **ORACOVER**<sup>®</sup> from centre, as we did in Fig. 5 and 13. Tack the entire surface with low heat, then again repeat the same procedure with middle range (130 °C) as in Step 8. Keep your iron flat to the surface so all of the **ORACOVER**<sup>®</sup> is tightly bonded to the surface. For the second and final shrinkage you can also use a paint-stripping gun, see step 9. In doing so the covering must be firmly pressed onto the surface with a soft cloth (or kitchen roll), or better still, with the **ORACOVER**<sup>®</sup>-felt blade (ref. no. 0915), see fig. 9a and 9b.



Fig. 9 / 9a Gradually work around curves



Fig. 9a



Fig. 9b Final shrinking



Fig. 10a Trim off surplus



Fig. 10b Complete bonding



Fig. 11a-d Covering of the wing tip

## 5a. COVERING SHEETED SURFACES WITH STYRENE FOAM CORES (Fig. 9a, 9b)

Superheated steam is used in the production of polystyrene foam cores; so many foam wings often contain relatively high levels of residual moisture. At ordinary room temperature a stable microclimate stabilizes inside the core retaining the moisture. That is the reason why moisture even after long periods hardly evaporates from foam cores. The heat applied during the covering process draws moisture from the cores and can produce bubbles in the film. Sometimes during bubbling, the covering can be ripped from the wooden surface leaving wood fibres attached to the covering. As a result you may get "permanent wrinkles" where it becomes impossible to iron the covering back onto the surface of the wood. To avoid this problem we recommend you apply a thin layer of **ORACOVER**<sup>®</sup> - iron-on adhesive (ref. no. 0960) as a moisture barrier and let it dry overnight. Note: it is important to apply a thin layer so that the solvent in the adhesive does not damage the foam core. Once this barrier has cured, you can cover the model.

Set your covering iron to low (90 °C) tacking the **ORACOVER**<sup>®</sup> from centre, as we did in Fig. 6 and 13. Tack the entire surface with low heat; then again repeat the same procedure with medium heat (120 - 130 °C) as in step 8. Keep your iron flat on the surface so all of the **ORACOVER**<sup>®</sup> is tightly bonded to the surface. For the second and final shrinkage you can also use a paint-stripping gun, see step 9. In doing so the covering must be firmly pressed onto the surface with a soft cloth (or kitchen roll), or better still, with the **ORACOVER**<sup>®</sup>-felt blade (ref. no. 0915). Do not use too excessive heat, as you may cause damage to the foam core (fig. 9a, 9b).

## 6. COVERING THE WING TIP (Fig. 11a, b, c, d)

Set the iron to high (150 - 200 °C) for difficult curves. Pull and stretch the **ORACOVER**<sup>®</sup> around the wing tip while heating it with the iron, tacking the material in place. (see Fig. 8). As the **ORACOVER**<sup>®</sup> cools, maintain the tension to allow the adhesive to grip.

DO NOT attempt to eliminate all wrinkles at this stage. If there are deep folds along the tip, then heat the **ORACOVER**<sup>®</sup> and release the folds, and re-stretch until reasonably smooth. You can easily do these jobs with a heat gun (fig. 11a, b, c, d).

Note that **ORACOVER**<sup>®</sup> can be ironed onto the structure and then heated and removed without damage to the material as often as needed.



Fig. 12a  
For inside corners, first slit 45°.



Fig. 12b  
Fold and bond covering.



Fig. 13



Fig. 14



Fig. 15

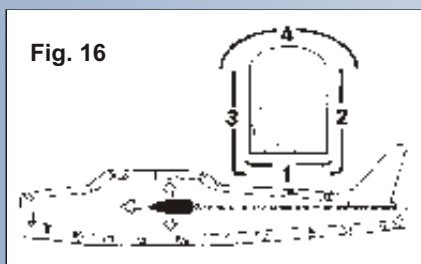


Fig. 16

## 7. SEAL THE EDGES (Fig. 10a,10b)

When you have completed covering the bottom of the wing and sealed the wing tip using a high temperature setting, trim the **ORACOVER**<sup>®</sup> to about a ½ cm overlap and seal the edges with the iron (fig. 10a, 10b) - DO NOT shrink **ORACOVER**<sup>®</sup> over the framework yet.

## 8. WING UPPER SURFACE

To cover the upper surface of the wing use the same procedure as that used for the lower, except you must cut a little more **ORACOVER**<sup>®</sup> (required at the wing tip for stretching). Note: Be sure to reduce the heat to low (90 °C).

## 9. COMPLETING THE COVERING (Fig. 13, 14)

After the top and bottom have been tacked down, it is time to uniformly shrink the material to the surface. Set the iron to high range (150 °C). Use the same method you applied during tacking (Step 4). This reheats the adhesive to a higher temperature, providing a superior bond to the wood (see fig. 13, 14). Experience shows that once you shrink the covering, some areas may not be securely attached. We therefore recommend you repeat this procedure. If you use a heat gun instead of a covering iron make sure you press the covering firmly onto the airframe surface. This allows the adhesive to set permanently. You can use a soft cloth (or kitchen roll) to do this or better still: use the **ORACOVER**<sup>®</sup>- felt blade (ref. no. 0915), see fig. 9a, 14, 15. If the **ORACOVER**<sup>®</sup> is not bonded to the surface properly, wrinkles could appear.

## 10. COVERING THE FUSELAGE (Fig. 16)

Cut the **ORACOVER**<sup>®</sup> to the outline of the surface to be covered with about 1 cm of overlap (see Fig. 16). Lay the **ORACOVER**<sup>®</sup> on the surface. Using low range (90 °C) tack a centre strip down the length of the fuselage. Using the entire surface of the iron, work with gentle pressure from the centre strip outward as shown in Step 4 and 5 (see Fig. 16). Trim the excess overlap to approximately ½ cm. Increase the iron heat to high range (150 °C). Seal all edges at this time. Pass the iron over the entire fuselage as you did in Step 8 to eliminate all wrinkles.

Fig. 16

Fuselage - first do bottom then sides, finally top



## 11. HELPFUL HINTS

### CAMBERED PROFILES (S-SHAPED SECTION)

When covering wings with a concave lower surface, tack the **ORACOVER**<sup>®</sup> effectively onto all wooden parts at 90 °C - without shrinking. Then shrink the open bay without heating the sealed parts. It may be useful to make a simple cardboard template, to protect the sealed parts of the structure, when using a heat gun.

### VENTILATION HOLES (PRESSURISATION)

When covering open frame structures, tail planes and fins, etc. make sure you have made a few internal ventilation holes. If not, drill holes of 1 - 2 mm through all ribs and webs. This allows hot air to exhaust out of the entire airframe during the covering process. If hot air is prevented from escaping from a wing bay, it may expand the covering locally, and prevent shrinking causing wrinkles/slack areas after cooling.

### FIRE WALL

Bond all edges around engine area with a hot iron to prevent oil seepage under the **ORACOVER**<sup>®</sup>. Also coat the inside of the engine area with the two-component paint **ORACOLOR**<sup>®</sup>, overlapping this proofer on to the **ORACOVER**<sup>®</sup>.

### FOAM

At low range (90 °C) **ORACOVER**<sup>®</sup> can be applied to foam. Use a test piece of foam to get the feel of the material. Instead of **ORACOVER**<sup>®</sup> you can also use **ORASTICK**<sup>®</sup> on foam surfaces sticking it directly onto the foam. If reworking with the iron is necessary make sure the iron temperature does not exceed 95 °C as more heat may cause damage to the foam surface.

### EPP

(Expanded PolyPropylene) To achieve a better bonding on rough and uneven surfaces we recommend the application of a thin layer of **ORACOVER**<sup>®</sup> EPP Adhesive (ref. no. 0982). Let it dry over night. You can apply the **ORACOVER**<sup>®</sup> or **ORASTICK**<sup>®</sup> covering the next day. As the surface keeps a certain tack it is important to apply the covering as plain as possible. When ironing and shrinking the covering make sure the temperature affecting the surface does not exceed 160 °C as the heat may damage the surface of the EPP.

### PAINTING

**ORACOVER**<sup>®</sup> can easily be painted. You will achieve best results using the **ORACOLOR**<sup>®</sup> paint system. **ORACOLOR**<sup>®</sup> is available in the full range of **ORACOVER**<sup>®</sup> colours. **ORACOLOR**<sup>®</sup> is a true two-component paint, after polymerisation it is fuel-proof and iron-proof. For adequate paint adhesion dull the surface with 000 grade steel wool and clean it with **ORACOVER**<sup>®</sup> special solvent for iron-on adhesive (ref. no. 0980).

### CLEAN UP

Any colour or adhesive left on your iron or smeared on your covering iron can be removed with a clean rag while the iron is hot. Any residue on the covering can be removed with **ORACOVER**<sup>®</sup> special solvent for iron-on adhesive (ref. no. 0980) or **ORATEX**<sup>®</sup> special solvent for iron-on adhesive (ref. no. 0969 - 0972). Use these special solvents on your iron only when the iron is **SWITCHED OFF AND COLD!** Do not switch the iron on with special solvent still on its surface! When working with special solvent make sure the room is aired properly as the special solvent can release potentially explosive gases.

### DECALS

Follow manufacturer's instructions on decal applications.

