

# CERTIFICATS

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**MASTERTENT<sup>®</sup>**  
*folding tents*

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ZERTIFIKAT ◆ CERTIFICATE ◆ CERTIFICADO ◆ CERTIFICAT ◆ СЕРТИФИКАТ ◆ 認証証書 ◆ CERTIFICATE ◆ CERTIFICATE



Product Service

## CERTIFICATE

No. B 09 06 46481 006

**Holder of Certificate:** ZINGERLEMETAL AG

Förche 7  
39040 Natz-Schabs (BZ)  
ITALY

**Production Facility(ies):** 46481

**Certification Mark:**



**Product:** Tents

**Model(s):** Mastertent S43 / Mastertent S33  
Mastertent S40 / Mastertent Shop

**Parameters:**

Structure:	Aluminium
Profile thickness:	43 mm; 33 mm; 40 mm
Size:	MT 1,5 m x 1,5 m; MT 1,5 m x 3,0 m MT 4,0 m x 2,0 m; MT 3,0 m x 3,0 m MT 4,5 m x 3,0 m; MT 6,0 m x 3,0 m MT 8,0 m x 4,0 m; MT 6,0 m x 4,0 m MT 4,0 m x 4,0 m; MT 5,0 m x 5,0 m MTS 4,5 m x 3,8 m; MTS 6,0 m x 3,8 m MTS 4,3 m x 4,3 m

**Tested according to:** PPP 63029:2007

The product was tested on a voluntary basis and complies with the essential requirements. The certification mark shown above can be affixed on the product. It is not permitted to alter the certification mark in any way. In addition the certification holder must not transfer the certificate to third parties. See also notes overleaf.

**Test report no.:** 71343683

**Date:** 2009-06-25  
**Page** 1 **of** 1



TÜV SÜD Product Service GmbH · Zertifizierstelle · Ridlerstrasse 65 · 80339 München · Germany



## CLASSIFICATION OF REACTION TO FIRE PERFORMANCE IN ACCORDANCE WITH EN 13501-1: 2002

<b>Sponsor</b>	Zingerlemetal AG Förche 7 I-39040 Natz/Schabs Italy
<b>Prepared by</b>	Efectis Nederland BV Lange Kleiweg 5 P.O. Box 1090 NL-2280 CB RIJSWIJK The Netherlands
<b>Notified Body no.</b>	1234
<b>Product name</b>	LKR056400 - Polyester Oxford 500x500D
<b>Classification report no</b>	2003-CVB-R0289[REv.1]
<b>Issue number</b>	2
<b>Date of issue</b>	September 2008
<b>Project number</b>	006.35102/01.21.01

This classification report consists of four pages and may only be used in its entirety.

This report is issued by Efectis Nederland BV (previously TNO Centre for Fire Research). Efectis Nederland BV and her sister company Efectis France are full subsidiaries of Efectis Holding SAS since 1 January 2008, in which the Dutch TNO and the French CTICM participate. The activities of the TNO Centre for Fire Research were privatized in Efectis Nederland BV since 1<sup>st</sup> July 2006. This is in response to international developments and requests by customers. In order to be able to give a better answer to the customer's request and offer a more comprehensive service of high quality and a wider range of facilities, the international collaboration has been further expanded. This is done with highly experienced partners in fire safety in Norway (Sinter-NBL), Spain (Afiti-Licof), Germany (IFT), USA (South West Research Institute) and China (TFRD). Further information can be found at our website.

## 1. Introduction

This classification report defines the classification assigned to **polyester fabric**, type **LKR 056400 - Oxford 500x500D**, in accordance with the procedures given in EN 13501-1: 2002.

## 2. Details of classified product

### 2.1 General

The product, **polyester fabric**, type **LKR 056400 - Oxford 500x500D**, is defined as a cloth for tents e.g.

### 2.2 Product description

According to the manufacturer the product, type LKR 056400-Oxford 500x500D, is a polyester fabric, FR grade with a surface density of 0.225 kg/m<sup>2</sup>.

## 3. Test reports & test results in support of classification

### 3.1 Test reports

Name of Laboratories	Name of sponsor	Test reports	Test method
Efectis Nederland B.V., The Netherlands	Zingerlemetal AG, Italy	2003-CVB-R0233 (NL)	EN ISO 11925-2:2002 EN 13823:2002

## 3.2 Test results

Test method & test number	Parameter	No. tests	Results	
			Continuous parameter - mean (m)	Compliance parameters
EN 13823	FIGRA <sub>0.2MJ</sub> [W/s]	3	0	-
	FIGRA <sub>0.4MJ</sub> [W/s]		0	-
	THR <sub>600s</sub> [MJ]		0.5	-
	LFS < edge		-	Compliant
	SMOGRA [m <sup>2</sup> /s <sup>2</sup> ]		7	-
	TSP <sub>600s</sub> [m <sup>2</sup> ]		83	-
	Flaming debris - flaming ≤ 10 s - flaming > 10 s		-	Compliant Compliant
EN-ISO 11925-2 surface flame impingement	F <sub>s</sub> ≤ 150 mm	6	-	Compliant
	Ignition of filter paper		-	Compliant
EN-ISO 11925-2 edge flame impingement	F <sub>s</sub> ≤ 150 mm	6	-	Compliant
	Ignition of filter paper		-	Compliant

## 4. Classification and field of application

### 4.1 Reference of classification

This classification has been carried out in accordance with clause 8.2 of EN 13501-1:2002.

