



Who We Are ?

Adak Sanat Polyemr, as the first manufacturer of Catalytic Converter Supporting Mat, has been founded in 2016. ASP has 200 employees in six sites

Our main products are as follows

- Catalytic Converter Supporting Mat
- Diesel After Treatment System (DOC-DPF-SCR-POC)
- Automotive Insulation
- Ceramic Fiber Paper
- Automotive Trim Parts
- Automotive Electrical Parts





The company has been certified by IQNET International Certification Network for ISO 9001:2015 and IATF 16949:2016 on December 2018, valid until December 2021.

ASP's Revenue

- 2019: 0.7 millions USD
- 2020: 2 millions USD
- 2021: 6 millions USD
- 2022 prediction: 10 millions USD

Our Main Customers

- **Sapco Co.**

Iran Khodro's engineering design and component supplier

- **Mega Motor Co.**

The Manufacturer of Full Engines, Gear Boxes and Axles for SAIPA CO

- **Iran Khodro Diesel Co.**

Manufacturer of commercial vehicles in the Iranian market

- **Zamyad Co.**

Iranian commercial vehicle manufacturing company

- **Crouse Co.**

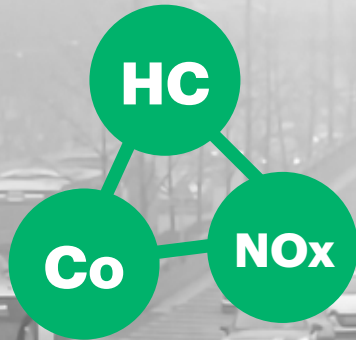
A tier-1 supplier of automotive parts for the automotive industry



Brief Introduction Of Products

CATALYTIC CONVERTER SUPPORTING MAT





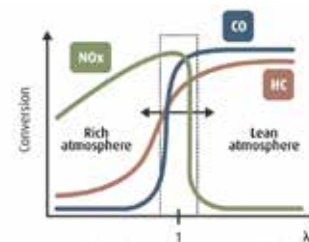
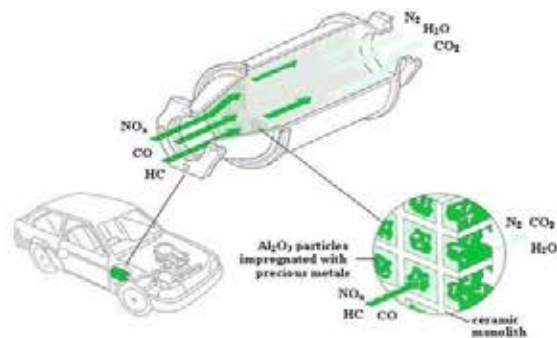
Air Pollution and Its Health Effects

- Internal combustion engines have harmful exhaust gas.
- Primary pollutants produced by petrol-powered vehicles include carbon monoxide, nitric oxides and unburned hydrocarbons.
- The most common effects of CO exposure are fatigue, headaches, confusion, and dizziness due to inadequate oxygen delivery to the brain.
- Nitric oxides can cause breathing problems, headaches, chronically reduced lung function, eye irritation, and loss of appetite.
- Swallowing or inhaling hydrocarbons can cause lung irritation with coughing, choking, shortness of breath, and neurologic problems.

Solution to Petrol Engines' Pollution



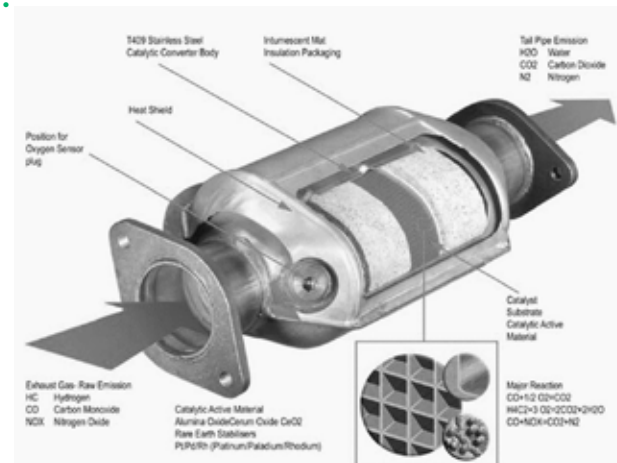
- "A three-way catalyst oxidizes exhaust gas pollutants – both hydrocarbons (HC) and carbon monoxide (CO) – and reduces nitrogen oxides (NOx) into the harmless components of water, nitrogen and carbon dioxide (CO₂)."
- In lambda controlled three-way catalysts the following three basic reactions are catalyzed in parallel.