### TRIMMING, DESIGNS, MARKINGS, ETC.

Since **ORACOVER**<sup>®</sup>'s special adhesive will not generate its own bubbles when applied over itself, it can be used for trim and markings. However, good workmanship is still required because if you are not careful you can entrap air. Applied at low heat, **ORACOVER**<sup>®</sup> will bond tightly to itself. For optimum coverage, a darker colour should go over a lighter one. Smaller designs should be positioned and tacked in place at one end: Pull design up at the opposite end and iron down starting from the tacked

end without trapping air. Larger designs (such as sunbursts) should be positioned and the narrowest end tacked in place. Then, working towards the wide end, iron the design down. Pin striping, etc., can be made by cutting thin strips of **ORACOVER®**. To apply multicoloured patterns onto a fuselage in open frame structure or a wing (open framework structure), iron the single patterns on the backing paper on a flat table together. The iron should have a temperature of approx. 80 °C. Allow for a 1,5 cm overlap at the seams. Darker colours should always go over lighter colours, so that the edges of the dark colour do not show through the lighter one. Pay attention to accurate positioning when ironing on. When ironing the pattern on do not heat the seams of the pattern too much - the heat could melt the adhesive and shrink the seam. If you use a heat gun protect the seams from overheating using a cardboard template, if applicable.



## PATCHING and REPAIRS

So that the patch bonds well, be sure to remove all traces of engine oil and exhaust. For a simple tear or puncture, cut patch 0.8 to 2 cm larger than the area to be repaired. With the iron set at low heat, apply the patch directly to the clean surface. Or for a neater repair, carefully cut out the entire bay and apply a new patch with a minimum of ½ cm overlap.

## HEAT GUN

**ORACOVER®** will shrink to the surface with the use of a heat gun and will appear to have covered it well, but it will not have bonded to the surface. If you are using a heat gun for final bonding, follow Steps 4, 5, 10 and 10a for proper tacking. Use the heat gun to shrink the **ORACOVER®** over open framework as in step 8. Over sheeted areas, heat the **ORACOVER®** and using a 100 % cotton rag, quickly rub the heated area of **ORACOVER®**. This rubs the adhesive into the wood for a solid bond. Be sure to do small areas at a time. The finished effort is well worth the extra time.

## SCALE and CHROME COLOURS

**ORACOVER®** SCALE and CHROME have an aluminium layer of only nanometres' thickness on the backside of the covering film. This layer is designed to maximize colour density and quality. To minimize the RF shielding effect of the covering on a fuselage covered with **ORACOVER®** SCALE or CHROME we strongly recommend leading the Rx aerial out of the fuselage by the shortest route and running it out to the leading edge of the fin, or use a whip aerial. The same applies to wings covered with **ORACOVER®** SCALE or CHROME: Do not run the Rx aerial along the wing as this too may cause a loss of signal. Always make sure that the Rx aerial has an open destination field. We recommend you follow the same procedure with models constructed from carbon fibre.

## WOOD and MOISTURE

Please be aware that wooden model structures absorb moisture and swell in warm, humid conditions and contract under cool dry conditions. If you build and cover your model in humid conditions and then later the weather changes to cool and dry; the covering film tension will decrease as the wood releases moisture and shrinks. In this case you will need to re-iron the covering in order to remove sags or wrinkles.

We would appreciate your comments and suggestions regarding **ORACOVER®** and its applications.

**PLEASE NOTE:** Recently, more and more model aircraft with styrene foam wings have appeared on the market. To reduce production costs in many of these models pre-dried foam is no longer used; instead foam containing a relatively high residual moisture content is used. To ensure this moisture stays inside the foam we recommend you create a moisture barrier by applying a thin coat of **ORACOVER®** -iron-on adhesive (ref. no. 0960). Allow to dry overnight.

MADE IN GERMANY

# ORASTICK®

## APPLICATION INSTRUCTIONS



FREE OF PVC

## PRESSURE-SENSITIVE, HEAT-SET COVERING FILM

All the superior qualities of **ORACOVER®** plus the convenience of peel-and-stick application! **ORASTICK®** is a high-tech, polymerized polyester covering film that's peel-and-stick applied then heat-shrunk to deliver sag-free, permanent covering, season after season.

**ORASTICK®** is available in the full range of fade-free **ORACOVER®** colours and its perfect gloss is designed to yield a rich, realistic finish. **ORASTICK®** can be easily painted, too.



Fig. 1 Recommended tools



Fig. 2 Sand surfaces smooth



Fig. 3A Temperature test at approx. 90°C



Fig. 3C Temperature test at approx 150°C

### 1. TOOLS YOU'LL NEED (Fig. 1)

- Hobby covering iron
- Cutter bar / ruler / scissors
- ORACOLOR®** - filler (ref. no. 0999)
- ORACOVER®** - felt blade (ref. no. 0915)
- Soft cloth / kitchen roll
- Hobby heat gun or paint-stripping gun
- Scalpel (ref. no. 0914) or cutting knife (ref. no. 0916)
- ORASTICK®** - bonding emulsion (ref. no. 0970)
- ORASTICK®** - glue solvent (ref. no. 0990)

### 2. SURFACE PREPARATION (Fig. 2)

Take time to sand your model completely. Fill any gaps or dents in the surface with filler. Finish with 320 grit sandpaper on a sanding block. Completely vacuum your model and wipe it free of dust.

Place some adhesive tape directly onto the airframe. If you can pull the tape off easily and the tape ends up covered with fine wood particles, then your surface needs more preparation.

If the surface is NOT suitable to take a finish, despite your best efforts, we recommend you apply **ORASTICK®** - bonding emulsion (ref. no. 0970) to your airframe before covering.

### 3. SETTING THE TEMPERATURE OF YOUR IRON

Correct iron temperature is the key to easy covering of with **ORASTICK®**. Use a pocket or oven thermometer to measure temperature. If you don't have a thermometer, use the following simple checks to adjust your iron:



Fig. 4



Fig. 5a



Fig. 5b



Fig. 6



Fig. 7



Fig. 8

A Low Range (90 °C) - Adhesive becomes very soft and sticky (fig. 3A).

B Medium Range (130 °C) - Midway between high and low.

C High Range (150 °C) - At scrap of **ORASTICK®** will wrinkle and shrink.

D Foam test - An easy and reliable way to find the 90 °C setting on your iron is to test the warm iron on a piece of foam. If the foam “squeaks”, but does not melt when the iron only slides over it, the iron has a temperature of 90 - 95 °C. Depending on the type of foam the melting point is between 95°C and 105 °C.

**Note:** For especially difficult curves, you can increase the iron temperature from 150 to 200 °C. At 180 °C you can stretch **ORASTICK®**. Bear in mind that **ORASTICK®** starts to melt at approximately 250 °C!

#### 4. APPLICATION OVER OPEN FRAMEWORKS: WING (Fig. 4-8)

Starting with the bottom of the wing, cut a piece of **ORASTICK®** at least 2 cm oversize around the edges and 15 cm oversize at the tip (fig. 4).

Discard the backing paper. We recommend sticking a strip of adhesive tape to both an upper and lower edge of the covering - let strips of tape overlap (fig. 5a). When you then pull off the overlapping ends of the tape, you can easily separate the covering from the paper backing. When discarding the film, always put the covering with the upside on a flat surface (table). Always separate the backing from the covering and not the other way to avoid kinks or wrinkles in the covering (fig. 5b). Lift the covering approximately 8 - 12 cm off the backing paper and fold it back.

Then fold the backing paper under (fig. 6). Trial fit the piece of **ORASTICK®** to the wing undersurface and check for alignment (fig. 6).

When satisfied with its position, lay it over onto the wood, as in fig. 7. Use your hand or a cloth to gently tack the covering in place.

Carefully peel off all the backing. If you find large wrinkles, gently lift the **ORASTICK®** and reposition it, removing the wrinkles (fig. 8).

When you are satisfied, rub the **ORASTICK®** down with a soft cloth or with the **ORACOVER®** - felt blade (ref. no. 0915) in the following sequence:

- 1) “main line”: straight along the main spar, from root to tip.
- 2) from the “main line” in parallel strokes to the leading edge (root to tip).
- 3) from the “main line” in parallel strokes to the trailing edge (root to tip).
- 4) rub all edges securely down

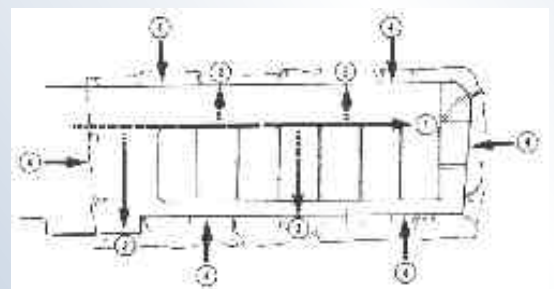




Fig. 9a



Fig. 9b



Fig. 10



Fig. 11



Fig. 12



Fig. 13a

## 5. PROTECTION OF OVERLAPPING **ORASTICK**<sup>®</sup>

In order to avoid any unwanted bonding of overlapping edges, cover them with pieces of backing paper.



## 6. COVERING WING TIP (Fig. 9a-e)

Using a cloth and either a hobby iron, or heat gun on a high setting, work **ORASTICK**<sup>®</sup> around the wing tip by small amounts at a time to match the wing tip's compound curves. Use plenty of heat whilst pulling out any wrinkles.



