

# Environmental Product Declaration

In accordance with ISO 14025 and EN 15804 for:

## Aluminium Composite Panels

from

**Albond – Sistem Metal**

TURKEY **EPD**<sup>®</sup>

ENVIRONMENTAL PRODUCT DECLARATIONS



Programme:

EPD Turkey, a fully aligned regional programme  
[www.epdturkey.org](http://www.epdturkey.org)

The International EPD® System  
[www.environdec.com](http://www.environdec.com)

Programme  
operator:

EPD Turkey:  
SÜRATAM – Turkish Centre for Sustainable  
Production Research & Design Nef 09 B Blok  
No:7/15 34415 Kağıthane/Istanbul, TURKEY

EPD International AB

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S-P-01261  
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Geographical  
scope:

Global



## General information

### Information about the organization

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Name and location of production site: Çorlu, Tekirdağ / Turkey

## About the company

From its establishment in 2002 until 2004, Albond – Sistem Metal operated as an aluminium composite panels distributor. In May 2005, Sistem Metal commenced production of PE class composite panels with the instalment of its assembly line with an annual production capacity of 1,750,000 m<sup>2</sup>. Thanks to its quality-based approach, Albond – Sistem Metal became a leading exporter company and grew rapidly.

Albond continues production successfully within its new factory build in 2010 which has a 30,000 m<sup>2</sup> enclosed area in Çorlu, Tekirdağ. With the addition of the new factory, Albond increased its production capacity to 7,500,000 m<sup>2</sup>. With 4 composite panel assembly lines within its premises, Albond secured its position as a sector leader in producing A2, FR, and PE fire class composite panels.

With the investment for its 4<sup>th</sup> assembly line, Albond became the first company in Turkey to operate 2-meter-wide production capacity. In addition, Albond introduced a state-of-the-art aluminium bobbin painting line with a capacity of 20,000 tonnes per year. In addition to establishing its slitting and cutting-to-length lines, with the cooperation of world's biggest paint producers, Albond established its paint mixing unit within its premises and completed its integrated production facility investments.

Albond has received 5 awards from Istanbul Exporters Association for its exports. Albond exports 45% of its yearly production, mainly to European countries such as Spain, England, Italy, France, Germany, Poland and Benelux which composes 70% of all exports. Albond is the biggest aluminium composite panels exporter in Turkey. Albond became the aluminium composite panels producer company with the most increase in exports and received the first-place prize in this category from Istanbul Materials and Minerals Association. From its very beginning until today, Albond kept progressing and year by year, it achieves better ranks among Turkey's biggest industrial enterprises list (ISO 500).

## Product information

Product name: Aluminium Composite Panel

Product identification: Albond A2, Albond FR, Albond PE Aluminium composite panels.

Product description: The products referred are aluminium composite panels composed with the integration of two aluminium sheets with a mineral or polyethylene filler amongst them. Aluminium composite panels are mostly used as cladding material for building interior or exteriors. They can also be used within the advertising sector and for decoration. Aluminium composite panels can have different fire classes according to their filler material properties.

UN CPC code: 41534, Plates, sheets and strip, of aluminium, of a thickness exceeding 0.2 mm