### 4.2 Classification

The product, **polyester fabric**, type **LKR 056400 - Oxford 500x500D**, in relation to its reaction to fire behaviour is classified:

**B**

The additional classification in relation to smoke production is:

**s2**

The additional classification in relation to flaming droplets / particles is:

**d0**

**Reaction to fire classification: B-s2, d0**

### 4.3 Field of application

This classification is valid for the following product parameters:

- Surface density approx. 0.225 kg/m<sup>2</sup>

This classification is valid for the following end use applications:

- Mounted over an open metal frame, as a cloth for tents e.g.
- The product can be mounted vertically or horizontally.

### 4.4 Duration of the validity of this classification report

There are no limitations in time on the validity of this report.

## 5. Limitations

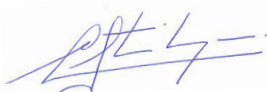
This classification document does not represent type approval or certification of the product.

The classification assigned to the product in this report is appropriate to a declaration of conformity by the manufacturer within the context of system 3 attestation of conformity and CE marking under the Construction Products Directive.

The manufacturer has made a declaration, which is held on file. This confirms that the product's design requires no specific processes, procedures or stages (e.g. no addition of flame-retardants, limitation of organic content, or addition of fillers) that are aimed at enhancing the fire performance in order to obtain the classification achieved. As a consequence the manufacturer has concluded that system 3 attestation is appropriate.


The test laboratory has, therefore, played no part in sampling the product for the test, although it holds appropriate references, supplied by the manufacturer, to provide for traceability of the samples tested.

Signed



Ing. C.C.M. Steinhage

Approved



W. Langstraat

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## CLASSIFICATION OF REACTION TO FIRE PERFORMANCE IN ACCORDANCE WITH EN 13501-1: 2002

<b>Sponsor</b>	Zingerlemetal AG Förche 7 I-39040 Natz/Schabs Italy
<b>Prepared by</b>	Efectis Nederland BV Lange Kleiweg 5 P.O. Box 1090 NL-2280 CB RIJSWIJK The Netherlands
<b>Notified Body no.</b>	1234
<b>Product name</b>	LKR056300 - Polyester Oxford 250x250D
<b>Classification report no</b>	2003-CVB-R0290(D)[Rev.1]
<b>Issue number</b>	2
<b>Date of issue</b>	September 2008
<b>Project number</b>	006.35102/01.21.01

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## 1. Introduction

This classification report defines the classification assigned to **polyester fabric**, type **LKR056300 - Oxford 250x250D**, in accordance with the procedures given in EN 13501-1:2002.

## 2. Details of classified product

### 2.1 General

The product, **polyester fabric**, type **LKR056300 - Oxford 250x250D**, is defined as a cloth for tents e.g.

### 2.2 Product description

According to the manufacturer the product, type LKR056300 - Oxford 250x250D, is a polyester fabric, FR grade with a surface density of 0.15 kg/m<sup>2</sup>.

## 3. Test reports & test results in support of classification

### 3.1 Test reports

Name of Laboratories	Name of sponsor	Test reports	Test method
Efectis Nederland B.V., The Netherlands	Zingerlemetal AG, Italy	2003-CVB-R0232 (NL)	EN ISO 11925-2:2002 EN 13823:2002

### 3.2 Test results

Test method & test number	Parameter	No. tests	Results	
			Continuous parameter - mean (m)	Compliance parameters
EN 13823	FIGRA <sub>0.2MJ</sub> [W/s]	3	0	-
	FIGRA <sub>0.4MJ</sub> [W/s]		0	-
	THR <sub>600s</sub> [MJ]		0.3	-
	LFS < edge		-	Compliant
	SMOGRA [m <sup>2</sup> /s <sup>2</sup> ]		4	-
	TSP <sub>600s</sub> [m <sup>2</sup> ]		60	-
	Flaming debris - flaming ≤ 10 s - flaming > 10 s		-	Compliant Compliant
EN-ISO 11925-2 surface flame impingement	Fs ≤150 mm	6	-	Compliant
	Ignition of filter paper		-	Compliant
EN-ISO 11925-2 edge flame impingement	Fs ≤150 mm	6	-	Compliant
	Ignition of filter paper		-	Compliant

## 4. Classification and field of application

### 4.1 Reference of classification

This classification has been carried out in accordance with clause 8.2 of EN 13501-1:2002.