- $2 \text{NO} + 2 \text{CO} \rightarrow \text{N}_2 + 2 \text{CO}_2$
- $2 \text{CO} + \text{O}_2 \rightarrow 2 \text{CO}_2$
- $2 \text{C}_2\text{H}_6 + 7 \text{O}_2 \rightarrow 4 \text{CO}_2 + 6 \text{H}_2\text{O}$

The Main Part of -3Way Catalyst Converter

- To perform these chemical reactions, Palladium, Platinum and Rhodium (Known as PGM) must be COATED in the honeycomb substrate element (CPSI=400-1200).
- To insert the catalyst in the catalytic converter, the CANNING process must be applied.
- In the canning process, the SUPPORTING MAT is the most important, high-technology part to be used.
- The canning process is selected and designed according to the substrate specifications. Accordingly, the required mat will be designed to correspond to the canning process.



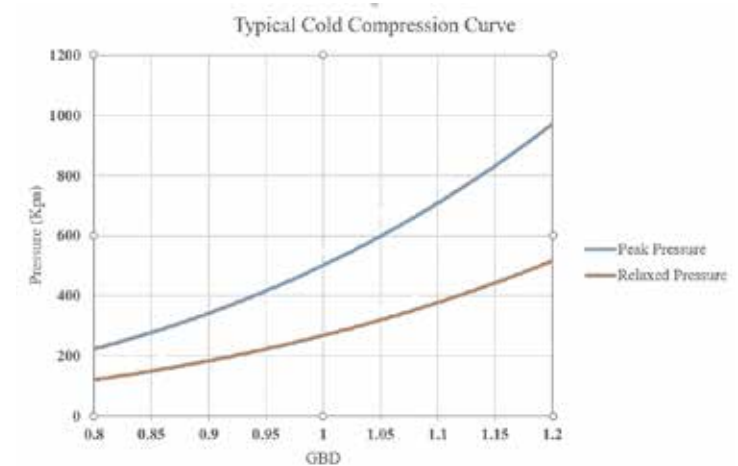
Why mat is important in catalytic converters?

- Any wrong design or application of Mat may lead to substrate honeycomb crack, breakage or easily released (Push-out Test). The coated substrate, because of its honeycomb shape, is highly sensitive to pressure while it costs almost 70% of the catalytic converter value because of the coated PGM inside.
- This part must fix the coated substrate in its position, while it must damp the vibrations to avoid substrate and PGM further damages. Therefore, it must act as a SPRING.
- Each Catalytic Converter needs its special supporting mat, based on following criteria:
 - Engine specifications such as temperature, back pressure, etc.
 - Substrate specification such as dimension, CPSI, etc.
 - Catalytic converter specification such as location.
 - Canning process type
 - Designed gap based on customer specifications.
- High quality catalytic converter supporting mat is exclusively manufactured by US companies (Unifrax, 3M) or companies under US license (Ibiden).

**ADAK SAN-
AT POLY-
MER
IS THE
ONLY
MAT MANU-
FACTURER
IN THE MID-
DLE EAST.**

Our Product Specification

- Full range of basis weight and thickness according to the customer's requirements
- Nominal GBD: 0.75, 0.9 and 1 gr/cm³ for intumescent and 0.6 gr/cm³ for Non-Intumescent, according to the different products
- Maximum Operating Temp.: up to 1100 oC suitable for local vehicles
- LOI: Maximum 10% according to the Standards and Test Plans
- Expansion Ratio: according to KES T-L461A
- Heat Conductivity at 650 oC: 0.115 W/m.k
- Tensile Strength: higher than 100 Kpa according to test plans
- Compression Test: two types of tests are applied



Different Types of Supporting Mat



Intumescent

- Expands in temperatures below 460 oC

Material:

- Ceramic Fiber
- Vermiculite
- Binder: mixture of more than 12 additives



Non- Intumescent

- Does not expand

Material:

- Ceramic Fiber
- Binder: mixture of more than 12 additives
- Higher Manufacturing Technology

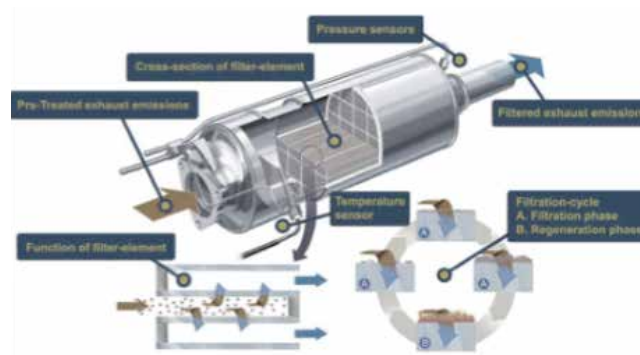
Brief Introduction Of Products

Diesel After-treatment System (ATS)



DPF

- the International Agency for Research on Cancer (IARC), which is part of the World Health Organization (WHO), classified diesel engine exhaust as carcinogenic to humans (Group 1), based on sufficient evidence that exposure is associated with an increased risk for lung cancer.
- A diesel particulate filter (DPF) is a device designed to remove diesel particulate matter or soot from the exhaust gas of diesel engines.



International Agency for Research on Cancer



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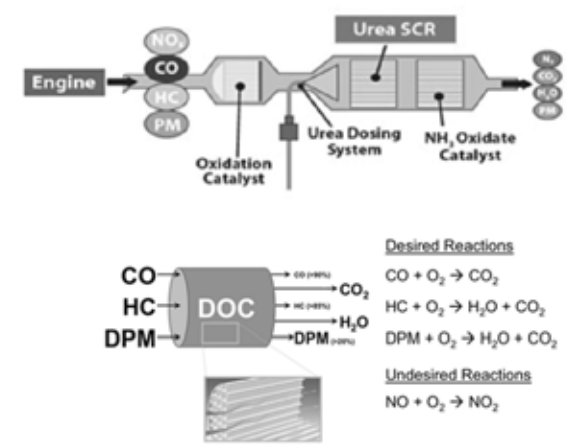
12 June 2012

IARC: DIESEL ENGINE EXHAUST CARCINOGENIC

Lyon, France, June 12, 2012 -- After a week-long meeting of international experts, the International Agency for Research on Cancer (IARC), which is part of the World Health Organization (WHO), today classified diesel engine exhaust as carcinogenic to humans (Group 1), based on sufficient evidence that exposure is associated with an increased risk for lung cancer.

SCR and DOC

- Besides particulate matters, diesel engines emit gaseous pollution like petrol engines, including CO, HC and NOx.
- To reduce NOx emission in diesel engines, selective catalytic reduction (SCR) has been widely used.
- Diesel oxidation catalyst (DOC) has been used to oxidize CO and HC.



Our Market In Iran

- Customers for ATS products, are Iranian commercial vehicle manufacturers.
- ASP's ATS are used as OEM part in vehicles mentioned below:



Saipa Diesel Tractors and Trucks

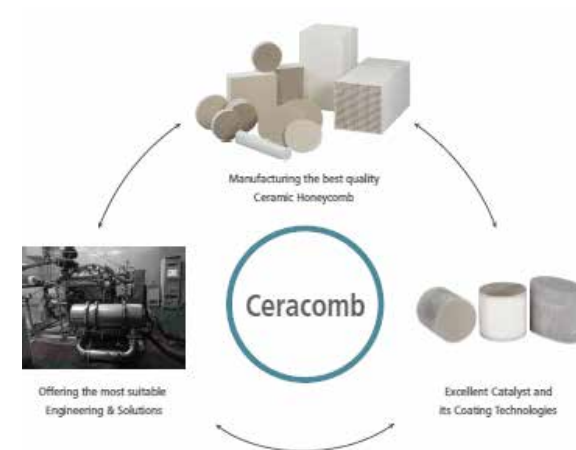


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ASP IS THE ONLY ATS MANUFACTURER IN IRAN

Our Foreign Cooperator, Ceracomb

- Founded in 1987
- The first manufacturer of After Treatment Ceramic equipment in South Korea
- Activities
- Industrial and Automotive After Treatment Ceramic Equipment
- Industrial and Automotive Catalytic Converters
- Industrial and Automotive After Treatment Coating Equipment
- Manufacturer and Importer of DOC, DPF, SCR, TWC, VOC, etc.