Geographical scope: Turkey

## LCA information

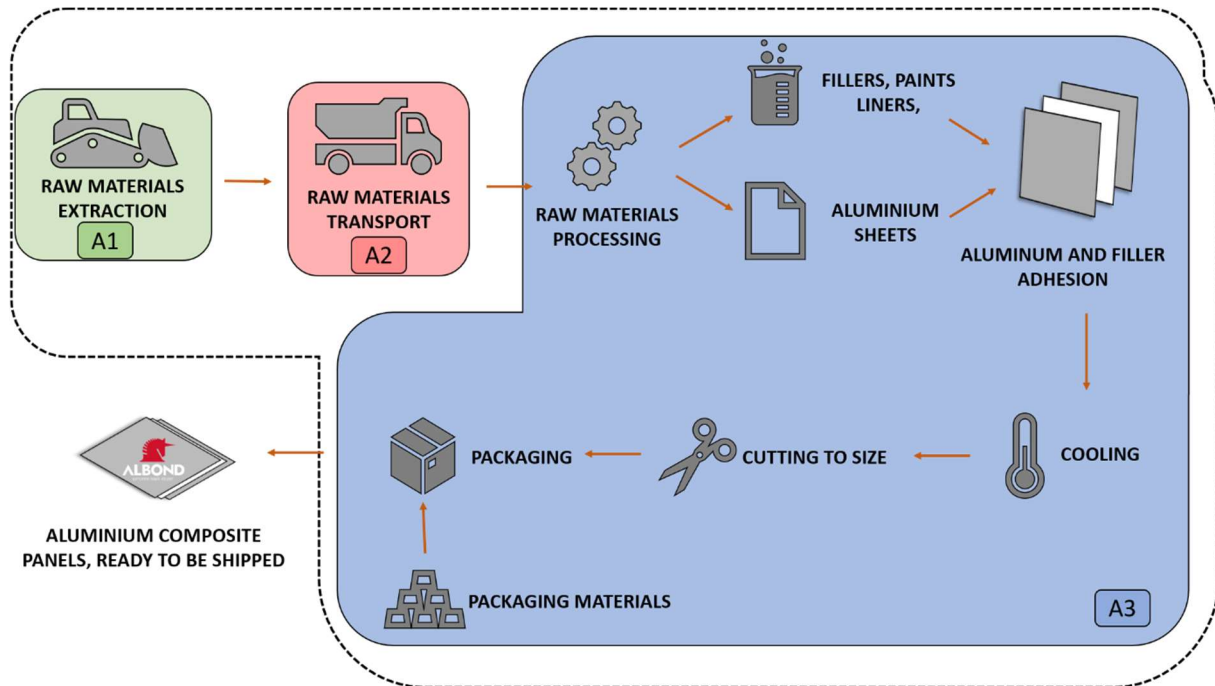
Functional unit / declared unit: 1 m<sup>2</sup>

Reference service life: 20 years

Time representativeness: 2017

Database(s) and LCA software used: TLCID (Turkish Lifecycle Inventory Database), Ecoinvent 3.4, SimaPro

System diagram:



Description of system boundaries: This is a cradle to gate EPD. In this study, the system boundary involves raw materials (A1), transport (A2) and manufacturing (A3). Raw materials stage includes extraction and pre-treatment processes before production. Transport includes transport of raw materials needed for the production to the production facility in Çorlu. Manufacturing stage includes electricity, natural gas and diesel use during the production processes. It also includes packaging materials.

Excluded lifecycle stages: The life cycle stages A4, A5, B1-7 and C1-3 was excluded from the LCA study.

More information: Life cycle assessment calculations required for this EPD were done using SimaPro, a life cycle assessment program. Energy calculations were obtained using Cumulative Energy Demand v 1.10, which is present in SimaPro's latest version. Environmental Impacts were calculated using CML-IA baseline v4.2 and water scarcity potential was calculated using AWARE (Available Water Remaining) method. Global Warming Potential was calculated using IPCC GWP 100a method. Albond produces painted aluminium panels and aluminium composite panels. This EPD is relevant for Albond Aluminium Composite Panels with fire class A2, FR and PE. Mass allocation was made between different fire classes based on the production amounts provided by Albond. No cut-off rule was applied within the LCA study underlying this EPD.

Fire Classes:

Fire Class	Standard
A2 (A2 s1 d0)	EN 13501-1 and EN 1716
FR ( B s1 d0)	EN 13501-1
PE ( D s2 d0)	EN 13501-1

Technical Specifications:

Specification	Measure
Yield Strength (kg/mm <sup>2</sup> )	4.1
Tensile Strength (kg/mm <sup>2</sup> )	4,8
Elongation (l0=5,65 A0 <sup>12</sup> - %)	15
Bending Strength (MPa)	122
Bending Elasticity Modulus (MPa)	10834
Thermal Resistance (m <sup>2</sup> K/W) (m <sup>2</sup> K/W)	0,0103
Deviation Temperature (° C)	115
Heat Transition Coefficient (Wm <sup>2</sup> /K)	5,54
Linear Thermal Expansion (mm/m/° C)	0,024
Temperature Resistance (° C)	-50 / 80
Sound Transmission Loss (dB)	25
Rigidity (kN m <sup>2</sup> /m) (4mm)	0.240
Section Modulus (cm <sup>3</sup> /m) (4mm)	1.75
Rigidity (kN m <sup>2</sup> /m) (3mm)	0.125
Section Modulus (cm <sup>3</sup> /m) (3mm)	1.25

