ATLAS QUALITY POLICY
ATLAS/AVAL ETICS CODE OF PRACTICE

Version 1/10
Issued on 22.01.2010

CODE OF PRACTICE

1. INTRODUCTION – ATLAS GROUP

ATLAS is a producer of construction chemicals. The company was founded in 1991 and in just few years achieved a leading position in Polish construction chemistry market. ATLAS is well known and well liked in Poland - 80% of the Polish people recognise the brand. Thanks to ATLAS products, which make building easy and fast, the Poles have come to like modern ready-made mortars. Moreover, ATLAS has created new and powerful brand - one of the most valuable Polish brands - starting from scratch.

ATLAS GROUP consists of fifteen business entities. The concern has ten plants, and raw materials for their products come from its own four mines - of gypsum, anhydrite and quartz sand.

ATLAS implements its mission by projecting, manufacturing and trading building materials.

Main groups of products:

- Materials for Fixing Ceramic and Stone Tiles
- Composite Thermal Insulation Systems and Renders
- Self-levelling Floors and Screeds
- Ready-to-use Mortars
- Sealing Materials
- Paints
- Gypsum Products
- Materials for Historic Building Renovation (Golden Age)
- Priming, Washing and Protective Materials

We offer our Customers safe and environment friendly products. We achieve that by reliable projecting, modern technology and discerning quality control. It is possible due to long-term cooperation with proven group of suppliers for raw materials, packaging and services.

Developing partnership cooperation and trade advisory system, we meet our Customers' expectations.

We strengthen our market position not only by trade expanding and taking care about brand prestige but as well by generating profit ensuring company's growth.

To meet our employees satisfaction we care about job stability, safe work conditions and promoting higher qualifications within the complex of trainings.

Proceeding our economic policy, we undertake to prevent pollution. Thus, we care about our and the posterity natural environment.

By carrying about the health of each human being we aspire to ensuring safety, prevent the possible accidents at work, potential accident events or morbid conditions.

We undertake to respect legal requirements.

Within an Integrated Management System we enhance our products and activity, taking particularly into consideration environmental impact.

2. ATLAS/AVAL ETICS - HISTORY OF USE

ATLAS ETICS were introduced in 1993, first basing on the Polish Technical Approval issued by Instytut Techniki Budowlanej in Warsaw.
The first European Technical Approval was granted on May 29th, 2006. Till 2009 the following European Technical Approvals for ATLAS brand were granted:

ETA – 06/0081
ETA – 06/0173
ETA – 07/0316

In 2007 ATLAS GROUP introduced the new brand – AVAL, designed for distribution mainly in Great Britain, Ireland, Scandinavia and Romania. AVAL ETICS were granted the following European Technical Approvals (basing on the Evaluation Reports of ATLAS ETICS as characteristics of products are the same, only the product names differ)[1]:

ETA – 06/0187
ETA – 06/0281

Furthermore German certificates for ATLAS ETICS were granted:
Zulassung Z-33.84-963
Zulassung Z-33.84-964

Till 2009, only in Poland more than 130 000 000 m² of walls were insulated with ATLAS ETICS.
ATLAS/AVAL ETICS have been installed also in the following countries:[2]

WESTERN EUROPE:
GERMANY
DENMARK
SWEDEN
THE NETHERLANDS
GREAT BRITAIN
IRELAND
CENTRAL, EASTERN EUROPE & ASIA:
CZECH REPUBLIC
SLOVAKIA
ROMANIA
RUSSIAN FEDERATION
BELARUS
UKRAINE
LITHUANIA
LATVIA
ESTONIA
MOLDOVA
KAZAKHSTAN
MONGOLIA

[1] The full list of equivalents of ATLAS brand products is available in MATERIALS DATA SHEETS part.
[2] Basing on the direct supplying by ATLAS GROUP net of distribution. Many Polish warehouses export ATLAS products to Europe, Asia and Africa.

3. CUSTOMERS CARE

ATLAS GROUP guarantees vast customer service during all phases of distribution and installation cooperation:

1. technical service
2. marketing service
3. current customer service

Technical assistance

Wide range of information concerning ATLAS/AVAL ETICS is easy of attainment on official ATLAS GROUP website:
www.atlas.com.pl (Polish version)
http://www.atlas.com.pl/en/katalog/ (English version)

http://www.atlas.com.pl/aval/katalog/ (English version, AVAL brand)

The official website offers the following data:

- Technical data sheets of products
- ETICS detailed description (properties, products, installation, maintenance)
- Patterns of colours of renders and paints
- Certificates, technical approvals etc.
- Company data
- Contact

All technical data sheets, technical approvals and system descriptions can be easily downloaded in a pdf. file version.

ATLAS offers also a direct technical support to architects, installers, contractors and distributors in a form of phone technical services:
ATLAS FOREIGN MARKET TECHNICAL ADVISE CENTER:
+48 58 522 08 20 (Polish speaking)
fax: +4858 522 08 22

+48 42 714 08 02 (English speaking, Polish speaking)
Fax. +48 42 714 0807

+48 800 168 083 – 24h help desk (Polish speaking)
+48 607 781 018 – 24h help desk (English speaking)

In case of more detailed issues one may be requested for an official inquiry in writing. In such case the following e-mail addresses are valid:
export@atlas.com.pl
mgoslawski@atlas.com.pl
dareks@atlas.com.pl

Marketing assistance
As described in point 4 of this Code of Practice

Customer assistance

Current customer assistance concerning e.g.:

- order preparation
- shipments

- phone and e-mail inquiries
- after – sale commercial care

is conducted by ATLAS GROUP EXPORT DEPARTMENT:

ATLAS GROUP EXPORT DIRECTOR
Lech Gabrielczak
+48 42 714 0793
(mob.) +48 42 601 979 854
lech@atlas.com.pl

FOREIGN MARKETS MANAGER (EU)
Michal Goslawski
+48 42 714 0808
(mob.) +48 607 781 018
mgoslawski@atlas.com.pl

EXPORT SPECIALISTS
Zbigniew Bilicki
Joanna Sieradzka
+48 42 714 0792
(mob.) +48 603 096 042
(fax) +48 42 714 0807
export@atlas.com.pl
eksport@atlas.com.pl

4. MARKETING SUPPORT

ATLAS GROUPS assures wide marketing support for any entity engaged in ATLAS/AVAL ETICS installation and/or distribution.

The marketing support is mostly free of charge and consists of supplying with:

- product catalogues
- technical instructions
- leaflets
- advertisement boards
- patterns of colours
- patterns of ETICS
- patterns of structures of renders
- other gadgets

There is also a possibility of financial and marketing support designed for a particular project or partner. The form and scope of marketing cooperation regarding press/radio/TV advertising, special marketing items (banners, flags, showrooms) is to be agreed in a form of written contract basing on mutual agreement.

ATLAS GROUPS presents its products at the most recognized international fairs and business meetings (Germany, Great Britain, Russia, Ukraine, Jordan, Dubai) and cooperate with ATLAS distributors at preparation, design and service of their fair stand during local or national meetings and fairs.

All international marketing actions are conducted in ATLAS GROUP by EXPORT SUPPORT DEPARTMENT:
Jaskowa Dolina 17, 80-252 Gdansk, Poland
+48 58 52 20 817 (English speaking)

+48 601 979 835 (Polish speaking)
+48 609 780 246 (English speaking)

tomczyk@atlas.com.pl
skrajewski@atlas.com.pl

5. CONTRACT

In sale – purchase cooperation between ATLAS GROUP and its partners no separate contract is necessary, but if requested a written sale – purchase agreement can be signed. The draft of an agreement is presented in Attachment 1 to this document.
All ATLAS/AVAL ETICS approved installers are obliged to make a contract with their investors on each project conducted. We do not impose any particular contract form, but please remember to list in the project contract the following details:

- data of the Parties
- address of the project location
- project description
- ETICS used (with a list of products to be used, especially indicated the type of thin-coat render to be installed, the amount of products should reflect their consumption and substrate absorptiveness)
- Installation start time
- Approximate time of work
- Installator's responsibility
- Installator's warranty on ETICS installation

6. COOPERATION WITH PARTNERS IN IRELAND

The Certificate Holder does not intend to give exclusive or preferential rights to any partner. Any entity with its registered office in Ireland is allowed to purchase the products manufactured by the Certificate Holder and distribute them among its commercial partners.

Although, as the Certificate Holder bares responsibility for the ETICS design, supply and installation, he must control the sale and use of the materials. Therefore, the Certificate Holder introduces the special titles of Official ATLAS/AVAL Distributor or/and Approved ATLAS/AVAL ETICS Installer, that entities registered in Ireland may apply for.

An up-to-date list of Official Distributors and/or Approved Installers is available at Certificate Holder's customer service units on request.

The Certificate Holder bares responsibility for the ATLAS/AVAL ETICS installation performed only by his Official ATLAS/AVAL Distributor or/and Approved ATLAS/AVAL ETICS Installer.

Certificate Holder

The Certificate Holder is obliged to:

a) Assure access to any technical materials regarding the manufactured products and their use (free of charge). It includes:
    - Up-to-date product catalogues
    - Up-to-date certificates (IAB, ETA and other, if legally required)
    - Up-to-date instructions

b) Assure free of charge training of the Approved Contractor's/Approved Installer's workmen in time and place mutually agreed.

c) Assure essential technical support in a form of e-mail, letter or phone correspondence.

d) Give current information regarding any quantity, quality, legal changes concerning the products and their use.

e) As not all of the ETICS elements are manufactured by the Certificate Holder (e.g. insulation panels), he assures an up-to-date list of accepted insulation manufacturers.

f) Issue free of charge certificates to Official Distributors, Approved Contractors/Approved Installers, ETICS Operatives and ETICS Supervisors.

g) Visit the site on a regular basis (at least once per 6 months) to ensure that work is carried out in according with the project specific site package, including the Certificate holder's installation manual

Official Distributor

The Official Distributor is an entity that:

a) Was given by the authorized Certificate Holder's representatives the official terms of cooperation and pricelist in writing. The title of Official Distributor is confirmed in writing, in a form of certificate issued by the Certificate Holder's authorized representatives.

b) Purchases the Certificate Holder's products directly from his authorized units, i.e. from the Atlas Export Department at least once per 2 months. The quantity of products to be purchased in this time is 10.000 kg of liquid products (primers, paints, dispersion renders etc.) and/or 22.000 kg of products of any type.

c) Distributes the products among Irish partners without any exclusive or preferential price, quantity or quality rights.

d) Has adequate storage facilities to assure proper storage and delivery conditions of ETICS elements.

e) Distributes the insulation manufactured by companies different than the Certificate Holder in accordance to an up-to-date list of accepted manufacturers confirmed with the Certificate Holder's authorized representatives.

f) Keeps on stock vast amounts of ETICS materials to assure constant distribution of products. In case of temporary lack of particular materials assures their prompt accessibility on customer's request.

g) Conducts the preliminary selection and technical training of the installers and proposes particular entities for further Certificate Holder's training and assessment. The Official Distributor is not allowed to grant the certificate of Approved ATLAS/AVAL ETICS installer.

h) Assures essential technical support in a form of e-mail, letter or phone correspondence. Assures access to any technical materials regarding the ETICS products and their use (free of charge). It includes:

- Up-to-date product catalogues
- Up-to-date technical certificates and/or approvals (IAB, ETA and other, if legally required)
- Up-to-date instructions

The Certificate of Official Distributor is valid for 1 year – after this time the distributor is obliged to pass the theoretical and practical exam to be granted the renewed certificate.

The Certificate may be terminated earlier in case of:

- Considerable breach of rules presented in these regulations, and in spite of 1-month Certificate Holder's notice calling for breach termination, the breach continues.
- Negligence or improper storage and use of products, use of products not in conformity with instructions presented in up-to-date manufacturer's catalogue, or interference into product quantity and quality composition.
- other circumstances that may bring the Certificate's Holder or ATLAS/AVAL ETICS into disrepute

Each Official Distributor is obliged to participate in a free of charge theoretical and practical training forwarded by ATLAS company at least once per year. The time and place of training is to be arranged mutually. The training should last at least 5 days.

The training comprises of:

a) Theoretical part
   - Terms of use of ATLAS/AVAL ETICS
   - Types of ATLAS/AVAL ETICS
   - Current legal environment
   - Description of products and their use
   - Design preparation – U – value calculation, products selection etc.
   - Terms of selection of a suitable thermal insulation system
   - Terms of installation of each part of thermal insulation systems
   - Frequent mistakes and ways to avoid them
   - Repairs and maintenance of thermal insulation systems
   - Duties and responsibilities of approved contractors/installers

b) Practical part
- Practical installation of ATLAS/AVAL ETICS
- Practical repairs of thermal insulation systems

Approved ETICS installer/contractor

ATLAS/AVAL ETICS Approved contractor/Approved installer is obliged to comply with the following requirements:

- Has proven knowledge of the ATLAS/AVAL ETICS use and installation (practical and theoretical)
- Has a current ETICS Contractor (Installer) certificate issued by the Certificate Holder
- Has adequate number of trained workmen to assure correct and prompt system installation
- Has at least one workman responsible for current supervision of installation of ATLAS/AVAL ETICS (ETICS Supervisor), that:
  - Has been additionally trained in principles and terms of installation of ATLAS/AVAL ETICS, confirmed with a proper certificate.
  - Has a minimum of 5 years experience (theoretical and practical) in the thermal insulation systems installation.
  - Has a current ETICS Supervisor card issued by the Certificate Holder valid for 3 years (with possibility of revision).
  - Confirms the correctness of installation of each part of the ATLAS/AVAL ETICS.

- Has at least one ETICS Operative, that:
  - Has been additionally trained in principles and terms of installation of ATLAS/AVAL ETICS, confirmed with a proper certificate.
  - Has a minimum of 5 years experience (theoretical and practical) in the thermal insulation systems installation.
  - Has a current ETICS Operative card issued by the Certificate Holder valid for 3 years (with possibility of revision).
  - Has sufficient knowledge of IS EN 13914-1:2005 *Design, preparation and application Of External rendering and internal plastering.*
- Prepares the insulation project in accordance to the up-to-date regulations and Certificate Holder's technical requirements. In case of non – standard project prepares a bespoke project and confirms it with Certificate Holder's authorized technical representatives.
- Records and renders reasonably accessible to Certificate Holder's representatives the technical and photo files of currently forwarded and completed projects. Prepares the check-list report in accordance to the requirements of the Certificate Holder. The technical data should list the following elements:

- Full address of the project site;
- ETICS used with list of the materials used;
- Time of installation of each part of the system;
- Details – insulation of window and door reveals, plinth, attics, fixings design, thermal bridging, etc.;
- Indicates the elements where, due to specific building construction, the minimum required U – value was not complied with – gives the reason of inconformity and the particular U – value reached (e.g. at window reveals);
- Check – out reports in accordance to the Certificate Holder's requirements.

- Complies the technical procedures of Systems installation in accordance to: regulations (e.g. Technical Guidance Document), current ETA and IAB certificates regulations, other regulations on installation and maintenance of thermal insulation systems, construction practice and other manufacturer's instructions presented in up-to-date catalogues, brochures or other publications.
- Allows, on written notice of the Certificate's Holder, the inspection of each phase of the ATLAS/AVAL ETICS installation at any time and obligatory at least once per 3 months.

Each ATLAS/AVAL ETICS contractor/installer complying with requirements of Certificate Holder is to be granted the ATLAS/AVAL ETICS (ETICS Contractor/Installer) certificate.

The Certificate is valid for 3 years – after this time the installer is obliged to pass the theoretical and practical exam to be granted the renewed certificate:

The Certificate may be terminated earlier in case of:

- Considerable breach of rules presented in these regulations, and in spite of 1-month Certificate Holder's notice calling for breach termination, the breach continues.

- Negligence or improper storage and use of products, use of products not in conformity with instructions presented in up-to-date manufacturer's catalogue, or interference into product quantity and quality composition.
- other circumstances that may bring the Certificate's Holder or ATLAS/AVAL ETICS into disrepute

Each Approved Contractor/Installer is obliged to participate in a free theoretical and practical training forwarded by ATLAS company at least once in 3-years time. The time and place of training is to be arranged mutually. The training should last at least 5 days.

The training comprises of:

c) Theoretical part
   - Terms of use of ATLAS/AVAL ETICS
   - Types of ATLAS/AVAL ETICS
   - Current legal environment
   - Description of products and their use
   - Design preparation – U – value calculation, products selection etc.
   - Terms of selection of a suitable thermal insulation system
   - Terms of installation of each part of thermal insulation systems
   - Frequent mistakes and ways to avoid them
   - Repairs and maintenance of thermal insulation systems
   - Duties and responsibilities of approved contractors/installers

d) Practical part
- Practical installation of ATLAS/AVAL ETICS
- Practical repairs of thermal insulation systems

7. ETICS INSTALLATION

Installation shall be carried out by Certificate Holder's trained applicators who have been approved by NSAI Agrément to install the systems. Installation shall be in accordance with the Certificate Holder's instructions and the requirements of regulations (e.g. Technical Guidance Document), current ETA and IAB certificates regulations, other regulations on installation and maintenance of thermal insulation systems, construction practice and other manufacturer's instructions presented in up-to-date catalogues, brochures or other publications.

Approved Installer/Contractor or Certificate Holder prepares a bespoke site packaged for each project, including U-value calculations, requirements for materials handling and storage, method statements for installation, building details, fixing requirements, provision for impact resistance, maintenance requirements etc. This document forms part of the contract documentation for circulation to the home owner and the installer. Installers will be expected to adhere to the specification.

In case of standard projects it is not obligatory to confirm the project design with the Certificate Holder's authorized technical representatives. Any deviations from the standard Certificate Holder's requirements must be approved the Certificate Holder's authorized technical representatives.

In case of non – standard projects (e.g. buildings higher than 18 m, high wind loads etc.) a bespoke design must be prepared in cooperation with the Certificate Holder's authorized technical representatives and confirmed by them.

DESIGN

As the certificate holder is responsible for the design, supply and installation of the ATLAS/AVAL ETICS he obliges the ETICS installers to follow the list of elements required for a design. The design of the ATLAS/AVAL ETICS should indicate the following elements:

a) site full address
b) home owner's name and, if different, the investor's name
c) building purpose – always follow the up-to-date regulations in the system selection. Because of their purpose some buildings may demand special ETICS solutions (e.g. fire barriers)
d) building location – the location of the building impacts the material selection, e.g. it is suggested to use easily cleaned renders (silicone, mosaic) for walls exposed to high contamination or road traffic.
e) U – value – indicate the U – value to be reached. In case of elements, where the minimum U – value rate cannot be reached because of the construction limitations (e.g. window reveals) indicate the particular U – value reached.
f) system name, list of selected products with quantity – always take into consideration the substrate absorptiveness in product consumption calculations
g) details – indicate the details insulation in accordance to Certificate Holder's requirements and graphic schemes. In case of any deviations from the Certificate Holder's requirements always confirm the design of details with the Certificate Holder's authorized technical representatives.
h) time of installation – indicate the time of installation of each system element – particular weather conditions may have effect on the product selection (e.g. in temperatures 0 up to +5 it is allowed to use ATLAS STOPTER K20/AVAL KT 85 only).

DESIGN PROCESS

Survey

1. Complete a Site Survey Sheet
2. Inspect area to ensure that residents are not exposed to site risks
3. Inspect the properties to assess their suitability to receive insulation. Take photographic evidence. The main areas to be considered are:
    a. Major cracks in the external walls
    b. Badly cracked or missing render
    c. Defective pointing
    d. Signs of frost damage
    e. Any defects that may lead to water penetration
    f. If defects are found a list of remedial works to be carried out should be prepared
4. All Flora removed from the walls. Record all wall vents, cables and pipe work with photographic evidence
5. Identify and highlight to the homeowner any pre-existing damage to walls, windows, etc. to building to be worked on as well as neighbouring buildings
6. Inspect work area to ensure that operatives are not exposed to falls

Preperation

1. On arrival at site the External wall Insulation Technicians should check that:
   All loose fittings on external walls have been removed to a safe place (providing entrance to the property has been permitted)
2. Material and tools will have to be brought to work area
3. Power wash building
4. Errect scaffolding (if required)

5. Remove/relocate drains, down pipes, ect.
6. Errect necessary construction signage

Installation (see figure 1.)

1. Complete a Design Process Worksheet (updated throughout process)
2. Fix base rail
3. Reroute cables, wires
4. Flue to be extended (if necessary) and 200mm area around flue insulated with fire proof insulant; chimney breasts insulated with fire proof insulant
5. Fix insulation to plinth (see figure 6.)
6. Fix insulation to walls (see figure 10.) for eave area insulation)
    a. If building is an attached dwelling or apartment complex, all boundary/party walls are required to have an adequate fire barrier (see figure 13.)
    b. Minimum insulation for window reveals is 20mm, to be noted if unable to reach this level on Design Process Worksheet
7. Fix insulation board with mechanical fixings
8. Fix window sill extensions
9. Flues are checked to ensure they are clear from obstruction. Airbricks are checked to ensure they give a clear airflow
10. Fix profiles
11. Apply base coat to insulation
12. Apply mesh on insulation
13. Apply second layer of base coat
14. Apply finish coat

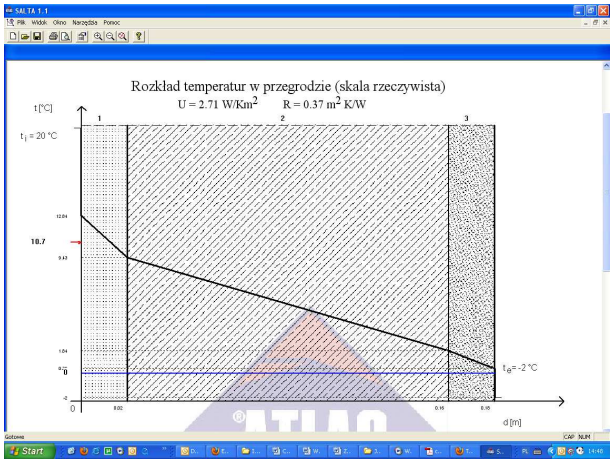
Final

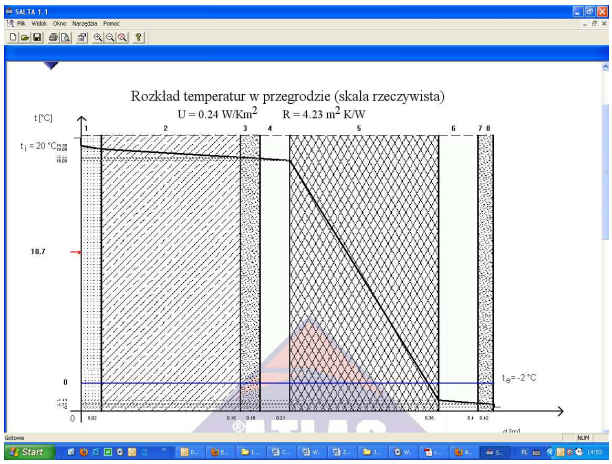
1. Fix drains, re-attach down pipes as necessary
2. Complete a Final Check Sheet
3. Clean area (remove scaffolding)
4. Complete all necessary paperwork, calculate final u-value

See Atlas Code of Practice for detailed method of fixing insulation and working with Atlas/Aval products.