Certificate



Our Foreign Cooperator, Kailong

Kailong High Technology Co., Ltd., founded in 2001, is located in the well-known southern city with three-thousand-year history—Wuxi.

It is not only one state-level high-tech enterprise providing research and development, production, sales, and after-sales service, but also National Enterprise Technology Center, laboratory center accredited by China National Accreditation Service for Conformity Assessment (CNAS), and national postdoctoral research station.

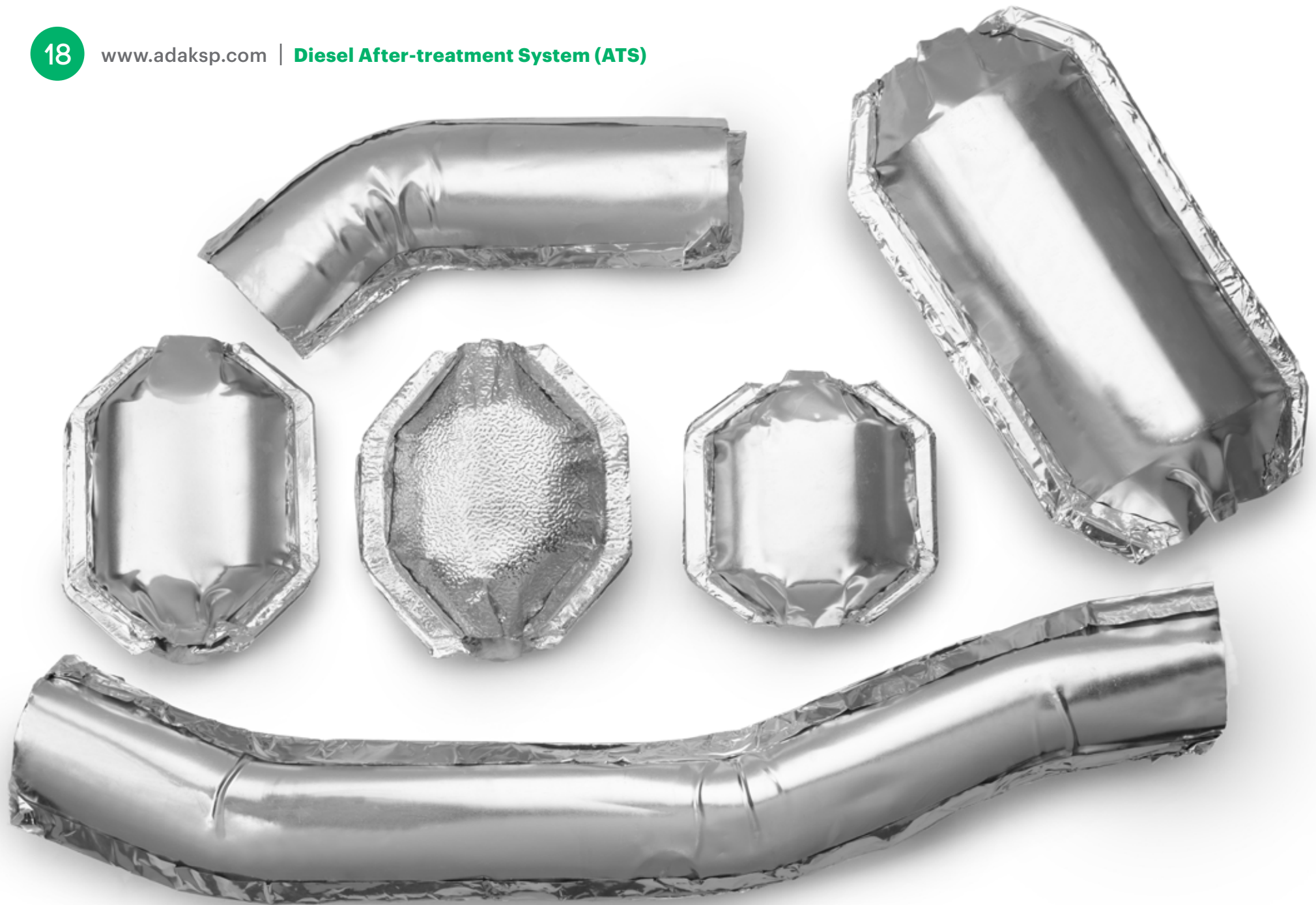
Besides the headquarter, the company also possesses Kailong Institute of Technology, Kailong Lanfeng New Material Technology Co., Ltd., Jiangsu Kailong Baodun Power Technology Co., Ltd., covering a total area of over 153333m², with more than 1,200 employees.