## Content declaration

### Product

Materials	Albond A2 Composite Panel	Albond FR Composite Panel	Albond PE Composite Panel
Aluminium Sheet, % of total mass	25-30%	29-34%	27-43%
Mineral Filler, % of total mass	60-65%	45-48%	-
Adhesive, % of total mass	2%	3%	5-7%
Polyethylene Filler, % of total mass	7%	18-19%	50-65%
Coating, % of total mass	1%	1%	1%
Total, kg/m <sup>2</sup>	7.8-8.3	6.8-7.3	4.6-5.8

No substances included in the Candidate List of Substances of Very High Concern for authorization under the REACH regulations are present in Albond's Aluminium Composite Panels, either above the threshold for registration with the European Chemicals Agency or above 0.1 % (wt/wt).

### Packaging

Distribution packaging: Pallet, plastic fleeces, cardboard bracing, corrugated board

Consumer packaging: Protective film

After use, packaging materials can be re-used or recycled. Wooden pallets, plastic and paper materials can be collected separately and directed to the recycling circuit.

## Environmental performance for A2 Composite Panels

### Potential Environmental Impact

PARAMETER		UNIT	A1	A2	A3	TOTAL A1-A3
Global warming potential (GWP)	Fossil	kg CO <sub>2</sub> eq.	51.1E+0	1.3E+0	2.4E+0	54.8E+0
	Biogenic	kg CO <sub>2</sub> eq.	549.8E-3	11.0E-3	67.8E-3	628.6E-3
	Land use and land transformation	kg CO <sub>2</sub> eq.	124.8E-3	513.5E-6	744.1E-6	126.1E-3
	TOTAL	kg CO <sub>2</sub> eq.	51.8E+0	1.3E+0	2.5E+0	55.6E+0
Acidification potential (AP)		kg SO <sub>2</sub> eq.	312.4E-3	16.4E-3	9.5E-3	338.3E-3
Ozone Depletion Potential (ODP)		kg CFC 11 eq.	2.4E-6	221.2E-9	129.7E-9	2.7E-6
Eutrophication potential (EP)		kg PO <sub>4</sub> <sup>3-</sup> eq.	73.5E-3	2.0E-3	4.0E-3	79.5E-3
Formation potential of tropospheric ozone (POCP)		kg C <sub>2</sub> H <sub>4</sub> eq.	7.7E-3	-458.1E-6	128.5E-6	7.3E-3
Abiotic depletion potential – Elements		kg Sb eq.	327.3E-6	1.1E-6	25.0E-6	353.4E-6
Abiotic depletion potential – Fossil resources		MJ, net calorific value	441.9E+0	18.2E+0	35.7E+0	495.9E+0
Water scarcity potential		m <sup>3</sup> eq.	9.4E+0	139.4E-3	945.0E-3	10.5E+0

### Use of resources

Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	49.6E+0	377.0E-3	9.7E+0	59.7E+0
	Used as raw materials	MJ, net calorific value	000.0E+0	000.0E+0	2.7E+0	2.7E+0
	TOTAL	MJ, net calorific value	49.6E+0	377.0E-3	12.4E+0	62.4E+0
Primary energy resources –	Use as energy carrier	MJ, net calorific value	486.4E+0	20.1E+0	36.3E+0	542.8E+0