## 7. TRIM AND SEAL THE EDGES (Fig.10,11,12)

Trim the edges with our Scalpel (ref. no. 0914) or cutting knife (ref. no. 0916) as shown in fig.10 and 11 from the inside. Seal the edges with the iron set to 'high' (fig. 12).

## 8. UPPER WING

Follow the same procedure for covering the upper wing surface. Allow a 1 ½ cm overlap along joints in the covering.



## 9. COMPLETE THE COVERING (Fig. 13 u. 14)

Using either a hobby iron with a cloth, or a heat gun, or a paint-stripping gun on high, shrink small sections of covering at a time. Rub the **ORASTICK**<sup>®</sup> down with a cloth, or better still: with the **ORACOVER**<sup>®</sup>-felt blade (ref. no. 0915), until it is cool. This ensures the best possible bond with your airframe.

## 10. COVERING SHEETED SURFACES - OPEN FRAME STRUCTURES

Repeat the procedure for wings described above with one exception: Instead of a *covering iron* use a *heat gun* to shrink **ORASTICK**<sup>®</sup>. Rub firmly with a soft cloth (or the **ORACOVER**<sup>®</sup>-felt blade, ref. no. 0915). This will ensure a good bond to the wood. By using a heat gun you will avoid the dents that can accidentally be created with an iron.

## 10a. COVERING SHEETED SURFACES - WITH STYRENE FOAM CORES

Superheated steam is used in the production of polystyrene foam cores. This means that many foam wings often contain relatively high levels of residual moisture. At ordinary room temperature a stable microclimate develops inside



Fig. 13b



Fig. 14a



Fig. 14b



Fig. 15



Fig. 16



Fig. 17

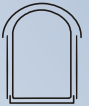
the core thus retaining any moisture within. This is the reason why moisture - even after long periods - remains locked within many foam cores.

However, the heat applied during the covering process draws moisture from the cores and can produce bubbles in the film. Sometimes during bubbling, the covering can be physically torn from a wooden surface leaving wood fibres attached to the covering. As a result, you may suffer "permanent wrinkles" where it becomes impossible to iron the covering back onto the wood. To avoid this problem we recommend you apply a thin layer of **ORASTICK**<sup>®</sup> - bonding emulsion (ref. no. 0970) to your wing sheeting as a moisture barrier - and let it dry overnight. Note: it is important to apply a thin layer so that the solvent in the adhesive does not damage the foam core. Once this barrier has cured, you can cover the model.

Finally, follow the procedure described above in "Covering sheeted surfaces - open frame structures".

## 11. COVERING THE FUSELAGE

Your fuselage is covered in the same way as your wing. Start with the bottom, then the sides and finally cover the upper surface. Allow a 1 ½ cm overlap along joins in the covering.



## 12. TRIMMING

After cutting out a piece of trim, simply position it, remove the backing and rub down as in fig. 15, 16, 17, 18 and 19. When satisfied, go over with the **ORACOVER**<sup>®</sup> - iron or heat gun and cloth or the **ORACOVER**<sup>®</sup> -felt blade (ref. no. 0915).

## 13. FOAM

Foam can be covered by first tacking your covering into position, then rubbing gently using your hand, a cloth or the **ORACOVER**<sup>®</sup> -felt blade (ref. no. 0915). Judiciously apply heat and rub the surface gently to complete the bonding process.

**NOTE:** Do not overheat as foam will melt at relatively low temperatures. Test using scrap foam first. In order to avoid damaging the foam surface, do not exceed a temperature of 95 °C.

## 14. EPP

(Expanded PolyPropylene) To achieve a better bonding on rough and uneven surfaces we recommend you apply a thin layer of **ORASTICK**<sup>®</sup> bonding emulsion (ref. no. 0970). Allow to air-dry overnight. You can apply **ORASTICK**<sup>®</sup> covering on the following day. As the surface will be tacky it is important to apply the covering as smoothly as possible. When ironing and shrinking the covering make sure the iron temperature does not exceed 160 °C as excessive heat may damage the surface material.



Fig. 18



Fig. 19

## 15. HELPFUL HINTS

### CAMBERED PROFILES (S-SHAPED SECTION)

When covering wings with a concave lower surface, tack the **ORASTICK**<sup>®</sup> effectively onto all wooden parts at 90 °C - without shrinking. Then shrink the open bay without heating the sealed parts. It may be useful to make a simple cardboard template, to protect the sealed parts of the structure, when using a heat gun.

### VENTILATION HOLES (PRESSURISATION)

When covering open frame structures, tail planes and fins, etc. make sure you have made a few internal ventilation holes. If not, drill holes of 1-2 mm through all ribs and webs. This allows hot air to exhaust out of the entire airframe during the covering process. If hot air is prevented from escaping from a wing bay, it may expand the covering locally, and prevent shrinking causing wrinkles/slack areas after cooling.

### FIREWALL

Bond all edges around engine area with a hot iron to prevent oil seepage under the **ORASTICK**<sup>®</sup>. Also coat the inside of the engine area with the two-component paint **ORACOLOR**<sup>®</sup>, overlapping this proofer on to the **ORASTICK**<sup>®</sup>.

### PAINTING

**ORASTICK**<sup>®</sup> can easily be painted. You will achieve best results using the **ORACOLOR**<sup>®</sup> paint system. **ORACOLOR**<sup>®</sup> is available in the full range of **ORACOVER**<sup>®</sup> / **ORASTICK**<sup>®</sup> colours. As **ORACOLOR**<sup>®</sup> is a two-component paint system, it is fuel-proof and iron-proof, i. e. you can iron over the paint coating without causing damage to it. For adequate paint adhesion dull the surface with 000 grade steel wool and clean it with **ORASTICK**<sup>®</sup> glue solvent (ref. no. 0990).

### DECALS

Follow manufacturer's instructions on decal applications.

### CLEANING UP

Any colour or adhesive left on your iron or smeared on your covering iron can be removed with a clean rag while the iron is hot. Any residue on the covering can be removed with **ORASTICK**<sup>®</sup> glue solvent (ref. no. 0990). Use this special solvent on your iron only when the iron is **SWITCHED OFF AND COLD!** Do not use the iron if traces of solvent are still present! When working with special solvent make sure the room is aired properly as the special solvent can release gases that are potentially explosive.

### PATCHING and REPAIRS

As **ORASTICK**<sup>®</sup> is self-adhesive, field repairs can be made by cleaning the damaged area first. Cut a patch 2 cm oversized and apply over damaged area.

### TRIMMING

The patch can be later ironed down securely in the workshop. Since **ORASTICK**<sup>®</sup>'s special adhesive will not bubble when DESIGNS are applied onto the film, it can be used for trim and markings. However, good workmanship is still required because if you are not careful you can trap air bubbles.

### MARKINGS ETC.

Applied at low heat, **ORASTICK**<sup>®</sup> adhesive will bond tightly to itself. For optimum coverage, a darker colour should be placed over a lighter one. Smaller trim designs should be positioned and tacked in place at one end: Pull design out at the opposite end and tack down starting from the stuck end without trapping air. Use the **ORACOVER**<sup>®</sup>-felt blade (ref. no. 0915) to position the design on the surface. Larger designs (such as sunbursts) should be positioned and the narrowest end tacked in place. Then, working towards wide end, tack design down.

Pin striping, etc., can be produced by cutting **ORASTICK**<sup>®</sup> into thin strips. To apply multicoloured patterns onto a fuselage or a wing in open framework structure, tack the single patterns on the backing paper on a flat table together. Allow a 1,5 cm overlap at joins. Darker colours should always go over lighter colours, so that the edges of the dark colour do not show through the lighter one. Pay attention to accurate positioning when tacking. When re-ironing the pattern do not overheat the joins the heat could melt the adhesive and shrink the material at the join. If you use a heat gun protect the joins from overheating using a cardboard template, if applicable.

Large surface area trim designs should be glued onto a wet surface as follows: First wet the surface by spraying (using an empty cleaner bottle) a solution of water mixed with one or two drops of washing-up liquid onto the surface. Slide the trim design onto the wet surface. Position the design accurately and squeeze the water out using the **ORACOVER**<sup>®</sup>-felt blade (ref. no. 0915) moving from the middle to the edges of the design. Using this technique you can apply large trim schemes to any surface. We recommend you let the design dry out thoroughly for 1-2 days.

## SCALE and CHROME COLOURS

**ORASTICK**<sup>®</sup> SCALE and CHROME have an aluminium layer just nanometres thick on the undersurface of the covering film. The covering is 100 % opaque. To minimize the RF shielding effect of the covering on a fuselage covered with **ORASTICK**<sup>®</sup> SCALE or CHROME we strongly recommend you lead the aerial through the fuselage and out to the upper edge of the fin / vertical tail, or use a rod aerial. This applies also to wings covered with **ORASTICK**<sup>®</sup> SCALE or CHROME. Do not run the aerial along the wing as this may cause a loss of radio range. You must attach your Rx aerial to the top end of the fin of your model. Observe the same precautions when finishing models containing carbon fibre components.