U – VALUE

Thermal conductivity, (U – value), is the property of a material that indicates its ability to conduct heat. It appears primarily in Fourier's Law for heat conduction. Thermal conductivity is measured in watt per kelvin per metre ($W \cdot K^{-1} \cdot m^{-1}$). Multiplied by a temperature difference (in Kelvin, K) and an area (in square metres, m^2), and divided by a thickness (in metres, m) the thermal conductivity predicts the energy loss (in watts, W) through a piece of material.To calculate the U – value follow the recommendations of the EN ISO 6946. It is allowed to use any electronic U – value calculators available (e. g. on – line). As for now the Certificate Holder's U – value calculator (called "SALTA") is available in Polish, the English version is to be issued in the 2nd half of 2010. The thermal conductivity and water vapour permeability is given in the technical data sheets of the products. For insulation follow the data presented on the package or in manufacturer's technical data sheet.The particular U – value to be reached is specified in the up – to – date local or national building regulations. In case of elements, where the minimum U – value rate cannot be reached because of the construction limitations (e.g. window reveals) indicate the particular U – value reached.In case of doubt, it is requested to confirm the calculations with Certificate Holder's Official Distributors or technical representatives.





U – value calculation with use of ATLAS SALTA calculator – standard wall before ETICS installation and after (system ATLAS/AVAL ETICS with EPS 0,15 m wide)

U-value calculation Design Type Hollow Block House
[Composed hollow concrete block wall, rendered externally and plaster internal finish]

U-value prior to external wall insulation

Material	Thermal Cond. (W/mK)	Thickness	Resistance (m2K/W)
Internal Surface	-	-	0.13
Plaster Gypsum	0.43100	19mm	0.0442
Hollow Block	-	215mm	0.21
Rendering external	0.57100	19mm	0.0333
External Surface	-	-	0.04
			Rtotal = 0.4575

U-value is the inverse of Rtotal
1/0.4575 = U-value = **2.1858 W/m^{2}K**

Note 1: Thermal Conductivity and Resistance of materials taken from Building Regulations 2008 Technical Guidance Document L (ie: 215 mm hollow concrete block thermal resistance = 0.21 m2K/W)

U-value after external wall insulation

Material	Thermal Cond. (W/mK)	Thickness	Resistance (m2K/W)
Internal Surface	-	-	0.13
Gypsum plaster	0.43100	19mm	0.0442
Hollow Block	-	215mm	0.21
Rendering external	0.57100	19mm	0.0333
Polystyrene 031	0.031	100mm	3.2258
Basecoat	0.57	5mm	0.0088
Render topcoat	0.43	2mm	0.0047

External Surface	-	-	0.04

Rtotal = 3.6968

U-value is the inverse of Rtotal
1/3.6968 = U-value = **0.2705 W/m^{2}K**

Note 2: Polystyrene 031 is Swisspor Lambda 031 Fasda; Basecoat is Aval KT85; Render topcoat is Aval KT60

Note 3: Plinth and window reveal areas will not have 100mm of polystyrene insulation. Use maximum amount of insulation that is physically and economically viable.

U-value calculation Design Type Apartment Complex
[Rendered dense concrete block external leaf, 60mm partial cavity fill, dense concrete block inner leaf and plaster internal finish]

U-value prior to external wall insulation

Material	Thermal Cond. (W/mK)	Thickness	Resistance (m2K/W)
Internal Surface	-	-	0.13
Plaster Gypsum	0.43100	19mm	0.0442
Inner Leaf	1.33	100mm	0.0752
Cavity Insulation	0.037	60mm	1.6216
Air Cavity	-	-	0.18
External Leaf	1.33	100mm	0.0752
Rendering external	0.57100	19mm	0.0333
External Surface	-	-	0.04

Rtotal = 2.1995

U-value is the inverse of Rtotal
1/2.1995= U-value = **0.4546 W/m^{2}K**

U-value after external wall insulation

Material	Thermal Cond. (W/mK)	Thickness	Resistance (m2K/W)
Internal Surface	-	-	0.13
Plaster Gypsum	0.43100	19mm	0.0442
Inner Leaf	1.33	100mm	0.0752
Cavity Insulation	0.037	60mm	1.6216
Air Cavity	-	-	0.18
External Leaf	1.33	100mm	0.0752
Polystyrene 031	0.031	100mm	3.2258
Basecoat	0.57	5mm	0.0088
Render topcoat	0.43	2mm	0.0047
Rendering external	0.57100	19mm	0.0333
External Surface	-	-	0.04

Rtotal = 5.4388

U-value is the inverse of Rtotal
1/5.4388 = U-value = **0.1839 W/m^{2}K**

ETICS SELECTION

<table>
<tr><td colspan="2">Thermal insulation</td><td>EPS polystyrene</td><td>Elastified EPS polystyrene</td><td>XPS polystyrene</td><td>Mineral wool/lamella</td></tr>
<tr><td colspan="2">Effect</td><td>- providing external walls with appropriate thermal insulation</td><td>- providing external walls with appropriate thermal insulation
- providing external walls with appropriate sound insulation</td><td>- providing external walls with appropriate thermal insulation
- creating a long-lasting thermal insulation, resistant to mechanical damage, moisture and biological factors (decay)</td><td>- providing external walls with appropriate thermal insulation
- providing external walls with appropriate sound insulation
- providing external walls with appropriate fire resistance
- providing external walls with appropriate vapour permeability insulation</td></tr>
<tr><td colspan="2">ETICS name</td><td colspan="2">ATLAS/AVAL</td><td>ATLAS XPS</td><td>ATLAS/AVAL ROKER</td></tr>
<tr><td colspan="6">Main ETICS coats</td></tr>
<tr><td colspan="2">Basic fixing</td><td>ATLAS STOPTER K20
AVAL KT 85
ATLAS STOPTER K10
AVAL KT 83
ATLAS HOTER U
AVAL KT 55
ATLAS HOTER S
AVAL KT 53</td><td>ATLAS STOPTER K20
AVAL KT 85
ATLAS STOPTER K10
AVAL KT 83
ATLAS HOTER U
AVAL KT 55
ATLAS HOTER S
AVAL KT 53</td><td>ATLAS STOPTER K20
AVAL KT 85
ATLAS STOPTER K10
AVAL KT 83
ATLAS HOTER U
AVAL KT 55
ATLAS HOTER S
AVAL KT 53</td><td>ATLAS ROKER W20
AVAL KT 190

mechanical fixings</td></tr>
<tr><td colspan="2">Additional (mechanical) fixing</td><td>mechanical fixings</td><td>mechanical fixings</td><td>mechanical fixings</td><td>mechanical fixings</td></tr>
<tr><td colspan="2">Reinforced coat</td><td>ATLAS STOPTER K20
AVAL KT 85

ATLAS HOTER U
AVAL KT 55

Glass fibre mesh</td><td>ATLAS STOPTER K20
AVAL KT 85

ATLAS HOTER U
AVAL KT 55

Glass fibre mesh</td><td>ATLAS STOPTER K20
AVAL KT 85

ATLAS HOTER U
AVAL KT 55

Glass fibre mesh</td><td>ATLAS ROKER W20
AVAL KT 190

Glass fibre mesh</td></tr>
<tr><td colspan="2">Key coat</td><td>ATLAS CERPLAST
AVAL KT 16
ATLAS SILKAT ASX
AVAL KT 15
ATLAS SILKON ANX
AVAL KT 76</td><td>ATLAS CERPLAST
AVAL KT 16
ATLAS SILKAT ASX
AVAL KT 15
ATLAS SILKON ANX
AVAL KT 76</td><td>ATLAS CERPLAST
AVAL KT 16
ATLAS SILKAT ASX
AVAL KT 15
ATLAS SILKON ANX
AVAL KT 76</td><td>ATLAS CERPLAST
AVAL KT 16
ATLAS SILKAT ASX
AVAL KT 15
ATLAS SILKON ANX
AVAL KT 76</td></tr>
<tr><td rowspan="4">Thin - layer render</td><td>Mineral</td><td>ATLAS CERMIT SN
AVAL KT 137
ATLAS CERMIT DR
AVAL KT 35
ATLAS CERMIT SN-MAL
ATLAS CERMIT PS
AVAL KT 150</td><td>ATLAS CERMIT SN
AVAL KT 137
ATLAS CERMIT DR
AVAL KT 35
ATLAS CERMIT SN-MAL
ATLAS CERMIT PS
AVAL KT 150</td><td>ATLAS CERMIT SN
AVAL KT 137
ATLAS CERMIT DR
AVAL KT 35
ATLAS CERMIT SN-MAL
ATLAS CERMIT PS
AVAL KT 150</td><td>ATLAS CERMIT SN
AVAL KT 137
ATLAS CERMIT DR
AVAL KT 35
ATLAS CERMIT SN-MAL
ATLAS CERMIT PS
AVAL KT 150</td></tr>
<tr><td>Acrylic</td><td>ATLAS CERMIT N
AVAL KT 60
ATLAS CERMIT R
AVAL KT 64
ATLAS DEKO M
AVAL KT 77</td><td>ATLAS CERMIT N
AVAL KT 60
ATLAS CERMIT R
AVAL KT 64
ATLAS DEKO M
AVAL KT 77</td><td>ATLAS CERMIT N
AVAL KT 60
ATLAS CERMIT R
AVAL KT 64
ATLAS DEKO M
AVAL KT 77</td><td></td></tr>
<tr><td>Silicate</td><td>ATLAS SILKAT N
AVAL KT 72
ATLAS SILKAT R
AVAL KT 73</td><td>ATLAS SILKAT N
AVAL KT 72
ATLAS SILKAT R
AVAL KT 73</td><td>ATLAS SILKAT N
AVAL KT 72
ATLAS SILKAT R
AVAL KT 73</td><td>ATLAS SILKAT N
AVAL KT 72
ATLAS SILKAT R
AVAL KT 73</td></tr>
<tr><td>silicone</td><td>ATLAS SILKON N
AVAL KT 74</td><td>ATLAS SILKON N
AVAL KT 74</td><td>ATLAS SILKON N
AVAL KT 74</td><td>ATLAS SILKON N
AVAL KT 74</td></tr>
</table>

		ATLAS SILKON R AVAL KT 75	ATLAS SILKON R AVAL KT 75	ATLAS SILKON R AVAL KT 75	ATLAS SILKON R AVAL KT 75
Optional coat					
Paint	Acrylic	ATLAS ARKOL E AVAL KT 44	ATLAS ARKOL E AVAL KT 44	ATLAS ARKOL E AVAL KT 44	
	Silicate	ATLAS ARKOL S AVAL KT 54	ATLAS ARKOL S AVAL KT 54	ATLAS ARKOL S AVAL KT 54	ATLAS ARKOL S AVAL KT 54
	silicone	ATLAS RKOL N AVAL KT 48 ATLAS FASTEL AVAL KT 46	ATLAS RKOL N AVAL KT 48 ATLAS FASTEL AVAL KT 46	ATLAS RKOL N AVAL KT 48 ATLAS FASTEL AVAL KT 46	ATLAS RKOL N AVAL KT 48 ATLAS FASTEL AVAL KT 46

Insulation work should be carried out in favourable weather conditions. The substrate and ambient temperature during installation and during the drying of the individual materials should be between +5°C and +25°C, relative air humidity below 80%. ATLAS STOPTER K20/AVAL KT 85 can be used in temperatures 0 ÷ +25°C during the application, and not less than -5°C min. 8 hours after the application conclusion. The façade should be covered and protected from precipitation, direct sunlight and strong wind. It is recommended to install protection mesh along scaffolding. In winter time the use of protection mesh along scaffolding is obligatory

Substrate preparation, pull – out test

Before insulation works commencement it is essential to examine the technical condition of the façade (substrate), with special attention paid to load capacity of the substrate, its humidity and evenness.

ATLAS/AVAL ETICS (systems) can be used to insulate plastered or not plastered solid concrete walls as well as walls made of bricks, aerated concrete blocks, concrete and structural clay tiles. The substrate should be even, structurally sound and free from anything that may impair mortar adhesion (e.g. grease, bitumen, dust). The existing dirt and layers with low strength should be removed by blasting them off with a high – pressure jet of water or mechanically (scratching, chipping, polishing). Surface with algae and moss should be cleaned with a steel brush and than protected with ATLAS MYKOS/AVAL KT 99. Wash off under pressure or scrape off the remainder of poorly adhering paint coats. Hammer off loose or flaking elements ("hollow" sound indicates that the old render has separated from the wall and must be removed) and fill in defects using materials recommended for that purpose e.g. ATLAS PLASTERING MIX/AVAL KT 111, ATLAS LEVELLING MORTAR.
Any unevenness up to 10 mm should be leveled to the thickness of the adhesive mortar, larger depressions or irregularities of the surface up to 20 mm should be smoothened. Bigger unevenness (more than 20 mm) should be leveled by fixing insulation boards of different thickness (the minimum board thickness cannot be lower than the required one calculated in the insulation project).

If in doubt as to substrate quality and absorptiveness, assess its loading capacity in actual conditions by means of the pull-off method. The result (adhesion) should not be lower than 0.08 MPa. It is recommended to conduct a pull – off test – clean the substrate, prime the substrate with ATLAS UNIGRUNT/AVAL KT 17, apply with an adhesive layer of less than 10 mm small pieces of insulation (10 x 10 cm) at 8 – 10 different points of the substrate. After 72 - 96 hours pull off the fixed insulation – if the insulation breaks within the insulation (living part adhered to the substrate) the capacity is correct. If the insulation tears off with adhesive or adhesive and parts of the substrate – increase the binding of the of weak, dusty or highly absorptive substrates by the priming with ATLAS UNI-GRUNT/AVAL KT 17. The priming should be conducted at least 2 hours before the insulation application.
Before the insulation works commencement additional conditions must be fulfilled:

- roofing work, assembly or replacement of windows, insulation and substrates of terraces or balconies must be finished or commissioned;
- all adjacent surfaces which will not be insulated have been properly protected against damage;
- all heavy external elements have been replaced and the quality of their fixing checked. Any corroded or damaged fixings must be replaced. As it is not allowed to fix any heavy elements to the ETICS the length of fixing has been checked, and, if necessary, replaced. All metal elements have been assembled in the substrate with ATLAS MONTER assembly mortar.
- all flashings and horizontal surface protection of attics, cornices and other elements have been finished to extract any rain water that might be present at the façade.

The layers of ETICS should be protected against direct sunshine, rainfall and strong wind. It is recommended to install protection mesh along scaffolding. In winter time the use of protection mesh along scaffolding is obligatory. It is not allowed to carry the works in snowfall, rain or strong wind.

Insulation

The thickness of thermal insulating material should be in accordance with the technical design and selected individually for each wall of the building, based on the calculated overall heat transfer coefficient U, amongst others. The heat transfer coefficient should meet the requirements as to the thermal insulation properties of partitions, set out in the technical and regulations currently in force.

Always use the insulation in accordance to the Certificate Holder's requirements listed in the IAB Certificate, European Technical Approvals and instructions. The code of the insulation must be indicated on the package or in technical data sheet issued by its manufacturer.

a) In case of EPS boards (system ATLAS/AVAL ETICS) use only seasoned, self – extinguishing expanded boards according to EN 13163. Do not use EPS panels of unknown code, declaration of conformity or aging time[3]. An up – to date list of accepted polystyrene boards is available by Certificate Holder's customer service and Official Distributors' representatives.
b) In case of mineral wool (MW) and lamella boards - factory-prefabricated coated or uncoated mineral wool boards (MW) or lamella according to EN 13162.
c) In case of XPS - factory – prefabricated uncoated panels made of extruded polystyrene foam (XPS) according to EN 13164.

All insulation materials listed above are easy of attainment in all European Union countries. Each ATLAS/AVAL ETICS Official Distributor is obliged to offer insulation products consistent with proper designation codes together with other system elements.

In Ireland appropriate insulation products are available e.g. at:

MBC PROJECT, 11 Ash Lawns, Clonbalt Woods, Longford, +353 857 866 089

[3] As a standard practice polystyrene blocks should be seasoned (aged) before cutting into separate boards for 6 up to 8 weeks, but this time differs and depends on a particular technology of production. Common European norms EN 13163 and EN 13164 do not designate a minimum time of seasoning, but to issue a declaration of conformity, the manufacturer is obliged to declare the dimensional stability parameter in 2 cases:
- in laboratory conditions (23°C, 50% relative humidity, 28 days)
- in specified conditions (23°C, 90% relative humidity, 48 hours)
The necessity of declaration of this parameter if the declaration of conformity is to be issued, imposes proper technology of production and seasoning.

CJ IMPORTS/ MUNSTER GREEN HOMES, 6 Lissanalta Close, Dooradoyle, Limerick, +353 851 348 877

If a full list of ATLAS/AVAL ETICS official distributors in Ireland requested, please make contact to:
Michal Goslawski, mgoslawski@atlas.com.pl; +48 42 714 0802; mob. +48 607 781 018

Fixing requirements [4]

Adhesive

The first step in the application of thermal insulation is to attach a plinth strip, which makes it easier to attach the first and next row of insulation panels along the horizontal line as well as provides a reinforcement for the lower edge of the system. The strip should be attached to the plinth of the building with dowels (min. 3 pcs/1m²), not lower than 30 cm above the ground level.[5] This distance ensures system protection against rising damp and also protects the rendering from contamination – mud particles carried by raindrops bouncing off the pavement or ground. If a plinth strip is impossible to install (e.g. if the thermal insulation is thicker than the largest available strip size), it can be replaced by two layers of glass fibre reinforcing mesh with a drip profile installed on the bottom edge of the insulation.

When the plinth strip has been installed, the thermal insulation panels can be attached. The first row of panels is installed so that it is supported by the plinth strip. Subsequent rows of panels should be staggered (the vertical joints between panels should alternate). The panels should be staggered both on wall surfaces and on the corners of the building. The principal element that bonds the thermal insulation to the substrate is the adhesive.

Mix the mortars with suitable amount of clean water. It is best to mix it mechanically, using a drill with a mixer. It is not recommend to add amount of water different than given in the technical data sheet, as it decreases the mortar durability.

It is applied to the panel surface in strips and dabs. The strip of adhesive applied along the panel perimeter should be at least 3 cm wide. Apply 6 - 8 dabs of adhesive, ca. 8 ÷ 12 cm in diameter, distributed evenly on the remaining surface. The adhesive applied to the panel should cover at least 40% of its surface (60% after application and pressing). [6] When the adhesive has been applied, the panel should be immediately placed on the substrate and pressed down with strokes of a long float. This ensures good distribution of the adhesive and allows to avoid deformation of the board's end face. The thickness of adhesive under the panel should not be higher than 10 mm. The boards should be tightly fixed, close to each other, in one plane. To avoid cracks in the reinforced layer and render coat, they should not touch each other in one line (should miss each other). Adhesive should not get to the boards joints. Any cracks between boards should be filled with the material used for the insulation (e.g. polystyrene or mineral wool). Do not use dished, broken or cracked boards.

When the adhesive used for insulation application has set (usually after 2 – 3 days) it is possible to cut off any protruding board edges on the corners and grind the whole surface down with a long float covered with sand paper or special rubbing board. Any uneven board edges should be eliminated and smoothed off. Finally clean the board surface to remove any loose particles.

Adhesive selection

[4] Graphic scheme – Figure 4 attached to this paper.
[5] Graphic scheme – Figure 6 attached to this paper.
[6] In case of XPS, MW and lamella panels first rub into board surface a thin layer of the mortar using a toothed trowel (10 – 12 mm toothing) and then apply the "proper layer" using the "strip-point" method. For even and smooth EPS substrates it is possible to spread the adhesive evenly on the whole panel surface using a toothed trowel (10 – 12 mm toothing) to produce a coat 2-5 mm in thickness.

+++ Adhesive particularly recommended

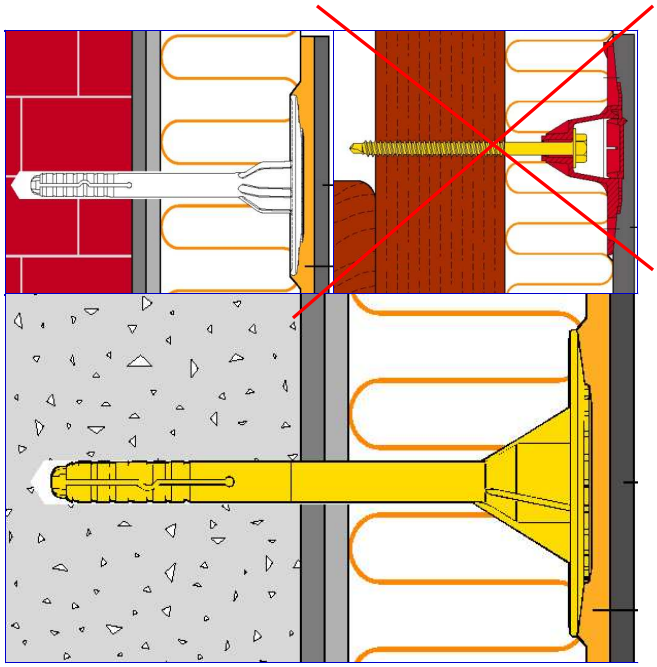
+ Adhesive can be used

Adhesive name	ATLAS STOPTER K20 AVAL KT 85	ATLAS STOPTER K10 AVAL KT 53	ATLAS HOTER U AVAL KT 55	ATLAS HOTER S AVAL KT 53	ATLAS ROKER W20 AVAL KT 190
Adhesive designation for ETICS systems					
Insulation panels application	+++	+++	+++	+++	+++
Reinforced coat application	+++		+++		+++
Types of insulation panels to be used					
EPS polystyrene boards	+++	+++	+++	+++	
XPS polystyrene panels	+++	+	+	+	
Elastified EPS polystyrene boards	+++	+++	+++	+++	
Mineral wool/lamella					+++
Substrate type					
Uncoated wall	+++	+++	+++	+++	+++
Cement – lime plaster	+++	+++	+++	+++	+++
Reinforced concrete	+++	+	+	+	+++
Old paints	+++		+		+++
Old thin – layer renders	+++	+	+++		+++
Parameters					
Adhesion to concrete	Min. 0,6 MPa	Min. 0,3 MPa	Min. 0,3 MPa	Min. 0,3 MPa	Min. 0,6 MPa
Adhesion to insulation products	Min. 0,1 MPa	Min. 0,1 MPa	Min. 0,1 MPa	Min. 0,1 MPa	Min. 0,015 MPa
Mortar reparation temperature	0 ÷ 25ºC	+5 ÷ 25ºC	+5 ÷ 25ºC	+5 ÷ 25ºC	+5 ÷ 25ºC

Mechanical fixings (anchors)

The technical design of thermal insulation should contain detailed information on the number, type and distribution of mechanical fixings (anchors). The type of fixings should take into consideration the

building location and type of substrate and insulation products to be used. Unless otherwise specified in the technical documentation, a minimum of 2 fixings should be installed for each panel (at least 4 ÷ 5 for $1m^2$ and 4 ÷ 6 for $1m^2$ in MW/lamella – based ETICS). Additional mechanical fixings are recommended on corners of the building or for panels thicker than 15 cm. Additional mechanical fixing is required in the case of thermal insulation of buildings higher than 12 metres. The depth of anchoring of fixings in the structural layer of the wall should be in accordance with the manufacturers' specifications. Do not harm the insulation structure when drilling or anchor installing. The fixing should not stick out of the insulation.