Non-renewable	Used as raw materials	MJ, net calorific value	4.1E+0	000.0E+0	6.4E+0	10.5E+0
	TOTAL	MJ, net calorific value	490.4E+0	20.1E+0	42.7E+0	553.3E+0
Secondary material		kg	000.0E+0	000.0E+0	000.0E+0	000.0E+0
Renewable secondary fuels		MJ, net calorific value	000.0E+0	000.0E+0	000.0E+0	000.0E+0
Non-renewable secondary fuels		MJ, net calorific value	000.0E+0	000.0E+0	000.0E+0	000.0E+0
Net use of fresh water		m <sup>3</sup>	225.1E-3	3.3E-3	9.0E-3	237.4E-3
<b>Waste production flows</b>						
Hazardous waste disposed		kg	-	-	35.1E-3	35.1E-3
Non-hazardous waste disposed		kg	-	-	558.9E-3	558.9E-3
Radioactive waste disposed		kg	-	-	-	-
<b>Output flows</b>						
Components for reuse		kg	-	-	000.0E+0	000.0E+0
Material for recycling		kg	-	-	496.1E-3	496.1E-3
Materials for energy recovery		kg	-	-	000.0E+0	000.0E+0
Exported energy, electricity		MJ	-	-	000.0E+0	000.0E+0
Exported energy, thermal		MJ	-	-	000.0E+0	000.0E+0

## Environmental performance for FR Composite Panels

### Potential Environmental Impact

PARAMETER		UNIT	A1	A2	A3	TOTAL A1-A3
Global warming potential (GWP)	Fossil	kg CO <sub>2</sub> eq.	50.1E+0	496.5E-3	2.4E+0	53.0E+0
	Biogenic	kg CO <sub>2</sub> eq.	524.0E-3	4.2E-3	69.1E-3	597.4E-3
	Land use and land transformation	kg CO <sub>2</sub> eq.	116.1E-3	137.6E-6	685.0E-6	116.9E-3
	TOTAL	kg CO <sub>2</sub> eq.	50.7E+0	500.8E-3	2.5E+0	53.8E+0
Acidification potential (AP)		kg SO <sub>2</sub> eq.	296.0E-3	1.8E-3	10.0E-3	307.8E-3
Ozone Depletion Potential (ODP)		kg CFC 11 eq.	2.1E-6	94.0E-9	127.5E-9	2.4E-6
Eutrophication potential (EP)		kg PO <sub>4</sub> <sup>3-</sup> eq.	67.5E-3	397.6E-6	3.8E-3	71.7E-3
Formation potential of tropospheric ozone (POCP)		kg C <sub>2</sub> H <sub>4</sub> eq.	7.1E-3	-85.6E-6	118.8E-6	7.2E-3
Abiotic depletion potential – Elements		kg Sb eq.	306.3E-6	794.2E-9	23.5E-6	330.7E-6
Abiotic depletion potential – Fossil resources		MJ, net calorific value	501.4E+0	7.6E+0	35.3E+0	544.3E+0
Water scarcity potential		m <sup>3</sup> eq.	9.5E+0	55.7E-3	873.2E-3	10.4E+0

### Use of Resources

Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	48.0E+0	114.8E-3	7.9E+0	56.1E+0
	Used as raw materials	MJ, net calorific value	000.0E+0	000.0E+0	2.5E+0	2.5E+0
	TOTAL	MJ, net calorific value	48.0E+0	114.8E-3	10.5E+0	58.6E+0



Primary energy resources – Non-renewable	Use as energy carrier	MJ, net calorific value	443.2E+0	8.2E+0	36.1E+0	487.6E+0
	Used as raw materials	MJ, net calorific value	121.3E+0	000.0E+0	6.0E+0	127.3E+0
	TOTAL	MJ, net calorific value	564.5E+0	8.2E+0	42.1E+0	614.8E+0
Secondary material	kg		000.0E+0	000.0E+0	000.0E+0	000.0E+0
Renewable secondary fuels	MJ, net calorific value		000.0E+0	000.0E+0	000.0E+0	000.0E+0
Non-renewable secondary fuels	MJ, net calorific value		000.0E+0	000.0E+0	000.0E+0	000.0E+0
Net use of fresh water	m <sup>3</sup>		208.2E-3	1.7E-3	9.1E-3	219.0E-3
<b>Waste Production Flows</b>						
Hazardous waste disposed	kg		-	-	32.9E-3	32.9E-3
Non-hazardous waste disposed	kg		-	-	523.3E-3	523.3E-3
Radioactive waste disposed	kg		-	-	-	-
<b>Output Flows</b>						
Components for reuse	kg		-	-	000.0E+0	000.0E+0
Material for recycling	kg		-	-	464.5E-3	464.5E-3
Materials for energy recovery	kg		-	-	000.0E+0	000.0E+0
Exported energy, electricity	MJ		-	-	000.0E+0	000.0E+0
Exported energy, thermal	MJ		-	-	000.0E+0	000.0E+0