### 4.2 Classification

The product, **polyester fabric**, type **LKR056300 - Oxford 250x250D**, in relation to its reaction to fire behaviour is classified:

**B**

The additional classification in relation to smoke production is:

**s2**

The additional classification in relation to flaming droplets / particles is:

**d0**

**Reaction to fire classification: B-s2, d0**

### 4.3 Field of application

This classification is valid for the following product parameters:

- Surface density approx. 0.151 kg/m<sup>2</sup>

This classification is valid for the following end use applications:

- Mounted over an open metal frame, as a cloth for tents e.g.
- The product can be mounted vertically or horizontally.

### 4.4 Duration of the validity of this classification report

There are no limitations in time on the validity of this report.

## 5. Limitations

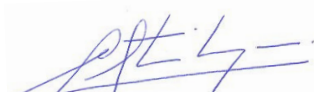
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The classification assigned to the product in this report is appropriate to a declaration of conformity by the manufacturer within the context of system 3 attestation of conformity and CE marking under the Construction Products Directive.

The manufacturer has made a declaration, which is held on file. This confirms that the product's design requires no specific processes, procedures or stages (e.g. no addition of flame-retardants, limitation of organic content, or addition of fillers) that are aimed at enhancing the fire performance in order to obtain the classification achieved. As a consequence the manufacturer has concluded that system 3 attestation is appropriate.

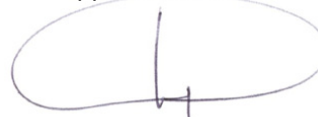
The test laboratory has, therefore, played no part in sampling the product for the test, although it holds appropriate references, supplied by the manufacturer, to provide for traceability of the samples tested.

Signed



Ing. C.C.M. Steinhage

Approved



W. Langstraat

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MODULARIO  
Interno - 269

Mod. 3 PC

SERVIZIO TECNICO  
Ispettorato Attività e Norme  
Speciali di Prevenzione



16498

## Ministero dell'Interno

DIREZIONE GENERALE DELLA PROTEZIONE CIVILE

VISTO il Decreto Ministeriale 26 giugno 1984 concernente "Classificazione di reazione al fuoco ed omologazione ai fini della prevenzione incendi";

VISTA l'istanza presentata dalla ditta F.LLI GIOVANARDI di GIOVANARDI CARLO & C. S.n.c. sita in via G. Marconi, 63 - 46039 VILLIMPENTA (MN), produttrice del materiale denominato "CRISTALPLUS FR 500" per ottenere l'omologazione del materiale stesso ai fini della prevenzione incendi;

VISTO il certificato di reazione al fuoco n. 3666 del 03/09/99 emesso per il predetto materiale dal L.A.P.I. S.r.l. di PRATO;

VISTA la scheda tecnica, allegata al predetto certificato, prodotta dalla ditta F.LLI GIOVANARDI di GIOVANARDI CARLO & C. S.n.c. di VILLIMPENTA (MN)

### SI OMOLOGA

con il numero di codice MN222A70CD200043, il prototipo del materiale denominato "CRISTALPLUS FR 500" prodotto dalla ditta F.LLI GIOVANARDI di GIOVANARDI CARLO & C. S.n.c. di VILLIMPENTA (MN), ai soli fini della prevenzione incendi, nella CLASSE di REAZIONE al FUOCO 2 (DUE) e se ne AUTORIZZA la riproduzione, ai sensi del decreto ministeriale citato in premessa, conformemente a tutte le caratteristiche apparenti e non apparenti, nonché a quelle dichiarate dalla predetta ditta nella scheda tecnica parimenti citata in premessa.

Sul marchio o sulla dichiarazione di conformità, da allegarsi ad ogni tipo di fornitura del materiale oggetto della presente omologazione, dovranno essere riportati:

- NOME DEL PRODUTTORE: Ditta F.LLI GIOVANARDI di GIOVANARDI CARLO & C. S.n.c.  
(o altro segno distintivo);
- ANNO DI PRODUZIONE: (da indicarsi);
- CLASSE DI REAZIONE AL FUOCO: 2 (DUE);
- CODICE: MN222A70CD200043;
- POSA IN OPERA: SOSPESO SUSCETTIBILE DI PRENDERE FUOCO SU AMBO LE FACCE;
- IMPIEGO: TENDONE;
- MANUTENZIONE: METODI "C e D" ALLEGATO A 1.6 AL D.M. 26/6/1984

Si richiamano tutti gli obblighi di legge spettanti al produttore e a tutti i soggetti comunque interessati, a norma del Codice Civile, del Codice Penale e del decreto ministeriale 26 giugno 1984.