Additional fixing using anchors can be commenced no earlier than 24 hours after attaching the panels.

The following types of mechanical fixings (anchors) are recommended:

- Fixings with hammer in nylon pin – recommended for EPS polystyrene boards, minimum embedment depth 25 mm
- Fixings with hammer in steel pin with plastic coated head – recommended for EPS, XPS, MW and lamella panels, minimum embedment depth 25 mm
- Long expansion zone insulation fixings with hammer in steel pin with plastic coated head - recommended for EPS, XPS, MW and lamella panels, minimum embedment depth 60 mm
- Stainless steel fixings – recommended for lamella boards fire barriers, minimum embedment depth 50 mm

It is allowed to use any mechanical fasteners covered by ETA issued according to ETAG 014. Each ATLAS/AVAL ETICS Official Distributor is obliged to offer proper ETICS fasteners together with other system elements.

The fixings are inserted into the drilled holes. The drilling tool must be suitable for the material of the bearing layer in order to combine maximum efficiency and safety. Make sure to avoid strong strokes when drilling into thin partition materials. It is recommended that the anchors should be fixed in a way minimizing the occurrence of thermal bridges. Holes with depth of 20 mm are ground into the

board so as to provide support for the flange of the anchor disk. The space should be filled with a disk made of the respective insulation material.

Profiles

In order to increase the resistance of the insulation system to mechanical damage, enable free water drainage, and provide expansion joints, appropriate profiles are used. The profiles are installed in specific places on the façade, such as corners, reveals, window sills etc. The profiles can also be installed during the embedding of reinforcing mesh in the reinforced coat. The profiles are installed using ATLAS STOPTER K-20/AVAL KT 85 or ATLAS HOTER U/AVAL KT 55 (for ATLAS/AVAL ETICS and ATLAS XPS ETICS) or ATLAS ROKER W20/AVAL KT 190 (for ATLAS/AVAL ROKER ETICS) adhesive before the application of the basic reinforced layer. In a first step apply an uniform mortar layer 15 cm wide, than place the profile into mortar and press down with a steel float. Afterwards embed profile in the middle of the mortar bed.

The following profiles can be used:

Drip profiles - are fixed on horizontal edges of window and door reveals, and other façade cavities. It is also fixed on the lower edge of the thermal insulation if the skirting board cannot be used e.g. thermal insulation boards are thicker than the largest available board size. They ensure mainly correct removal of water flowing down the vertical façade surfaces. Therefore, they eliminate the risk of stains and plaster damage. The profiles also protect the edge from mechanical damage.[7]

Corner profiles - are fixed on various edges exposed to mechanical damage during utilisation e.g. in door and window reveals, quoins, etc. Mechanical harm does not result in permanent damage of the edge owing to the elasticity of the material.[8]

Window profile - is fixed between window or door frame woodwork and finishing layers of the thermal insulation system. They are available in two widths: 6 and 9 mm. The window profile has a polyurethane tape that eliminates plaster cracks and damages resulting from thermal expansion of reveals and plaster. Moreover, it facilitates arrangement and control of plaster thickness and, during work, protects woodwork from dirt; protective foil can be quickly and easily adhered to profile "flap" and then quickly removed after work conclusion by breaking off the flap with used foil. The window profile protects the space between the casing and plaster from humidity, dirt, microorganisms and insects, and improves thermal, sound and damp insulation there. It can be used for all types of joinery (wood, PVC, aluminium). Select the type of profile (6 or 9 mm) appropriately to the assumed thickness of the reinforced layer and plaster. On the casing, mark the planned contact line with the plaster coating and then remove the white protective strip on the polyurethane tape and adhere the profile to the casing so that its edge corresponds with the aforementioned line. The profile is always fixed with the "flap" towards the inside of the opening. When the yellow protective strip is removed, adhere appropriately cut foil that protects the joinery in this place of the profile. Fill in the inside of the profile completely with the reinforced layer and thin-layer plaster. Break off the flap with the foil after completed work.[9]

Expansion joint profile - is fixed between thermal insulation boards in places where construction expansion joint go through or if the thermal insulation layer needs to be divided. It is available in two versions: straight – expansion joint on the façade plane , and angle - expansion joint in the internal corner. The profile can be used in the expansion gap of 10 to 30 mm width. The profile consists of two parts: hard (PVC-U) – that contacts thermal insulation boards, and soft (PVC-P) – that fills in the

[7] Graphic scheme – Figure 7 attached to this paper.
[8] Graphic scheme – Figure 5 attached to this paper.
[9] Graphic scheme – Figure 7 attached to this paper.

space between them. The soft part is made in the coextrusion process; therefore, its combination with the hard part ensures very high durability and resistance. The expansion joint profile ensures permanent tightness (to humidity, dirt, microorganisms and insects) and correct cooperation of adjacent parts of the building and thermal layer arrangement. Tightness of the whole expansion joint depends on correct combination of two successive profiles vertically: the upper one and the lower one. They are combined using a special assembly section attached to every profile. It is made of soft PVC-P and has an adhesive layer (with a protective tape). Adhere the assembly section to the lower end of the upper profile (on the bottom of its soft part) and to the upper end of the lower profile (on the top of the soft part). It is also possible to use overlaps – the upper profile needs to overlap the lower one. To do that, cut off 10 mm sections from the hard part of the profile so that the overlap is made only of the soft parts. To obtain perfectly straight run of combined profiles, apply attached plugs that, during fixing, are to be pressed from the bottom in the sticking out parts "tips" of the upper profile and then the lower profile.[10]

Sill profile- is fixed under the sill, ensuring appropriate expansion joints between the sill and thermal insulation system layers. The sill profile ensures permanent tightness (to humidity, dirt, microorganisms and insects) and stiffens the sill (owing to appropriately shaped upper profile surface). The sill profile has a polyethylene tape that eliminates plaster cracks and damages resulting from thermal expansion of materials. Moreover, it facilitates application and control of plaster thickness. When fixing the profile, pay special attention to even cutting of thermal insulation boards to opening clearance and horizontal profile fixing. Directly before profile fixing, remove the protective tape from the polyethylene foam strip.

Note: Before fixing the expansion joint profile, fill in the gap with thermal insulation material e.g. polyurethane or polyethylene expansion joint cord. After profile fixing, protect the gap from dirt resulting from work related to preparation of the reinforced layer or plaster. To do that, put foamed polystyrene strips on it; remove the strips after plastering.

Firebreaks[11]

In case of any project requiring special fixing provisions (e.g. for building higher than 18 m or with high wind loads where extra mechanical fasteners should be used) always confirm the project details with the Certificate Holder's authorized technical representatives.

Firebreaks should be installed on joints of external wall with internal compartments (ceiling, partition walls. The fire barrier should be of noncombustible material, i.e. lamella, be at least 150 mm high and 200 mm wide, continuous and unbroken for the full perimeter of the building and for the full thickness of the insulation. Firebreaks should be adhesively bonded to the substrate, the thickness of an adhesive should be smaller than the EPS adhesive thickness. Reinforce the boards with ATLAS ROKER W20/AVAL KT 190 adhesive. Afterwards mechanically fix the reinforced layer (through the basecoat reinforcement) with stainless steel fire fixings and even the surface to the EPS reinforced layer level. The mechanical fixing should at 400 mm centres. Fire fixing at the rate of one per m^2 is required above two storey's (5.0m)

Any deviations from the fixing provisions listed must be approved by the Certificate Holder's authorized technical representative.

[10] Graphic scheme – Figure 8 attached to this paper.
[11] Graphic scheme – Figure 13 attached to this paper.

Reinforced layer

The reinforced coat consists of a glass fibre mesh embedded in a coat of ATLAS STOPTER K-20/AVAL KT 85 or ATLAS HOTER U/AVAL KT 55 (for ATLAS/AVAL ETICS and ATLAS XPS ETICS) or ATLAS ROKER W20/AVAL KT 190 (for ATLAS/AVAL ROKER ETICS) adhesive. The mesh has an appropriate mechanical strength, a uniform and strong weave, and a high resistance to alkali. The installation of the reinforcing coat should be commenced no earlier than 2 ÷ 3 days after the installation of insulating panels. First, any uneven spots on the surface of the thermal insulation panels should be removed by sanding. Then the wall surface should be reinforced in the corners of windows and doorways by embedding ca. 20x30 cm sized mesh strips in the adhesive coat. The strips should be placed at 45° angle to the reveal edges. Installation of the reinforced coat involves application of a uniform coat of adhesive to the entire surface of thermal insulation material and embedding strips of reinforcing mesh in the adhesive. To make it easier, the mesh can be first pressed into the adhesive in a few spots and then the entire strip is embedded using a notched trowel. A correctly embedded mesh should be completely invisible under the coat of adhesive and it should not be in direct contact with the panel surface. The reinforced coat should be continuous, i.e. the subsequent strips of mesh should overlap by a minimum of 10 cm, and 15 cm on corners. The mesh strips should also overlap with the mesh of the finishing profiles. The overlaps should not coincide with the joints between adjacent panels. Two layers of mesh should be used where necessary, i.e. on the ground floor level of the building and on the plinths. The final step consists of smoothing the reinforced mesh with a steel trowel. This should be done with great care, for constructional and aesthetic reasons. Any uneven spots left after this step should be removed by sanding. Since the rendering is relatively thin, and should be uniform on the whole surface of the facade, any uneven spots left on the reinforced coat may prevent correct installation of the rendering. The thickness of the reinforced layer – not less than 3 mm for EPS & XPS boards, min. 5 mm for MW/lamella boards.

It is allowed to apply additional reinforced layer to increase the durability and resistance of the system against accidental impacts, e.g. on the ground floor walls. Apply the additional reinforced layer before the application of the basic layer – the final mesh layer can be applied only when the additional reinforcement is set.

The day after the application it is allowed to polish off the signs left by the long float with a sandpaper and to fill small cavities if necessary. The edges of the building are most easily shaped and polished with a long angle float.

The layers of ETICS should be protected against direct sunshine, rainfall and strong wind during their application and drying. It is recommended to install protection mesh along scaffolding. In winter time the use of protection mesh along scaffolding is obligatory. It is not allowed to carry the works in snowfall, rain or strong wind. If a drop in temperature below+5°C has been forecasted for 3 consecutive days, adhesives other than ATLAS STOPTER K20/AVAL KT 85 should not be applied. If there is a drop in temperature below 0°C for the next 3 days forecasted, all works should be stopped.

Rendering coat

The top finishing coat of ATLAS/AVAL ETICS systems may consist of a thin layer rendering, or rendering coated with facade paint. If ATLAS CERMIT SN-MAL mineral render is used, it is absolutely essential to apply a top coat of facade paint for protection and aesthetic appearance.
The finishing coat should be selected based on the calculations of thermal and moisture protection properties for the wall to be insulated and the service conditions for the insulation system. In design preparation the following factors should be taken into consideration:

- Water vapour permeability of substrate – for walls made of materials with high vapour permeability (e.g. cellular concrete) or for mineral wool/lamella – based ETICS renders with high water vapour permeability should be used (e.g. mineral or silicate);

- Building age – for old building walls renders with high water vapour permeability should be used (e.g. silicate);
- Neighbourhood – the neighbourhood of green areas may create conditions for existence of mould, lichen, alga and moss. In such case it is recommended to use renders with high alkaline reaction (e.g. mineral or silicate with pH~12). All dispersive renders have biocide additives and low absorptiveness which reduce the risk of microorganism existence.
- Building location – for buildings located close to heavy – traffic roads or other sources of pollution silicone render is recommended, due to its self – cleaning ability.
- Colour – it is possible to choose a particular colour from the ATLAS PATTERN OF COLOURS – 41 colours for mineral renders, 655 for acrylic, 352 for silicate and 655 for silicone. The patterns of colours are available at Certificate Holder's representatives , Official Distributors' representatives and on web site www.atlas.com.pl. In order to avoid variations in shades of coloured renders, it is advisable to render any one stretch of surface using product with the same manufacturing date. If the renders are used in thermal insulation systems, avoid dark colours with reflection coefficient of scattered light below 20%. Share of the renders in such colours should not exceed 10% of façade surface. Some colours should not be applied on strongly insulated surfaces – these ones are additionally marked in the pattern of colours.
- Price – some renders are cheaper (e.g. mineral), some more expensive (e.g. silicone). The price depends on the chemical composition of a render and does not have an effect on a product quality.

Render selection

+ + + high level
+ + medium level
+ basic level

Render type	mineral				acrylic			silicate		silicone	
Render name	CERMIT SN AVAL KT 137	CERMIT DR AVAL KT 35	CERMIT SN-MAL	CERMIT PS AVAL KT 150	CERMIT N AVAL KT 60	CERMIT R AVAL KT 64	DEKO M AVAL KT 77	SILKAT N AVAL KT 72	SILKAT R AVAL KT 73	SILKON N AVAL KT 74	SILKON R AVAL KT 75
Type of binder	cement				acrylic resin			resins dispersion, liquid glass		resins dispersion, silicone resin	
Texture	spotted	rustic	spotted	sand-like	spotted	rustic	mosaic	spotted	rustic	spotted	rustic
Max. aggregate thickness [mm]	1,5 2,0 3,0	2,0 3,0	1,5 2,5	1,0	1,5 2,0 3,0	2,0 3,0	1,0 2,0	1,5 2,0	2,0	1,5 2,0	2,0
Number of colours	41	41	-	1	655	655	60	352	352	655	655
Vapour permeability	+ + +				+			+ + +		+ +	
Impact resistance	+				+ + +			+ + +		+ + +	

Water resistance (hydrophobicity)	+	+ + +	+ +	+ + +
Aging resistance	+ + +	+ +	+ + +	+ +
Dirt resistance	+	+ +	+ +	+ + +
Biological factors resistance	+ + +	+ +	+ + +	+ + +

Installation of the rendering coat can be commenced about three days after the application of the reinforced coat. Regardless of the type of the thin-layer ATLAS render to be used, it should be preceded by a coat of an appropriate render primer, suitable for the type of rendering selected. The render primer prevents the penetration of impurities from the adhesive into the render, protects and reinforces the substrate and, above all, increases the bond strength between the render and the substrate. Besides, the render primer can act as a temporary protection of the reinforced coat (until the render is applied) for up to six months from its installation. The rendering may consist of thin-layer renders with grain size between 1.5 mm and 3.0 mm (depending on the type of render). They can be coated with ATLAS facade paints, in accordance with the procedure described in their respective technical data sheets.
ATLAS/AVAL thin – layer renders should be applied over prepared substrate as an even layer using a float made of stainless steel. Thickness of the layer should correspond with the aggregate grain size. Remove excess of material, place it in the bucket and mix.
Form texture of the surface using a float made of plastic with circular moves for spotted texture renders and vertical or circular moves (depending on the expected line arrangement) for rustic texture renders.[12]
Open time of the mass (between mortar application and floating) depends on substrate absorptivity, ambient temperature and mass consistency. Experimentally (for a given type of substrate and given weather) determine the maximum area that can be prepared in one technological cycle (application and floating). Apply the mix using the "wet on wet" method, preventing one batch from drying before application of another one. Otherwise the "seams" will be visible. Plan technological gaps in advance e.g. in corners or building angles, under rainwater pipes, etc. Apply a self-adhesive tape along a pre – defined line. Than apply the render and float it. Afterwards remove the tape together with the excess material. When the render is set, protect its edge with the tape and apply the render on the next working field.

If you wish to combine renders of different colours apply a self-adhesive tape along a pre – defined line. Than apply the render and float it. Afterwards remove the tape together with the excess material. When the render is set, protect its edge with the tape and apply the differently coloured render.
Protect the rendered surface during work and when it dries from direct sunlight, wind and precipitation. Drying time depends on the render type, substrate, temperature and relative humidity of air. In case of increased humidity and temperature ca.+5°C, render setting time may extend.

Use the scaffolding net covers obligatorily during the render application and drying (for at least 3 days in temperature of +20°C and relative air humidity of 60%). The distance between the insulation board surface and the scaffolding cannot make the floating of the render difficult. It is not allowed to carry the works in snowfall, rain or strong wind. If a drop in temperature below +5°C has been forecasted for 3 consecutive days, renders should not be applied.

[12] Notes: For mosaic renders ATLAS DEKO M/AVAL KT 77 always smooth wet render in the same direction. The mosaic render is particularly recommended for plinths or socles liable to become dirty or get in contact with water. The lack of uniform render texture due to local irregular floating may result in differences in colour shades on the rendered surface.

Paint coat

Renders can be coated with ATLAS facade paints, in accordance with the procedure described in their respective technical data sheets.

Render coatings can be painted after complete drying, not earlier, however, than:

Acrylic paint ATLAS CERTON/AVAL KT 45:
- cement – lime and mineral renders: after 4÷6 weeks[13]

Acrylic paint ATLAS ARKOL E/AVAL KT 44:
- mineral renders: after 4÷6 weeks
- acrylic renders: after min. 7 days

Silicate paint ATLAS ARKOL S/AVAL KT 54:
- mineral renders: after 48 hours

Silicone paint ATLAS ARKOL N/AVAL KT 48:
- mineral renders: after 2÷4 weeks
- acrylic renders: after min. 7 days

Silicone paint ATLAS FASTEL/AVAL KT 46:
- mineral renders: after min. 5 days
- acrylic renders: after min. 7 days
- traditional plasters: after min. 2÷4 weeks

Apply thin and even layer of ATLAS/AVAL paints to prepared substrate. Use a roller or brush, or paint by spraying not earlier than 6 hours after substrate priming. The number of applied paint layers depends on substrate absorptiveness and structure (two layers are recommended). Apply the next layer crosswise to the first one min. 6 hours later. Plan technological gaps in advance e.g. in corners or building angles, under rainwater pipes, etc. Apply paint continuously (with the "wet on wet" method) on the planned surface, avoiding any breaks in work.
Apply the successive layer after the previous one completely dries (after min. 6 hours), criss-cross, maintaining the same direction of application for a given paint layer. Use undiluted paint for the final coat. Plan technological gaps in advance e.g. in corners or building angles, under rainwater pipes, etc. Apply paint continuously (with the "wet on wet" method) on the planned surface, avoiding any breaks in work. The drying time depends on the substrate, temperature and relative humidity of air and is from ca. 2 to 6 hours. The time depends on colour intensity of the paint used. Uniform colour of the painted surface largely depends on the degree of substrate drying. Applied paint slightly smoothes substrate texture in a natural manner. In case of painting surfaces differing in respect of texture and technical parameters, different colour shades of the same paint may result.
Do not paint in case of high humidity and low temperatures (below +5°C). Protect the painted surface during work and when it dries from direct sunlight, wind and precipitation.
Non-observance of manufacturer's requirements, in particular in respect of substrate preparation, method of application and façade protection from weather, may result in discolouration and salt efflorescence - this is a completely natural phenomenon.
To avoid differences in colour shades, apply paint of the same production date on one surface. Applied paint slightly smoothes substrate texture in a natural manner. In case of painting surfaces differing in respect of texture and technical parameters, different colour shades of the same paint may result. If the paints are used in thermal insulation systems, avoid dark colours with reflection coefficient of scattered light below 20%. Share of the paints in such colours should not exceed 10% of

[13] The aging time presented can be reached in favorable weather conditions (temperature above +5ºC, humidity below 65%). In case of lower temperature or/and higher humidity the aging time may be longer. In case of renders do not apply paint earlier than 48 hours after last precipitation.

façade surface. Some colours should not be applied on strongly insulated surfaces – these ones are additionally marked in the pattern of colours.

Paint selection in respect of substrate

+ + + Paint particularly recommended
+ Paint can be used

Paint type	acrylic		silicate	silicone	
Paint name	ATLAS ARKOL E AVAL KT 44	ATLAS CERTON AVAL KT 45	ATLAS ARKOL S AVAL KT 54	ATLAS ARKOL N AVAL KT 48	ATLAS FASTEL AVAL KT 46
Substrate					
Concrete/reinforced concrete	+ + +	+ + +	+	+ + +	+ + +
Cement & cement – lime plaster	+ + +	+ + +	+ + +	+ + +	+ + +
Mineral thin - layer	+	+ + +	+ + +	+ + +	+ + +
Acrylic thin - layer	+ + +	+		+ + +	+
Silicate thin - layer	+	+	+ + +	+	+
Silicone thin - layer	+	+		+ + +	+
Asbestos – cement panels	+ + +			+ + +	+

Paint selection in respect of its features

+ + + high level
+ + medium level
+ basic level

Paint type	acrylic		silicate	silicone	
Paint name	ATLAS ARKOL E AVAL KT 44	ATLAS CERTON AVAL KT 45	ATLAS ARKOL S AVAL KT 54	ATLAS ARKOL N AVAL KT 48	ATLAS FASTEL AVAL KT 46
Feautures					
Covering	+ + +	+ + +	+ + +	+ + +	+ + +
Vapour permeability	+	+ +	+ + +	+ +	+ +
Water resistance (hydrophobicity)	+ + +	+ +	+ +	+ + +	+ + +
Dirt resistance	+ +	+ +	+ +	+ + +	+ + +
Biological factors resistance	+ +	+ +	+ + +	+ + +	+ + +

Use the scaffolding net covers obligatorily during the render application and drying (for at least 1 day in temperature of +20°C and relative air humidity of 60%). It is not allowed to carry the works in snowfall, rain or strong wind. If a drop in temperature below +5°C has been forecasted for 3 consecutive days, paints should not be applied.