## Environmental performance for PE Composite Panels

### Potential Environmental Impacts

PARAMETER		UNIT	A1	A2	A3	TOTAL A1-A3
Global warming potential (GWP)	Fossil	kg CO <sub>2</sub> eq.	42.4E+0	283.1E-3	2.1E+0	44.8E+0
	Biogenic	kg CO <sub>2</sub> eq.	647.9E-3	2.3E-3	60.7E-3	710.9E-3
	Land use and land transformation	kg CO <sub>2</sub> eq.	106.7E-3	79.1E-6	663.4E-6	107.4E-3
	TOTAL	kg CO <sub>2</sub> eq.	43.1E+0	285.5E-3	2.2E+0	45.6E+0
Acidification potential (AP)		kg SO <sub>2</sub> eq.	248.7E-3	1.2E-3	8.3E-3	258.2E-3
Ozone Depletion Potential (ODP)		kg CFC 11 eq.	1.8E-6	53.3E-9	113.9E-9	2.0E-6
Eutrophication potential (EP)		kg PO <sub>4</sub> <sup>3-</sup> eq.	59.5E-3	248.9E-6	3.5E-3	63.2E-3
Formation potential of tropospheric ozone (POCP)		kg C <sub>2</sub> H <sub>4</sub> eq.	6.2E-3	-59.3E-6	89.4E-6	6.2E-3
Abiotic depletion potential – Elements		kg Sb eq.	277.4E-6	428.6E-9	22.2E-6	300.0E-6
Abiotic depletion potential – Fossil resources		MJ, net calorific value	374.5E+0	4.3E+0	30.8E+0	409.6E+0
Water scarcity potential		m <sup>3</sup> eq.	7.5E+0	31.6E-3	820.2E-3	8.3E+0

### Use of Resources

Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	42.8E+0	65.2E-3	8.6E+0	51.5E+0
	Used as raw materials	MJ, net calorific value	000.0E+0	000.0E+0	2.4E+0	2.4E+0
	TOTAL	MJ, net calorific value	42.8E+0	65.2E-3	11.0E+0	53.8E+0

Primary energy resources – Non-renewable	Use as energy carrier	MJ, net calorific value	376.7E+0	4.7E+0	31.2E+0	412.6E+0
	Used as raw materials	MJ, net calorific value	40.9E+0	000.0E+0	5.7E+0	46.6E+0
	TOTAL	MJ, net calorific value	417.6E+0	4.7E+0	36.9E+0	459.2E+0
Secondary material	kg		000.0E+0	000.0E+0	000.0E+0	000.0E+0
Renewable secondary fuels	MJ, net calorific value		000.0E+0	000.0E+0	000.0E+0	000.0E+0
Non-renewable secondary fuels	MJ, net calorific value		000.0E+0	000.0E+0	000.0E+0	000.0E+0
Net use of fresh water	m <sup>3</sup>		179.4E-3	930.6E-6	7.9E-3	188.2E-3
<b>Waste Production Flows</b>						
Hazardous waste disposed	kg		-	-	29.7E-3	29.7E-3
Non-hazardous waste disposed	kg		-	-	472.1E-3	472.1E-3
Radioactive waste disposed	kg		-	-	-	-
<b>Output Flows</b>						
Components for reuse	kg		-	-	000.0E+0	000.0E+0
Material for recycling	kg		-	-	419.1E-3	419.1E-3
Materials for energy recovery	kg		-	-	000.0E+0	000.0E+0
Exported energy, electricity	MJ		-	-	000.0E+0	000.0E+0
Exported energy, thermal	MJ		-	-	000.0E+0	000.0E+0

## Programme-related information and verification

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804.