Brief Introduction Of Products

Exhaust Insulation to be used in automotive industry





Catalytic Convertor and DPF Insulation

They are all localized based on local capabilities and knowledge.

This insulation can reduce the temperature from 600-700 °C of exhaust pipe to 85-100 °C on the other side.

To increase the resistance to fatigue and impact, special considerations have been applied.



- A wide variety of insulators are manufactured by Adak Sanat Polymer Co.
- These are to name but a few
 - Catalytic Convertors Insulation
 - DPF's insulation
 - Insulation to cover exhaust pipes
 - Exhaust Heat Shield Insulation
 - And Automotive Engine and Body insulations can be mentioned.





Roof and Body Sound and Heat Insulation

Some Others Heat and Sound Insulation



Engine Bay Insulation



EGR and Engine's part Insulation

Brief Introduction Of Products

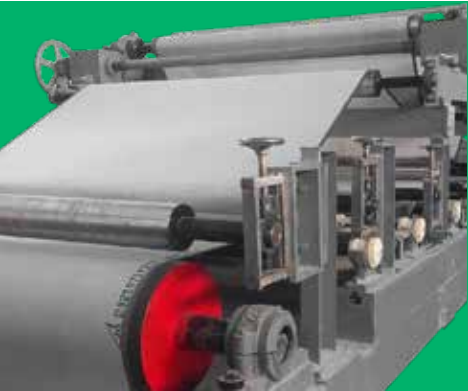
Ceramic Fiber Papers



- As a new product, Adak Sanat Polymer designed and manufactured a fully automatic line of producing Ceramic Fiber Paper for the first time in Iran.
- Ceramic Fiber Paper is mainly considered a heat insulation based on Alumina-silica. Higher density, lower thickness, higher flexibility and ease of use has made this material more applicable than RCF. Ceramic Fiber Paper is a light insulator that can stand high temperatures up

to 1430 oC. Furthermore, low thermal conductivity has made this product a good solution for different uses.

- This product can be used as sound insulation too because of its great noise reduction capability. Since the product has low thickness, it can be easily rolled or wrapped around different heat resources to decrease thermal conduction.



- One the main characteristics of Ceramic Fiber Paper is that since it does not contain Asbestos, it is not harmful for human life. This white product is totally environmental friendly.
- Also, this paper is self extinguishable and is suitable to be used in places with probability of fire to avoid its spread. The product is resistant to thermal shock and it can be used in places with extreme thermal fluctuations.



The main applications of Ceramic fiber paper are in:

- Automotive industry including exhaust heat shielding, engine and muffler heat and sound insulations
- Aerospace industry including Igniter line protector, Heat shields, oxygen generators
- Petrochemical industry including Heat protection for transfer lines, Heat insulation in oil platform machineries
- Steel Manufacturing Industry including High temperature industrial oven insulation, investment casting mold wrapping, heat treating parting agent
- Appliances industry including Home oven, Electrical Heaters, Wood burning stoves
- Safety clothing and equipment including lining in firefighters uniform and Refractory bags
- Construction Industry as sound and heat insulation
- Electrical Industry as heat and electrical insulation

- One of the main weaknesses of this product in the market is its vulnerability to water, That's why it Cannot be used in close proximity to water or vapor and this mainly restricts its application in many places.
- For the first time in the world, Adak Sanat Polymer has achieved the technology to make this product water repellent.
- The water repellent ceramic fiber paper technology has resolved this problem by presenting a nano technology solution. The water repellent ceramic fiber paper can be easily used as heat insulation up to 650 oC in wet and vapory area. It can even be submerged in water, The weight changes for water absorption would be zero.
- Based on this Nano technology, the Ceramic fiber paper consumption can be developed in many areas of Construction, petrochemical, Automotive, etc.



