

# ENURONALISTICS STATES S

# CEMENTITIOUS ADHESIVES FOR EXTERNAL THERMAL INSULATION COMPOSITE SYSTEMS







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### **ENVIRONMENTAL PRODUCT DECLARATION**

### ATLAS CEMENTITIOUS ADHESIVES FOR EXTERNAL THERMAL INSULATION COMPOSITE SYSTEMS

Issuance date: 10.03.2014 Validity date: 10.03.2019

### **EPD PROGRAM OPERATOR**

BUILDING RESEARCH INSTITUTE 00-611 Warsaw, ul. Filtrowa 1 www.itb.pl

### **MANUFACTURER:**

ATLAS spółka z o.o. 91-222 Łódź, ul. Św. Teresy 105, Poland atlas@atlas.com.pl www.atlas.com.pl

### Manufacturing sites information

Zakład Produkcyjny PIOTRKÓW TRYBUNALSKI, 97-300 Piotrków Trybunalski, ul. Wronia 61/63, Poland

Zakład Produkcyjny BYDGOSZCZ, 85-758 Bydgoszcz, ul. Przemysłowa 32,, Poland

Zakład Produkcyjny DĄBROWA GÓRNICZA, 41-306 Dąbrowa Górnicza, ul. Roździeńskiego 2, Poland

> Zakład Produkcyjny SUWAŁKI, 16-400 Suwałki, Dubowo II nr 33, Poland

Wytwórnia Klejów i Zapraw Budowlanych S.A. 95-100 Zgierz, ul. Szczawińska 52A, Poland

### ENVIRONMENTAL PRODUCT DECLARATION ATLAS **CEMENTITIOUS ADHESIVES** FOR EXTERNAL THERMAL INSULATION COMPOSITE SYSTEMS



### **1. BASIC INFORMATION**

This declaration is the type III Environmental Product Declaration (EPD) based on ÉN 15804:2012 and verified according to ISO 14025. It contains information about the impact of declared construction materials on environment and their aspects verified by the independent Advisory Board according to ISO 14025. Basically, a comparison or evaluation of EPD data is possible only if all the compared data were created according to EN 15804:2012 (see point 5.3 of the norm) and the building context.

Issuance date: 10.03.2014 Validation date: 01.03.2014 Validity date: 10.03.2019 Declared durability: 50 years

### 2. LIFE CYCLE ASSESSMENT (LCA)

### Declared unit

The declaration refers to 1 kg of dry mortar. System limits

The life cycle analysis of the examined products covers A1-A3 modules (Cradle to Gate) in accordance with EN 15804:2012. Its include production, including raw materials extraction and energy provision up to the finished, packed product at the factory gate. Processes whose total contribution to the final result, according to mass looked at, is less than 0.5 % was ignored.

### Data collection period

The data for manufacture of the examined products refer to the year 2012. The life cycle assessments were prepared for Poland as reference area.

### Data quality

The values determined to calculate the LCA originate from verified Atlas inventory data.

### Assumptions and estimates

The impacts of the representative ATLAS products were aggregated using weighted average. Impacts for each product and factory were inventoried and calculated separately. Databases

The data for the processes come from the following databases: Ecoinvent, EMPA, Ullmann's, Plastic-Europe, ITB-Data, SPC.

### **3. PRODUCT INFORMATION**

This environmental product declaration covers factory manufactured adhesives designed to insulate external walls of the buildings by using EPS-boards. Adhesives are used for fixing EPS-boards to the substrate as well as for mesh embedding. This environmental product declaration is valid for the following adhesives:

ATLAS HOTER S ATLAS STOPTER K-10 ATLAS HOTER U ATLAS STOPTER K-20 ATLAS STOPTER K-50

### **4. PRODUCT DESCRIPTION**

ATLAS HOTER S is cementitious adhesive manufactured as a dry mix of cement binder, quartz sand, limestone powder and additives. For bonding EPS boards (including boards made of graphite), intended for interior and exterior use.

ATLAS STOPTER K-10 is cementitious adhesive manufactured as a dry mix of cement binder, quartz sand, limestone powder



and additives. For bonding EPS boards (including boards made of graphite), intended for interior and exterior use.