Construction details insulation[14]

Proper insulation of the construction details (balconies, corners, window reveals, bases etc.) is extremely important and should be described in detail in the insulation design. Always remember to avoid thermal bridges, and, if the construction of a particular detail, does not allow to reach the minimum U – value required, always indicated the particular U – value reached. Always follow the manufacturer's instructions, it is recommended to use the finishing profiles.

Balconies and terraces insulation
Install the insulation on the wall in accordance to the Certificate Holder's requirements and provisions. For the substrate below the starter track use the XPS polystyrene boards. Between the basic insulation and the XPS insulation leave of joint with an expanding tape and seal with ATLAS SILTON S sanitary silicone.

Insulation finishing at eaves
The wall insulation should be joined with the roof insulation and ensure the insulation continuity. After the wall insulation assemble gutters, pipes and flashing.

Flat roof attic insulation
Apply EPS boards to the vertical attic elements, and XPS boards on the horizontal surface. When the adhesive is set, apply ATLAS HOTER U/AVAL KT 55 or ATLAS STOPTER K20/AVAL KT 85 adhesive on the XPS boards and top parts of the EPS boards in the attic area (ca. 15 cm). Embed the glass fibre mesh. When the adhesive is set, apply the reinforced layer on the vertical and horizontal attic surfaces. Afterwards fix mechanically (into the substrate) cement fibre boards. Apply the render coat and install the flashing. The joint of render coat and flashing seal with ATLAS SILTON S sanitary silicone.

Anchoring of a structural element
Apply the 15 cm wide layer of ATLAS HOTER U/AVAL KT 55 or ATLAS STOPTER K20/AVAL KT 85 adhesive mortar around the element. Embed the 40 – 55 cm glass fibre mesh into the adhesive leaving parts of it free. When the adhesive is set install the insulation boards, leaving a joint 10 mm wide between the element and the insulation. Turn the free mesh parts on the boards and embed into ATLAS HOTER U/AVAL KT 55 or ATLAS STOPTER K20/AVAL KT 85 adhesive mortar. Apply the reinforced layer and the render coat on the surface. The joint around the element seal with ATLAS SILTON S sanitary silicone.

Joint of different insulation – based ETICS
The joint of different can be done with a set – off (Figure 14) or in one layer (Figure 15). For the set – off joint apply the starter track leave a joint between ETICS systems with an expanding tape and seal it with ATLAS SILTON S sanitary silicone. For the one layer – joint use the expansion joint profile and follow the Certificate Holder's provisions.

ATLAS/AVAL ETICS INSTALLATION [15]

ATLAS is an External Thermal Insulation Composite System (ETICS) with render coatings. The product has been given European Technical Approval no. ETA-06/0081 issued in accordance with guidelines of European Technical Approvals ETAG 004: 2000.

The main objectives of the system are as follows:
- providing external walls with appropriate thermal insulation,
- increase durability of external walls by ensuring better protection from weather.

[14] Graphic schemes – Figures 4 - 15 attached to this paper.
[15] Graphic scheme – Figure 1 attached to this paper.

The thermal insulation technology consists in fixing thermal insulation made of foamed polystyrene boards to the substrate and preparation of a reinforced layer, a render coating and, optionally, a paint coating on the insulation. ATLAS can be used only as an adhered system or as an adhered system with additional mechanical fixing. The system can be applied on new or existing external surfaces of vertical building wall (plastered or not) made of masonry or adhered materials, such as bricks and blocks (ceramic, lime-sand, stone, cellular concrete), or of concrete (poured at the construction site or in the form of prefabricated elements). It can also be fixed on surfaces of horizontal or tilted structural elements provided that they are not directly exposed to precipitation. These may include ceilings over passages, internal walls and roofs (on the ceiling's side) of garages or cellars adjacent to heated rooms. The substrate on which ATLAS will be used should have reaction to fire class: A1 or A2-s1 d0 according to EN 13501-1.

System preparation

In the system design and during work, take into account requirements of ETAG 004: 2000, ETA-06/0081 Approval, ETA-06/0187 Approval and the technical and legal regulations currently in force in the country where the system is to be installed. This applies especially to the requirements as to the insulating properties of partitions, energy efficiency requirements, construction safety, fire safety and the conditions of starting and conducting a building project. Besides, all work should be done in accordance with the information contained in the technical design of thermal insulation, technical instructions issued by ATLAS and in the Technical Data Sheets of the individual components of the system. Technical documentation should be developed individually for a particular building, with consideration to its location and construction.

Substrate preparation

ATLAS/AVAL ETICS system can be used to insulate plastered or not plastered solid concrete walls as well as walls made of bricks, aerated concrete blocks, concrete and structural clay tiles. The substrate should be even, structurally sound and free from anything that may impede mortar adhesion. Hammer off loose or flaking elements and fill in defects using materials recommended for that purpose e.g. ATLAS PLASTERING MIX/AVAL KT 111, ATLAS LEVELLING MORTAR. Wash off under pressure or scrape off the remainder of poorly adhering paint coats. In case of weak, dusty or highly absorptive substrates, prime using ATLAS UNI-GRUNT/AVAL KT 17.

Insulation selection. Foamed polystyrene board fixing

Thermal insulation comprises of seasoned, self – extinguished, factory – prefabricated, expanded polystyrene EPS according to EN 13163 with the designation code and other properties given in Table below:

Designation code according to EN 13163	Standard EPS EPS-EN 13163-T2-L2-W2-S1-P3-BS115-CS(10)70-DS(N)2-DS(70,-)2-TR100 EPS-EN 13163-T2-L2-W2-S2-P4-BS115-CS(10)70-DS(N)2-DS(70,-)2-TR100 EPS-EN 13163-T2-L2-W2-S2-P3-BS115-CS(10)70-DS(N)2-DS(70,-)2-TR100 EPS-EN 13163-T2-L2-W2-S2-P4-BS115-CS(10)70-DS(N)2-DS(70,-)1-TR150 Elastified EPS* EPS-EN 13163-T2-L1-W2-S2-P4-BS100-DS(N)2-DS(70,-)1-TR80		
Reaction to fire according to EN 13501-1	**Maximum density (kg/m^3)**	**Thickness (mm)**	**Class**
EPS panels	20	20 ÷ 250	E
Surface condition	Cut surface		
Water absorption, partial immersion (%) according to EN 1609	≤ 1,0		
Water vapour diffusion resistance factor (μ) according to EN 12086	20 ÷ 40		
Tensile strength perpendicular to the faces in dry conditions (kPa) according to EN 1607	according to TR in above mentioned designation codes		
Shear strength (N/mm^2) according to EN 12090	$0,02 \le f_{\tau k} \le 0,10$		
Shear modulus of elasticity (N/mm^2) according to EN 12090 - standard EPS - elastified EPS*	 $1,0 \le G_m \le 3,0$ $0,3 \le G_m \le 1,0$		
Thermal resistance	Defined in the CE marking in reference to EN 13163		

* Elastified EPS is made from standard EPS by short time high load pressing to reduce the dynamic stiffness.

Begin with fixing a skirting board on the wall. It ensures level maintenance in case of the first and successive layers of foamed polystyrene boards and reinforces the lower system edge. It should be fixed on the base of the building not lower than 30 cm under the ground level. This distance ensures system protection from capillary moisture and secures the plaster coating from dirt such as mud caused by raindrops falling on pavement or ground. Skirting boards can be replaced by reinforcing mesh or two layers of glass fibre mesh.
When the skirting board is fixed, begin application of the thermal insulation. Fix the first row of boards on the basis of the initial board. Place successive boards alternatively. This is applicable on the wall surface and in building corners. The main component that fixes foamed polystyrene to the substrate is ATLAS HOTER S/AVAL KT 53 or ATLAS STOPTER K10/AVAL KT 83 adhesive. It is applied on boards using the "strip-point" method. The circumferential block located along board edges should be at least 3 cm wide. Evenly distribute 6÷8 patches of 8÷12 cm in diameter on the remaining surface. The mortar applied should cover at least 40% of board surface. Place the board on the substrate and press it down the substrate immediately after mortar application. In some cases, use ca. 4÷6 plastic fasteners for 1 m^2. Use mechanical fasteners in corners of buildings or in case of foamed polystyrene that is more than 15 cm thick. Additional mechanical fixing is required if thermal insulation of buildings

is more than 12 m high or if load capacity of the substrate is low and difficult to determine. Details as to the quantity, type and length of fasteners and their arrangement should be included in the thermal insulation project. Begin additional fixing of the thermal insulation using mechanical fasteners not earlier than 1 day after board fixing. The anchoring depth of additional fixing elements in the structural wall layer made of solid materials should be min. 6 cm. In case of cavity bricks, structural clay tiles or cellular concrete blocks, fasteners need to be anchored min. 9 cm.

Reinforced layer preparation

To improve resistance of the thermal insulation layer to mechanical damage, before setting in the mesh, apply ATLAS corner profiles on all vertical building quoins as well as door and window casings. Begin preparation of the reinforced layer not earlier than 2 days after board fixing. The reinforced layer consists of a glass fibre mesh set in ATLAS HOTER U/AVAL KT 55 or STOPTER K20/AVAL KT 85. The mesh recommended for ATLAS/AVAL ETICS system is characterised by appropriate mechanical strength, regular and durable braid, and resistance to alkali. Start the reinforced layer from grinding possible irregularities of foamed polystyrene boards. Then, apply a layer of ATLAS HOTER U/AVAL KT 55 or STOPTER K20/AVAL KT 85 adhesive and distribute it evenly on the surface using a notched float. Set previously cut mesh strip in the mortar. It is convenient to first press the mesh into the mix only in a few places and then set in the whole strip using a notched float. If the mesh is set correctly, it is not visible under the adhesive. The reinforced layer has to be continuous i.e. successive mesh strips should overlap min. 10 cm, whereas overlaps in quoins should be min. 15 cm. Mesh overlaps cannot correspond with joints between foamed polystyrene boards. Reinforce wall surfaces near the contact places of vertical and horizontal quoins of window openings and doorways by setting in additional mesh strips askew. Finally, smooth the reinforced layer using a float made of metal. The work has to be very careful not only due to structural reasons, but also because of layer appearance. If there are any irregularities after smoothing, grind them off. Due to small thickness of the plaster coating (1.5 mm, 2 mm and 3 mm), any irregularities in the reinforced layer may prevent correct render coating preparation.

Primer preparation

Regardless of the type of ATLAS/AVAL thin-layer plaster applied on the thermal insulation, prepare a priming layer made of priming mass on the reinforced layer. The priming coat should be appropriate for a given render type: ATLAS CERPLAST/AVAL KT 16 mineral and acrylic renders, ATLAS SILKAT ASX/AVAL KT 15 silicate renders, ATLAS SILKON ANX/AVAL KT 76 silicone renders. The priming coat will prevent any contamination of adhesives from reaching the render layer, reinforce the substrate and increase render adhesion to the substrate. Moreover, priming coats may serve as temporary protective layers of the reinforced layer (before render is applied) for up to six months from their preparation.

Thickness of ATLAS/AVAL ETICS coats

Table below presents the thickness of all elements of ATLAS/AVAL ETICS applied on the insulation material already fixed with anchors:

Components	Base	Particles size (mm)	Thickness (mm)	Coverage (kg/m²)
BASE COATS To be used with all finishing coats indicated here after				
ATLAS STOPTER K20 AVAL KT 85	Cement based powder requiring addition of 0,20 ÷ 0,22 l/kg water; Base: sand, cement, limestone filler, synthetic resin, additives	-	2,0 ÷ 3,0	3,0 ÷ 3,5 (powder)

ATLAS HOTER U AVAL KT 55	Cement based powder requiring addition of 0,20 ÷ 0,22 l/kg water; Base: sand, cement, limestone filler, synthetic resin, additives	-	2,0 ÷ 3,0	3,0 ÷ 3,5 (powder)
GLASS FIBRE MESHES				
SSA 1363 SM (100) or VERTEX 145A/AKE 145A/R 117 A 101	-	-	-	-
KEY COATS To be used with finishing coats indicated here after				
ATLAS CERPLAST AVAL KT 16 or ATLAS SILKAT ASX AVAL KT 15 or ATLAS SILKON ANX AVAL KT 76	Water, styrolacrylat binder, mineral fillers, silicone emulsion, additives	-	-	0,25 ÷ 0,35
FINISHING COATS				
ATLAS CERMIT mineral AVAL mineral	Powder requiring addition of 0,18 ÷ 0,26 l/kg water; Base: sand, cement, limestone filler, synthetic resin, additives	1,5/2,0/2,5/3,0	Regulated by particles size	2,5 ÷ 4,5 (powder)
ATLAS CERMIT acryl AVAL acryl	Ready to use paste; Base: sand, acryl-copolymyre binder, mineral fillers, additives	1,5/2,0/3,0	Regulated by particles size	2,5 ÷ 4,5 (paste)
ATLAS SILKAT AVAL silicate	Ready to use paste; Base: sand, silicate binder, mineral fillers, additives	1,5/2,0	Regulated by particles size	2,5 ÷ 3,5 (paste)
ATLAS SILKON AVAL silicone	Ready to use paste; Base: sand, silicone resin, mineral fillers, additives	1,5/2,0	Regulated by particles size	2,5 ÷ 3,5 (paste)
PRIMERS To be used with finishing coats indicated here after				
ATLAS ARKOL SX AVAL KT 52 or ATLAS ARKOL NX AVAL KT 47	Water, styrolacrylat binder, mineral fillers, silicone emulsion, additives	-	-	0,05 ÷ 0,20
DECORATIVE FINISHES (PAINTS) – used optionally				
ATLAS ARKOL E AVAL KT 44 or ATLAS ARKOL S AVAL KT 54 or ATLAS ARKOL N ATLAS FASTEL AVAL KT 48 AVAL KT 46	Ready to use pigmented liquid; Base: acryl-copolymyre binder (acrylic paint) Base: silicate binder (silicate paint) Base: silicone resin (silicone paint)	-	-	0,125 ÷ 0,250 In case of silicate paint: 0,200 ÷ 0,280

Design for impact

The resistance to hard body impacts (3 Joules and 10 Joules) and the perforation (Perfotest), determined according to ETAG 004 clauses 5.1.3.3, 5.1.3.3.1, 5.1.3.3.2 (with mesh: SSA 1363 SM(100) or VERTEX 145A/AKE 145A/R 117 A 101) lead to categories given in Table below:

		Single mesh
Standard EPS + base coat ATLAS STOPTER K20/AVAL KT 85 (with relevant key coat) + finishing coat indicated hereafter:	ATLAS CERMIT mineral/ AVAL mineral	Category III[1]
	ATLAS CERMIT acryl/ AVAL acryl	Category III[1]
	ATLAS SILKAT/ AVAL silicate	Category III[1]
	ATLAS SILKON/ AVAL silicone	Category III[1]
Standard EPS + base coat ATLAS HOTER U/AVAL KT 55 (with relevant key coat) + finishing coat indicated hereafter	ATLAS CERMIT mineral/ AVAL mineral	Category III[1]
	ATLAS CERMIT acryl/ AVAL acryl	Category III[1]
	ATLAS SILKAT/ AVAL silicate	Category III[1]
	ATLAS SILKON/ AVAL silicone	Category III[1]
Elastified EPS + base coat ATLAS STOPTER K20/AVAL KT 85 (with relevant key coat) + finishing coat indicated hereafter:	ATLAS CERMIT mineral/ AVAL mineral	Category III[1]
	ATLAS CERMIT acryl/ AVAL acryl	Category III[1]
	ATLAS SILKAT/ AVAL silicate	Category II[1]
	ATLAS SILKON/ AVAL silicone	Category II[1]
Elastified EPS + base coat ATLAS HOTER U/AVAL KT 55 (with relevant key coat) + finishing coat indicated hereafter	ATLAS CERMIT mineral/ AVAL mineral	Category III[1]
	ATLAS CERMIT acryl/ AVAL acryl	Category III[1]
	ATLAS SILKAT/ AVAL silicate	Category II[1]
	ATLAS SILKON/ AVAL silicone	Category III[1]
[1] use categories according to ETAG 004, clause 6.1.3.3, table 8		

ATLAS ROKER/AVAL ROKER ETICS INSTALLATION [16]

ATLAS ROKER/AVAL ROKER is an External Thermal Insulation Composite System (ETICS) with render coatings. The product has been given European Technical Approval no. ETA-06/0173 issued in

[16] Graphic scheme – Figure 3 attached to this paper.

accordance with guidelines of European Technical Approvals ETAG 004: 2000.

The main objectives of the system are as follows:

- providing external walls with appropriate thermal insulation,
- increase durability of external walls by ensuring better protection from weather.

The thermal insulation technology consists in fixing thermals insulation made of mineral wool boards to the external surface of building walls and preparation of a reinforced layer, a plaster coating and, optionally, a paint coating on the insulation. The system can be applied on new or existing external surfaces of vertical building wall (plastered or not) made of masonry or adhered materials, such as bricks and blocks (ceramic, lime-sand, stone, cellular concrete), or of concrete (poured at the construction site or in the form of prefabricated elements). It can also be fixed on surfaces of horizontal or tilted structural elements provided that they are not directly exposed to precipitation. These may include ceilings over passages, internal walls and roofs (on the ceiling's side) of garages or cellars adjacent to heated rooms. The substrate on which ATLAS will be used should have reaction to fire class: A1 or A2-s1 d0 according to EN 13501-1.

System preparation

In the system design and during work, take into account requirements of ETAG 004: 2000, ETA-06/0173 Approval, ETA-06/0281 Approval and technical and legal regulations applicable in the country in which the system will be used, in particular in respect of partition insulation, energy requirements, structural safety, fire safety, and conditions of work commencement and conduction. Moreover, carry out all work in accordance with information included in the technical project of the thermal insulation, Technical Sheets of individual system components and other ATLAS technical instructions. Technical documentation should be developed individually for each building and adjusted to its degree of complexity. ATLAS ROKER/AVAL ROKER system consists of non-bearing structural elements; therefore, it does not affect stability of elements to which it is fixed. The value of additional thermal resistance R the wall achieves after the system is applied needs to be calculated in accordance with EN ISO 6946 as the total of product's thermal resistance to thermal insulation and thermal resistance of the finishing layer render. If required in accordance with EN ISO 6946, calculations should take into account effect of thermal bridges resulting from application of mechanical fasteners. The system complies with the criteria of item 5.1.4.2 in ETAG 004: 2000. Therefore, no limits as to wall length or the distance between system expansion profile are introduced unless these result from other requirements, in particular structure of the building in which the system will be used. Carry out thermal insulation work in favourable weather Substrate and ambient temperature during work and when individual materials dry should be from +5°C to +25°C. The façade should be covered and protected from precipitation, direct sunlight and strong wind.

Substrate

The substrate should be even, structurally sound and free from anything that may impede mortar adhesion. Hammer off loose or flaking elements and fill in defects using materials recommended for that purpose e.g. ATLAS PLASTERING MIX/AVAL KT 111, ATLAS LEVELLING MORTAR. ATLAS/AVAL ROKER system can be fixed to substrates covered with strongly adhering coats of façade paints or thin-layer plasters. Wash off under pressure or scrape off the remainder of poorly adhering paint coats. In case of weak, dusty or highly absorptive substrates, prime using ATLAS UNI-GRUNT/AVAL KT 17. The substrate should be prepared in accordance with ETAG 004: 2000 requirements. If in doubt as to substrate quality, assess its loading capacity in actual conditions. The result (adhesion) should not be lower than 0.08 MPa; then, damage in the thermal insulation layer can be deemed as a positive result of the tearing test of the adhered square.

Mineral wool board fixing

Thermal insulation comprises of factory-prefabricated coated or uncoated mineral wool boards (MW) or lamella according to EN 13162 with the designation codes and other properties given in the Table below:

Designation code according to EN 13162	MW-EN 13162-T5-DS(TH)-CS(10)40-TR15-WS-WL(P)-MU1 MW-EN 13162-T4-DS(TH)-CS(10)40-TR15-WS-WL(P)-MU1 MW-EN 13162-T5-DS(TH)-CS(10)40-TR100-WS- WL(P)-MU1 MW-EN 13162-T5-DS(TH)-CS(10)30-TR10-WS-WL(P)-MU1 MW-EN 13162-T5-DS(TH)-CS(10/Y)50-TR80-WS-WL(P)-MU1		
Reaction to fire according to EN 13501-1	**Maximum density (kg/m^3)**	**Thickness (mm)**	**Class**
MW board	135,0	20 to 250	A1
Tensile strength perpendicular to the faces in dry conditions (kPa) according to EN 1607	according to TR in above mentioned designation codes		
Shear strength (N/mm^2) according to EN 12090	$0,02 \leq f_{\tau k}$		
Shear modulus of elasticity (N/mm^2) according to EN 12090	$1,0 \leq G_m$		
Thermal resistance	Defined in the CE marking in reference to EN 13162		

Thermal insulation thickness should be selected individually for each wall in the building, among others, on the basis of overall heat-transfer coefficient U. It should comply with thermal insulation requirements of partitions specified in applicable technical and legal regulations. Begin with fixing a skirting board on the wall. It ensures maintenance of even level in case of the first and successive layers of thermal insulation boards and reinforces the lower system edge. It should be fixed on the base of the building not lower than 30 cm under the ground level. This distance ensures system protection from capillary moisture and secures the plaster coating from dirt such as mud caused by raindrops falling on pavement or ground. If a skirting board cannot be used (e.g. if the thermal insulation layer is thicker than the largest available board size), it is allowable to use two layers of glass fibre mesh with a drip profile on the lower edge of the thermal insulation. When the skirting board is fixed, begin application of the thermal insulation. Fix the first row of boards on the basis of the initial board. Place successive boards alternatively (vertical joints between boards should be shifted in relation to one another). This is applicable on the wall surface and in building corners. From the point of view of the technical project and load transfer, the system can be only adhered (with lamella boards made of mineral wool) or adhered with additional mechanical fixing (with regular or lamella boards made of mineral wool). Adhesive can be applied on thermal insulation layers using two methods: partially (only regular boards) or completely (regular and lamella board, in case of even and smooth substrate). Partial application is referred to as the "strip-point" method. First float board surface with a thin layer of the mortar and then apply the "proper layer" using the "strip-point" method. The circumferential block located along board edges should be at least 3 cm wide. Evenly distribute 6÷8 patches of 8÷12 cm in diameter on the remaining surface. The mortar applied should cover at least 40% of board surface. Place the board on the substrate and press it down the substrate immediately after mortar application. Begin fixing mechanical fasteners not earlier than 1 day after

board fixing. Use 4÷6 fasteners for 1 m^2. Details as to the quantity, type and length of fasteners and their arrangement should be included in the thermal insulation project. The anchoring depth of additional fixing elements in the structural wall layer should be consistent with requirements of their manufacturers. To improve resistance of thermal insulation layer arrangement to mechanical damage, ensure free water removal and professional preparation of expansion joints, fix finishing profiles on the thermal insulation layer. The profiles are applied in all special places of the façade such as: corners, reveals, sills, etc. They can also be fixed with setting mesh in the reinforced layer of the system. In case of profile fixing, use ATLAS ROKER W-20/AVAL KT 190 adhesive.