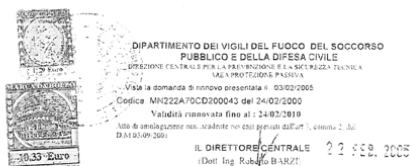
Roma, 24 FEB. 2000

Fasc. 4190 sott. 212

N.B. IL PRESENTE ATTO DI OMOLOGAZIONE  
E' RIPRODUCIBILE UNICAMENTE  
NELLA SUA INTEGRALE STESURA

IL DIRETTORE GENERALE

*Dirigente*  
*Carlo Stazzini*  
Carlo Stazzini





## CLASSIFICATION OF REACTION TO FIRE PERFORMANCE IN ACCORDANCE WITH EN 13501-1:2007+A1:2009

<b>Sponsor</b>	Zingerlemetal AG Förche 7 I-39040 Natz / Schabs (BZ) Italy
<b>Prepared by</b>	Efectis Nederland BV Lange Kleiweg 5 P.O. Box 1090 NL-2280 CB RIJSWIJK The Netherlands
<b>Notified Body no.</b>	1234
<b>Product name</b>	<b>PVC fabric</b>
<b>Classification report no</b>	2012-Efectis-R9353c
<b>Issue number</b>	1
<b>Date of issue</b>	August 2012
<b>Project number</b>	2012353

This classification report consists of four pages and may only be used in its entirety.

## 1. Introduction

This classification report defines the classification assigned to **PVC fabric** in accordance with the procedures given in EN 13501-1:2007+A1:2009.

## 2. Details of classified product

### 2.1 General

The product, **PVC fabric**, will be used for tents.

### 2.2 Product description

The product is composed of:

Material: PVC fabric, laminated 400 gr/m<sup>2</sup>  
 Specifications: PES 250x250D, 22x23 / sq.inch  
 Treatment: UV + F/R  
 Width: 190cm  
 Colour: white

The product has a total thickness of 0.3 mm and a mass per unit area of approx. 400 kg/m<sup>2</sup>.

### 2.3 Manufacturer/Importer

Wonpoong  
South Korea

## 3. Standards, reports, results and criteria in support of this classification

### 3.1 Reports

Name of Laboratories	Name of sponsor	Report ref. no.	Test method
Efectis Nederland BV The Netherlands	Zingerlemetal AG Italy	2012-Efectis-R9353a 2012-Efectis-R9353b	EN ISO 11925-2:2010 EN 13823:2010

## 3.2 Test results

Test method and test number	Parameter	No. tests	Results	
			Continuous parameter – mean (m)	Compliance with parameters
EN-ISO 11925-2				
surface flame impingement	Fs ≤150 mm [mm]	6	95	-
	Ignition of filter paper		-	Compliant
edge flame impingement	Fs ≤150 mm [mm]	6	86	-
	Ignition of filter paper		-	Compliant
EN 13823				
PVC fabric	FIGRA <sub>0,2MJ</sub> [W/s]	3	14	-
	FIGRA <sub>0,4MJ</sub> [W/s]		0	-
	THR <sub>600s</sub> [MJ]		0,5	-
	LFS < edge		-	Compliant
	SMOGRA [m <sup>2</sup> /s <sup>2</sup> ]		123	-
	TSP <sub>600s</sub> [m <sup>2</sup> ]		142	-
	Flaming debris - flaming ≤ 10 s - flaming > 10 s		-	Compliant Compliant

## 3.3 Classification criteria

Classification criteria of the Single Burning Item (SBI) test			
Class	Fire	Class	Smoke
A2	FIGRA <sub>0,2 MJ</sub> ≤ 120 W/s LFS < edge of the long wing specimen THR <sub>600s</sub> ≤ 7,5 MJ	s1	SMOGRA ≤ 30 m <sup>2</sup> /s <sup>2</sup> TSP <sub>600s</sub> ≤ 50 m <sup>2</sup>
B	FIGRA <sub>0,2 MJ</sub> ≤ 120 W/s LFS < edge of the long wing specimen THR <sub>600s</sub> ≤ 7,5 MJ	s2	SMOGRA ≤ 180 m <sup>2</sup> /s <sup>2</sup> TSP <sub>600s</sub> ≤ 200 m <sup>2</sup>
C	FIGRA <sub>0,4 MJ</sub> ≤ 250 W/s LFS < edge of the long wing specimen THR <sub>600s</sub> ≤ 15 MJ	Class	Droplets
		d0	No flaming droplets/particles
		d1	Flaming droplets/particles < 10 s
D	FIGRA ≤ 750 W/s	d2	Not d0 or d1

## 4. Classification and field of application

### 4.1 Reference of classification

This classification has been carried out in accordance with clause 11 of EN 13501-1:2007+A1:2009.