ATLAS HOTER U is manufactured as a dry mix of cement binder, quartz sand, limestone powder, cellulose fibres and additives with. Designed for fixing thermal insulation boards and for the reinforced layer (base coat). For bonding EPS boards (including boards made of graphite), intended for interior and exterior use ATLAS STOPTER K-20 is manufactured as a dry mix of cement binder, guartz sand, limestone powder, cellulose fibres and additives. Designed for fixing thermal insulation boards and for the reinforced layer (base coat). For bonding EPS boards (including boards made of graphite), intended for interior and exterior use. ATLAS STOPTER K-50 is manufactured as a dry mix of white cement binder, quartz sand, limestone powder, glass fibres and additives. Suitable for the installation of different types of thermal insulation panels and the subsequent execution of a reinforced layer - the adhesive can be used with expanded polystyrene (white and graphite-enhanced) and also with mineral wool (facade and lamella). No priming masses under renders required.

### USE

Adhesives are used for fixing EPS- or XPS-boards to the substrate as well as for mesh embedding. The exception is ATLAS STOPTER K-50 which is suitable also for bonding MW boards. There are two types of adhesives: first – only for fixing thermal insulation products to the substrate, second - for fixing thermal insulation boards and for the reinforced layer (base coat) installation in the external thermal insulation of buildings. In both types of substrates are the same: concrete of all classes, aerated concrete, cement or lime-cement plasters, sandstone and rough walls of bricks, blocks, hollow blocks and other ceramic or silicate materials.

### **FUNCTION**

The function of adhesives in thermal insulation systems is:

- permanent joining the substrate with thermal insulation boards
- providing protection against mechanical damage to the boards
- creation of appropriately strong and even substrate for thin - coat rendering coat

### **5. PRODUCT TECHNICAL DATA**

Adhesive ATLAS HOTER S

Trade name	ATLAS HOTER S
Description	dry mortar, powder blended at the factory that requires only mixing with a quantity of water
Color	grey
Density	1.3 kg/dm <sup>3</sup>
Consistency	9.0 cm
Bond strength between adhesive and substrate (concrete)	$\geq 0.3 \text{ N/mm}^2$
Bond strength between adhesive and insulation product	≥ 0.1 N/mm <sup>2</sup>
Assumed consumption	4.0 – 5.0 kg/m <sup>2</sup> (powder)
Thickness	2.0 – 5.0 mm
Dangerous substance	see MSDS
Content of soluble chromium (VI) in ready-to-use mix	≤ 0.0002 %
Technical requirements	AT-15-6348/2010 as a single product AT-15-9090/2014 as element of thermal insulation system



### ENVIRONMENTAL PRODUCT DECLARATION ATLAS CEMENTITIOUS ADHESIVES FOR EXTERNAL THERMAL INSULATION COMPOSITE SYSTEMS in accordance with ISO 14025:2010 and EN 15804:2012



### Adhesive ATLAS STOPTER K-10

Trade name	ATLAS STOPTER K-10
Description	dry mortar, powder blended at the factory that requires only mixing with a quantity of water
Color	grey
Density	1.4 kg/dm <sup>3</sup>
Consistency	9.0 cm
Bond strength between adhesive and substrate (concrete)	≥ 0.25 N/mm <sup>2</sup>
Bond strength between adhesive and insulation product	≥ 0.08 N/mm <sup>2</sup>
Assumed consumption	4.0 – 5.0 kg/m <sup>2</sup> (powder)
Thickness	2.0 – 5.0 mm
Dangerous substance	see MSDS
Content of soluble chromium (VI) in ready-to-use mix	≤ 0.0002 %
Technical requirements	AT-15-4857/2013 as a single product AT-15-9090/2014 as element of thermal insulation system

### Adhesive ATLAS HOTER U.

Trade name	ATLAS HOTER U
Description	dry mortar, powder blended at the factory that requires only mixing with a quantity of water
Color	grey
Density	1.4 kg/dm <sup>3</sup>
Consistency	9.0 cm
Bond strength between adhesive and substrate (concrete)	≥ 0.3 N/mm <sup>2</sup>
Bond strength between adhesive and insulation product	≥ 0.1 N/mm <sup>2</sup>
Assumed consumption	Board application: 4.0 – 5.0 kg/m <sup>2</sup> (powder) Base coat: 3.0 – 3.5 kg/m <sup>2</sup> (powder)
Thickness	2.0 – 5.0 mm
Dangerous substance	see MSDS
Content of soluble chromium (VI) in ready-to-use mix	≤ 0.0002 %
Technical requirements	AT-15-6347/2010 as a single product AT-15-9090/2014 as element of thermal insulation system

