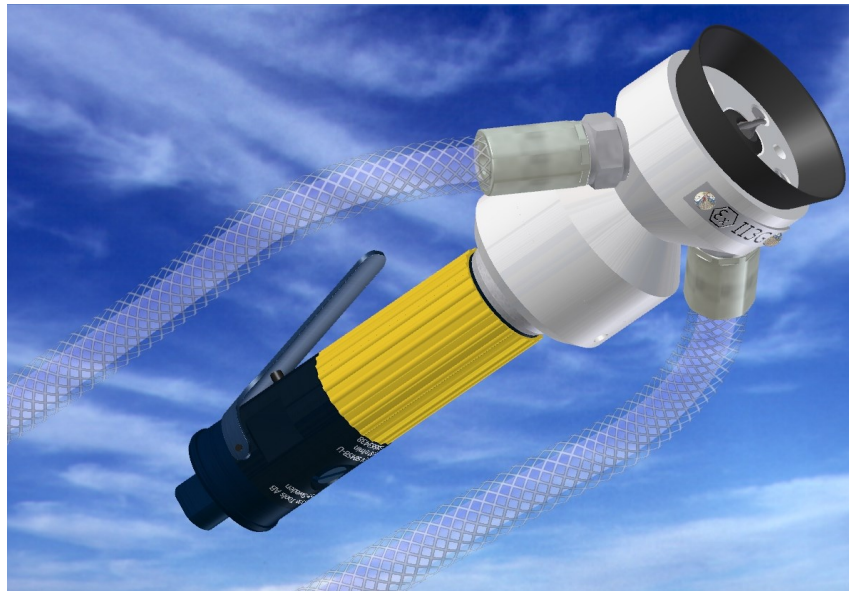




Range of products ATN Engineering can supply

ATN can supply a wide range of specialised equipment for recycling WEEE products



Date: 23 July 2014



Foreword

ATN Engineering BV is the world leading supplier of refrigerator degassing equipment. It is located in the north of Holland and we supply plants throughout the world. We are always innovating, and expanding our experiences that makes us able to build machines that have the highest efficiency for the lowest possible costs.

- Refrigerator recycling
- Television recycling
- Gas separation
- Gas destruction
- Data collecting systems
- Electronic separation systems
- Second-hand machines
- Rental machines

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INTRODUCTION



We are able to supply stage one degassing plants with a capacity of more than 200 refrigerators per hour. But only with a sufficient logistic system you will be able to use this capacity efficiently. With our logistic solutions you will be able to operate our stage one degassing machines at maximum capacity.

All plants are engineered in accordance with the PED and ATEX regulations, as well as the WEEE Directive. They are also certified by T.U.V. Germany or another NoBo.

Degassing Machines



ATN-BK MOB

The ATN-BK1 is a mobile degassing machine. This machine can be supplied on a trailer that can be towed by a car or van.

Capacity: 28 refrigerators per hour.

Draining time: 1.5 minutes average



ATN-BK 1

Single drill-head machine for degassing domestic refrigerators.

Capacity: up to 42 refrigerators per hour. Stand-alone machine that is able to degas domestic refrigerators within 1 minute.

Perfect for a small recycling plant.

ATN-PT8

Based on the same machine as the ATN-BK1, this unit can be supplied as a piercing-plier machine. The capacity is then 38 refrigerators per hour, based on 70% logistic efficiency.



ATN-BK2/3

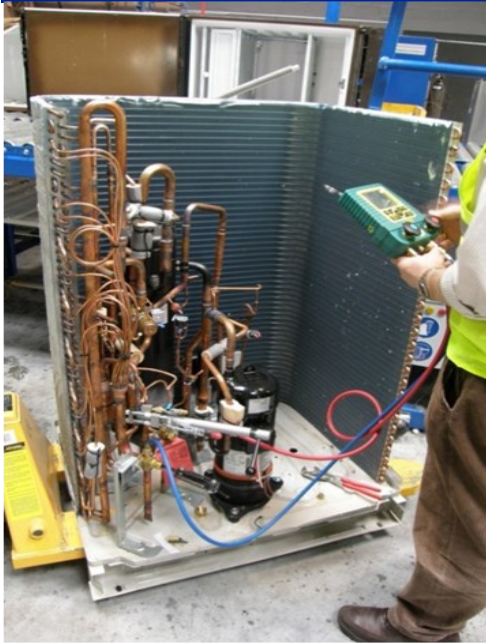
Degassing machine for degassing domestic refrigerators with 2 or 3 drill-heads. With this machine it is possible to degas 84 (2 drill-heads) to 126 (3 drill-heads) refrigerators per hour, provided that your logistic system allows you to work with at least 70% efficiency. This means that the machine is actually degassing 70% of each hour. Most logistic systems don't allow a higher efficiency. The machine can handle all common gases from domestic refrigerators except NH₃. The machine runs fully automatically. The operator only has to connect the compressor and complete the compressor penetration. The oil and gas is then drained within 1 minute.