## 4.2 Classification

The product, **PVC fabric**, in relation to its reaction to fire behaviour is classified:

**B**

The additional classification in relation to smoke production is:

**s2**

The additional classification in relation to flaming droplets / particles is:

**d0**

**Reaction to fire classification: B - s2, d0**

## 4.3 Field of application

This classification is valid for the following product parameters:

- Thickness 0.3 mm
- Surface density 400 g/m<sup>2</sup>
- Other properties laminated

This classification is valid for the following end use applications:

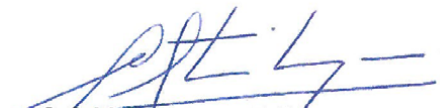
- Substrate not applicable
- Air gap free standing
- Methods and means of fixing not applicable
- Joints no joints
- Other aspects of end use conditions used for tents


## 4.4 Duration of the validity of this classification report

There are no limitations in time on the validity of this report.

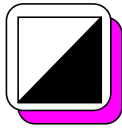
## 5. Limitations

This classification document does not represent type approval or certification of the product.

  
C.C.M. Steinhage B.Sc.  
Project leader reaction to fire

  
A.J. Lock  
Project leader reaction to fire





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 Traminerstraße 2  
 39040 Auer  
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 Tel: 0471/502862  
 Fax: 0471/518541

## Summary of Structural Calculations for MASTERTENT

### 1 Project Description

This description represents only a summary of the structural analysis. Detailed calculations are retained by ZINGERLEMETAL and can be made available, if there is a legitimate need.

The maximum allowable wind forces and the maximum allowable area loads on the tent structure are computed for both, the "35" and the "50" profiles.

### 2 Applicable Standards

CNR-UNI 10011    CNR 10012-85    CNR 10022-84    CNR 10024-86  
 DIN 18800

### 3 Methodology

The symmetric tent structure is analyzed longitudinally and in cross section. The scaffold is considered as a flat structure and the resulting forces are considered to act perpendicular on a plane surface. For simplicity reasons, the perpendicular force has been substituted by three individual forces acting on three locations.

The vertical forces transmitted down through the struts are considered as weights acting on the base plates. Calculations were performed for two different load values on the base plates, 30 kg and 7 kg. These two values were used to calculate the maximum wind speed the tent can be exposed to (longitudinally and across), before the tent starts to move. The allowable maximum value is based on the worst case scenario. Calculations are also carried out to check stress levels and structural stability.

Material properties and geometric parameters were provided by the ZINGERLEMETAL. Any deviation from these properties and parameters will render this calculation invalid.

### 4 Materials

Aluminum: F12:  $R=120N/mm^2$   
 Maximum allowable stress:  $R_{allow}: 60N/mm^2$     DIN 18800 Load Case HZ

### 5 Load Computation

Wind Load according to Chapter 5.1.3 ff CNR 10012-85

#### 5.1 Wind Pressure

$$W = p \times G \times C$$

W.. Wind Pressure    p.. kinetic Wind Pressure    G.. Gust Factor    C.. Force Factor

$$W = v_z^2 / 1,6 \times G \times C$$

$$\Rightarrow W = 1,167 \times v^2$$

$$\Rightarrow v = \sqrt{W / 1,167}$$

#### 5.2 Force Calculation

$$F_{Bymin} = -300N \quad [\text{for base plate with 30kg load}]$$

$$F_{Bymin} = -70N \quad [\text{for base plate with 7kg load}]$$

##### a) Vertical Forces

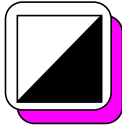
$$\Sigma M_B = 0$$

$$\Sigma F_y = 0 \quad F_{AY} + F_{BY} - 2F_{V1} - F_{V2} = 0$$

$$\Sigma F_x = 0 \quad F_{AX} - F_{BX} = F_{h1} + F_{h2} + F_{h3}$$

$$\Sigma M_x = 0 \quad M_i = F_{AX} X$$

$$M_{ij} = F_{BX} S - (F_{V1} X - F_{By}) X - F_{h3} h - 2F_{V1} (X-a)$$



Ing. Norbert Gruber  
 Traminerstraße 2  
 39040 Auer  
 Email: [gruber.norbert@rolmail.net](mailto:gruber.norbert@rolmail.net)  
 Tel: 0471/502862  
 Fax: 0471/518541

## b) Supplementary Energy

$$U^* = 1/(2EJ_1) \int M_I^2 dx + 1/(2EJ_2) \int M_{II}^2 dx$$

$$\delta U^*/\delta F_{AX} = 0 \quad 1/(2EJ_1) \int M_I^2 \delta M_I / \delta F_{AX} dx + 1/(2EJ_2) \int M_{II}^2 \delta M_{II} / \delta F_{AX} dx = 0$$

$$F_{AX} = 2a(F_{h1} s + F_{h2} s + F_{h3} s - F_{v1} a + F_{By} a + F_{h3} h) / (s^2 J_2 / 3J_1 + 2as)$$

For "30" Profiles:  $F_{AX} = 2a(F_{h1} s + F_{h2} s + F_{h3} s - F_{v1} a + F_{By} a + F_{h3} h) / (0,1415 s^2 + 2as)$   
 $F_{BX} = F_{AX} - F_{h1} - F_{h2} - F_{h3}$

