



Advanced
Waste Recycling
(ARRT Token)
Project

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**Advanced Waste Recycling
(ARRT Token) Project**

Waste To Energy Processing System

**Brief description of the technology,
the current level of its implementation
and development prospects**



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Advanced
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<https://arrt.pro>

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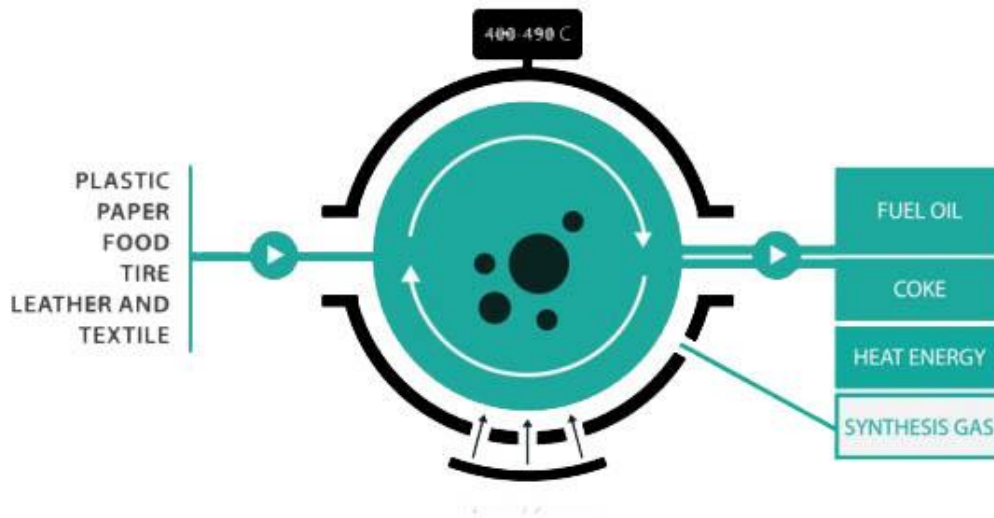


Current ARRT Project Technology introduction

Pyrolysis refers to thermal methods for processing carbon-containing materials in order to extract raw materials and/or energy resources and is implemented by heating the material in a controlled environment in the absence of oxygen. This method is based on the thermal decomposition of high-molecular compounds into components with lower molecular weight and is widely used for processing waste wood, plastic, rubber waste, oil sludge and some other types of waste. The products of waste processing using this technology are liquid and gaseous hydrocarbons, as well as solid carbonaceous residue.

The yield of pyrolysis products, as well as their ratio, depend on the type of waste and the temperature of the process. With increasing temperature, a redistribution of the ratio of processed products occurs with an increase in the proportion of the gaseous component. Absolutely all products of pyrolysis processing of carbon-containing materials are liquid. In particular, gaseous pyrolysis products can be used as an energy carrier to generate thermal and/or electrical energy. The liquid hydrocarbon fraction formed during the condensation of primary pyrolysis gas can be used to produce high-quality liquid fuel, and at the same time is a valuable raw material for the petrochemical industry. The solid carbon residue (charcoal) can be used as solid heating fuel or as carbon black.

The quality of pyrolysis products is determined by the temperature-time parameters of the process, and can be significantly increased by their additional processing.



Pic 1. Schematic diagram of the waste recycling process

Core of ARRT Project

The idea for the project arose while working on an innovative design for a flameless gas burner for household heating appliances, which is based on a metal mesh emitter. During testing of the burner prototype, the high efficiency of the combined radiation-convective mechanism of heat transfer from the burner to the heated object was confirmed.

The experience of previous work on the creation of equipment for the thermal destruction (pyrolysis) of solid wastes, using the example of chamber and screw-type installations heated exclusively by flue gases, has shown that these installations have a low efficiency of heat transfer to the waste material, especially when processing materials that, when heated, become into a liquid state.

The project idea was tested on a prototype drum-type reactor. Test results showed the possibility of achieving a temperature inside the reactor sufficient to carry out the pyrolysis process. At the same time, high heating efficiency of the processed material was observed.



There are several main types of installations that implement pyrolysis technology in relation to solid and paste-like carbon-containing materials. The most common are chamber, screw and drum type installations. Moreover, for each type of installation there are many design options. Each of the pyrolysis installations has its own design features, which ultimately determine the efficiency of processing in relation to a particular type of material and, of course, its cost.

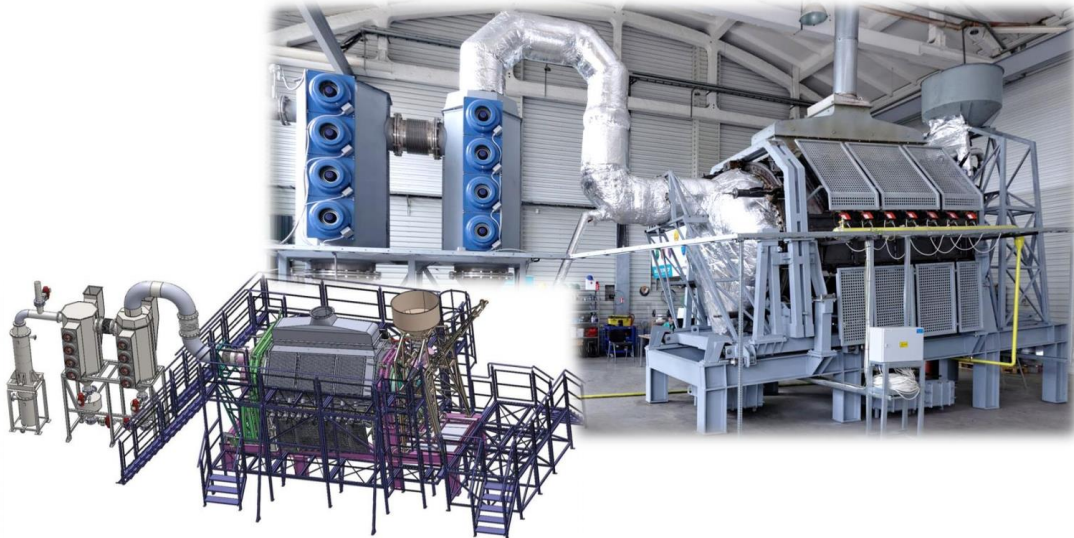
When assessing the economic efficiency of pyrolysis waste processing, such indicators as process productivity, quality and liquidity of processed products, cost of technological equipment, its reliability and maintainability are taken into account.