### Adhesive Atlas STOPTER K-20

Trade name	ATLAS STOPTER K-20
Description	dry mortar, powder blended at the factory that requires only mixing with a quantity of water
Color	grey
Density	1.4 kg/dm <sup>3</sup>
Consistency	9.0 cm
Bond strength between adhesive and substrate (concrete)	≥ 0.25 N/mm <sup>2</sup>
Bond strength between adhesive and insulation product	≥ 0.08 N/mm <sup>2</sup>
Assumed consumption	Board application: 4.0 – 5.0 kg/m <sup>2</sup> (powder) Base coat: 3.0 – 3.5 kg/m <sup>2</sup> (powder)
Thickness	2.0 – 5.0 mm
Dangerous substance	see MSDS
Content of soluble chromium (VI) in ready-to-use mix	≤ 0.0002 %
Technical requirements	AT-15-3092/2013 as a single product AT-15-9090/2014 as element of thermal insulation system

### Adhesive ATLAS STOPTER K-50

Trade name	ATLAS STOPTER K-50
Description	dry mortar, powder blended at the factory that requires only mixing with a quantity of water
Color	white
Density	1.4 kg/dm <sup>3</sup>
Consistency	9.0 cm
Bond strength between adhesive and substrate (concrete)	≥ 0.25 N/mm <sup>2</sup>
Bond strength between adhesive and insulation product	≥ 0.08 N/mm <sup>2</sup>
Assumed consumption	Board application: 4.0 – 5.0 kg/m <sup>2</sup> (powder) Base coat: 3.0 – 3.5 kg/m <sup>2</sup> (powder)
Thickness	2.0 – 5.0 mm
Dangerous substance	see MSDS
Content of soluble chromium (VI) in ready-to-use mix	≤ 0.0002 %
Technical requirements	AT-15-8512/2010 as element of thermal insulation system AT-15-9090/2014 as element of thermal insulation system



### **6. PRODUCT MANUFACTURE**

Raw materials and energy.

Table 1. Raw materials used to produce ATLAS adhesives

No	Name of semi-finished product or raw material	total used in production [Mg]	used on product [%/kg]		used on product [kg/m²]
1	raw materials	20567.8		95.45	3.1274
2	additives	372.4		1.73	0.065
3	rest components (each < 0,5%)	153.6		0.71	0.0281
4	pallet	341.9		1.59	0.0423
5	PE foil st	44.5		0.21	0.0136
6	PE foil	3.3		0.02	0.0008
7	multilayer paper bag	65		0.30	0.0072

The figure below show the working process during the production of dry mixes. The raw materials are stored in the production factory in silos, big bags, or sacks accordingly. They are dosed and intensely mixed according to the applicable formulation. Next, the products, in the form of dry mixes, are packed into paper bags and send to quality control. Then, they are temporarily stored, or delivered directly to the site as ready-to-use products.

Figure 1. Production process – dry mixes (scheme)



### Quality assurance

Integrated Management System consists of three complementary subsystems:

- the quality management ISO 9001:2008 (since 1999);
- environmental management ISO 14001:2004 + Cor 1:2009 (since 2008);
- the management of occupational health and safety BS OHSAS 18001:2007 (since 2009)

### Packaging

Dry adhesives are packed in paper bags (25 kg). These products must be transported and stored in tightly sealed bags, in dry conditions (most preferably on pallets). Protect against humidity. Shelf life in conditions as specified is 12 months from the production date shown on the packaging.

### **7. PRODUCT APPLICATION**

### Fixing of thermal insulations products:

Adhesives are delivered as dry mortar, powder blended at the factory that requires only mixing with water. The whole content of the packaging should be poured into the measured amount of water and then mixed by means of the drill with a mixer until the homogenous mass. The mortars should be applied on the wall contacting side of the panel using the "bead - spot" method. It consists in the application of continuous circumferential bead (at least 3 cm wide) at the edge of the board and 6+8 patches of 8+12 cm in diameter evenly distributed on the whole surface. In total, apply as much adhesive as sufficient to cover at least 40 % of the surface of the board (after pressing down to the substrate, at least 60 %) and to ensure appropriate binding of the board with the wall. Immediately after the application of the mortar on the board, fix the board to the substrate and strike it to place it in the required position, so that the mortar thickness under the board does not exceed 1 cm. In case of even and smooth substrates, the mortar can be evenly distributed with a notched trowel on the whole surface of the board to ensure 2 - 5 mm of adhesive layer after fixing.