Reinforced layer

The reinforced layer consists of a reinforcing mesh made of glass fibre set in ATLAS ROKER W-20/AVAL KT 190 mortar. The mesh is characterised by appropriate mechanical strength, regular and durable braid, and resistance to alkali. Begin preparation of the reinforced layer not earlier than 2 days after board fixing. Then, reinforce wall surfaces near the contact places of vertical and horizontal quoins of window openings and doorways. To do this, set 20x30 cm mesh strips in it. The strips should be at the angle of 45° in relation to the lines determined by reveal edges. To prepare the reinforced layer, distribute ATLAS ROKER W-20/AVAL KT 190 mortar evenly on the whole thermal insulation surface and then set in successive mesh strips. First, apply mortar layer using 2/3 of the final quantity and distribute it evenly. Set previously cut mesh strip in the mortar. First press it down in several spots in the applied mortar and then carefully cover it with the mortar using a notched float so that the mesh is not visible. Then, apply the remaining 1/3 of the mortar and carefully smooth the surface. If the mesh is set correctly, it is not visible under the adhesive; it should not directly contact the thermal insulation layer. The reinforced layer has to be continuous i.e. successive mesh strips should overlap min. 10 cm, whereas overlaps in quoins should be min. 15 cm. Overlaps are also required in contact places of the proper reinforcing mesh with the finishing profile mesh. Mesh overlaps cannot correspond with joints between mineral wool boards. Finally, smooth the reinforced layer using a float made of metal. The work has to be very careful not only due to structural reasons, but also because of layer appearance. If there are any irregularities after smoothing, grind them off. Due to small thickness of the plaster coating and the fact that is has to be maintained on the whole façade surface, any irregularities in the reinforced layer may prevent correct plaster coating preparation.

Primer preparation

Regardless of the type of ATLAS thin-layer plaster applied on the thermal insulation, prepare a priming layer made of priming mass on the reinforced layer. The priming coat should be appropriate for a given render type. The priming coat will prevent any contamination of adhesives from reaching the render layer, reinforce the substrate and increase plaster adhesion to the substrate. Moreover, priming coats may serve as temporary protective layers of the reinforced layer (before plaster is applied) for up to six months from their preparation.

Thickness of ATLAS/AVAL ROKER ETICS coats

Table below presents the thickness of all elements of ATLAS/AVAL ROKER ETICS applied on the insulation material already fixed with anchors:

Components	Base	Particles size (mm)	Thickness (mm)	Coverage (kg/m²)
BASE COATS To be used with all finishing coats indicated here after				
ATLAS ROKER W20 AVAL KT 190	Cement based powder requiring addition of 0,20 ÷ 0,25 l/kg water; Base: sand, cement, limestone filler,	-	4,0 ÷ 5,0	5,5 ÷ 6,5 (powder)

	synthetic resin, additives			
GLASS FIBRE MESHES				
SSA 1363 SM (100) or VERTEX 145A/AKE 145A/R 117 A 101	-	-	-	-
KEY COATS To be used with finishing coats indicated here after				
ATLAS CERPLAST AVAL KT 16 or ATLAS SILKAT ASX AVAL KT 15 or ATLAS SILKON ANX AVAL KT 76	Water, styrolacrylat binder, mineral fillers, silicone emulsion, additives	-	-	0,25 ÷ 0,35
FINISHING COATS				
ATLAS CERMIT mineral AVAL mineral	Powder requiring addition of 0,18 ÷ 0,26 l/kg water; Base: sand, cement, limestone filler, synthetic resin, additives	1,5/2,0/2,5/3,0	Regulated by particles size	2,5 ÷ 4,5 (powder)
ATLAS SILKAT AVAL silicate	Ready to use paste; Base: sand, silicate binder, mineral fillers, additives	1,5/2,0	Regulated by particles size	2,5 ÷ 3,5 (paste)
ATLAS SILKON AVAL silicone	Ready to use paste; Base: sand, silicone resin, mineral fillers, additives	1,5/2,0	Regulated by particles size	2,5 ÷ 3,5 (paste)
PRIMERS To be used with finishing coats indicated here after				
ATLAS ARKOL SX AVAL KT 52 or ATLAS ARKOL NX AVAL KT 47	Water, styrolacrylat binder, mineral fillers, silicone emulsion, additives	-	-	0,05 ÷ 0,20
DECORATIVE FINISHES (PAINTS) – used optionally				
ATLAS ARKOL S AVAL KT 54 or ATLAS ARKOL N ATLAS FASTEL AVAL KT 48 AVAL KT 46	Ready to use pigmented liquid; Base: silicate binder (silicate paint) Base: silicone resin (silicone paint)	-	-	0,125 ÷ 0,250 In case of silicate paint: 0,200 ÷ 0,280

Design for impact

The resistance to hard body impacts (3 Joules and 10 Joules) and the perforation (Perfotest), determined according to ETAG 004 clauses 5.1.3.3, 5.1.3.3.1, 5.1.3.3.2 (with mesh: SSA 1363 SM(100) or VERTEX 145A/AKE 145A/R 117 A 101) lead to categories given in Table below:

		Single mesh
Mineral Wool panels + base coat ATLAS ROKER W20/AVAL KT 190	ATLAS CERMIT mineral/ AVAL mineral	Category III[1]
	ATLAS SILKAT/ AVAL silicate	Category II[1]

(with relevant key coat) + finishing coat indicated hereafter:	ATLAS SILKON/ AVAL silicone	Category II[1]
Mineral Wool lamella + base coat ATLAS ROKER W20/AVAL KT 190 (with relevant key coat) + finishing coat indicated hereafter	ATLAS CERMIT mineral/ AVAL mineral	Category III[1]
	ATLAS SILKAT/ AVAL silicate	Category II[1]
	ATLAS SILKON/ AVAL silicone	Category II[1]
[1] use categories according to ETAG 004, clause 6.1.3.3, table 8		

ATLAS XPS ETICS INSTALLATION [17]

ATLAS XPS is an External Thermal Insulation Composite System (ETICS) with render coatings. The product has been given European Technical Approval no. ETA-07/0316, issued in accordance with guidelines of European Technical Approvals ETAG 004: 2000. The thermal insulation technology consists in fixing thermal insulation made of extruded polystyrene (XPS), that combined with ATLAS/AVAL thermal insulation products, makes a specialistic thermal system.
Considering the characteristics and type of the thermal insulation, ATLAS XPS system can be applied on new or existing external surfaces of vertical building wall, ground course, foundations and basement walls.
The main objectives of the system are as follows:

- providing external walls with appropriate thermal insulation,
- increase durability of external walls by ensuring better protection from weather,
- providing durable thermal insulation resistant to damages, moisture impact and biological agents (decay),
- the use of one type of thermal insulation material on the whole external wall surface (XPS boards can be also applied below ground level) or mixing of different thermal insulation materials on one external wall surface - the system is compatible with ATLAS/AVAL composite thermal insulation system with EPS polystyrene boards (according to ETA-06/0081).

The thermal insulation technology consists in fixing thermal insulation made of extruded polystyrene boards to the substrate and preparation of a reinforced layer, a render coating and, optionally, a paint coating on the insulation. ATLAS can be used only as an adhered system or as an adhered system with additional mechanical fixing. The system can be applied on new or existing external surfaces of vertical building wall (plastered or not) made of masonry or adhered materials, such as bricks and blocks (ceramic, lime-sand, stone, cellular concrete), or of concrete (poured at the construction site or in the form of prefabricated elements). It can also be fixed on surfaces of horizontal or tilted structural elements provided that they are not directly exposed to precipitation. These may include ceilings over passages, internal walls and roofs (on the ceiling's side) of garages or cellars adjacent to heated rooms. The substrate on which ATLAS XPS will be used should have reaction to fire class A1 or A2-s1 d0 according to EN 13501-1.

System preparation

Both in the design phase and during the actual application of ATLAS XPS system consideration should be given to the requirements of ETAG 004: 2000, European Technical Approval ETA-07/0316 as well as the technical and legal regulations currently in force in the country where the system is to be installed. This applies especially to the requirements as to the insulating properties of partitions,

[17] Graphic scheme – Figure 2 attached to this paper.

energy efficiency requirements, construction safety, fire safety and the conditions of starting and conducting a building project. Besides, all work should be done in accordance with the information contained in the technical design of thermal insulation, technical instructions issued by ATLAS and in the Technical Data Sheets of the individual components of the system. Technical documentation should be developed individually for a particular building, with consideration to its location and construction. ATLAS XPS consists of non-bearing building elements and does not affect the stability of the elements to which it is attached. The additional thermal resistance R that a wall gains after the system is installed should be calculated according to EN ISO 6946 as the total of the thermal resistance of thermal insulating material and the thermal resistance of render finish coats. If required, the calculations should allow for the effect of thermal bridging due to the use of mechanical fasteners. The system meets the requirements of section 5.1.4.2 ETAG 004: 2000, so no restrictions are introduced as to the wall length or distance between expansion joints, unless they arise from other factors, especially the construction of the building on which the system is to be installed. Insulation work should be carried out in favourable weather conditions. The substrate and ambient temperature during installation and during the drying of the individual materials should be between +5°C and +25°C. The façade should be covered and protected from precipitation, direct sunlight and strong wind.

Substrate

The substrate should be sound, flat and cleaned of any materials that might affect adhesion. Insufficiently bound or loose substrate fragments should be knocked off, and the resulting holes should be repaired using appropriate materials, e.g. ATLAS PLASTER MIX/AVAL KT 111 or ATLAS LEVELLING MORTAR. ATLAS XPS system can also be fixed to substrates finished with strongly bonded coats of facade paints or thin-layer plasters. In these cases the thermal insulating material should be attached using ATLAS STOPTER K-20/AVAL KT 85 or ATLAS HOTER U/AVAL KT 55 adhesive. Residues of peeling coatings should be removed by pressure washing or scraped off. Weak substrates or substrates of high absorption should be primed with ATLAS UNI-GRUNT/AVAL KT 17 emulsion. The substrate should be appropriately prepared to meet the requirements of ETAG 004: 2000. If the substrate quality is doubtful, a bond strength test should be carried out in real conditions. The result (bond strength) should not be lower than 0.08 MPa.

Attaching extruded polystyrene (XPS) panels

Thermal insulation comprises of factory – prefabricated uncoated panels made of extruded polystyrene foam (XPS) according to EN 13164 with the designation code and other properties given in Table below:

Designation codes according to EN 13164	XPS-EN 13164-T2-CS(10/Y)200-DS(TH)-TR100-WL(T)1,5 XPS-EN 13164-T1-CS(10/Y)250-DS(TH)-TR100-WL(T)1,5		
Reaction to fire according to EN 13501-1	**Maximum density (kg/m^3)**	**Thickness (mm)**	**Class**
XPS panels	40,0	20 to 200	E
Water absorption, partial immersion (kg/m^2) according to EN 1609	≤ 1,0		
Water vapour diffusion resistance factor μ according to EN 12086	μ = 100 to 200		
Tensile strength perpendicular to the faces in dry conditions (kPa) according to EN 1607	≥ 100		
Shear strength (N/mm^2) according to EN 12090	$0,02 \leq f_{tk}$		
Shear modulus of elasticity (N/mm^2) according to EN 12090	$1,0 \leq G_m$		
Thermal resistance	defined in the CE marking in reference to EN 13164		

The thickness of thermal insulating material should be in accordance with the technical design and selected individually for each wall of the building, based on the calculated overall heat transfer coefficient U, amongst others. The heat transfer coefficient should meet the requirements as to the thermal insulation properties of partitions, set out in the technical and regulations currently in force. The first step in the application of thermal insulation is to attach a plinth strip, which makes it easier to attach the first and next row of XPS panels along the horizontal line as well as provides a reinforcement for the lower edge of the system. The strip should be attached to the plinth of the building, not lower than 30 cm above the ground level. This distance ensures system protection against rising damp and also protects the rendering from contamination – mud particles carried by raindrops bouncing off the pavement or ground. If a plinth strip is impossible to install (e.g. if the thermal insulation is thicker than the largest available strip size), it can be replaced by two layers of glass fibre reinforcing mesh with a drip profile installed on the bottom edge of the insulation. When the plinth strip has been installed, the thermal insulation XPS panels can be attached. The first row of panels is installed so that it is supported by the plinth strip. Subsequent rows of panels should be staggered (the vertical joints between panels should alternate). The panels should be staggered both on wall surfaces and on the corners of the building. The principal element that bonds the thermal insulation to the substrate is the adhesive. It is applied to the panel surface in strips and dabs. The strip of adhesive applied along the panel perimeter should be at least 3 cm wide. Apply 6÷8 dabs of adhesive, ca. 8÷12 cm in diameter, distributed evenly on the remaining surface. The adhesive applied

to the panel should cover at least 40% of its surface. When the adhesive has been applied, the panel should be immediately placed on the substrate and pressed against it. For even and smooth substrates it is possible to spread the adhesive evenly on the whole panel surface using a notched trowel to produce a coat 2÷5 mm in thickness. Additional fixing using mechanical fasteners can be commenced no earlier than 24 hours after attaching the panels.

The technical design of thermal insulation should contain detailed information on the number, type and distribution of fasteners. Unless otherwise specified in the technical documentation, a minimum of 4 fasteners should be installed for each panel (at least 4 for 1 m^2). Mechanical fasteners are recommended on corners of the building or for panels thicker than 15 cm. Additional mechanical fixing is required in the case of thermal insulation of buildings higher than 12 metres. The depth of anchoring of additional fasteners in the structural layer of the wall should be in accordance with the manufacturers' specifications. In order to increase the resistance of the insulation system to mechanical damage, enable free water drainage, and provide expansion joints, appropriate profiles are used. The profiles are installed in specific places on the façade, such as corners, reveals, window sills etc. The profiles can also be installed during the embedding of reinforcing mesh in the reinforced coat. The profiles are installed using ATLAS STOPTER K-20/AVAL KT 85 or ATLAS HOTER U/AVAL KT 55 adhesive.

Reinforced coat

The reinforced coat consists of a glass fibre mesh embedded in a coat of ATLAS STOPTER K-20/AVAL KT 85 or ATLAS HOTER U/AVAL KT 55 adhesive. The mesh has an appropriate mechanical strength, a uniform and strong weave, and a high resistance to alkali. The installation of the reinforcing coat should be commenced no earlier than 2 days after the installation of insulating panels. First, any uneven spots on the surface of the thermal insulation panels should be removed by sanding. Then the wall surface should be reinforced in the corners of windows and doorways by embedding ca. 20x30 cm sized mesh strips in the adhesive coat. The strips should be placed at 45° angle to the reveal edges. Installation of the reinforced coat involves application of a uniform coat of adhesive to the entire surface of thermal insulation material and embedding strips of reinforcing mesh in the adhesive. To make it easier, the mesh can be first pressed into the adhesive in a few spots and then the entire strip is embedded using a notched trowel. A correctly embedded mesh should be completely invisible under the coat of adhesive and it should not be in direct contact with the panel surface. The reinforced coat should be continuous, i.e. the subsequent strips of mesh should overlap by a minimum of 10 cm, and 15 cm on corners. The mesh strips should also overlap with the mesh of the finishing profiles. The overlaps should not coincide with the joints between adjacent panels. Two layers of mesh should be used where necessary, i.e. on the ground floor level of the building and on the plinths. The final step consists of smoothing the reinforced mesh with a steel trowel. This should be done with great care, for constructional and aesthetic reasons. Any uneven spots left after this step should be removed by sanding. Since the rendering is relatively thin, and should be uniform on the whole surface of the facade, any uneven spots left on the reinforced coat may prevent correct installation of the rendering.

Primer preparation

Regardless of the type of the thin-layer ATLAS render to be used, it should be preceded by a coat of an appropriate render primer, suitable for the type of rendering selected. The render primer prevents the penetration of impurities from the adhesive into the render, protects and reinforces the substrate and, above all, increases the bond strength between the render and the substrate. Besides, the render primer can act as a temporary protection of the reinforced coat (until the render is applied) for up to six months from its installation.

Thickness of ATLAS XPS ETICS coats

Table below presents the thickness of all elements of ATLAS XPS ETICS applied on the insulation material already fixed with anchors:

Components	Base	Particles size (mm)	Thickness (mm)	Coverage (kg/m²)
BASE COATS To be used with all finishing coats indicated here after				
ATLAS STOPTER K20 AVAL KT 85	Cement based powder requiring addition of 0,20 ÷ 0,22 l/kg water; Base: sand, cement, limestone filler, synthetic resin, additives	-	2,0 ÷ 3,0	3,0 ÷ 3,5 (powder)
ATLAS HOTER U AVAL KT 55	Cement based powder requiring addition of 0,20 ÷ 0,22 l/kg water; Base: sand, cement, limestone filler, synthetic resin, additives	-	2,0 ÷ 3,0	3,0 ÷ 3,5 (powder)
GLASS FIBRE MESHES				
SSA 1363 SM (100) or VERTEX 145A/AKE 145A/R 117 A 101	-	-	-	-
KEY COATS To be used with finishing coats indicated here after				
ATLAS CERPLAST AVAL KT 16 or ATLAS SILKAT ASX AVAL KT 15 or ATLAS SILKON ANX AVAL KT 76	Water, styrolacrylat binder, mineral fillers, silicone emulsion, additives	-	-	0,25 ÷ 0,35
FINISHING COATS				
ATLAS CERMIT mineral AVAL mineral	Powder requiring addition of 0,18 ÷ 0,26 l/kg water; Base: sand, cement, limestone filler, synthetic resin, additives	1,5/2,0/2,5/3,0	Regulated by particles size	2,5 ÷ 4,5 (powder)
ATLAS CERMIT acryl AVAL acryl	Ready to use paste; Base: sand, acryl-copolymyre binder, mineral fillers, additives	1,5/2,0/3,0	Regulated by particles size	2,5 ÷ 4,5 (paste)
ATLAS SILKAT AVAL silicate	Ready to use paste; Base: sand, silicate binder, mineral fillers, additives	1,5/2,0	Regulated by particles size	2,5 ÷ 3,5 (paste)
ATLAS SILKON AVAL silicone	Ready to use paste; Base: sand, silicone resin, mineral fillers, additives	1,5/2,0	Regulated by particles size	2,5 ÷ 3,5 (paste)

PRIMERS To be used with finishing coats indicated here after				
ATLAS ARKOL SX AVAL KT 52 or ATLAS ARKOL NX AVAL KT 47	Water, styrolacrylat binder, mineral fillers, silicone emulsion, additives	-	-	0,05 ÷ 0,20
DECORATIVE FINISHES (PAINTS) – used optionally				
ATLAS ARKOL E AVAL KT 44 or ATLAS ARKOL S AVAL KT 54 or ATLAS ARKOL N ATLAS FASTEL AVAL KT 48 AVAL KT 46	Ready to use pigmented liquid; Base: acryl-copolymyre binder (acrylic paint) Base: silicate binder (silicate paint) Base: silicone resin (silicone paint)	-	-	0,125 ÷ 0,250 In case of silicate paint: 0,200 ÷ 0,280

Design for impact

		Single mesh
Rendering system: base coat ATLAS STOPTER K20/AVAL KT 85 (with relevant key coat) + finishing coat indicated hereafter:	ATLAS CERMIT mineral/ AVAL mineral	Category III[1]
	ATLAS CERMIT acryl/ AVAL acryl	Category III[1]
	ATLAS SILKAT/ AVAL silicate	Category III[1]
	ATLAS SILKON/ AVAL silicone	Category III[1]
Rendering system: base coat ATLAS HOTER U/AVAL KT 55 (with relevant key coat) + finishing coat indicated hereafter	ATLAS CERMIT mineral/ AVAL mineral	Category III[1]
	ATLAS CERMIT acryl/ AVAL acryl	Category III[1]
	ATLAS SILKAT/ AVAL silicate	Category III[1]
	ATLAS SILKON/ AVAL silicone	Category III[1]
[1] use categories according to ETAG 004, clause 6.1.3.3, table 8		

HEALTH AND SAFETY

Health & safety procedures are constant for all types of ETICS. The use of products is described on each package, also the health & safety cards are available at (Polish language version) http://www.atlas.com.pl/pl/atlasarchitekta/
English version is available on request.

In case of each product all marking concerning the health & safety is indicated, e.g. all products containing cement have Xi marking together with written caution: ” Irritant. Contains cement. Protect skin, eyes and respiratory tract. Keep away from the reach of children. Do not inhale dust. In case of contact with eyes, immediately rinse with plenty of water and seek medical attention. In case of ingestion, immediately seek medical attention and show the packaging or label”.

In the system design and during work, take into account requirements of ETAG 004: 2000, European Technical Approvals, technical and legal regulations applicable in the country in which the system will be used, in particular in respect of partition insulation, energy requirements, structural safety, fire safety, and conditions of work commencement and conduction. Moreover, carry out all work in accordance with information included in the technical project of the thermal insulation, Technical Sheets of individual system components and other ATLAS technical instructions.

MATERIALS DATA SHEETS

All techncal data sheets of the products manufactured by the Certificate Holder are attached to this Code of Practice dokument.

All products technical data sheets are also available on:

- ATLAS GROUP official website http://www.atlas.com.pl/en/katalog/
- ATLAS Catalogues of Products (printed and electronic version)

Each data sheet is checked, revised, and if needed, updated at least once a year. In case of significant change in product characteristics, legal environment etc. the data sheets are updated immediately.

As ATLAS GROUP offers its products under 2 brands – ATLAS – and – AVAL – the Table below presents the list of ATLAS ETICS products together with their AVAL equivalents. Each technical data sheet referring to ATLAS brand products refers to its AVAL brand equivalent.