Recycling productivity is determined primarily by the thermal efficiency of the process, or the efficiency of heat transfer from the heating source to the material being processed. This indicator, along with such indicators as reliability and maintainability of equipment, characterizes the scientific and technical level of development and largely determines the cost of technological equipment.

About our concept of technological equipment creating

A detailed analysis of all the above factors, as well as previous experience in the field of creating equipment for the thermal processing of various types of waste, allowed us to develop our own concept of pyrolysis equipment. Currently, this concept has been put into practice in the form of a prototype.

A prototype of the pyrolysis installation has passed preliminary tests. The test results showed that the installation is efficient and makes it possible to implement the process of low-temperature pyrolysis for a wide class of solid and paste-like carbon-containing materials.



Pic 2. Engineering diagram (general drawing) and appearance of the actually created working prototype.

Advantages of technologies and equipment offered by Advanced Waste Recycling (ARRT Token) project

- ✓ High efficiency of reactor heating due to a combination of radiation and convective mechanisms of heat transfer from the heater to the reactor vessel;
- ✓ High efficiency of heating the pyrolyzed material due to the large area of its contact with the internal surface of the reactor heated to a high temperature, as well as due to the ability to regulate the thickness of the layer of pyrolyzed material and its effective mixing during the pyrolysis process;
- ✓ Smooth adjustment of thermal power supplied to the reactor;
- ✓ High degree of equipment reliability due to simplicity of design and improved maintainability.
- ✓ Guaranteed safety of equipment operation in non-stop mode.
- ✓ Monitoring and maintaining process parameters at a given level;
- ✓ Possibility of quickly setting up equipment when switching to processing new raw materials.



Level of readiness of ARRT project (According to TRL System Engineering Handbook)

TECHNOLOGY READINESS LEVEL	
9	REGULAR USE OF TECHNOLOGY
8	TECHNOLOGY HAS BEEN TESTED AND CERTIFIED
7	TECHNOLOGY DEMONSTRATION IN OPERATING CONDITIONS
6	DEMONSTRATION OF TECHNOLOGY ON A MODEL OR PROTOTYPE
5	THE LAYOUT OR COMPONENT IS TESTED UNDER REAL CONDITIONS
4	LAYOUT OR COMPONENT TESTED UNDER LABORATORY CONDITIONS
3	CALCULATION AND/OR EXPERIMENTAL PROOF OF CONCEPT
2	THE CONCEPT OF A NEW TECHNOLOGY IS FORMULATED
1	THE MAIN PRINCIPLES OF THE NEW TECHNOLOGY ARE REVEALED

Preliminary ARRT Project Roadmap

Q4, 2023	Q1, 2024	Q2, 2024	Q3, 2024
Start of ARRT project tokenization. Creation of the ARRT token in the Erc20 and Bsc20 blockchains. Creating a community on social networks. Ceed and OTC pre-sales.	Start of the first phase of token presale. Preparation for preliminary testing of a prototype pyrolysis equipment with the creation of a test methodology and program.	Conducting preliminary tests of complete prototype pyrolysis equipment. Continued growth of the ARRT project community.	Start of the second phase of ARRT token presale. Analysis of the results of preliminary tests and development of recommendations for improving its individual components and elements.
Q4, 2024	Q1, 2025	Q2, 2025	Q3, 2025
Development of technical documentation for components and elements of a pyrolysis installation that are subject to modernization.	Start of the third phase of ARRT token presale. Manufacturing of modernized components and elements of a pyrolysis equipment and full installation.	Dismantling of components and elements of the pyrolysis equipment that need to be replaced, and installation of modernized ones.	Checking the functionality of the modernized equipment and conducting repeated tests of the pyrolysis equipment and full installation.
Q4, 2025			
Beginning of certification of equipment. Preparation for ARPT listing on centralized exchanges.			



Core of ARRT Project Team

Our joint (ThermoDeg™, Slovakia, and Astol Advanced Limited, Hong Kong) tokenization project Advanced Waste Recycling (ARRT Token) Project is focused on creating a new direction in the waste recycling industry, based on the latest developments in the field of thermal synthesis implemented by our project team. We hope that together with you we will be able to fully realize our potential and bring investors a profit of at least 10 times over the next few years.

The project is being implemented by a group of leading specialists in their field who have accumulated vast practical experience in implementing exactly this type of project.

Implementation will be carried out in-house by the team at its own production and office sites in Hungary and Belarus.



In case of any ambiguities or further clarifications, do not hesitate to write to us by e-mail info@arrt.pro