### Base coat installation

Adhesives are delivered as dry mortar, powder blended at the factory that requires only mixing with water. The whole content of the packaging should be poured into the measured amount of water and then mixed by means of the drill with a mixer until the homogenous mass. The base coat can be installed once the adhesive mortar used for board application has sufficiently set and any necessary additional mechanical fixings have been installed (after three days on average). Apply adhesive mortar to the surface of the installed insulation boards, spread it using a notched trowel and embed fiberglass mesh in the adhesive layer. It is recommended to apply the mesh in vertical strips and float the adhesive smooth over the mesh so it is not visible and does not contact the EPS boards directly.

### Occupational safety and environmental protection

Occupational safety and environmental protection are described in Material Safety Data Sheets (MSDS) for each product.

### Note

Specific information on application and other actions with these products are described in detail in the Technical Data Sheet available on the producer website **www.atlas.com.pl**.



### ENVIRONMENTAL PRODUCT DECLARATION ATLAS CEMENTITIOUS ADHESIVES FOR EXTERNAL THERMAL INSULATION COMPOSITE SYSTEMS in accordance with ISO 14025:2010 and EN 15804:2012



### 8. EMISSIONS (LCI) AND THEIR IMPACT ON THE ENVIRONMENT

The following chapter show the life cycle inventory analysis of the adhesives with regard to primary energy needs, water needs, emissions into air and waste.

Table 2. Primary energy	consumption	for A3	module
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Energy resource	Unit	total in production	used on product [unit/Mg]	used on product [unit/m²]
electricity	kWh	9981386	19.19	0.06
black coal	Mg	_	_	_
lignite coal	Mg	—	—	_
coke	Mg	_	_	_
ON	litrs	298963.6	0.57	0.002
benzin 95/98	litrs	_	_	_
oil	litrs	—	—	_
natural gas	m³	2423187	4.19	0.01
gas highly nitrogened	m³	_	_	_
LPG	litrs	_	_	—

Table 3. Emissions into air generated during production stage A3

Air emission	Unit	total in production [Mg]	used on product [kg/Mg]	used on product [kg/m²]
Dust	kg	10915.06	0.02	0.0001
CO	kg	5058.37	0.009	0.00003
CO <sub>2</sub>	kg	1118904.7	1.1	0.004
NO <sub>2</sub>	kg	2925.38	0.0065	0.00002
SO <sub>2</sub>	kg	453.42	1.00E-02	1.30E-04
NH3	kg	0.49	6.56E-07	2.13E-09
HCI	kg	9.27	1.24E-05	4.02E-08
CH <sub>4</sub>	kg	26.28	3.51E-05	1.14E-07

Table 4. Emissions into water generated during productionstage A3

Water and sewage	Unit	Total amount
Water	m <sup>3</sup>	24794
Industrial sewage	m <sup>3</sup>	6158
Water emissions		
BOD	mg/l	28
COD	mg/l	77
рН	°_	7.7
Suspended matter	mg/l	32
Nitrogen amonian	mg/l	0.64
Phosphorans	mg/l	0.9

Table 5.	Waste	generated	in	the	stage	of	product	manufa	IC-
	turing	Ā3			-				

Waste code	Unit	total in production [Mg]	used on product [kg/Mg]	used on product [kg/m²]
150101	Mg	113.384	0.185	0.00070
150102	Mg	76.513	0.125	0.00047
101382	Mg	1892.8	3.080	0.01170
150103	Mg	54.02	0.088	0.00033
150105	Mg	80.14	0.130	0.00050
161002	Mg	32.66	0.053	0.00020
170107	Mg	321.764	0.524	0.00199
150202	Mg	1.808	0.003	0.00001
170405	Mg	10.812	0.018	0.00007
160304	Mg	37.567	0.061	0.00023
150106	Mg	27.24	0.044	0.00017



### 9. ENVIRONMENTAL CHARACTERISTICS (LCA)

The results of the LCA with the indicators as per EPD requirement are given in the following tables for product manufacture (A1, A2, A3 modules).