The product Specification:

- Water Resistance up to 650 °C (As an innovation for the first time)
- Density: 100 – 300 Kg/m³ (200 for most uses)
- LOI < 8%
- Tensile Strength > 400 Kpa
- Good Sound Insulation capability
- Flexible and formable

- Self-Extinguishable
- Thickness: 0.5-25 mm
- Classification Temperature: up to 1430 °C
- (Up to 650 °C for water repellent CFP)
- Color: White
- Thermal Conductivity: 0.11-0.13 W/mk @650 °C



Brief Introduction Of Products

Automotive Trim Parts





Design and Manufacturing of Cars' Doors Trim (Vacuum Forming)

Wide Variety of Automotive Trim Parts are manufactured in Adak Sanat Polymer Co. Including

- Vacuum Forming Parts
- Hot Press Forming Parts
- Design and Assembly Parts



Design and Manufacturing of Nissan Pick Up Full Internal Trim (Vacuum Forming and Hot Press Forming)

Design and Manufacturing of City Bus Roof Internal Trim (Design and Assembly)



Design and Manufacturing of City Bus Internal Cabin (Vacuum Forming & Assembly)

Design and Manufacturing of ambulance bus Internal Trim (Design and Assembly)



Brief Introduction Of Products

Automotive Electrical Parts



Adak Sanat Polymer Co produces some automotive electrical parts including:

- Vehicle's cable harness
- Systems' relay box
- Some of electrical sensors like temperature sensors



ASP's production line







Available Equipment:

- Two Types of Electrical Ovens for different use
- Specialized Thermo-Mechanical Analyzer (TMA)
- Tensile Machine to perform Tensile, Compression and Bending Tests
- Specialized Thickness Gauge
- Aging Tester
- Erosion Tester
- Burning Rate Tester
- Heat Conductivity Tester



Electrical Ovens

Two Electrical Ovens in different sizes are used in ASP Co. One oven with 3L capacity and maximum temperature up to 1100 oC and the other one with 30 L capacity and maximum temperature up to 1500 oC are used for different purposes.

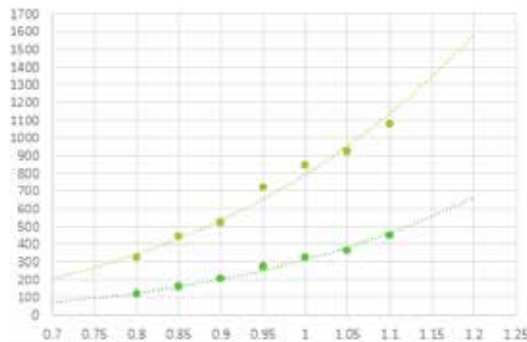


- This Machine is the first Machine in Iran which can test Thermo-Mechanical Performance of Mat and other material in Iran
- This machine measures the thickness change in different temperature.



Tensile Machine

- Tensile Machine to perform Compression, Tensile and Bending tests of different material.
- All machineries and equipment in laboratory and production are calibrated and monitored according to IATF 16949:2016 Standard.



Specialized Thickness Gauge

- The thickness gauge is specially designed to measure the thickness of mat and other ceramic fiber based products.
- The gauge diameter, the weight and other specifications are accurately designed based on foreign mat manufacturers.



Aging Tester

- The aging tester perform vibration on all types of material while two different ovens simulate different temperatures up and down side of an insulation.
- The tester can shows the endurance of insulation during temperature difference at the same time with vibration.



Erosion Tester

- The erosion tester analyze the erosion characteristic of a material, while a circulating wind flow by pressure up to 6 Bar is applied.



Heat Conductivity Tester

- The Heat Conductivity Tester measures the conduction capability of an insulation by Fiat Standard of 50570.
- In this test, a high temperature up to 600 oC is applied to one side of a material and the temperature on the other side is measured via special probes.
- By this test, the performance of an insulation may be easily analyzed and improved.



Burning Rate Tester

- The Burning Rate Tester analyze the burning rate of a material horizontally and vertically.
- An ideal burning rate for an insulation is Type A, which is self-extinguishable. Also many material with burning rate of below 100 mm/min may be used in different industries.