ATLAS BRAND PRODUCT NAMES	AVAL BRAND EQUIVALENTS
ATLAS STOPTER K20	AVAL KT 85
ATLAS STOPTER K10	AVAL KT 83
ATLAS HOTER U	AVAL KT 55
ATLAS HOTER S	AVAL KT 53
ATLAS ROKER W20	AVAL KT 190
ATLAS CERPLAST	AVAL KT 16
ATLAS CERMIT N ATLAS CERMIT R	AVAL KT 60 AVAL KT 64
ATLAS CERMIT SN ATLAS CERMIT DR	AVAL KT 137 AVAL KT 35
ATLAS CERMIT SN-MAL	AVAL KT 137
ATLAS CERMIT PS	AVAL KT 150
ATLAS SILKAT N ATLAS SILKAT R	AVAL KT 72 AVAL KT 73
ATLAS SILKAT ASX	AVAL KT 15
ATLAS SILKON N ATLAS SILKON R	AVAL KT 74 AVAL KT 75
ATLAS SILKON ANX	AVAL KT 76
ATLAS CERTON	AVAL KT 45
ATLAS ARKOL E	AVAL KT 44
ATLAS ARKOL S	AVAL KT 54
ATLAS ARKOL SX	AVAL KT 52

ATLAS ARKOL N	AVAL KT 48
ATLAS ARKOL NX	AVAL KT 47
ATLAS FASTEL	AVAL KT 46

7. REACTION TO FIRE

ATLAS/AVAL ETICS

The reaction to fire is determined to ETAG 004 clause 5.1.2.1. The product reached the classification given in Table below:

Configuration	Maximum declared organic content of the rendering system	Declared flame retardant content of the rendering system	Reaction to fire class according to EN 13501-1
ETICS ATLAS/ ETICS AVAL with mineral/ inorganic based rendering system: ▪ EPS of thickness up to and including 250 mm ▪ Adhesives: STOPTER K10, STOPTER K20, HOTER U, HOTER S, AVAL KT 83, AVAL KT 85, AVAL KT 55, AVAL KT 53 ▪ Base coats: STOPTER K20, HOTER U, AVAL KT 85, AVAL KT 55 ▪ Finishing coats: CERMIT mineral/AVAL mineral (with key coat CERPLAST/AVAL KT 16) or SILKAT/AVAL silicate (with key coat SILKAT ASX/AVAL KT 15)	Base coats ≤ 3,50% Finishing coats ≤ 4,90%	0%	B – s2,d0
ETICS ATLAS/ ETICS AVAL with organic based rendering system: ▪ EPS of thickness up to and including 250 mm ▪ Adhesives: STOPTER K10, STOPTER K20, HOTER U, HOTER S, AVAL KT 83, AVAL KT 85, AVAL KT 55, AVAL KT 53 ▪ Base coats: STOPTER K20, HOTER U, AVAL KT 85, AVAL KT 55 ▪ Finishing coats: CERMIT acryl/AVAL acryl (with key coat CERPLAST/AVAL KT 16) or SILKON/AVAL silicone (with key coat SILKON ANX/AVAL KT 76)	Base coats ≤ 3,50% Finishing coats ≤ 10,28%	0%	C – s2, d0
All other configurations (with decorative finishes)	-	-	No performance determined

ATLAS ROKER/AVAL ROKER ETICS

The reaction to fire is determined to ETAG 004 clause 5.1.2.1. The product reached the classification given in Table below:

Configuration	Maximum declared organic content of the rendering system	Declared flame retardant content of the rendering system	Reaction to fire class according to EN 13501-1
ETICS ATLAS ROKER/ ETICS AVAL ROKER with mineral/ inorganic based rendering system: ▪ MW of thickness 20 up to 200 mm ▪ Adhesives: ROKER W20, AVAL KT 190 ▪ Base coats: ROKER W20, AVAL KT 190 ▪ Finishing coats: CERMIT mineral/AVAL mineral (with key coat CERPLAST/AVAL KT 16) or SILKAT/AVAL silicate (with key coat SILKAT ASX/AVAL KT 15) ▪ Decorative finishes: ARKOL S/AVAL KT 54 (with primer ARKOL SX/AVAL KT 52), ARKOL N/AVAL KT 48 (with primer ARKOL NX/AVAL KT 47), FASTEL/AVAL KT 46 (with primer ARKOL NX/AVAL KT 47)	Base coats ≤ 4,05% Finishing coats ≤ 4,904% Decorative finishes ≤ 13,50%	0%	A2 – s2,d0
ETICS ATLAS ROKER/ ETICS AVAL ROKER with mineral/ inorganic based rendering system: ▪ MW of thickness 20 up to 200 mm ▪ Adhesives: ROKER W20, AVAL KT 190 ▪ Base coats: ROKER W20, AVAL KT 190 ▪ Finishing coats: SILKON/AVAL silicone (with key coat SILKON ANX/AVAL KT 76) ▪ Decorative finishes: ARKOL S/AVAL KT 54 (with primer ARKOL SX/AVAL KT 52), ARKOL N/AVAL KT 48 (with primer ARKOL NX/AVAL KT 47), FASTEL/AVAL KT 46 (with primer ARKOL NX/AVAL KT 47)	Base coats ≤ 4,05% Finishing coats ≤ 8,419% Decorative finishes ≤ 13,50%	0%	C – s2, d0
All other configurations (with with MW of thickness > 200 mm)	-	-	No performance determined

ATLAS XPS ETICS

The reaction to fire is determined to ETAG 004 clause 5.1.2.1. The product reached the classification given in Table below:

Configuration	Maximum declared organic content of the rendering system	Declared flame retardant content of the rendering system	Reaction to fire class according to EN 13501-1
ETICS ATLAS XPS rendering system indicated hereafter: ▪ XPS of thickness 20 up to 200 mm ▪ Adhesives: STOPTER K10, STOPTER K20, HOTER U, HOTER S, ▪ Base coats: STOPTER K20, HOTER U ▪ Finishing coats: CERMIT	Adhesives: ≤ 3,50% Base coats ≤ 3,50% Finishing coats ≤ 4,904% Decorative coats ≤ 13,50%	0%	B – s2,d0

mineral (with key coat CERPLAST) or SILKAT (with key coat SILKAT ASX) ▪ Decorative coats: ARKOL E, ARKOL S (with primer ARKOL SX), ARKOL N (with primer ARKOL NX), FASTEL (with primer ARKOL NX)			
ETICS ATLAS XPS rendering system indicated hereafter: ▪ XPS of thickness 20 up to 200 mm ▪ Adhesives: STOPTER K10, STOPTER K20, HOTER U, HOTER S, ▪ Base coats: STOPTER K20, HOTER U ▪ Finishing coats: CERMIT acrylic (with key coat CERPLAST) or SILKON (with key coat SILKON ANX) ▪ Decorative coats: ARKOL E, ARKOL S (with primer ARKOL SX), ARKOL N (with primer ARKOL NX), FASTEL (with primer ARKOL NX)	Adhesives: ≤ 3,50% Base coats ≤ 3,50% Finishing coats ≤ 10,28% Decorative coats ≤ 13,50%	0%	C – s2, d0

General conditions

With regard to fire stopping of cavities and limitations on use of combustible materials, walls must comply with Sections B3.2, B3.3 and B4 of TGD to Part B of the Building Regulations 1997 to 2008.

The mineral wool board is classed as noncombustible as per Table A8 d) of TGD to Part B of the Building Regulations 1997 to 2008.

Stainless steel fire fixings to be provided at the rate of one per square metre when specified. The fixing design should take account of the extra duty required under fire conditions.

Vertical and horizontal fire barriers shall be provided at each compartment floor and wall, including the second floor level of a three-storey single occupancy dwelling.[18]

Firebreaks should be adhesively bonded to the substrate and mechanically fixed (through the base reinforcement) with stainless steel fire fixings at 400 mm. The fire barrier should be of noncombustible material, i.e. lamella, be at least 150 mm high, continuous and unbroken for the full perimeter of the building and for the full thickness of the insulation. It is allowed to use any anchors covered by ETA issued according to ETAG 014. Fire fixing at the rate of one per m^2 is required above two storey's (5.0m)

Combustible material must be separated from a brick or blockwork chimney by at least 200 mm from a flue, or 40 mm from the outer surface of the brick or blockwork chimney, in accordance with Clause 2.15 of TGD to Part J of the Building Regulations 1997 to 2008. Metal fixings in contact with combustible materials should be at least 50mm from a flue.

In accordance to Section B4 of TGD to Part B of the Building Regulations 1997 to 2008 the provisions for the external surface of walls are as follows:

[18] Fire barriers graphic scheme – Figure 13 attached to this paper.

Height of building (m)	Distance from any point on the relevant boundary *	
	Less than 1 m	1 m or more
Less than 18	Class B - s3, d2 *(European) or Class 0 (National)*	No provision (unless it is a building described in Note (1))
More than 18	*Class B - s3, d2 (European) or Class 0 (National)*	*Class B - s3, d2 (European) or Class 0 (National) (2)*

Notes:
* The relevant boundary might be a notional boundary.
(1) Any part of the wall of a building comprising flats or maisonettes, or a building in the Residential (Institutional), Other Residential, Assembly and recreation purpose groups, which is 10 m or less above the ground or above a roof or any other part of the building to which people have access, should be Class C - s3-d2 (European) or have an index of performance (I) not more than 20 (National). Timber cladding at least 9 mm thick is also acceptable.

(2) Surfaces between 0 and 18 m above the ground may comprise of any material of Class C - s3 - d2 (European) or have an index of performance (I) not more than 20 (National). Timber cladding at least 9 mm thick is also acceptable.

8. WIND LOADS

Details as to the quantity, type and length of fasteners and their arrangement should be included in the thermal insulation project (in accordance with the requirements of BS 5427:Part 1 and BS 6399: Parts 2 and 3). Unless the technical documentation specifies requirements in this respect, use ca. 4÷5 fasteners for 1 m^2. In addition, fixings around window and door reveals should be at a maximum of 400mm centres in each board or section of board. Use mechanical fasteners in corners of buildings or in case of foamed polystyrene that is more than 15 cm thick. Additional mechanical fixing is required if thermal insulation of buildings is more than 12 m high.

This number of fasteners will be sufficient for general areas, but additional fasteners will be required for areas with high wind loads – a double line of fasteners for fixing panels to intermediate supports. For calculations of wind load use the methods listed in BS 6399.

The anchoring depth of additional fixing elements in the structural wall layer should be consistent with requirements of their manufacturers. All anchors covered by ETA issued according to ETAG 014 can be used.

In case of any project requiring special fixing provisions (e.g. for building higher than 18 m or with high wind loads where extra mechanical fasteners should be used) always confirm the project details with the Certificate Holder's authorized technical representatives.

9. EASE OF MAINTENANCE

External thermal insulation durability

According to European Technical Approvals the durability of ETICS should last minimum 25 years on condition that all system elements are used, and the installation is conducted in accordance to Manufacturer's requirements. According to ETAG 004:2000, being the guidelines to European Technical Approvals, current maintenance of the finishing layer is essential to proper durability of all

system elements. As ease of maintenance the following actions are provided repairs of damaged elements and, if necessary, application of new products or paints, consistent with system elements already used.

Check of the technical conditions of elevation - recommendation

The revision of technical conditions of elevation should be conducted systematically, best in spring time, just after the end of winter, when the likeness of possible damages is the biggest and weather conditions allow quick repairs. The table below shows the list of elements that should be checked systematically and advised maintenance actions:

CHECK OF THE BUILDING ELEMENTS

Elements to be checked	Scope of check	Maintenance action*
Condition of roof covering, roof flashing, eaves, wind bents etc.	Check of tightness of joints between flashing, between flashing and building elements, occurrence of corrosion, damages caused by wind etc.	Replacement of damaged or corroded elements, sealing of joints, protecting of elements from corrosion
Condition of window flashing, window sills, balconies, attics, etc.		
Tightness of permeability of sewerage systems and gutters	Tightness of gutters elements and their joints, mechanical damages, corrosion	Removal of leaves and dirt, sealing of joints, repair of damages
Condition of sealing and construction dilatations	Occurrence of cracks in dilatations, condition and any damages in the sealants	Only after consultation with architect and specialist construction companies
Fixing of additional elements on elevation: billboards, lighting etc.	Condition of fillers round the fasteners, occurrence of runs, corrosion of metal elements	Removal of damaged fillers in accordance to manufacturers' recommendations
* Recommendations listed above are just additional and should not be treated as a part of present ease of maintenance. Please consult all actions with specialists or manufacturers.		

CHECK OF THE EXTERNAL ELEVATION LAYER – RENDERS AND PAINTS

Elements to be checked	Scope of check	Maintenance action
Condition of surface in respect of dirt	Occurrence of organic or inorganic dirt – effect of sedimentation of dust, fumes, ash, dirt etc.	1. Surface cleaning 2. Surface painting (optional)
Condition of surface in respect of biological contamination	Occurrence of organic dirt: Mould (black or darkgrey deposit) Alga (green deposit) Mould & alga (green – black deposit)	1. Surface cleaning 2. Removal of biological contamination with special agents 3. Surface painting (optional)
Condition of surface in respect of mechanical damages, occurrence of cracks etc.	Depth and size of cracks	1. Surface cleaning 2. Filling cracks or application of a new layer 3. Surface painting (optional)
Condition of surface in respect of change of colour, fading, discolouring	Extent of change of colour, fading, discolouring	1. Surface cleaning 2. Priming 3. Painting

Condition of surface in respect of runs	Location and size of runs	1. Finding the reason of runs 2. Elimination of the reason of runs (e.g. repairs of damaged flashing) 3. Priming 4. Painting
Condition of surface in respect of efflorescence		1. Surface cleaning 2. Priming 3. Painting

Elevation maintenance - recommendations

REMOVAL OF DIRT FROM ELEVATION SURFACE

WASHING
MECHANICAL – hydrodynamic machine washing, the water pressure from 50 up to 150 bar. This method allows to clean most of dirt, even the old one. If necessary, the use of detergents and special washing agents is allowed. The temperature of water should not be higher than 140 ºC. Use of warm water gives better effects. Caution: always check the water pressure, detergent or agent on a small surface before whole elevation washing. All works should be done in accordance to health & safety procedures and manufacturers' instructions. Do not wash with water dusty and low-durable surfaces (e.g. monuments), do not wash the elevation in low temperature.

MANUAL – recommended only in case of small surfaces, use warm water with detergents or special washing agents and a brush with properly long stiff bristles.

STEAM WASHING – less effective than washing with water, but allows to prepare old, flaking paint for mechanical removal. Should be done mechanically with temperature up to 140 ºC.

SANBLASTING - recommended in case of very old, strongly adherent dirt. Usually done on well maintained architectonic details and elevations with vast amount of sculptures (mainly monuments).

CHEMICAL CLEANING - recommended for the removal of strongly adhering layers of paint and graffiti. Conducted with use of special chemical agents – after application on a surface agent softens the paint layer and allows its easy mechanical or manual removal.

REMOVAL OF BIOLOGICAL CONTAMINATION FROM ELEVATION SURFACE WITH ATLAS MYKOS

Occurrence of biological contamination of elevation surface is the effect of its original dirtying. The layer of dirt creates conditions for existence of mould, lichen, alga and moss. At the beginning the contamination is on the elevation surface only (deposit, slight decolouring), but if not removed, it leads to significant changes of colour and substrate damages.

ATLAS MYKOS is a high quality fungicide designed for removal of organic contamination (fungi, mould, lichen, algae and moss) from surfaces of structural elements. It can be also used for protection of mineral surfaces – both fresh and existing (but cleaned) ones - from degrading activity of microorganisms. In case of applying the fungicide to substrates other than mineral, it is recommended to make a test on a small part of substrate.

SUBSTRATE PREPARATION
Use ATLAS MYKOS on dry substrates. Before commencement of work, protect the surface from effects of precipitation and sunlight to prevent excessive drying of the fungicide. Eliminate all possible sources of moisture, resulting from, among others, leaky insulation, bad roof flashing and leaky water supply and sewerage systems, as well as leaky rain-water piping.

CONTAMINATION REMOVAL
Apply the appropriately prepared solution evenly on dried substrate using a brush, paint roller or by spraying. Wait a few minutes before contamination removal. Clean the substrate e.g. by scrubbing it with a brush. Finally, rinse the surface thoroughly with clean water. If the substrate contains intensive microbiological contamination, repeat all the aforementioned actions or apply undiluted ATLAS MYKOS.

MINERAL SURFACE PROTECTION
Apply the appropriately prepared solution evenly on dried and previously cleaned substrate using a brush or a paint roller or by spraying. Paint surfaces on which ATLAS MYKOS has been applied not earlier than after 48 hours from agent application. We recommend the use of silicone paints and agents, as they reduce absorptiveness of substrates and a risk of new biological contamination.
If the agent has been used indoors, the room in which it has been applied can be used not earlier than 48 hours from agent application.

Main repairs – repairs of damages, scratches and cracks of elevation

ELEVATIONS WITH TRADITIONAL CEMENT AND CEMENT-LIME PLASTER AS FINISHING COAT
The table below shows the list of most common damages to elevations and advised repair technology with sets of ATLAS/AVAL products.

Damage	Technology of repair	ATLAS/AVAL products
Local surface scratches and cracks (the render coat adhered to substrate – no thud when knocked with a hammer)	1. Surface washing 2. Broadening the cracks with a spatula 3. Priming of the cracks 4. Filling of cracks 5. Priming and painting to reach solid colour of elevation	UNIGRUNT/AVAL KT 17 REKORD ARKOL NX/AVAL KT 47 ARKOL N/FASTEL/AVAL KT 48/ AVAL KT 46
Broad elevation scratches and cracks (no loosening of render coat – no thud when knocked with a hammer)	1. Surface cleaning 2. Priming of elevation 3. Application of reinforced layer according to ETICS technology 4. Key coat application 5. Application of thin-layer plaster	UNIGRUNT/AVAL KT 17 STOPTER K20/AVAL KT 85 GLASS FIBRE MESH (VERTEX 145/AKE 145 or SSA-1363SM(100)) CERPLAST/AVAL KT 16 CERMIT mineral/AVAL mineral CERMIT acryl/AVAL acryl SILKAT ASX/AVAL KT 15 SILKAT/AVAL silicate SILKON ANX/AVAL KT 76 SILKON/AVAL silicone
Local loosening of render coat (visible loss of render coat, thud when knocked with a hammer)	1. Removal of damaged render 2. Priming of elevation 3. Application of a new	UNIGRUNT/AVAL KT 17 ATLAS PLASTERING MIX/ AVAL KT 111 ATLAS LEVELLING MORTAR

	plaster coat 4. Priming and painting to reach solid colour of elevation	
Flaking of paint, change of colour, fading, discolouring, runs, stains	1. Surface washing 2. Priming and painting to reach solid colour of elevation	ARKOL E/AVAL KT 44 ARKOL NX/AVAL KT 47 ARKOL N/AVAL KT 48 FASTEL/AVAL KT 46

ELEVATIONS WITH EXTERNAL THERMAL INSULATION OR THIN-LAYER RENDER AS FINISHING COAT

Damage	Technology of repair	ATLAS/AVAL products
Mechanical damages of thin-layer render and/or scratches and cracks of surface, reinforced layer complete	1. Removal of the thin-layer render coat 10 cm round the damage, do not harm the reinforced layer 2. Cleaning the substrate of dust 3. Key coat application 4. Application of a thin-layer render on the damaged part 5. Priming and painting to reach solid colour of elevation (optional)	CERPLAST/AVAL KT 16 CERMIT mineral/AVAL mineral CERMIT acryl/AVAL acryl (only on EPS or XPS ETICS) SILKAT ASX/AVAL KT 15 SILKAT/AVAL silicate SILKON ANX/AVAL KT 76 SILKON/AVAL silicone ARKOL E/AVAL KT 44 (only on EPS or XPS ETICS) ARKOL SX/AVAL KT 52 ARKOL S/AVAL KT 54 ARKOL NX/AVAL KT 47 ARKOL N/AVAL KT 48 FASTEL/AVAL KT 46
Damages of thin-layer render coat, reinforced layer and insulation material	1. Removal of damaged thermal insulation with the insulation layer 2. Removal of the thin-layer render coat 10 cm round the damage, remove the adhesive, leave the glass fibre mesh 3. Preparation of the thermal insulation and filling the damaged part 4. Application of the adhesive on the new thermal insulation, application of the reinforced layer (new mesh strips should overlap 10 cm the old mesh) 5. Key coat application 6. Application of a thin-layer render on the damaged part 7. Priming and painting to reach solid colour of elevation	EPS and/or XPS ETICS: STOPTER K20/AVAL KT 85 HOTER U/AVAL KT 55 GLASS FIBRE MESH (VERTEX 145/AKE 145 or SSA-1363SM(100)) CERPLAST/AVAL KT 16 CERMIT mineral/AVAL mineral CERMIT acryl/AVAL acryl SILKAT ASX/AVAL KT 15 SILKAT/AVAL silicate SILKON ANX/AVAL KT 76 SILKON/AVAL silicone Mineral wool ETICS: ROKER W20/AVAL KT 190 GLASS FIBRE MESH (VERTEX 145/AKE 145 or SSA-1363SM(100)) CERPLAST/AVAL KT 16 CERMIT mineral/AVAL mineral SILKAT ASX/AVAL KT 15 SILKAT/AVAL silicate SILKON ANX/AVAL KT 76 SILKON/AVAL silicone
Loosening of thin-layer render, reinforced layer complete	1. Removal of the thin-layer	As above

	render with a spatula 2. Cleaning the substrate of dust 3. Priming 4. Filling the surface with a cement-based adhesive 5. Key coat application 6. Application of a thin-layer render 7. Priming and painting (optional)	
Small scratches and micro-cracks of the surface	1. Surface washing 2. Priming and painting (paint with good covering properties)	ARKOL NX/AVAL KT 47 ARKOL N/AVAL KT 48 FASTEL/ARKOL KT 46
Regular cracks of the elevation surface (straight vertical and horizontal cracks), cracks structure the same as the structure of insulation boards joints	1. Surface washing 2. Application of a new reinforced layer on the whole elevation 3. Key coat application 4. Render coat application 5. Priming and painting (optional)	STOPTER K20/AVAL KT 85 GLASS FIBRE MESH (VERTEX 145/AKE 145 or SSA-1363SM(100)) CERPLAST/AVAL KT 16 CERMIT mineral/AVAL mineral CERMIT acryl/AVAL acryl (only on EPS or XPS ETICS) SILKAT ASX/AVAL KT 15 SILKAT/AVAL silicate SILKON ANX/AVAL KT 76 SILKON/AVAL silicone
Flaking of paint, change of colour, fading, discolouring, runs, stains (render coat complete)	1. Surface washing 2. Filling of defects (if necessary) 3. Key coat application 4. Render coat application 5. Priming and painting to reach solid colour of elevation	ARKOL E/AVAL KT 44 ARKOL NX/AVAL KT 47 ARKOL N/AVAL KT 48 FASTEL/AVAL KT46

Hydrophobisation of substrate with Atlas Silstop

ATLAS SILSTOP is a colourless solution of silicone dispersion in an organic solvent. After application, it reacts with components of air and with water in pores of the construction material. This reaction reduces absorptive degree of the primed material; therefore the protected surface is not contaminated easily and precipitation water runs down freely on the surface providing additional cleaning. ATLAS SILSTOP penetrates the material, at the same time providing great permeability of water vapour. It is resistant to alkalis, acid rain, UV radiation, aggressive urban environment and temperatures from –20°C to +80°C.