For "40" Profiles:  $F_{AX} = 2a(F_{h1} s + F_{h2} s + F_{h3} s - F_{v1} a + F_{By} a + F_{h3} h) / (0,0567 s^2 + 2as)$   
 $F_{BX} = F_{AX} - F_{h1} - F_{h2} - F_{h3}$

Approximation:  $F_{AXmax} = 2a(F_{h1} s + F_{h2} s + F_{h3} s - F_{v1} a + F_{h3} h) / (2as)$

Profile Values			B	H	B	h	Jy
50 Profile	J	43x43x2,5	43 mm	43 mm	38 mm	38 mm	73.365 mm <sup>4</sup>
35 Profile	J	33x33x2	33 mm	33 mm	29 mm	29 mm	29.419 mm <sup>4</sup>
Scissors	J <sub>s</sub>	30x15x2	15 mm	30 mm	11 mm	26 mm	6.245 mm <sup>4</sup>

## 5.3 Stress Analysis

Location I

$$\Sigma F_x = 0 \quad F_{h2} + S_{1x} = 0$$

$$\Rightarrow S_{1x} \quad \Rightarrow S_1 = S_{1x} / \sin \alpha$$

$$R_{max} = S_{1x} / A$$

Location II

$$\Sigma F_y = 0 \quad F_{v2} / 2 + S_{2y} = 0$$

$$\Rightarrow S_{2y} \quad \Rightarrow S_2 = S_{2y} / \cos \alpha$$

$$R_{max} = S_{2y} / A$$

## 5.4 Stability Check

$$Pk = p^2 E J_1 / l_k^2$$

## 6 Results

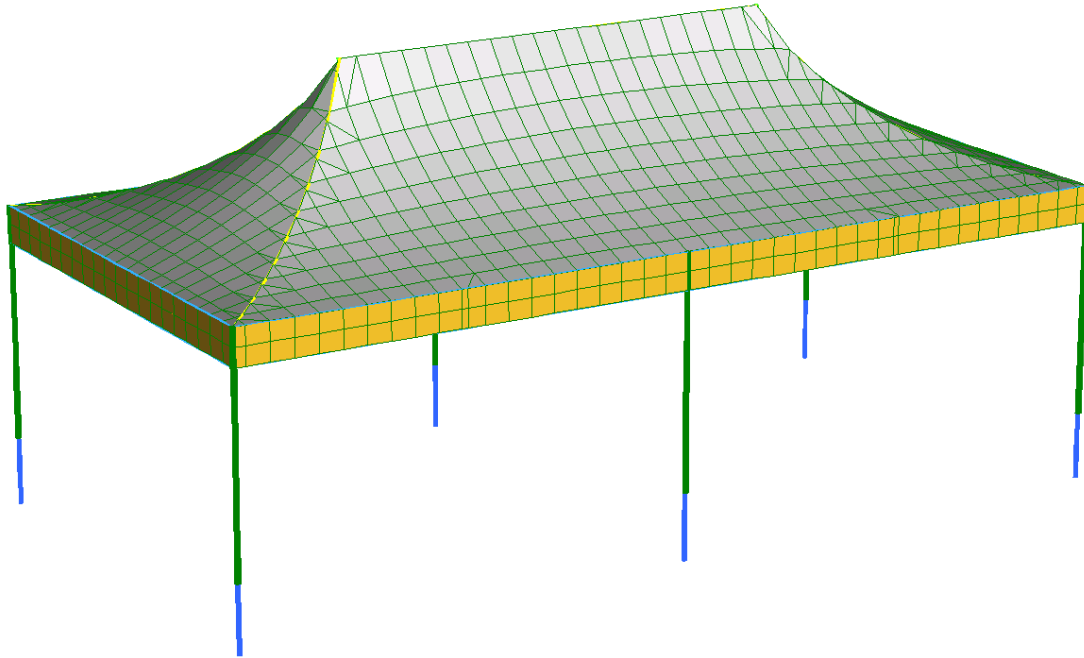
Allowable **Wind Speeds** and maximum allowable **Vertical Loads** for all tent types are determined from the equations shown above under utilization of the following tabulations.