## WOOD and MOISTURE

Models covered under humid or warm conditions are at risk of suffering from sagging covering when later exposed to normal or drier atmospheres. Wood naturally absorbs moisture present in the atmosphere and expands in the process. When it dries, it shrinks and any covering will sag as a result. So cover in dry conditions in order to avoid ironing your film at some later stage!

**PLEASE NOTE:** Recently, more and more model aircraft with styrene foam wings have appeared on the market. To reduce production costs in many of these models pre-dried foam is no longer used; instead foam containing a relatively high residual moisture content is used. To ensure this moisture stays inside the foam we recommend you create a moisture barrier by applying a thin coat of **ORASTICK**<sup>®</sup> bonding emulsion (ref. no. 0970). Allow to dry overnight.

We would appreciate your comments and suggestions regarding **ORASTICK**<sup>®</sup> and its applications.



--- INNOVATIVE PRODUCTS FOR GENERAL AVIATION ---

## ORATEX® UL 600



KIEBITZ ([www.jw-air.de](http://www.jw-air.de))



ZEPHYR ([www.atecaircraft.eu](http://www.atecaircraft.eu))



ULI 1 ([www.weller-flugzeugbau.de](http://www.weller-flugzeugbau.de))



ESCAPADE KID ([www.realityaircraft.com](http://www.realityaircraft.com))

Breaking new ground has always been one of the excellence goals of **LANITZ-PRENA FOLIEN FACTORY GmbH**. For the development of the **ORATEX®** product range for General Aviation, we threw



away the book on conventional covering materials and techniques and applied principles drawn from our proven model aircraft covering technologies.

In 2001, the Zurich University of Applied Sciences in Winterthur (Switzerland), developed a microlight glider known as "ARCHAEOPTERYX". The covering of this aircraft was revolutionary, they used 'off-the-shelf' **ORATEX®** model aircraft covering, available from any model shop. The "ARCHAEOPTERYX" project was very successful and led to the development of an aircraft with outstanding flight performance. For us, this was a landmark on the road to our goal of engineering a range of covering materials suitable for full-size aircraft. The success of this project encouraged us to develop a new type of **ORATEX®** specifically targeted at general aviation applications. For several years, we ran a series of scientific R&D projects culminating in the development of a range of special **ORATEX®** PRODUCTS for general aviation.

The first product to be released is **ORATEX® UL 600** for aircraft with a MTOW up to 600 kg.

This will be followed by **ORATEX® 3000** for aircraft with a MTOW up to 3000 kg (e.g. Piper Cub, Pitts Special, Ultimate, experimentals, homebuilts, and other open structure aircraft) and finally there will be **ORATEX® 6000** for aircraft up to 6000 kg MTOW (e.g. AN-2).

All **ORATEX®** PRODUCTS, (including **ORATEX®** iron-on fabric for general aviation) can be flown either painted or unpainted. The covering application technique is new: you put the adhesive on the airframe and those parts of the



ARCHAEOPTERYX ([www.archaeopteryx.ch](http://www.archaeopteryx.ch))



SHERWOOD RANGER ([www.g-tlac.com](http://www.g-tlac.com))



SIROCCO ([www.acla.eu/aircraft.html](http://www.acla.eu/aircraft.html))

covering to be glued to the airframe, let it dry, then iron the covering on. It's as simple as that! No more dope, fillers, sealers or sanding! And you always get a constant weight of covering every time you cover! **ORATEX®** PRODUCTS are available in eight attractive and popular colours.



MISTRAL ([www.pilotmix.com](http://www.pilotmix.com) (enter Mistral))

## ORATEX® UL 600

For aircraft with a MTOW up to 600 kg.

	width: 900 mm	width: 1800 mm
colour	ref. no.	ref. no.
natural white	12-000-090	12-000-180
white	12-010-090	12-010-180
antique	12-012-090	12-012-180
olive drab	12-018-090	12-018-180
corsair blue	12-019-090	12-019-180
fokker red	12-020-090	12-020-180
cub yellow	12-030-090	12-030-180
silver	12-091-090	12-091-180
polyester fabric covering	width: 1020 mm	width: 2040 mm
untreated (white)	12-099-090	12-099-180

### Technical data of: **ORATEX® UL 600 MK2**

- **Material thickness total:** approx. 120 µm - **Weight:** approx. 110 to 130 g/m<sup>2</sup> (depending on colour) - **Tensile strength lengthwise:** Min. 620 N / 50 mm - **Tensile strength crosswise:** Min. 580 N / 50 mm - **Breaking extension lengthwise:** approx. 30 % - **Breaking extension crosswise:** approx. 40 % - **Tear propagation load lengthwise:** Min. 14 N - **Tear propagation load crosswise:** Min. 9 N - **Shrinkage lengthwise:** Min. 7 % (reference temperature 170 °C) - **Shrinkage crosswise:** Min. 5 % (reference temperature 170 °C) - **Melting point:** 250 °C



## ORATEX® 3000

Due to its mechanical strength **ORATEX® 3000** is a covering designed for aircraft with a MTOW up to 3000 kg; hence it is most suitable for covering types like Piper Cub, Pitts, Ultimate, homebuilts and experimentals.



## ORATEX® 6000



**ORATEX® 6000** is the strongest fabric covering of the **ORATEX®** range. It is designed for aircraft with a MTOW of up to 6000 kg and can be used on types like agricultural aircraft, aerobatic aircraft, Warbirds and the AN-2.

## ACCESSORIES



### ORATEX® PINKED EDGE TAPE

**ORATEX® PINKED EDGE TAPE** is a heat-sealable product, widths 17 mm - 150 mm.

It is produced in all **ORATEX®** colours. **ORATEX® PINKED EDGE TAPE** can be applied where seams overlap or have to be reinforced. It can also be used as turbulator tape.

Customised dimensions (width/length) available on request.

<b>ORATEX® PINKED EDGE TAPES</b> length: 25m-roll							
colour	width: 17 mm	width: 25 mm	width: 50 mm	width: 75 mm	width: 100 mm	width: 125 mm	width: 150 mm
natural white	15-000-017	15-000-025	15-000-050	15-000-075	15-000-100	15-000-125	15-000-150
white	15-010-017	15-010-025	15-010-050	15-010-075	15-010-100	15-010-125	15-010-150
antique	15-012-017	15-012-025	15-012-050	15-012-075	15-012-100	15-012-125	15-012-150
olive drab	15-018-017	15-018-025	15-018-050	15-018-075	15-018-100	15-018-125	15-018-150
corsair blue	15-019-017	15-019-025	15-019-050	15-019-075	15-019-100	15-019-125	15-019-150
fokker red	15-020-017	15-020-025	15-020-050	15-020-075	15-020-100	15-020-125	15-020-150
cub yellow	15-030-017	15-030-025	15-030-050	15-030-075	15-030-100	15-030-125	15-030-150
silver	15-091-017	15-091-025	15-091-050	15-091-075	15-091-100	15-091-125	15-091-150



### ORATEX® STRAIGHT EDGE TAPE

**ORATEX® STRAIGHT EDGE TAPE** is a heat-sealable product, widths 25 mm - 125 mm. It is produced in all **ORATEX®** colours.

**ORATEX® STRAIGHT EDGE TAPE** can be applied where seams overlap or have to be reinforced. It can also be used as turbulator tape. Customised dimensions (width/length) available on request.

<b>ORATEX® STRAIGHT EDGE TAPES</b> length: 25m-roll						
colour	width: 25 mm	width: 35 mm	width: 50 mm	width: 75 mm	width: 100 mm	width: 125 mm
natural white	16-000-025	16-000-035	16-000-050	16-000-075	16-000-100	16-000-125
white	16-010-025	16-010-035	16-010-050	16-010-075	16-010-100	16-010-125
antique	16-012-025	16-012-035	16-012-050	16-012-075	16-012-100	16-012-125
olive drab	16-018-025	16-018-035	16-018-050	16-018-075	16-018-100	16-018-125
corsair blue	16-019-025	16-019-035	16-019-050	16-019-075	16-019-100	16-019-125
fokker red	16-020-025	16-020-035	16-020-050	16-020-075	16-020-100	16-020-125
cub yellow	16-030-025	16-030-035	16-030-050	16-030-075	16-030-100	16-030-125
silver	16-091-025	16-091-035	16-091-050	16-091-075	16-091-100	16-091-125

## ORATEX® DISPERSION HOTMELT ADHESIVE

The **ORATEX® HOTMELT DISPERSION ADHESIVE** is a revolutionary product which works without the unpleasant odours associated with conventional adhesives. It is applied to the structure to be covered and onto those parts of the covering which are to be ironed onto the airframe. You can use either a synthetic fibre brush or a spray gun. When the adhesive has dried you can iron the covering onto the airframe. If you have no more time, you can do it tomorrow, or the day after tomorrow, or whenever you have the time...