### Table 6. Environmental characteristic for 1 kg

	Environmental assessment information (MND – Module not declared, MD – Module Declared)															
Product stage		Construction process		Use stage							End of life				Benefits and loads beyond the system boundary	
Raw material supply	Transport	Manufacturing	Transport to construction site	Construction - installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse-recovery- recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
MD	MD	MD	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Environmental impacts (for 1 kg).											
Indicator	Unit	A1	A2	A3	A1-A3						
Global warming potential	[kg CO <sub>2</sub> eq.]	0.23	0.01	0.02	0.3						
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1.08E-08	5.09E-08	2.85E-10	6.20E-08						
Acidification potential of soil and water	[kg SO <sub>2</sub> eq.]	0.0005	0.00	0.00004	0.0005						
Eutrophication potential	[kg (PO <sub>4</sub> ) <sup>3</sup> - eq.]	0.0001	0.0001	0.00001	0.0002						
Formation potential of tropospheric ozone	[kg Ethene eq.]	0.0001	0.00	0.00	0.0001						
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	0.0012	0.00	0.00	0.0012						
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	1.0	0.1	0.4	1.5						
Environmental aspects on resource use (for 1 kg).											
Indicator	Unit	A1	A2	A3	A1-A3						
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA						
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA						
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	0.05	0.00	0.02	0.07						
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA						
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA						
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	1.26	0.11	0.42	1.79						
Use of secondary material	[kg]	0.05	0.00	0.00	0.05						
Use of renewable secondary fuels	[MJ]	0.13	0.00	0.00	0.13						
Use of non-renewable secondary fuels	[MJ]	0.20	0.00	0.00	0.20						
Net use of fresh water	[dm <sup>3</sup> ]	0.32	0.001	0.05	0.37						
Other environmental information d	escribing waste	categories (fo	or 1 kg).								
Indicator	Unit	A1	A2	A3	A1-A3						
Hazardous waste disposed	[kg]	0.0003	0.00	0.00	0.0003						
Non-hazardous waste disposed	[kg]	0.089	0.0004	0.0091	0.099						
Radioactive waste disposed	[kg]	0.00	0.00	0.00	0.00						
Components for re-use	[kg]	0.0000	0.0000	0.0049	0.0049						
Materials for recycling	[kg]	0.0082	0.0000	0.0009	0.0091						
Materials for energy recovery	[kg]	0.00	0.00	0.00	0.00						
Exported energy	[MJ]	0.00	0.00	0.00	0.00						



### IRONMENTAL PRODUCT DECLARATION ATLAS **CEMENTITIOUS ADHESIVES** FOR EXTERNAL THERMAL INSULATION COMPOSITE SYSTEMS in accordance with ISO 14025:2010 and EN 15804:2012



### VERIFICATION

The process of verification of an EPD is in accordance with ISO 14025, clause 8 and ISO 21930, clause 9. After verification, this EPD is valid for a 5-year-period. EPD does not have to be recalculated after 5 years, if the underlying data have not changed significantly.

### The basis for LCA analysis was EN 15804

Independent verification corresponding to ISO 14025 & 8.3.1.

external internal

Verification of EPD: dr eng. Aleksander Panek LCI audit and input data verification: msc eng. Dominik Bekierski LCA: dr eng. Michał Piasecki Verification of procedures and declaration: dr eng. Halina Preizner

### **NORMATIVE REFERENCES**

- ISO 14025:2006, Environmental management Type III environmental declarations Principles and procedure.
- ISO 21930:2007, Sustainability in building and construction Environmental declaration of building products.
- ISO 14044:2006, Environmental management Life cycle assessment Requirements and guidelines. .
- ISO 15686-1:2000, Buildings and constructed assets Service life planning Part 1: General principles .
- ISO 15686-8:2008, Buildings and constructed assets Service life planning Part 8: Reference service life EN 15804:2012, Sustainability in construction works Environmental product declarations Core rules for the product category of construction products.
- EN 15942:2011, Sustainability of construction works Environmental product declarations Communication format business-to-business





Zakład Fizyki Cieplnej, Instalacji Sanitarnych i Środowiska 02-656 Warszawa, ul. Ksawerów 21

# ŚWIADECTWO nr 013/2014 DEKLARACJI ŚRODOWISKOWEJ III TYPU

Wyroby:

Zaprawy klejące ATLAS: HOTER S, STOPTER K-10, HOTER U, STOPTER K-20, STOPTER K-50

Wnioskodawca:

ATLAS Sp. z o.o.

91-222 Łódź, ul. Św. Teresy 105

potwierdza się poprawność ustalenia danych uwzględnionych przy opracowaniu Deklaracji Środowiskowej III typu oraz zgodność z wymaganiami normy

## PN-EN 15804:2012

Zrównoważoność obiektów budowlanych. Deklaracje środowiskowe wyrobów. Podstawowe zasady kategoryzacji wyrobów budowlanych.

Niniejsze świadectwo, wydane po raz pierwszy 10 marca 2014 r. jest ważne 5 lat, lub do czasu zmiany wymienionej Deklaracji Środowiskowej

Kierownik Zakładu Fizyki Cieplnej, Instalacji Sanitarnych i Środowiska



Warszawa, marzec 2014 r.

Dyrektor Instytutu Techniki Budowlanej

Jan Bobrowicz