Base Plate=>	30kg	7kg
Tent Type	V[km/h]	V[km/h]
8x4(50)	42,9	25,4
4x4(50)	42,9	25,4
4x2 (50)	28,7	25,4
6x3(50)	48,2	25,4
6x4(50)	45,0	25,4
4,5x3(50)	43,7	25,4
3x3(50)	48,1	25,4
6x3	48,1	25,4
4,5x3 (35)	43,7	25,4
3x3 (35)	48,2	25,4
1,5x3 (35)	30,7	25,4

Maximum load on structure for "35" and "50" profiles:

$$120N/m^2 = 12kg/m^2$$

Calculations performed by:  
 Ing. Norbert Gruber



Structures: **Tent 8x4m, 6x4m, 4x4m, 6x3m, 4,5x3m, 3x3m, 3x2m, 2x2m, 5x5m**  
 valid also for tents with awning

Object: **Structural report**

Type: **Temporary structure**

Project and manufacture:

**ZINGERLEMETAL®**



Structural design:

**Dr. Ing. Massimo Maffei** Profession legally qualified and register in Engineer Order in Vicenza (ITALY) with position n° 1989

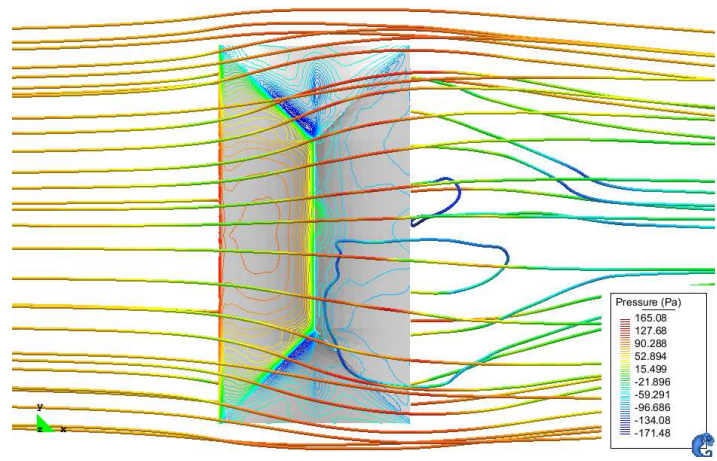
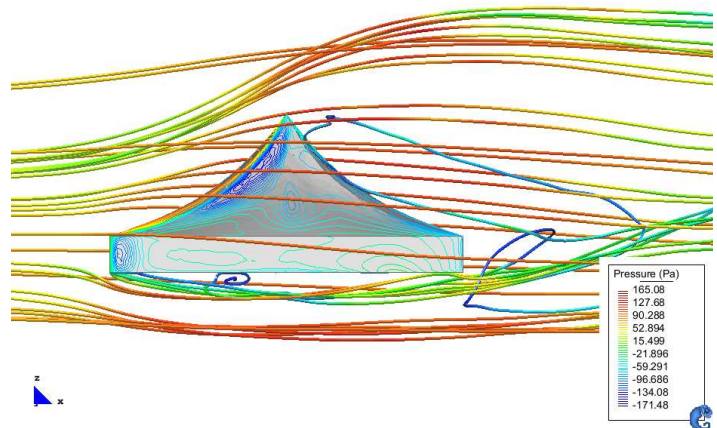
ZNG-050-RP1015	0	14-09-10 1	(15-09-2010)		
Report n°	Pag. n°D	ata	Revision n°	Check	Data



## 6 CONCLUSION

Here below it is possible to find some important points that summarize the analysis:

- The structure is a temporary tent, so in according with UNI EN 13782 snow load is not considered and the base velocity can be reduced as specified;
- The structure without belts lateral elements can support a wind that has a fundamental speed of 16 m/s (57.6km/h)
- The structure with belt lateral elements can support a wind that has a fundamental speed of 20 m/s (72km/h). In this case the helical pickets have a length of 43.5cm.
- The structure with belt lateral elements can support a wind that has a fundamental speed of 30 m/s (108km/h). In this case the pickets have diameter of Ø30mm and a length of 80cm.



## Eigenschaften Aluminium LEGA 6060

### Chemische Zusammensetzung in %

Legierung	Cu	Fe	Mg	Si	Mn	Zn	Ti	Cr	Al
<b>6060</b>	max	max			max	max	max	max	
Theoretische Werte	- 0,10	- 0,35	0,45 0,38-0,5	0,45 0,38-0,5	- 0,1	- 0,1	0,10	0,10	Rest

### Physikalische Eigenschaften

<p>Dichte: 2,70 kg/dm<sup>3</sup></p> <p>Schmelztemperatur: 600 °C</p> <p>Spezifische Hitze bei 100 °C: 0,22 cal/g<sup>-1</sup>°C<sup>-1</sup></p> <p>Wärmeleitfähigkeit bei 20 °C</p> <p>O: 0,42 cal/sec cm °C</p> <p><b>IDEAL ZUM ELOXIEREN</b></p>	<p>Koeffizient für lineare Expansion:</p> <p>20 bis 100 °C 23 · 10<sup>-6</sup> °C<sup>-1</sup></p> <p>20 bis 200 °C 24 · 10<sup>-6</sup> °C<sup>-1</sup></p> <p>20 bis 300 °C 25 · 10<sup>-6</sup> °C<sup>-1</sup></p> <p>Spezifischer elektrischer Widerstand bei 20 °C: T6:3,25 μ Ω cm</p> <p>Elastizitätsmodul: 6700 Kg/mm<sup>2</sup></p>
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 Exportnr. 019396  
 www.mastertent.com