**ORATEX® HOTMELT DISPERSION ADHESIVE** is available in the following sizes (shelf life approx. 3 month):

**ORATEX® HOTMELT DISPERSION ADHESIVE** as a triple pack (separate: adhesive resin, thickener, hardener) is available in the following sizes (shelf life 12 months):

product	quantity	ref. no.
<b>ORATEX®</b> DISPERSION HOTMELT ADHESIVE	50 ml	0974
<b>ORATEX®</b> DISPERSION HOTMELT ADHESIVE	100 ml	0975
<b>ORATEX®</b> DISPERSION HOTMELT ADHESIVE	500 ml	0976
<b>ORATEX®</b> DISPERSION HOTMELT ADHESIVE	1 litre	0977
<b>ORATEX®</b> DISPERSION HOTMELT ADHESIVE	5 litre	0978
<b>ORATEX®</b> DISPERSION HOTMELT ADHESIVE	10 litre	0979
<b>- 3 separate components -</b>		
<b>ORATEX®</b> DISPERSION HOTMELT ADHESIVE	1 litre	0987
<b>ORATEX®</b> DISPERSION HOTMELT ADHESIVE	5 litre	0988
<b>ORATEX®</b> DISPERSION HOTMELT ADHESIVE	10 litre	0989
SPECIAL REMOVER FOR <b>ORATEX®</b>	250 ml	0957
SPECIAL REMOVER FOR <b>ORATEX®</b>	500 ml	0958
SPECIAL REMOVER FOR <b>ORATEX®</b>	1 litre	0959



product	ref. no.
<b>ORATEX®</b> FELT BLADE	0948

## ORASTICK® TRANSPARENT MAP AND CHART PROTECTIVE LAMINATE



**ORASTICK®** Transparent Map and Chart Protective Laminate can be applied where surfaces have to be protected, e. g. aeronautical charts, marine charts, engineering drawings etc. Comments and routes marked with permanent marker or ballpen can be completely removed with solvent if necessary. **ORASTICK®** MAP AND CHART PROTECTIVE LAMINATE is made of pure polyester, hence it contains no plasticizer and no PVC. **ORASTICK®** TRANSPARENT MAP AND CHART PROTECTIVE LAMINATE is available in the following roll lengths: 2 m, 10 m, 20 m, 50 m, 100 m, 150 m, 250 m. Roll width: 60 cm.

## SILICONISED RELEASE PAPER

Use silicon release paper to prevent two pieces of fabric covered with adhesive from sticking together by accident.

<b>ORASTICK®</b> TRANSPARENT MAP	
width: 60 cm	ref. no.: 20-000
<b>SILICONISED RELEASE PAPER</b> - width: 60 cm -	
length: 2 m	ref. no.: 12-100-002
length: 5 m	ref. no.: 12-100-005

MADE IN GERMANY

# ORATEX® UL 600

## COVERING INSTRUCTIONS

### Iron-on polyester fabric covering for light aircraft



**ORATEX® UL 600** is an advanced iron-on polyester fabric covering which is patented worldwide. It is easy to handle and can be over painted.

**ORATEX® UL 600** consists of a polymerised multi-layer-system with integral colour and UV-protection which is applied to a polyester fabric especially developed for this specific application.

**ORATEX® UL 600** is available in many attractive colours, as this fabric covering is equipped with a UV-proof final top-coating, it does not need to be painted. However, **ORATEX® UL 600** can easily be painted with all **ORA-**

**COLOR®** paints in order to achieve a custom finish, **ORATEX® UL 600** and **ORACOLOR®** paints are fuel-proof. Depending on the different aircraft construction materials (e.g. aluminium, steel, wood, composite) the temperature setting for your iron may vary. In general, the fabrics are applied at 90 °C, so that they do not shrink when being ironed-on, however, as heat conductive materials like aluminium or steel will immediately dissipate much of the heat, you can apply much higher temperatures when working with these materials. In this case you can apply temperatures of approx. 130 - 170 °C without shrinking the fabric when ironing.

Whether or not the covering has to be rib stitched depends on the aircraft's designer and his constructional design. If the designer stipulates that rib stitching of the covering material is mandatory, then **ORATEX® UL 600** may be sewn in the conventional manner.

### 1. TOOLS YOU'LL NEED:

- Covering iron
- Scissors
- Cutter bar / ruler
- Synthetic fibre brush / spray gun
- ORATEX®**- felt blade (ref. no. 0948)
- Measuring tape
- Soft cloth / kitchen roll
- Scalpel (ref. no. 0914)
- Cutting knife (ref. no. 0916)
- Heat gun
- Sanding block
- Infrared thermometer
- Dividers
- Self adhesive tape for masking / fixing



## 2. MATERIALS YOU'LL NEED:

- ORATEX® UL 600**
- ORATEX®** iron-on **Pinked or Straight Edge Tapes**
- ORATEX®** Dispersion Hotmelt Adhesive (available types see 4)
- ORATEX®** Special Thinner, available in the following units:
  - 250 ml - ref. no.: 0969, 1 litre - ref. no.: 0973, 5 litre - ref. no.: 0971,
  - 10 litre - ref. no.: 0972
- Release paper (ref. no.: 12-100-005)
- Special remover for **ORATEX®** (ref. no.: 0957)



## 3. SURFACE PREPARATION

### Preparing metal surfaces

Take your time to thoroughly deburr all components (picture 1). Burrs can damage, cut or even cause fretting to the fabric (tear), this also applies to riveted construction (sharp edges, peaks) as well as for welded construction (weld seams). Thoroughly degrease the metal surface before covering, we recommend this be done with our **ORATEX®** Special Thinner (picture 2).



fig. 1

### Preparing aluminium surfaces

To prepare aluminium structures for covering we recommend that the aluminium is treated with a 2k zinc chromate etch primer. The etch primer ensures that the aluminium airframe is ready to accept the **ORATEX®** Dispersion Hotmelt Adhesive

After cleaning the aluminium with the **ORATEX®** Special Thinner you can apply the primer. We recommend to treat the inside of the tubes, too. After the primer has cured, the **ORATEX®** Dispersion Hotmelt Adhesive, this must be done with a synthetic fibre brush or spray gun (picture 3).



fig. 2

### Preparing steel surfaces

For steel construction: After preparing and degreasing the steel tubular construction apply an appropriate temperature-stable 2K primer this can be done with a spray gun. Once the primer is cured, a thin layer of the **ORATEX®** Hotmelt Adhesive can be sprayed or brushed onto it, for tubular structures spray or brush the complete tube (picture 3).



fig. 3

## 4. GENERAL ADVICE

· If you do not have an iron with a precise thermostat you can also measure the temperature with an infrared thermometer. For wooden wings a temperature of approx. 90°C must be set, metal wings need circa 130-170 °C, because the metal acts as a heat sink and dissipates heat very quickly.

· The **ORATEX®** Dispersion Hotmelt Adhesive consists of three components blended as a single product: the actual adhesive, thickener and the appropriate hardener. When applying heat (whilst ironing or shrinking) the adhesive not only bonds but also crosslinks (polymerises); this makes the adhesion temperature-stable. **ORATEX®** Dispersion Hotmelt Adhesive must be completely dry before you can start covering. This procedure can well be accelerated with a heat gun set on COLD air, it is essential that only cold air is applied as the hardener, which is already included in the

water-based adhesive, starts to react at temperatures exceeding 50°C. This means that, once this process is started, the adhesive hardens and cannot be used to for bonding the fabric anymore.

**Attention:** In order to achieve an optimal application of the adhesive a synthetic fibre brush must for applying the adhesive. If natural hair brushes are used the adhesive can dry up and form beads which are then brushed on with the adhesive. These beads can affect the visual appearance.

**Our adhesive is available in two different types:**

**1. Complete with hardener:**

50 ml ref. no.: 0974, 100 ml - ref. no.: 0975, 500 ml - ref. no.: 0976, 1 litre - ref. no.: 0977, 5 litre - ref. no.: 0978 and 10 litre - ref. no.: 0979.

**2. Separate components:**

Adhesive, thickener, hardener to be mixed, 1 litre - ref.no.: 0987, 5 litre - ref.no.: 0988, 10 litre - ref.no.: 0989.

## 5. ASSEMBLY POINTS, JUNCTION PLATES, RIVETS, JOINTS

All assembly points, junction plates, rivets and joints must be deburred and covered with a patch (picture. 4). This prevents the covering from being damaged by sharp edges, bumps and protrusions.

TO APPLY: Apply **ORATEX**® Dispersion Hotmelt Adhesive onto the aforesaid area. Apply **ORATEX**® Dispersion Hotmelt Adhesive onto the inner side of a piece of fabric. After the adhesive has dried cut the patches out of the fabric onto which the adhesive had been applied. Iron the patches on. If you have riveted metal cap strips we recommend you cover them with a patch which covers the whole fin including leading edge tube and trailing edge tube (see e. g. tubular construction as in picture 5).



fig. 4



fig. 5

## 6. SEWING

If the aircraft construction stipulates rib stitching is mandatory, then **ORATEX**® **UL 600** must be rib stitched. Actually, rib stitching is quite simple: it is done, as generally known, with needle and thread and industry approved knots (A). After all the rib stitching has been completed and knotted they are ironed on (B).



A



B



C



D

After the fabric has been rib stitched, the **ORATEX**® Dispersion Hotmelt Adhesive is applied over either side of the stitching and to a width of the **ORATEX**® Pinked or Straight edge tapes less 5 mm either side. (C). In order to achieve a good / clean result we recommend you mask the area where no adhesive should be applied with masking tape. Remove the masking tape straight after having applied the adhesive, once the adhesive has dried, iron the **ORATEX**® Pinked or Straight Edge Tape on at c. 90°C (D). Choose an iron temperature at which the pinked edge tape does NOT shrink.