ATLAS SILSTOP is designed for hydrophobisation and protection of absorptive stone elements, substrates made of ceramic (e.g. brick walls) and lime-sand materials, concrete and mineral plasters from adverse effect of external environment. It is perfect for priming substrate under silicone paints. It can also be used for hydrophobisation of old façade paint coats tightly adhering to the substrate and thin-layer mineral and acrylic plasters. It is suitable for indoor and outdoor use.

CAUTION: Do not use the agent on substrates layers of which (at the depth of agent penetration) contain materials not resistant to organic dissolvent e.g. foamed polystyrene located under the reinforcing layer of the thermal insulation system.

SUBSTRATE PREPARATION
The substrate should be dry, structurally sound and free from dust, dirt, oil, grease and wax.

APPLICATION
Apply the undiluted emulsion over the substrate with a roller or paintbrush. Application of another layer (on very absorptive substrates) or painting, e.g. ATLAS ARKOL N/AVAL KT 48 silicone paint, can be started when the first layer has completely dried i.e. after 6 hours.

PAINTING (optional)
Depending on needs painting with silicone paint ATLAS ARKOL N/AVAL KT 48 or ATLAS FASTEL/AVAL KT 46 is possible. In such case the layer of ATLAS SILSTOP becomes a priming layer for this type of paints.

Painting

Painting can be the last phase of renovation or maintenance of elevation surface, or a separate action bringing back the elevation beauty. Painting serves as:

- decorative action – gives the elevation a fresh, homogenous and attractive look
- technical action – creates a layer protecting the elevation against weather conditions, levels surface absorbability and fills in micro - cracks.

SUBSTRATE PREPARATION
The substrate should be dry, stable, even and structurally sound i.e. strong enough; it should be free from anything that may weaken adhesion, in particular dust, dirt, fat and wax.

PAINT SELECTION
In case of renovation painting the choice of paint is very important. For example, the silicate paint should be used for renovation painting of surfaces already painted with a silicate paint or silicate render coats. The Table below presents the recommendations concerning the paint selection:

Type Name	Acrylic ARKOL E AVAL KT 44	Dry acrylic CERTON	Silicate ARKOL S AVAL KT 54	Silicone ARKOL N AVAL KT 48	Silicone FASTEL AVAL KT 46
Substrate type					
Concrete/ Reinforced concrete	***	***	*	***	***
Plaster (cement and cement-lime)	***	***	***	***	***
Lime plaster	-	***	-	-	-
Thin-layer mineral render	*	***	***	*	***
Thin-layer acrylic render	***	*	-	***	***
Thin-layer silicate render	*	*	***	*	*

Thin-layer silicone render	*	*	-	***	***
Asbestos-cement plates	***	-	-	***	***
Properties					
Covering	***	***	**	***	***
Steam permeability	*	**	***	**	**
Water fastness	***	**	**	***	***
Dirt resistance	**	*	**	***	***
Biological factors resistance	**	*	**	***	***

*** - high level
** - medium level
* - basic level

PRIMING
Priming of substrate strengthens and evens substrate absorptivity and increases adhesion of paints. In case of renovation painting priming is even more important than in primary painting, as the substrate has been weakened by outdoor conditions.

PAINTING
Apply thin and even layer of ATLAS/AVAL paint on prepared and primed substrate. Use a roller or brush, or paint by spraying. Apply one or two layers depending on substrate absorptivity and structure. Plan technological gaps in advance e.g. in corners or building angles, under rainwater pipes, etc. Apply paint continuously (with the "wet on wet" method) on the planned surface, avoiding any breaks in work and preventing coat application on partially dried paint. Protect the painted surface during work and when it dries from direct sunlight, wind and precipitation. The drying time depends on the substrate, temperature and relative humidity of air and is from ca. 2 to 6 hours. Note: to avoid differences in colour shades in case of colour paints, apply paint of the same production date on one surface. Applied paint slightly smoothes substrate texture in a natural manner. In case of painting surfaces differing in respect of texture and technical parameters, different colour shades of the same paint may result.

Final remarks

All recommendations listed in this ease of maintenance set the basic repair and maintenance rules. All works should be done in accordance to health & safety procedures and manufacturers' instructions. When in doubt please make contact to professional maintenance companies or ATLAS technical advisors

10. GUARANTEE

According to European Technical Approvals the durability of ETICS should last minimum 25 years on condition that all system elements are used, and the installation is conducted in accordance to Manufacturer's requirements. According to ETAG 004:2000, being the guidelines to European Technical Approvals, current maintenance of the finishing layer is essential to proper durability of all system elements. As ease of maintenance the following actions are provided repairs of damaged

elements and, if necessary, application of new products or paints, consistent with system elements already used.

Each ATLAS/AVAL ETICS installer is obliged to grant minimum a one-year warranty on the system installation.

On investor's/homeowner's request an extra warranty (for up to 5 years) on the installation of ATLAS/AVAL ETICS may be granted, provided that the system has been installed and maintained according to ATLAS instructions and requirements.

The Certificate of Warranty and General Terms and Conditions are presented in Attachment 2 to this document.

11. IAB SCHEME DOCUMENT

IAB Scheme Document is presented in Attachment 4 to this Code of Practice.

12. COMPLAINTS PROCEDURE

ATLAS GROUP complaints procedure is a part of the integrated quality management system (number PS – 17) and is conducted by ATLAS Technical Department.

COMPLAINT RECEPTION

- ATLAS shall be liable for any damage to the goods resulting from improper packaging, and return the Buyer costs incurred in connection with it.
- Complaints concerning the quantity and quality of the goods are to be made within 14 days from the date of receipt of goods by the Buyer. The date of receipt of goods is considered to be the date of acceptance of goods to the Buyer's warehouse/location.
- Complaints regarding hidden defects of the goods shall be made by the Buyer to ATLAS immediately after their detection, not later than 14 days from the detection of the defect. The right to place a complaint concerning hidden defects of the goods is valid within one year after the date of sale.
- The reception of complaint can be conducted by the installer's representative or ATLAS Technical Department representative.
- A complaint can be received by any means of communication (telephone, fax, e-mail).
- If a complaint is addressed to the installer's representative he is obliged to pass the complaint to ATLAS representative immediately. All the documents concerning the complaint and a filled-in "Complaints form" is to be sent to ATLAS representative not later that 5 working days after complaint reception.
- Send any available samples of unused and used products to ATLAS Technical Department within 5 working days after the complaint reception. Indicate on the sample the complaint number, customer name and date of complaint.
-

COMPLAINT INVESTIGATION

- Each complaint should be investigated in maximum 30 days after the complaint reception.
- Regardless of the inspection effect (positive or negative) an answer to the complaint is to be prepared in writing, in the language of the original complaint.
- In case of variance in quality, confirmed by ATLAS, ATLAS shall replace the goods with variance in quality, or reduce the purchase price in a form of correcting invoice issue.
- The return of cost of installation of invalid products is to be settled in a separate contract, basing on mutual agreement.

COMPLAINT FORM

Complaint form is presented in Attachment 3 to this paper. This document is sent to any ATLAS distributor or approved installer together with the Code of practice.

13. ATLAS ADDRESS & CONTACT DATA

ATLAS Spółka z ograniczoną odpowiedzialnością
91 - 222 Łódź, ul. Św. Teresy 105, Republic of Poland
NIP: PL9471936467
REGON: 100253695
Bank:
„Bank Rozwoju Exportu" S.A. o/Łódź,
Piotrkowska 148/150
90 – 063 Łódź
SWIFT: BREXPLPWLOD
PLN: PL24114011080000224638001071
EUR: PL48114011080000224638001027
www.atlas.com.pl
export@atlas.com.pl

ATTACHMENT 1 – DRAFT OF CONTRACT

KONTRAKT Nr /2009
KUPNA - SPRZEDAŻY

Łódź -Polska 5 March 2010

ATLAS Sp. z o.o. z siedzibą w Łodzi-Polska, przy ulicy Św. Teresy 105, wpisaną do Rejestru Przedsiębiorców przez Sąd Rejonowy dla Łodzi Śródmieścia pod numerem KRS 0000264887, NIP nr PL9471936467, reprezentowaną przez Prezesa Zarządu, Pana Henryka Siodmoka, zwana dalej Sprzedawcą

i
Firma ..... zarejestrowana w ..... pod numerem..... NIP:..... pod adresem: ....., ul. ....., ..., reprezentowana przez ....., zwana dalej Kupującym,

podpisali niniejszy kontrakt o następującej treści:

1. PRZEDMIOT KONTRAKTU:

1.1. Przedmiotem Kontraktu jest określenie zasad i warunków nabywania przez Kupującego Towarów oferowanych przez Sprzedającego.

1.2. Na podstawie Kontraktu Kupujący zamawia Towary w formie pisemnej (poczta, fax, e-mail) a Sprzedawca zobowiązuje się sprzedawać Towary Kupującemu w miarę swoich możliwości w ilościach i terminie zgodnym z zamówieniem.

2. KONTRAKT WAŻNY DO: 31.12.2010

3. NAZWA TOWARU:
Kleje, suche mieszanki i inne materiały budowlane, których asortyment wyszczególniony jest w dokumentach wysyłkowych.

4. JEDNOSTKA MIARY: 1kg, 1szt. 1 op.

5. ILOŚĆ: nieograniczona

6. JAKOŚĆ:
Powinna odpowiadać wzorcom, wzornikom i certyfikatom deklarowanym przez Producenta (Sprzedającego)

7. WARUNKI DOSTAWY:

- FCA Zgierz, Poland, zgodnie z Incoterms 2000, dla transportów samochodowych;
- Lub inne warunki, zgodnie z Incoterms 2000,

CONTRACT No. /2009
SALES-PURCHASE

Łódź – Poland March 5, 2010

ATLAS sp. z o.o. with its registered office in Lodz, Poland, at Św. Teresy 105, entered in the Entrepreneurs Register by the District Court for Downtown Lodz, under number KRS 0000264887, NIP (Tax ID) No. PL9471936467, represented by the President of the Board, Mr. Henryk Siodmok, called hereinafter the "Seller"
and
....., with its registered office at:..... registered in: ..... under number: ....., VAT identification No. ..... represented by: ....., called hereinafter the "Buyer",

signed this contract as follows:

1. SUBJECT OF THE CONTRACT:

1.1. The subject of the Contract is to specify the terms and conditions of purchase by the Buyer of goods offered by the Seller.

1.2. Following the Contract the Buyer orders the goods in writing (fax) and the Seller undertakes to sell the goods to the Buyer within the limits of its capacity in the quantities and at times according to the order.

2. THE CONTRACT IS VALID UNTIL: 31.12.2010

3. GOODS:
Adhesive mortars, dry mixtures and other construction materials whose assortment is specified in the shipping documents.

4. UNIT OF MEASURE: 1 kg, 1 pcs., 1 package

5. QUANTITY: unlimited

6. QUALITY:
Should correspond to the patterns, specimens and certificates declared by the Manufacturer (Seller).

7. TERMS OF DELIVERY:

- FCA Zgierz, Poland, according to Incoterms 2000, for road carriages;
- or other conditions, according to Incoterms

wskazane na fakturze lub specyfikacji.

8. CENA:

8.1. Sprzedający przekazuje w formie pisemnej (za pośrednictwem fax lub e-mail) Kupującemu cennik w EUR na sprzedawane przez siebie towary. Cena rozumiana jest jako FCA dla transportów samochodowych, zawiera w sobie wartość samego towaru, jego opakowania, oznaczania, tary, materiałów załadunkowych (palet), koszt formalności eksportowych, załadunku towaru na środek transportu Kupującego. Na początku każdego miesiąca, cennik będzie korygowany przez Sprzedawcę, proporcjonalnie do zmiany średniego - miesięcznego kursu EUR w stosunku do PLN, podawanego przez NBP w odpowiednim komunikacie (dostępnym np. w Internecie). Skorygowany cennik, przekazany przez Sprzedawcę Kupującemu, obowiązuje od następnego dnia po dniu jego przekazania przez Sprzedającego.
Ponadto, Sprzedający zastrzega sobie prawo zmiany cennika na swoje produkty w uzasadnionych przypadkach (np. wzrost kosztów produkcji). O zmianie cennika Sprzedający zobowiązuje się informować Kupującego z wyprzedzeniem, nie krótszym niż 14 dni. Zmiana cen w cenniku nie stanowi zmiany kontraktu.

8.2. Do ceny określonej w cenniku może być dołączony system upustów w zależności od terminu płatności, a także kampanii sprzedażowych przeprowadzanych przez Sprzedającego potwierdzanych każdorazowo oficjalnym pismem.

9. OGÓLNA KWOTA KONTRAKTU:

Bez limitu.

10. SPOSÓB SKŁADANIA ZAMÓWIEŃ:

Zamówienie powinno być składane przez Kupującego w formie pisemnej. Przez datę zamówienia rozumie się datę otrzymania przez Sprzedawcę zamówienia. Jeżeli jest to dzień wolny od pracy lub jeżeli zamówienie to otrzymane zostało po godzinach pracy tj. po godzinie 16.00 czasu polskiego (fax, e-mail) to za datę otrzymania zamówienia rozumie się następny dzień roboczy. Po uzgodnieniu z Kupującym, Sprzedający potwierdza przyjęcie zamówienia w formie pisemnej i zobowiązuje się przesłać Kupującemu faxem lub pocztą elektroniczną fakturę pro forma w ciągu dwóch dni od momentu otrzymania zamówienia od Kupującego.

2000, indicated in the invoice or specification.

8. PRICE:

8.1. The Seller presents the Buyer in writing (by fax or e-mail) a price list in EUR for the goods sold by them. The price is to be understood as FCA for road carriages, it includes the value of the goods itself, its packaging, labeling, tare, shipping materials (pallets), cost of export formalities, and loading the goods onto the transport means of the Buyer. At the beginning of each month, the price list shall be updated by the Seller according to the change of the average monthly exchange rate of EUR towards PLN for the previous month, stated by the President of Polish National Bank in appropriate announcement. The updated price list, forwarded to the Buyer by the Seller by means of fax or e-mail, shall be binding from the next day after the day of sending by the Seller.
Apart from that, the Seller reserve the right to change the price list for their goods in justified cases (e.g. increase of manufacturing costs). The Seller oblige themselves to inform the Buyer about the alteration of the price list not later than 14 days in advance. The change of prices in the price list does not constitute the change of the Contract.

8.2. The prices specified in the price list may have a system of discounts attached, depending on the sales volume, payment terms as well as sales campaigns run by the Seller, and confirmed each time with an official writing.

9. TOTAL CONTRACT AMOUNT:

Unlimited**.**

10. WAY OF SUBMITTING ORDERS:

The order is to be submitted by the Buyer in writing. The date of the order is understood to be the date of receipt of the order by the Seller. If that day is a holiday or if the order is received after normal business hours, i.e. later than 4:00 pm in Poland (fax, e-mail), then the date of order is the next working day. After confirmation with the Buyer, the Seller confirms the receipt of the order in writing and undertakes to send a pro forma invoice by fax or e-mail to the Buyer within two days from the receipt of the Buyer's order.

Jeżeli Sprzedający nie potwierdzi w w/w terminie zamówienia, do zawarcia umowy nie dochodzi.
Sprzedający może przyjąć zamówienie z zastrzeżeniem zmian lub uzupełnień nie zmieniających istotnie jego treści i niezwłocznie poinformować o tym Kupującego. Jeżeli Kupujący niezwłocznie nie wyrazi zgody na zaproponowane przez Sprzedającego zmiany zamówienia, wtedy umowa nie dochodzi do skutku.
Strony dopuszczają możliwość wskazania przez Kupującego innego odbiorcy. Ustalenia te powinny być zawarte w odrębnym aneksie.

If the Seller does not confirm the order within the time limit specified above, no agreement is concluded.
The Seller may accept the order with the reservation of changes and supplements not changing its contents substantially, and inform the Buyer immediately to that effect. If the Buyer does not express immediate consent to the changes in the order suggested by the Seller, no agreement is concluded.
The Parties allow the possibility to indicate a different recipient by the Buyer. Such arrangements shall be included in a separate annex.

11. TERMIN ZAŁADUNKU:

Załadunek realizuje się partiami, zgodnie z zamówieniami Kupującego. Towar powinien być załadowany w ciągu 5 dni roboczych od daty potwierdzenia przyjęcia zamówienia przez Sprzedającego. Towary, które należy przygotować na specjalne zamówienie (kolorowe tynki, farby, suche zaprawy wskazane w ofercie produktowej), powinny być zamówione przez Kupującego na 5 dni roboczych przed załadunkiem.

11. LOADING TIME:

The loading is carried out in parts, according to the Buyer's orders. The goods are to be loaded within 5 working days from the date of confirmation of receipt of the order by the Seller. The goods to be prepared on special order (colored plasters, paints, dry adhesives indicated in the product offer) are to be ordered by the Buyer 5 working days before loading.

12. WARUNKI TRANSPORTOWE:

12.1. Towar wysyła się transportem samochodowym. Po uzgodnieniu stron, sposób dostarczania może być zmieniony, przy czym forma pisemna uzgodnienia jest obowiązkowa.

12.2. Sprzedający jest zobowiązany w formie pisemnej (faxem, e-mail) poinformować Kupującego o załadunku towaru i jego ilości.

12.3. Takie dane jak: cena, ilość, Sprzedający, Kupujący, data sprzedaży, termin i waluta płatności, waga netto ładunku, powinny być przedstawione w każdej fakturze VAT oraz w fakturze pro forma, będącej potwierdzeniem zamówienia. Dane przedstawione w fakturze VAT powinny być zgodne z danymi przedstawionymi w fakturze pro-forma i spełniać warunki niniejszej umowy, jeśli nie ma innych porozumień między Stronami.

12.4. Przy każdej wysyłce towaru, Sprzedający wystawia Kupującemu wszystkie niezbędne dokumenty, w tym oryginał faktury VAT.

12.5. Do każdej partii towaru powinny być dołączone następujące dokumenty:
- kopia dokumentu transportowego - 5 egz.;
- faktura lub specyfikacja magazynowa WZ-3 egz.

Ponadto Kupujący otrzymuje (najczęściej pocztą) do każdej partii towaru następujące dokumenty:

12. TERMS OF DELIVERY:

12.1. The goods are delivered with means of road transportation. After mutual settlement, the terms of delivery can be changed, but the settlement is to be in writing obligatorily.

12.2. The Seller is obliged to inform the Buyer in writing (fax, e-mail) about loading of the goods and their quantities.

12.3. Such details as: price, quantity, the Seller, the Buyer, date of sale, payment term and currency, net weight of goods are to be included in each VAT invoice and each pro forma invoice, being the confirmation of the order. The data provided in the VAT invoice must be compatible with the data provided in pro forma invoice and meet the conditions of this contract, unless agreed otherwise by the Parties.

12.4. At each shipment of goods, the Seller issues the Buyer all necessary documents, including the original VAT invoice.

12.5. Each shipment of goods must be accompanied with the following documents:
- a copy of the transport document – 5 copies;
- the invoice or warehouse specification WZ – 3 copies.

Apart from the above, the Buyer shall receive (most often by post) the following documents to each batch

- fakturę (jeśli nie została dołączona do towaru);
- oświadczenie o otrzymaniu towaru (do wypełnienia przez Kupującego).

12.6. Kupujący zobowiązuje się do niezwłocznego (nie później niż 30 dni od daty otrzymania towaru) dostarczenia Sprzedającemu dokumentów potwierdzających, że nastąpił wywóz towarów z Polski do ……
Niewykonanie tego zobowiązania przez Kupującego upoważnia Sprzedającego do żądania kary umownej w wysokości 22% wartości brutto całej dostawy.
Dowodami potwierdzającymi wywóz towarów z Polski są:
- kopia faktury;
- kopia dokumentu transportowego;
- oświadczenie Kupującego potwierdzające otrzymanie partii towaru.

of goods:
- the invoice (if it was not attached to the goods);
- declaration on receipt of the goods (to be filled in by the Buyer).

12.6. The Buyer is obliged to provide the Seller immediately (not later than 30 days after the receipt of goods) with documents confirming the shipment of the goods from Poland to ……..
Failure to meet this obligation by the Buyer gives the Seller the right to claim liquidated damages in the amount of 22% of the gross value of the whole shipment.
The evidence confirming the transport of goods outside Poland are:
- a copy of the invoice;
- a copy of the transport document;
- Buyer's statement confirming the receipt of the batch of goods.

13. OPAKOWANIA:
Towar w workach papierowych, wiadrach plastikowych, na bezzwrotnych paletach, obciągniętych folią, waga palety w zależności od asortymentu. Opakowanie towaru powinno zabezpieczyć towar podczas transportu i przechowywania, w warunkach niezbędnych dla dostarczanego towaru.

13. PACKAGING:
Goods in paper bags, plastic buckets, on non-returnable pallets, covered with wrapping foil, the weight of a pallet depending on the goods. The packaging shall protect the goods during transport and storage in conditions required for the goods delivered.

14. ZNAKOWANIE: standardowe, zakładowe

14. MARKING: Standard, factory marking.

15. OPŁATY:

15.1. Kupujący dokonuje 100% przedpłaty za zamówione Towary w EUR w formie przelewu środków pieniężnych na konto Sprzedającego na podstawie faktury pro forma wystawionej po otrzymaniu zamówienia.

15.2. Wszelkie koszty bankowe związane z przelewem pokrywa Kupujący.

15.3. Za datę zapłaty uważa się datę wpływu środków pieniężnych na rachunek bankowy Sprzedawcy.

15.4. W przypadku odmowy załadunku towaru Sprzedający zobowiązany jest zwrócić 100% przedpłaty (jeżeli takowa będzie miała miejsce) Kupującemu w ciągu 30 dni od dnia wpłynięcia pieniędzy na konto Sprzedającego.

15.5. Sprzedający oświadcza, że jest czynnym podatnikiem VAT UE i posiada nr NIP: PL9471936467.

15.6. Kupujący oświadcza, że jest czynnym podatnikiem VAT UE i posiada nr NIP: .....

15. FEES:

15.1. The Buyer forwards 100% payment in advance for the ordered goods in EUR in the form of a bank money transfer to the Seller's banking account, according the pro forma invoice issued after the receipt of the order.

15.2. All banking costs in connection with the money transfers are on the Buyer.

15.3. The time of payment is understood as a date of crediting the money to the Seller's banking account.

15.4. In case of refusal to load the goods, the Seller shall be obliged to return 100% of the down payment (if made) to the Buyer within 30 days after crediting the money to the Seller's banking account.