## ZINGERLEMETAL®

Technical data sheet / Technisches Datenblatt

### “OXFORD 500”

#### POLYESTER FABRIC / GEWEBE 500 x 500 D

Producer/Hersteller	Cetate Production
Finishing/Beschichtung:	PD, WR, PU colour 3x, F/R, ANTI-UV
Coating side/beschichtete Seite:	
- Main material/Hauptmaterial:	<i>Aromatic urethane Polymer: 60%</i>
- Fire retardant material/feuerfestes Material:	<i>Decabromo diphenyl Oxides: 20%</i>
	<i>Antimony Trioxide: 20%</i>
Front site/Frontseite:	
- Water repellency/wasserabweisend:	<i>Perfluoro Alkyl Copolymer: 10%</i>
Yarn/Garn:	100% Polyester 500x500D
Density/Webdichte:	46 (Warp) x 36 (Weft) per inch <sup>2</sup>
Weight/Gewicht:	220 gr/m <sup>2</sup>
Width/Breite:	155 cm
Colorant/Farbstoff:	Bagacrone – India
Highest traction and extension/Höchstzugkraft und –dehnung:	ISO 13934-1:1999 – Mittelwert aus je 5 Streifen
	Highest traction – warp
	Höchstzugkraft – Kette : 2.030 N
	Highest traction - shot
	Höchstzugkraft – Schuß : 1.577 N
	Highest extension - warp
	Höchstzugkraftdehnung – Kette : 26,6 %
	Highest extension - shot
	Höchstzugkraftdehnung – Schuß : 27,1%
Water purity/Wasserechtheit	ISO 105 E01:1994
	colour change/Änderung der Farbe : 5
	Anbluten der Begleitgewebe-Polyester : 5
	Anbluten der Begleitgewebe – Baumwolle: 5
Spot acid purity/Echtheit gegen Fleckensäure	ISO 105 E05:1997
	Water/Wasser : 5
	Acetic acid/Essigsäure : 5
	Sulfuric acid/Schwefelsäure : 4
Light-fastness/Lichtechtheit	ISO 105 B02: 1999
	Light-fastness/Lichtechtheitsnote : ≥ 6 (Mittelwerte)
Water-proofing/Wasserdichtheit	ISO 811: 1981 – Water-column-test/Wassersäuletest
	Average/Mittelwert : > 161 cm
	Highest value/Höchster Wert : > 200 cm
	Lowest value/Niedrigster Wert : 161 cm

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## ZINGERLEMETAL®

Technical data sheet / Technisches Datenblatt

### “OXFORD 250”

#### POLYESTER FABRIC / GEWEBE 250 x 250 D

Producer/Hersteller

Finishing/Beschichtung:

Coating side/beschichtete Seite:

- *Main material/Hauptmaterial:*
- *Fire retardant material/feuerfestes Material:*

Front site/Frontseite:

- *Water repellency/wasserabweisend:*

Yarn/Garn:

Density/Webdichte:

Weight/Gewicht:

Width/Breite:

Colorant/Farbstoff:

Highest traction and extension/Höchstzugkraft und -dehnung:

Cetate Production

PD, WR, PU colour 3x, F/R, ANTI-UV

*Aromatic urethane Polymer: 60%*  
*Decabromo diphenyl Oxides: 20%*  
*Antimony Trioxide: 20%*

*Perfluoro Alkyl Copolymer: 10%*

100% Polyester 250x250D

54 (Warp) x 45 (Weft) per inch<sup>2</sup>

160 gr/m<sup>2</sup>

155 cm

Bagacrone – India

ISO 13934-1:1999 – Mittelwert aus je 5 Streifen

Highest traction – warp

Höchstzugkraft – Kette : 1.198 N

Highest traction – shot

Höchstzugkraft – Schuß : 815 N

Highest extension – warp

Höchstzugkraftdehnung – Kette : 19,9 %

Highest extension – shot

Höchstzugkraftdehnung – Schuß : 23,0 %

ISO 105 E01:1994

colour change/Änderung der Farbe : 5

Anbluten der Begleitgewebe-Polyester : 5

Anbluten der Begleitgewebe – Baumwolle: 5

ISO 105 E05:1997

Water/Wasser : 5

Acetic acid/Essigsäure : 5

Sulfuric acid/Schwefelsäure : 4

ISO 105 B02: 1999

Light-fastness/Lichtechtheitsnote : ≥ 6 (Mittelwerte)

ISO 811: 1981 – Water-column-test/Wassersäuletest

Average/Mittelwert : > 200 cm

Highest value/Höchster Wert : > 200 cm

Lowest value/Niedrigster Wert : > 200 cm

Water purity/Wasserechtheit

Spot acid purity/Echtheit gegen Fleckensäure

Light-fastness/Lichtechtheit

Water-proofing/Wasserdichtheit

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