## 7. OVERLAPS

When overlapping of the fabric occurs the overlap must be of at least 5 cm (2 inch) width. When you stick fabric onto fabric apply the **ORATEX**® Dispersion Hotmelt Adhesive onto the upper side of the lower fabric. In order to obtain a

clean bond seam, mask the outside edges of the respective area. Apply the adhesive and remove the masking tape when the adhesive is still wet. It is recommended to use the **ORATEX**® Pinked or Straight tape as “protective tape” around leading edge tubes. This will protect the covering in this area from being damaged by little stones that are catapulted with high speed into the area of the leading edge by the propeller. Without a “protective tape” the covering around leading edge tubes can be affected in the long term.

## 8. COVERING THE TAILPLANE



fig. 6



fig. 7

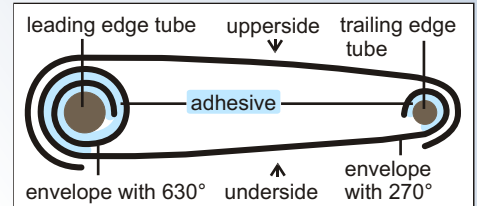


fig. 8

To get used to this unique covering system you can begin by covering the tailplane, rudders and flaps. To get started roll the fabric out on a flat even surface, with the outside of the fabric face down. Now position the tailplane on the fabric, ensuring the best economical use of the fabric (Fig. 6). If the structure is riveted, iron patches (made from fabric offcuts) onto the rivets and junction plates, thereby preventing the covering fabric from fretting and being damaged in these areas.

After the tailplane has been positioned on the fabric the contours of the complete framework should be traced onto the fabric marking all inner and outer contours of the tailplane with a pencil onto the inside of the fabric.

Now do the same for the upper side as well as for the underside. The underside of the tailplane is to be covered first, and the leading edge tube being wrapped with upto 630° of the fabric where possible (see. Drawing 1). For optimum bonding, the first 270° of fabric enveloping the inner side of the leading edge tube will be coated with adhesive on the OUTSIDE of the fabric. In order to mark the cutting edge of the fabric, an outer reference line is to be drawn additionally to the line marking the contours.



Drawing 1

The distance between this reference line and the line marking the contours equates the circumference of the outer leading edge tube + 75%.

**Example: Tube diameter (d) 5 cm:**

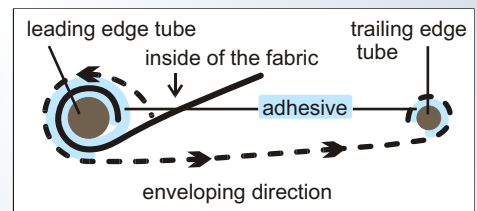
$$\text{Pi} \cdot \text{d} \cdot 1,75 = 3,14 \cdot 5 \cdot 1,75 \approx 27,5 \text{ cm}$$

This means you should add 27.5 cm of fabric, beginning at the contour line. For adding fabric when covering the trailing edge tube, the distance between the contour line and the reference line for cutting equates 80% of the circumference of the tube.

**Example: Tube diameter (d) 2 cm:**

$$\text{Pi} \cdot \text{d} \cdot 0,8 = 3,14 \cdot 2 \cdot 0,8 \approx 5 \text{ cm}$$

This means you should add 5 cm of fabric, beginning at the rear contour line.



Drawing 2

The fabric area between the outer reference/cutting line and the line at the rear end of the leading / trailing edge tube as well as those parts that will be covered by bars and bands/longerons must now be coated with **ORATEX**® Dispersion Hotmelt Adhesive. After the adhesive has dried the fabric will be cut. Please note that for curves (wing tips etc.) you will need additional 20-25 cm for gripping the fabric when pulling it around the curvature.

Where bars or ribs are to be enveloped cuts are made into the fabric (fig. 7 and fig. 9). The cut-offs can later be used as patches to be ironed onto ribs or bars. Covering begins at the leading edge tube and is continued to the trailing edge.

Now you can begin ironing the fabric onto the inner sides of the leading edge tube. To simplify matters you should always begin with the straight tubes. The tapering parts will be covered only after the fabric has been ironed on to the trailing edge. The fabric will practically be wrapped around the leading edge tube of the structure to be covered and will then be ironed on (fig. 8). For tapering parts the wrapping at the leading edge tube is to be reduced to 270°. Curvatures like tips will be fixed by ironing (fig. 8/14).





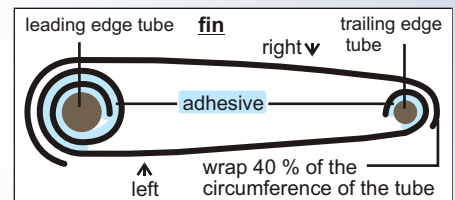
During ironing the fabric must be firmly stretched around the structure with one hand, as it becomes more elastic when heated. If there are any creases you can shrink them out by increasing the heat (fig. 17/19). In order to create a large “anchoring area” iron the fabric around the trailing edge within a radius of 270°. Deal with the other outer tubes in the same way. When covering the upper side, iron the fabric onto the outer structure of the leading edge tube with a 180° wrap, and the outer structure of the trailing edge with a 150° wrap (Drawing 3).

With the exception of the fins (fig. 10) the bottom side will be covered first, in the same way as the tailplane, the wings and flaps. To prevent adhesion of the fabric in areas where it is not required, lay release paper on the inside area of the tube to be covered (fig. 11/12).



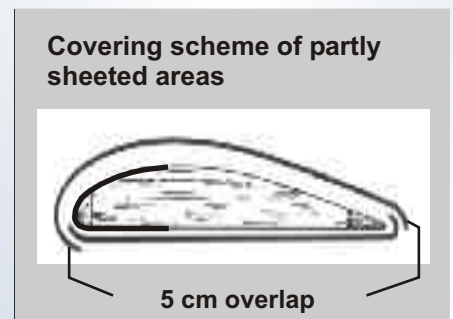
Now you prepare the fin for covering. For this purpose position the fin on the fabric and mark a reference line around it, using dividers (fig. 13). For the first side to be covered the distance between the reference line and the tube equates the circumference of the tube + 75% for the leading edge tube, while for the trailing edge it equates 80% of the circumference of the tube. For the other side it equates c. 40% of the circumference of the tube. Take good care that the overlap at the tubes does not extend into the airflow (Drawing 3).

Turn the fin and do the markings for the other side. Then coat the fabric covering of the two fin-sides with adhesive, up to the reference line. For a safe and firm bond ensure that all parts of the fabric touching the structure are well coated with adhesive. When the adhesive has dried cut the fabric around curvatures with an overlap of 10-15 cm, along the outer reference line (fig. 15). Iron on as before (fig. 14/19).



Drawing 3

After ironing the **ORATEX**® covering on the tube, areas where the fabric overlap contacts the fabric just applied have to be coated with **ORATEX**® Dispersion Hotmelt Adhesive. When the adhesive has dried, iron on the exterior side. The covering is ironed around the tube structure with a 180° overlap and at the trailing edge it is ironed on with a 270° wrap. Where compound curves exist the fabric can be very creased initially but with the application of heat, stretching and some practice these creases can be eliminated. Please note the temperature applied must NOT exceed 200°C (fig. 16/18/19).





The use of a heat gun and some higher temperatures can assist in removing some creases with shrinking and stretching. After using a heat gun you must hold the fabric down for a moment so that the adhesive can cool down and bond the fabric to the surface. After the covering has been neatly ironed on (fig. 17) it is possible that some creases are still present (fig. 20).



Now use the heat gun, the fabric can be shrunk with the heat gun set at a temperature of 350°C (fig. 21/22/23/24). You may wonder about the 350°C, but please note that the temperature of the air hitting the covering is controlled by the distance from the fabric: The bigger the distance, the lower the temperature hitting the fabric. For controlling the temperature during shrinking, please measure the temperature of the fabric surface with the help of an infrared thermometer. 200 °C should NOT be exceeded.



To avoid burning your fingers when pressing down the fabric to the structure you best use our felt blade (ref. no. 0948) (fig. 23/24).

For neatly ironing down the upper side of the fins onto the underside, mark the edge of the area to be coated with adhesive with auxiliary dots (fig. 25/26). Cut the fabric along the markings and iron on.

Around the curvature any unevenness of the covering on the upper side is neatly eliminated by ironing and shrinking with increased temperature (fig. 27/28/29).





fig. 30



fig. 31



fig. 32



fig. 33



fig. 34



fig. 35

Iron straight seams, which do not require shrinking with a temperature of 90-100 °C (wooden structures) and for metal structures temperatures of 130-170°C may be necessary because of the heat conductivity of the material. For neat seams always mark reference lines for the cutting edge with the help of dividers. The inner reference line serves to limit the adhesive coating to the area where it is needed (fig. 32/33). To prevent the fabric from moving prematurely you can loosely wrap it around the structure and fix it with tape (fig. 31). After the fabric has been cut (fig. 33) iron it on (fig. 34). Apply increased temperatures for ironing and shrinking around curvatures like the tips.

For lettering you can use our special self-adhesive film **EASYPLOT**® (fig. 35) which can be ironed on at 80°C. When ironing we recommend you cover the film with release paper.