<b>Programme:</b>	<p>EPD Turkey, a fully aligned regional programme          EPD Turkey,  <a href="http://www.epdturkey.org">www.epdturkey.org</a></p> <p>EPD Turkey:          SÜRATAM – Turkish Centre for Sustainable Production Research &amp; Design Nef 09 B Blok No:7/15, 34415 Kağıthane / İstanbul, Turkey  <a href="http://www.suratam.org">www.suratam.org</a></p>	<p>The International EPD® System</p> <p>EPD International AB          Box 210 60          SE-100 31 Stockholm          Sweden</p> <p><a href="http://www.environdec.com">www.environdec.com</a>  <a href="mailto:info@environdec.com">info@environdec.com</a></p>
<b>EPD registration number:</b>	S-P-01261	
<b>Published:</b>	2018-11-05	
<b>Valid until:</b>	2023-10-09	
<b>Product Category Rules:</b>	PCR 2012:01. Construction Products and Services. 2.2	
<b>Product group classification:</b>	UN CPC 41534	
<b>Reference year for data:</b>	2017	
<b>Geographical scope:</b>	Global	

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): <i>PCR 2012:01. Construction Products and Construction Services. 2.2,</i>
PCR review was conducted by: Martin Erlandsson, IVL Swedish Environmental Research Institute
Independent third-party verification of the declaration and data, according to ISO 14025:2006:
<input type="checkbox"/> EPD process certification <input checked="" type="checkbox"/> EPD verification
Third party verifier: <i>&lt;name, organisation and signature of the third party verifier&gt;</i>
<i>In case of accredited certification bodies:</i> Accredited by: <i>&lt;name of the accreditation body and accreditation number, where applicable&gt;</i> .
<i>In case of recognised individual verifiers:</i> Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier:
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

## References

### **General Programme Instructions of the International EPD® System. Version 3.0.**

**/EN 13501-1/** Fire classification of construction products and building elements – Part 1: Classification using test data from reaction to fire tests

**/ISO 8301/** Thermal insulation – Determination of steady – State thermal resistance and related properties – Heat flow meter apparatus.

**/EN 15804/** EN 15804:2012+A1:2013, Sustainability of construction works - Environmental Product Declarations — Core rules for the product category of construction products

**/ISO 14025/** DIN EN ISO 14025:2009-11: Environmental labels and declarations - Type III environmental declarations — Principles and procedures

**/ISO 14040 and ISO 14044/** DIN EN ISO 14040:2006-10, Environmental management - Life cycle assessment - Principles and framework (ISO 14040:2006) and Requirements and guidelines (ISO 14044:2006)

**/Construction Products and Construction Services PCR 2012:01 v.2.2/** Prepared by IVL Swedish Environmental Research Institute, Swedish Environmental Protection Agency, SP Trä, Swedish Wood Preservation Institute, Swedisol, SCDA, Svenskt Limträ AB, SSAB, The International EPD System, 2012:01






**/The International EPD® System/** The International EPD® System is a programme for type III environmental declarations, maintaining a system to verify and register EPD®s as well as keeping a library of EPD®s and PCRs in accordance with ISO 14025.[www.environdec.com](http://www.environdec.com)

**/Ecoinvent /** Ecoinvent Centre, [www.Eco-invent.org](http://www.Eco-invent.org)

**/TLCID/** Turkish Life Cycle Inventory Database, Turkish Centre for Sustainable Production Research and Design (SÜRATAM), [www.suratam.org](http://www.suratam.org)

**/SimaPro/** SimaPro LCA Package, Pré Consultants, the Netherlands, [www.pre-sustainability.com](http://www.pre-sustainability.com)

### Contact information:

Programme:	EPD registered through fully aligned regional programme: EPD Turkey: <a href="http://www.epdturkey.org">www.epdturkey.org</a>  ENVIRONMENTAL PRODUCT DECLARATIONS	The International EPD <sup>®</sup> System <a href="http://www.environdec.com">www.environdec.com</a> 
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3 <sup>rd</sup> party verifier:		LCA Studio Vladimír Kočí, PhD Šárecká 5, 16000 Prague 6 - Czech Republic <a href="http://www.lcastudio.cz">www.lcastudio.cz</a>