15.5. The Seller declares that is an active UE VAT payer with Tax ID No. PL9471936467.

15.6. The Seller declares that is an active UE VAT payer with Tax ID No……..

16. WYPOWIEDZENIE UMOWY:

Każda ze stron ma prawo do wypowiedzenia Kontraktu z zachowaniem 1-miesięcznego okresu wypowiedzenia.

Sprzedawca ma prawo do wypowiedzenia Kontraktu ze skutkiem natychmiastowym, w przypadku jakiegokolwiek opóźnienia w dokonaniu zapłaty przez Kupującego.

16. TERMINATION:

Each Party has the right to terminate the contract after a 1-month notice.

The Seller shall have the right to terminate the Contract with immediate effect in case of any default in payment on the part of the Buyer.

17. OGÓLNE WARUNKI DOSTAWY:

17.1. Sprzedawca gwarantuje wysoką jakość towarów, jak również całkowitą ich zgodność z warunkami Kontraktu i specyfikacjami.

17.2. Sprzedawca jest zobowiązany załadować towar bez uszkodzeń, w opakowaniach zabezpieczających go w transporcie.

17.3. Sprzedawca ponosi odpowiedzialność za uszkodzenie towaru w wyniku nieodpowiedniego opakowania i zwraca Kupującemu koszty z tym związane, a także koszty powstałe w wyniku wysyłki transportu pod niewłaściwy adres, jeżeli nastąpiło to z winy Sprzedawcy.

17.4. Reklamacje dotyczące ilości i jakości towaru powinny być składane w ciągu 14 dni od dnia otrzymania towaru przez Kupującego. Przez datę otrzymania towaru rozumie się datę wyładunku towaru w miejscu przeznaczenia, zaś Sprzedający powinien podjąć decyzję na temat zgłoszonej reklamacji w ciągu 14 dni od dnia otrzymania reklamacji.

17.5. Reklamacje dotyczące ilości i jakości przesłane do Sprzedającego po tym terminie nie będą rozpatrywane.

17.6. Reklamacje dotyczące wad ukrytych towaru zgłaszane są Sprzedającemu przez Kupującego niezwłocznie po ich ujawnieniu, nie później jednak niż w terminie 14 dni od ich ujawnienia. Prawo do zgłaszania reklamacji w zakresie wad ukrytych przysługuje Kupującemu w okresie 1 roku od daty sprzedaży towaru.

17.7. Przyjęcie towaru pod względem ilości dokonywane jest przez porównanie z zamówieniem Kupującego uzgodnionym i potwierdzonym przez Sprzedającego. Przyjęcie towaru pod względem jakości towaru, dokonywane jest przez Kupującego zgodnie z wzorcami, wzornikami i certyfikatami Sprzedającego.

17.8. W przypadku potwierdzonej przez

17. GENERAL TERMS AND CONDITIONS OF DELIVERY:

17.1. The Seller guarantees high quality of the goods as well as their absolute compatibility with the provisions of the Contract and specifications.

17.2. The Seller shall be obliged to load the goods without damage, in packaging protecting the goods in transport.

17.3. The Seller shall be liable for any damage to the goods resulting from improper packaging, and return the Buyer costs incurred in connection with it as well as costs resulting from shipping the goods to the wrong address if it was caused by Seller's fault.

17.4. Complaints concerning the quantity and quality of the goods are to be made within 14 days from the date of receipt of goods by the Buyer. The date of receipt of goods is considered to be the date of acceptance of goods to the Buyer's warehouse, and the Seller shall make a decision concerning the complaint within 14 days after receipt of the complaint.

17.5. Complaints concerning the quantity and quality lodged after that time will not be considered.

17.6. Complaints regarding hidden defects of the goods shall be made by the Buyer to the Seller immediately after their detection, not later than 14 days from the detection of the defect. The right to place a complaint concerning hidden defects of the goods is valid within one year after the date of sale.

17.7. Quantitative acceptance of the goods shall be effected by comparison with the Buyer's order coordinated with and confirmed by the Seller. Qualitative acceptance of the goods is made by the Buyer according to specimens, patterns and Seller's certificates.

17.8. In case of variance in the quantity of goods,

Sprzedającego niezgodności towaru pod względem ilości, Sprzedający uzupełnia braki przy kolejnej wysyłce lub zmniejsza kwotę do zapłaty za towar o wartość brakującego towaru.

17.9. W przypadku potwierdzonej przez Sprzedającego niezgodności dotyczącej jakości, Sprzedający wymienia towar nie spełniający wymogów jakości określonych w Kontrakcie lub obniża jego cenę sprzedaży poprzez wystawienie faktury korygującej.

confirmed by the Seller, the Seller shall supply the missing part with the next delivery or shall reduce the amount payable for the goods by the amount of the goods missing.

17.9. In case of variance in quality, confirmed by the Seller, the Seller shall replace the goods with variance in quality, or reduce the purchase price in a form of correcting invoice issue.

18. SIŁA WYŻSZA:

Żadna ze stron nie ponosi odpowiedzialności za całkowite lub częściowe niewykonanie zobowiązań, jeżeli nastąpi to z przyczyn takich jak: powódź, pożar, trzęsienie ziemi i inne zjawiska przyrody, jak również wojna i działania wojenne, blokady, działania organów państwowych, powstałe po podpisaniu kontraktu, na które strony nie mają wpływu. Przy czym terminy wykonania zobowiązań wynikających z kontraktu przenosi się na czas po zaprzestaniu występowania wyżej wymienionych czynników. Strona, która nie może wykonać zobowiązań z wyżej wymienionych powodów powinna bezzwłocznie, w formie pisemnej, poinformować drugą Stronę o ich zaistnieniu, a także o zakończeniu występowania tych czynników.
Odpowiednie zaświadczenie Izby Przemysłowo Handlowej lub innego kompetentnego organu będzie dostatecznym dowodem na zawieszenie wykonywania zobowiązań.

18. FORCE MAJEURE:

Neither Party shall be responsible for complete or partial non-performance of their obligations if it results from such causes as: flood, fire, earthquake and other natural phenomena, as well as war and acts of war, blockades, state authorities' actions, taking place after the signing of the Contract, being beyond the influence of the Parties. However, the terms of performance of obligations resulting from the Contract shall be postponed to the time after cessation of the above mentioned factors. The Party unable to perform its obligations for the above mentioned causes shall immediately and in writing inform the other Party of their occurrence and of the cessation of occurrence of those factors.
Appropriate confirmation from the Chamber of Industry and Trade or other competent authority shall be satisfactory evidence for suspension of performance of the obligations.

19. ARBITRAŻ:

19.1. Wszelkiego rodzaju spory, wynikłe w trakcie wykonania niniejszego Kontraktu, strony będą starały się rozwiązywać drogą polubowną. W przypadkach, w których nie będzie to możliwe, spory podlegają rozpatrzeniu przez Sąd Arbitrażowy przy Krajowej Izbie Gospodarczej w Warszawie. Przy rozstrzyganiu ewentualnych sporów, wynikłych podczas realizacji niniejszego Kontraktu, będzie miało zastosowanie prawo polskie.

19.2. Żadna ze stron nie ma prawa przekazywać osobom trzecim praw i zobowiązań wynikających z Kontraktu, bez pisemnej zgody drugiej strony.

19.3. Wszelkie zmiany i uzupełnienia Kontraktu muszą mieć formę pisemną i muszą być podpisane przez Sprzedającego i Kupującego.

19.4. Wszelkie rozmowy i ustalenia poprzedzające podpisanie Kontraktu w momencie podpisania Kontraktu tracą swą moc.

19. SETTLEMENT OF DISPUTE:

19.1. The Parties shall try to resolve all the disputes arising during the performance of the Contract in an conciliatory way. In cases when it is not possible, the disputes shall be settled by the Arbitration Court at the National Chamber of Commerce in Warsaw. At settlement of all possible disputes arising during the performance of this Contract the Polish law shall be applied.

19.2. Neither Party has the right to transfer the rights and obligations resulting from the Contract to any third persons without written consent of the other Party.

19.3. Any amendments and supplements to the Contract require written form and must be signed by the Seller and Buyer.

19.4. All talks and arrangement preceding the signing of this Contract become void on signing the Contract.

20. OGÓLNE WARUNKI:

20.1. Kontrakt zawarty jest w języku polskim i angielskim równolegle. Obie wersje językowe mają taką samą moc prawną jednakże w razie rozbieżności pomiędzy wersjami językowymi wiążącą dla stron jest wersja polska. Każda ze stron otrzymuje po jednym egzemplarzu Kontraktu.

20.2. Strony uzgodniły, że Kontrakt jak i inne uzgodnienia do Kontraktu mogą być wstępnie dostarczone stronom za pośrednictwem poczty, poczty elektronicznej, faxu. Jednak moc prawną posiadają jedynie dokumenty oryginalnie podpisane.

20. GENERAL CONDITIONS:

20.1. The Contract is executed in Polish and English languages simultaneously. Both language versions have the same legal power, however, in case of divergence between the language versions, the Polish version is binding for the Parties. Each Party receives one copy of the Contract.

20.2. The Parties have agreed that the Contract and other arrangements accompanying the Contract may be preliminarily delivered to the Parties by post, electronic mail, and fax. However, only originally signed documents have the legal power.

21. DANE STRON:

SPRZEDAJĄCY:
ATLAS Spółka z ograniczoną odpowiedzialnością
91 - 222 Łódź, ul. Św. Teresy 105, Rzeczpospolita Polska
NIP: PL9471936467
REGON: 100253695
Nazwa banku:
„Bank Rozwoju Exportu" S.A. Oddział Łódź,
ul. Piotrkowska 148/150
90 – 063 Łódź
SWIFT: BREXPLPWLOD
PLN: PL24114011080000224638001071
EUR: PL48114011080000224638001027
GBP:

KUPUJĄCY:
.....
NIP: .....
REGON: .....
Nazwa banku: .....
Nr rach.: .....
SWIFT: .....
IBAN: .....

Sprzedający/Seller

21. DATA OF THE PARTIES:

SELLER:
ATLAS Spółka z ograniczoną odpowiedzialnością
91 – 222 Łódź, ul. Św. Teresy 105, Rzeczpospolita Polska
NIP: PL9471936467
REGON: 100253695
Bank:
„Bank Rozwoju Exportu" S.A. Oddział Łódź,
ul. Piotrkowska 148/150
90 – 063 Łódź
SWIFT: BREXPLPWLOD
PLN: PL24114011080000224638001071
EUR: PL48114011080000224638001027
GBP:

BUYER:
.....

.....

Kupujący/Buyer

ATTACHMENT 2 – CERTIFICATE OF WARRANTY, WARRANTY TERMS & CONDITIONS

ATLAS Sp z o.o.

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with its registered office at Łódź, ul. Św. Teresy 105, entered into the National Court Register – Business Register under KRS number 0000264887 by the District Court Łódź-Śródmieście in Łódź Commercial Court XX Commercial Division,
Share capital: 966 454 700.00 PLN

Office: 91-421 Łódź ul Kilińskiego 2 , tel. (0-42) 631-88-00

CERTIFICATE OF WARRANTY

External thermal insulation system

ETICS ATLAS/AVAL* / ETICS ATLAS/AVAL ROKER* /
ETICS ATLAS XPS*

ATLAS sp. z o.o.
(hereinafter referred to as Warrantor),

grants ....
(enter the name of the Company - Warrantee)

with its registered office at.. ....,
(enter the exact address of the registered office of the Company – Warrantee)

entered in the business register..... ....
(hereinafter referred to as Warrantee) a product warranty for the period of ....
..... for the following products: ....
constituting ATLAS ETICS thermal insulation system ETICS ATLAS/AVAL* / ETICS ATLAS/AVAL ROKER* / ETICS ATLAS XPS* assuring that the above mentioned products are of good quality, which means that within the period of warranty they will have properties as specified in "ATLAS Product Catalogue"
(issue: .....) and in the *EUROPEAN TECHNICAL APPROVAL ETA ....., provided that each and every requirement set out in the General Terms and Conditions of Warranty" is met, and, in particular, that the contractor adheres to the procedures and techniques of installation of the thermal insulation system.

The CERTIFICATE OF WARRANTY has been issued for products to be installed on the following building(-s):
Name of building(-s)..... ....
Location of building(-s) /address/ ....
"General Terms and Conditions of Warranty for ATLAS thermal insulation systems" and "ATLAS Product Catalogue" (issue .....) constitute an integral part of this CERTIFICATE OF WARRANTY.
Place and date of issue of the CERTIFICATE OF WARRANTY ....
/Name and signature of an Authorised Representative of the Warrantor/

Revision 22.10.2007
The Warrantee confirms that he received a copy of the "General Terms and Conditions of Warranty for ATLAS thermal insulation systems" and "ATLAS Product Catalogue" on signing this CERTIFICATE OF WARRANTY.
The Warrantee hereby declares that he is familiar with the "General Terms and Conditions of Warranty for ATLAS thermal insulation systems" and accepts them without reservations.

....
signature/signatures of the Warrantee or persons authorised to sign declarations for and on behalf of the Warrantee

* - delete as applicable

Revision 22.10.2007

GENERAL TERMS AND CONDITIONS OF WARRANTY FOR ATLAS/AVAL THERMAL INSULATION SYSTEMS

I. GENERAL

These General Terms and Conditions of Warranty apply to the products of ATLAS Sp. z o.o. specified in the Catalogue of Products covered by the Warranty (hereinafter referred to as the Catalogue), being an annexe to the Terms and Conditions.

II. DEFINITIONS

Warrantor - ATLAS Sp. z o.o. 91 -222 Łódź, ul. Św. Teresy 105.

Warrantee – a sole trader providing building services who has been issued with the Certificate of Warranty, or an entity that acquired the rights arising from the Warranty.

Investor – a natural person, legal person or other organisation not being a legal person to whose order the Warrantee provides building services with the use of the products mentioned in par. I p. 1.

Warrantee's Representative – an employee of the Warrantee authorised to act on behalf of the Warrantor in connection with the Warranty.

Products – denotes the products detailed in the Certificate of Warranty.

Catalogue – the latest issue of Atlas Product Catalogue as of the date of receipt of the Certificate of Warranty by the Warrantee.

Reference Document – a document (e.g. Technical Approval or Standard) indicated by the Warrantor in the Catalogue, specifying, in particular, the requirements as to the Product or insulation system containing the Product as a component.

Certificate of Warranty – a document assuring the quality of the Products issued to the Warrantee.

III. SCOPE AND CONDTIONS OF WARRANTY

1. The Warrantor assures that the Products are good quality, which means that the Products have properties as specified in the Catalogue, provided as an annexe to each Certificate of Warranty, and that they also meet the requirements detailed in the Reference Document specified in the Catalogue.

2. The Warrantor grants a ..... – month warranty for the Products used in the building specified in the Certificate of Warranty (hereinafter referred to as the Period of Warranty) provided that the Products purchased are installed on the above mentioned building before the expiry date as indicated on the packaging of these Products. The Warrantor assures under this Warranty that within the Period of Warranty the products shall meet the requirements specified in p.1

3. The Period of Warranty begins on the day of signing, in the presence of Warrantee's Representative as confirmed by his signature, of the final acceptance report for the work completed by the Warrantee for the Investor with the use of Warrantor's Products.

4. The Warranty is granted for the Products used by the Warrantee, who ensures adherence to the procedures and techniques of system installation in accordance with: requirements of ETAG 004:2000, European Technical Approvals ETA granted to ATLAS Sp. z o. o., the regulations in force, the conditions of execution and acceptance of building works concerning systems of thermal insulation of buildings, best practice in building, and the Manufacturer's indications, in particular according to the conditions specified in the Catalogue that apply to the Product used.

5. The Warrantor is not liable under this Warranty for any damage to the Products or absence of properties as specified in p. 1, resulting from:

- negligence or incompetent storage or handling of Products, or failure to use the Products in accordance with the documentation specified in p.1 by the Warrantee or third parties, or tampering with the composition of the Products as to the proportions and quality of ingredients,

- external factors not due to the Product, in particular: force majeure, subsidence of the building, organic contamination, heavy contamination of the facade surface resulting from the unfavourable location of the building,

- taking improper action or adopting incorrect solutions in the technical documentation of the building referred to in p. 2, concerning: elements of that building, elements connected to the building (e.g. billboards) or materials used – which may have an adverse effect on the system and Products covered by the Warranty.

- action by third parties, for which the Warrantor is not liable, in particular, improper action or omission as to the use of the building in accordance with its conditions of maintenance,

- contractor's errors.

6. The Warrantor's liability under this Warranty is limited to the supply of Products that are free of defects, or repair only to the extent of the defect, provided that the defect is discovered within the Period of Warranty and that it is reported and that the Warrantee's duties detailed in par. IV are fulfilled. The scope of work connected with the replacement of Products or repair shall be subject to the Warrantor's agreement and approval.

7. The Warranty does not cover standard maintenance activities, e.g. cleaning, painting and maintenance of the facade, removal of any contamination or repair of mechanical damage to the facade.

8. The Warrantor undertakes to investigate a reported claim within 30 days from signing the inspection report referred to in par. IV p. 1 item i). This term may be extended if any expert opinion concerning the claim is required, however, the Warrantor shall make an effort to limit this period to the minimum necessary.

9. The Warrantor is obliged to produce, at the Warrantee's request, the documents that authorise the sale of the individual product batches, in accordance with the relevant legal regulations.

IV. DUTIES OF THE WARRANTEE

1. The Warrantee's rights under this Warranty concerning the Products purchased referred to in par. I may be exercised provided that the Warrantee fulfils the following duties:

a) written notification to the Warrantor of the commencement of building works with the use of the Products, as well as about the completion of works and the date of final acceptance, the notification being made in at least seven (7) - day advance,

b) email and fax notification to the Warrantor's Representative of the date of acceptance of the individual stages of thermal insulation project, made in at least two-day advance.

c) providing supervision of the building works with the use of the Products, by an ETICS Supervisor having appropriate qualifications (construction licence, valid ETICS Supervisor certificate issued by Certificate Holder),

d) acceptance, by the ETICS Supervisor, of all stages of the building works, confirmed by en appropriate entry in the construction log, and, at the Warrantor's request, making the construction log available to the Warrantor's Representative for inspection,

e) enabling the Warrantor's Representative to check the execution of the individual stages of building work with the use of the Products and other materials that are components of the system in accordance with the relevant Reference Document,

f) compliance with Warrantor's Representative's comments and instructions concerning the execution of building work with the use of the materials, made in writing,

g) immediate notification of a claim in writing, no later than within 7 days from the date of discovery of any defects of a Product covered by this Warranty by the Warrantee,

h) ensuring appropriate protection of the Product being the basis for the claim and the area of its application to enable verification of the claim as to the Product's defects,

i) participation, together with the Warrantor's Representative, in preparation of the inspection report, which report shall otherwise be drawn up by only one party,

j) undertaking necessary steps, agreed with the Warrantor's Representative, in order to limit the damage to the insulation system in the area of application of the Product being the subject of the claim,

k) producing the technical documentation on the basis of which building work was executed with the use of the Products,

l) obtaining and supplying to the Warrantor's Representative of paid invoices for all batches of Products and other materials being components of the system used by the Warrantee, together with the documents authorising the sale of the relevant batches,

m) production of the Certificate of Warranty by the Warrantee, signed by an authorised representative of the Warrantor and by the Warrantee.

2. Failure to perform any of the duties detailed in par. 1 by the Warrantee results in forfeit of rights under this Warranty.

3. Claim notification is considered to be made within the notification period as specified in par. IV p. 1 item g) if the claim notification is sent within this period by registered mail, return receipt requested, to the address of the Warrantor's registered office.

V. FINAL PROVISIONS

1. In the event of the Warrantor's failure to perform or improper performance of its obligations under the Warranty, its liability under the Warranty shall be limited to the amount of settled invoices for the Products and the costs of replacement or repair of these Products to the same extent. The above defines the entire liability of the Warrantor under this Warranty.

2. The Warrantee may transfer its rights under the Warranty subject to the Warrantor's approval in writing.

3. Any correspondence to the Warrantor in connection with the Warranty shall be sent by registered mail and addressed to: ATLAS sp. z o.o., Łódź ul. Kilińskiego 2, postal code 91-421, with a note "WARRANTY".

4. In case of discrepancy between the provisions of the Certificate of Warranty and the general terms and conditions herein, the provisions of the Certificate of Warranty apply.

5. The Terms and Conditions of Warranty set out herein, as well as the Warranty itself, are in force on the territory of Poland.

6. Any disputes shall be resolved in accordance with Polish law.

7. The competent court to resolve any disputes that may arise is the court of the competent and local jurisdiction with respect to the Warrantor's registered office address.

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ATTACHMENT 3 – COMPLAINT FORM AND DECLARATION

Case No ....

COMPLAINT FORM

Complaint: _

_ _

(name of Product)

Customer: _

_ _

_ _

_ _

(Company, Name, Address, Phone number)

Seller/Installer : _

_ _

_ _

_ _

(Company, Name, Address, Phone number)

Invoice No: _ **, Date of purchase :** _ _ _ _ _ _

Amount of product: _

Factory marking on the Product: _

Participants: 1. _

2. _

3. _

Date and place : _

Date of complaint occurrence : _

Date of complaint transmission to ATLAS : _

Description (according to the Customer): _

Customer's expectations: _
_ _
_ _

Attachments: _
_ _
_ _
(samples of unused and used product, factory marking, invoices)

Remarks : _

With this point the Form is ended and signed:

1. _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ **2.** _ **3.** _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

The way of purchase of the Product (indicate the agents if any): _
_ _
_ _

Proposed settlement with reasons: _
_ _
_ _
_ _
_ _
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _

ATLAS Representative Signature _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Version 1/10
Issued on 22.01.2010

DECLARATION

Date of complaint:

I inform, that in connection with the complaint concerning:

I agree to accept the Product:

And service in a form of:

Hereto I declare, that the form of settlement written above satisfies my expectations concerning the complaint.

Date and place : _

Name and surname of the Customer : _

Signature : _

Remarks:

……….

After signing please send this declaration to
Tel. +48 42 714 0807
or
ATLAS Sp. z o. o.
Dział Zastosowań Wyrobów
ul. Kilińskiego 2, 91-421 Łódź

ATTACHMENT 4 – IAB SCHEME

ATTACHMENT 5 – ATLAS/AVAL ETICS SCHEMES (15 SCHEMES)

ATTACHMENT 6 – TECHNICAL DATA SHEETS OF THE PRODUCTS MANUFACTURED BY THE CERTIFICATE HOLDER

ATTACHMENT 7 – CHECK OUT REPORT