## 9. COVERING THE WINGS

When covering the wing follow the same procedure described above for the tailplane. First, mark the contours of the wing on the inside of the fabric. To make things a bit more convenient, mark the complete structure of the upper side and bottom side of the wing onto the rolled out fabric. Apply the adhesive onto the marked area, at the same time, apply adhesive onto the inner side of a strip of fabric, which will be used for patches. Use these patches to cover all rivets, e. g. on the rib cap strips. The patches will protect the fabric from being damaged by sharp metal edges. After the patches have been ironed-on, apply adhesive onto the upper side of all the patches.

After the adhesive has dried, the wings are being covered. Cover the bottom side first, then the upper side. When covering it is an advantage to start with the leading edge tube, the fabric being wrapped around to the leading edge tube. Where fabric lies on fabric the **ORATEX**® Dispersion Hotmelt Adhesive must be applied, allow to dry thoroughly. After that, pull the fabric taught towards the trailing edge tube and then iron it on (pictures 36/37/38/39/40/41). At the trailing edge, the fabric should be wrapped through at least 270°.



fig. 36



fig. 37



fig. 38



After having finished this job turn the wing around and cover the upper side of the wing following the same methods as above. Make sure especially at obstacles that the covering is ironed on very carefully (pictures 39/42). In order to gain the maximum contact area for the adhesive and the fabric around the root rib and the wing tip, the fabric must be ironed neatly around or into the root rib (picture 41).



Use round reinforcing patches to protect fly lead and control wire exits. Apply one patch on the inside and one on the outside of the lead through (fig. 43). Wrinkles on the tube can be shrunk away with elevated temperatures (fig. 42).

Before you start shrinking the covering with the heat gun make sure that all ironed bonds are done properly. When you then tighten the fabric with the heat gun it is recommended to cover the seams with a strip of corrugated cardboard. This will prevent the adhesive from being softened by the high temperature, and the fabric will not “pull away” when being shrunk, as during the shrinking process the heat is not always distributed constantly, we recommend you repeat this procedure (1-2 times). Overlaps must be at least 5 cm wide (leading edge tube, trailing edge tube).

Designs and markings can easily be done with our **EASYPLOT**® cutting film (picture 44).

## TIPS



Preparation for marking and cutting (fig E).

Wherever there are holes or control cable exits in the covering one has to create a bearing surface. 0.8 mm plywood is suitable here (fig F).

Also at the edges, **ORATEX**® **UL 600** can be applied very easily. Cut the covering with enough overlap so that when you then stretch it whilst applying heat with the heat gun (350°C indicated on the heat gun, if it has a temperature display) you will not burn your fingers (fig G).



Concave curves cannot be achieved without some cuts (fig H). Once the individual strips are pre-heated, they go easily around the curves (fig I). After having completed, the finish looks professional (fig J).



It is not easy to position the holes or cuts accurately (fig K). To reach this stage it took two people approx. 3 hours (fig L). Despite the difference in height the edge can be covered easily (fig M).



Where rib stitching is required teamwork is necessary. When feeding the thread precise arrangements are essential. Depending on the conditions a certain body height is necessary, the use of auxiliary means is allowed here (fig's N/O/P). Conventional rib stitching practices are recommended.

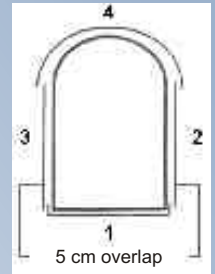


After having fed in and knotted all threads, all knots can be ironed-on (fig Q). After that, **ORATEX**<sup>®</sup> Dispersion Hotmelt Adhesive must be brushed onto all the seams (fig R). Finally, the **ORATEX**<sup>®</sup> Pinked Edge Tape is ironed on at c. 90°C (fig S).

## 10. COVERING THE FUSELAGE

When covering the fuselage follow the same procedure described above for the wing. Follow the covering scheme 1-4 shown in the sketch. When covering the fuselage one can either start with the fuselage itself or with the undercarriage, as shown in this example. A rough cut of the fabric is fixed with masking tape at the bottom of the

undercarriage. Then, mark all areas where the undercarriage contacts the fabric. Mark also the outer cutting line, ensure that the tube should be wrapped with a radius of 270°. Brush the **ORATEX®** Dispersion Hotmelt Adhesive onto all contact areas of both the fabric and the undercarriage. When covering it is advantageous to start with the bottom side of the undercarriage. After the adhesive has dried cut and iron the fabric as usual as already described, adhesive is applied to all the assembly points, after the glue has dried apply a glue-brushed patch of fabric and iron it on. This will protect the actual covering from being damaged by sharp edges.



Before starting the covering job, make sure the **ORATEX®** Dispersion Hotmelt Adhesive is completely dried. The drying procedure can be accelerated with a heat gun set on COLD air. However, it is essential that only cold air is applied as the hardener, which is already included in the water-based adhesive, starts to react when exposed to elevated temperatures. This means that, once this process is started, the adhesive hardens and cannot be used for bonding the fabric anymore.



fig. 45



fig. 46



fig. 47

Fly leads and control cable exits (e.g. for brake Bowden cables) should be reinforced with 0.8 mm plywood. **ORATEX®** Dispersion Hotmelt Adhesive must be applied to the sides of the wood and of the fabric that are to be joined. After having dried, the piece of wood is ironed onto the fabric. This way a stable lead-through is produced (picture 45).

When covering the upper side of the undercarriage follow the same procedure as described above. Ensure that the overlapping seam (fabric - fabric) is glue-brushed with **ORATEX®** Dispersion Hotmelt Adhesive before you start covering. In order to achieve neat seams, mask areas before applying adhesive with masking tape, remove the masking tape before the adhesive has dried. All joints and holes are to be reinforced with the iron-on **ORATEX®** Pinked Edge Tape. Even areas considered difficult can be treated easily (pictures 47/48).



fig. 48



fig. 49



fig. 50

To ensure minimum joints and seams, the covering of the fuselage should consist of as few fabric parts as possible. Start with the bottom side of the fuselage (picture 49), ensure that the fabric wraps around the fuselage tubes at the sides with approx. 270°. For the right hand side of the fuselage, one piece of fabric is used, it is held in place with adhesive tape (picture 50).



fig. 51



fig. 52



fig. 53

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Mark the contours of the fuselage on the fabric and brush **ORATEX**<sup>®</sup> Dispersion Hotmelt Adhesive onto the marked area (position of the fuselage) on the fabric, also apply to the structure of the fuselage. After the adhesive has dried, iron the fabric on starting at the front and moving backwards, the difficult areas on the fuselage can be covered easily (picture 51). Before ironing the right hand fuselage covering down, temporarily fix the covering for the left hand side of the fuselage and mark the contours on the fabric (picture 52).

After the right hand side is already completely ironed on, the fabric is being shrunk with a heat gun (picture 53).



fig. 54



fig. 55



fig. 56

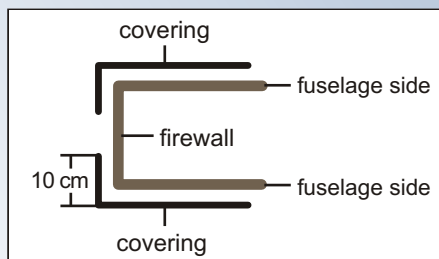
Another possibility to reinforce fly leads and control cable exits such as Bowden cables is to bolt two 0,5 mm aluminium plates together (picture 54). Even the really difficult areas can be handled easily with the **ORATEX**<sup>®</sup> fabric (pictures 55/56).



fig. 57



fig. 58



Drawing 4

The rib in the fin is being sewed (pictures 57/58).

To achieve an ideal bonding at the firewall area, iron the fuselage covering from the bottom of the fuselage, both the sides and the upper side at least 10 cm onto the firewall (Drawing 4).



fig. 59



fig. 60



fig. 61

In pictures 59/60 the rudder is already sewn. Now the seams are sealed with **ORATEX**<sup>®</sup> Pinked Edge Tape. If you follow these instructions carefully your result should look similar (picture 61).

## 11. COVERING WOODEN STRUCTURES

This chapter is about how to cover wooden structures or structures made of compound materials. We chose the flap of a ZEPHYR as an example. What makes this flap special is the fact that it is made of compound materials: The leading edge does not only consist of wood as usual, but additionally GRP had been used. When covering GRP take care not to exceed a temperature of 100°C, to avoid softening and deformation or delamination. In our case the flap will be newly covered, in exactly the same way as the original, the leading edge itself is left uncovered (see black reference line for cutting, fig. 68). As the flap is symmetrically shaped, another specialty can be shown: Covering in one piece, the flap being seamlessly covered around the trailing edge.

## Procedure:



fig. 62



fig. 63



fig. 64

The flap is laid onto the inside of a piece of **ORATEX® UL600** of appropriate size (fig. 62), and the contours are outlined on the fabric with a pencil. Then the flap is folded over the trailing edge, and in this reversed position the contours are again outlined onto the fabric. Now coat the area within the pencil markings with **ORATEX®** dispersion hotmelt adhesive (fig. 63). Also the structure is now being coated with the adhesive (fig. 64, 65).



fig. 65



fig. 66



fig. 67

After the adhesive has THOROUGHLY dried, the flap will be positioned on the inside of the fabric according to the pencil markings (fig. 66). Then wrap the fabric around the trailing edge (fig. 67).



fig. 68



fig. 69



fig. 70

Fig. 68 shows the black reference line marking the cutting line on the top and bottom of the leading edge. Beginning at the trailing edge the covering is ironed on in the direction of the leading edge, on both sides.

Before ironing, tighten the fabric at the top and the bottom simultaneously, by pulling it with one hand and at the same time pushing the wrapped flap in the direction of the trailing edge, so that the fabric wrapping the structure is now pulled as tight and crease-free as possible. Then, beginning at the trailing edge, iron on with approx. 100°C (fig. 69,70). After ironing make a seam at the upper and lower reference line (fig. 71).

Take care not to damage the GRP surface. Now the overlapping fabric on the sides of the end ribs will be ironed onto the ribs. For this purpose make cuts into the fabric according to fig. 72.

Now it is time to make the facing panels to cover the end ribs. Use a pencil to mark the contours of the ribs on the inside of a piece of **ORATEX® UL 600**, for the facing panels. Then apply **ORATEX®** dispersion hotmelt adhesive onto



fig. 71



fig. 72



fig. 73



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the ribs and the fabric within the marked contours. After the adhesive has dried cut out the marked pieces of fabric, 1mm undersize. Position the fabric pieces carefully on the ribs, so that the outer ends of the facing panels are exactly parallel to the outer rib edges. Now iron the panels on to the ribs. Finally, the covering is tightened with the help of a heat gun. Take care to control the temperature with the help of an infrared thermometer. When shrinking it is important that you protect the seams from the heat using a piece of cardboard, otherwise the adhesive could become too hot and liquid, and the fabric would begin to slip (fig. 73,74).

## 12. COLOURING

**ORATEX® UL 600** is available in eight classic aircraft colours. If you wish to create your own colour scheme, you can paint the fabric with our **ORACOLOR®** paint system.

If you cover parts made of GRP or CFRP use light colours (preferably white or silver). If dark coloured areas are exposed to direct sun light an extraordinary heat develops which may cause softening of the GRP or CFRP structure.



**SOLE MANUFACTURER: LANITZ-PRENA FOLIEN FACTORY GmbH**

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Von der Fédération Internationale de l'Automobile (FIA) Paris zugelassenes Stelle zur Prüfung von Schutzkleidung für Auto-Rennfahrer – FIA standard 8856-2000



## UNTERSUCHUNGSBERICHT | TESTREPORT

<b>Order-No STFI:</b>	<b>2026/08</b>
<b>order-No customer:</b>	
<b>date of report:</b>	<b>2009-04-24</b>
<b>responsible preparation:</b>	<b>Bieber</b>
<b>Applicant:</b>	<b>Lanitz-Prena Folien Factory GmbH Mr. Siegfried Lanitz Am Ritterschlosschen 20 04179 Leipzig</b>
<b>Test order:</b>	
<b>of:</b>	<b>2008-05-08</b>
<b>order receipt:</b>	<b>2008-05-13/ 2008-09-23</b>
<b>test material received:</b>	<b>2008-05-13</b>

### Test content

**Textil-physical tests to coated fabrics for aircraft coverings**

The standards belonging to the test methods are stated in subitem 'test results'

Seite 2 von 2 Seiner zum Untersuchungsbericht vom 2009-04-24 Auftrags Nr. 2062/08



## Test item


processing code	article description	marking by applicant	colour	material composition
1	Oratex UL 500	sample B	silver	PES fabric (woven), PU-coated
2	Ceconite NC	sample A	silver	PES-fabric (woven), PU-coated

Sampling was supplied by the issuer. The test department is not informed about the sampling procedure.


## Test results

test parameter / (standard)	dimension	sample-No.	
		1	2
maximum force (DIN EN ISO 13934-1) warp weft	N	881,49	557,84
		612,31	567,25
elongation at maximum force (DIN EN ISO 13934-1) warp weft	%	32,50	30,48
		47,39	50,43
adhesion force (DIN 53357) warp weft	N	23,1	15,8
		23,6	15,4
tear force (DIN EN ISO 13937-2) warp weft	N	14,02	12,50
		9,30	7,86
bursting test (DIN EN ISO 13938-2) bursting strength bursting distension	kPa mm	444,5	375,5
		25,9	25,8
air permeability (DIN EN ISO 9237)	l/m <sup>2</sup> s	0	0

The results are arithmetic means. Statistical surveys are available in the laboratory.  
The test results refer to the specimen delivered. This test report should not be copied in parts.

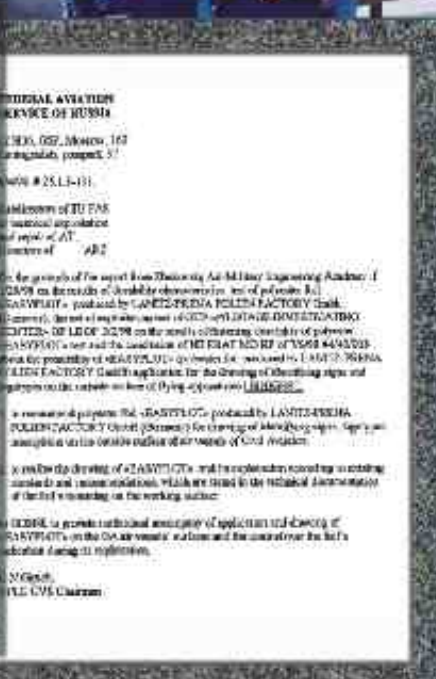
  
Dr. Eng. M. Mägel  
Head of Accredited Test Department



  
Eng. B. Bieber  
Special field responsible

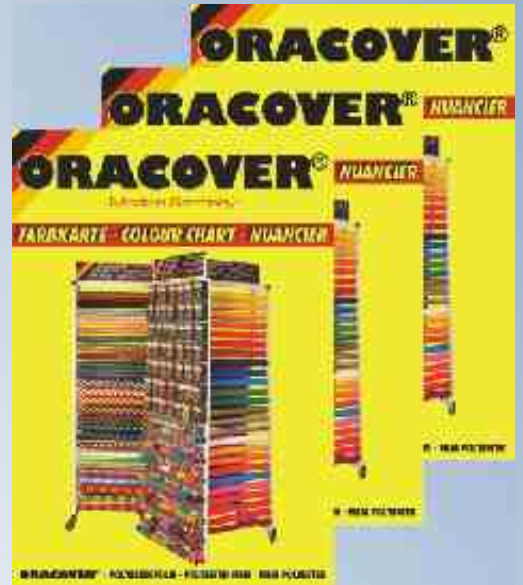
## International certifications

We have concentrated the distribution of our products in Eastern Europe on the Russian market. After extensive tests and examinations our covering materials have gained approval for the use in military as well as civil aviation. **EASYPLOT®** for instance is admitted for high speed aviation up to MACH 4.18, for signs and markings on airplanes as well as for covering whole airplane parts.



## ORACOVER® - COLOUR CHART -

Our **ORACOVER®** colour chart containing original colour samples of all our covering films can be bought directly from us at a price of 11.00 € plus postal charges (4.50 € within Europe, 8.00 € outside Europe).



## Research, development, quality control



**ORACOVER®** is being continuously performance tested on our factory-owned CTSW at a flight speeds of up to 250 km/h.



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Adventure, passion, freedom  
Committed to flying!*

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## Airborne – outdoor trousers

Comfortable fit, stretch cotton, practical pockets, adjustable, different!  
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- 0805** Airborne-Outdoor charcoal **129,00 €** each  
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BY M.E.N.S.



Inside leg/ inch	Waist/inch				
	32	34	36	38	40
32	32 R	34 R	36 R	38 R	40 R
34	32 L	34 L	36 L	38 L	40 L
36	32 E	34 E	36 E	38 E	40 E

When ordering please note: the order number is made up of the colour number and the size in the measurement table e.g. 0806-38L

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Five-pocket jeans with Airborne motif, weftstretch fabric for freedom of movement .  
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# airborne

BY M.E.N.S.



Photo: © Cornelius Braun



Photo: © PME Legend

## Pilot's jacket "PME legend"

Leather, black, with lambskin collar, various patches.

**0810 389,90 €** each

Leather, brown, with lambskin collar, various patches.

**0811 389,00 €** each

Size	black	brown
M	0810 M	0811 M
L	0810 L	0811 L
XL	0810 XL	0811 XL
XXL	0810 XXL	0811 XXL
XXXL	0810 XXXL	0811 XXXL

## Airborne Polo

Fine cotton, with zip and breast pocket, various colours (black, navy, ruby, white), various sizes.

**0809 Airborne Polo 44,90 €** each

Colour	Size				
	48	50	52	54	56
black	0809 010 1 480	0809 010 1 500	0809 010 1 520	0809 010 1 540	0809 010 1 560
navy	0809 030 1 480	0809 030 1 500	0809 030 1 520	0809 030 1 540	0809 030 1 560
white	0809 001 1 480	0809 001 1 500	0809 001 1 520	0809 001 1 540	0809 001 1 560
ruby	0809 070 1 480	0809 070 1 500	0809 070 1 520	0809 070 1 540	0809 070 1 560



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## Impressions



Finanziert aus Mitteln der Europäischen Union und des Freistaates Sachsen.



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