Degassing time per drill-head: 1 minute average

ATN-PT16/24

Degassing machine for degassing domestic refrigerators with 16 or 24 piercing-pliers. Degassing time per piercing-pliers: 10 minutes average, with 70% logistic efficiency, that means that a capacity of up to 67 and 100 refrigerators per hour. This machine is able to degas all common gases from domestic refrigerators except NH₃. it is always possible. Except for the connection of the piercing-plier to the copper lines of the refrigerator, the machine runs fully automatically.

Degassing time:**Drill-head 1 minute****piercing-plier 10 minutes**



ATN-16 PT HD

This machine is designed for degassing refrigerators and air-conditioning units, with 16 piercing-pliers for the refrigerators and one clamp for the AC-unit. This machine can degas refrigerators as well as air-conditioning units.

The 16 piercing-pliers are able to degas 67 refrigerators per hour. At the same time, the machine is able to degas up to 30 Kg of refrigerant gas per hour. All common gases from refrigerators and air-conditioning units can be degassed, except NH₃. The machine is supplied with extended operator training. Degassing air-conditioning units requires more skill and knowledge than refrigerator degassing. Safety is a very important issue during training.



ATN 2BK HD

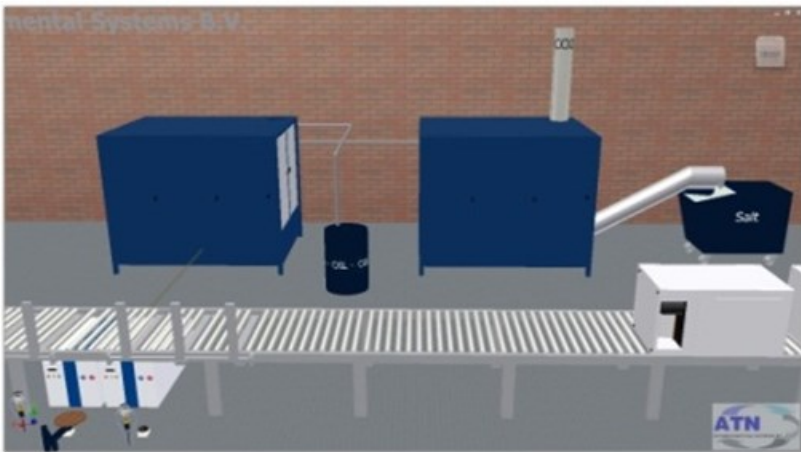
Degassing machine for degassing refrigerators and air-conditioning units, with 2 drill-heads for domestic refrigerator degassing and 1 drill-head and a piercing device for degassing air-conditioning units. A capacity of 84 refrigerators and up to 30 Kg of refrigerant gas per hour can be achieved with this machine. All common refrigerants except NH₃ can be degassed. Using the drill head to remove the oil from the compressor of an air-conditioning unit, you are able to empty the compressor completely. The large amount of gas from an AC-unit is stored in a 2m³ buffer-tank. The programmable-logic-controller (PLC) regulates the gas into the condensation part of the machine. This guarantees that the gas from the refrigerators is condensed first, in order to ensure the maximum capacity of the refrigerator recycling.

Other Machines



ATN SEP

This machine not only degasses but also separates the gases drained from refrigerators automatically. R12, R134a and R600a are stored in different pressure tanks. This saves on destruction costs, because only the R12 has to be destroyed. R600a and R134a can be reused, offering an opportunity for extra profit.



ATN GDS

This unit is used to destroy the gas recovered from a cooling unit after the oil is separated. It replaces the condensing unit of the refrigerator degassing machine. There are no gas destruction costs (more than 2.50 Euros per Kg), and lower power costs, as a condensation unit uses 40% more energy than the gas destruction plant. There is a considerable reduction in CO₂, as the refrigerant is reduced to CO₂ (reduction 11000 x) and salt. Flammable refrigerants offer energy benefits, as they can be used for heating purposes.



ATN GDL

The ATN GDL is able to destroy the gas collected in stage 2 of the refrigerator recycling plant. It replaces the condensing-unit, which is no longer necessary. The plant consists of a number of catalytic filters that are heated by a microwave system. The blowing agents are pushed through the filters and a gas scrubber produces CO₂ and salt. A fully automatic system controls the process, including emissions. The emissions are within the limits set by TA-Luft. With this unit, stage 2 refrigerator recycling no longer requires a condensing unit. You save on gas destruction costs, as well as electrical power, because the power consumption of the ATN GDL is more than 40% lower than similar condensing units. With the power savings you also save on CO₂ emissions. And what's more, by treating R11 in this plant you can also reduce emissions by 14000 CO₂ equivalents. The energy benefits from Pentane can be used for other heating purposes. The ATN GDL is electrical driven. No natural gas is needed.

ATN DC

The **ATN-DC** enables you to collect data from both the inputs and outputs of the degassing machine (drill-head only). All data is logged and sends a daily or weekly report to your PC. The automatically logged data helps you to run a perfect bookkeeping system, producing accountable reports for your environmental agency.

The following data is automatically stored and sent to a computer in your office:

- Size
- Pressure or no pressure
- Type of filled gas.
- Filling weight
- Average weight of collected refrigerant per refrigerator.
- Total weight of refrigerant.
- Average weight of oil collected.
- Total weight of oil collected.
- When an ATN SEP is installed, even the weight per refrigerant.

The list on the next page is an example of what the records could look like.

10-02-2012

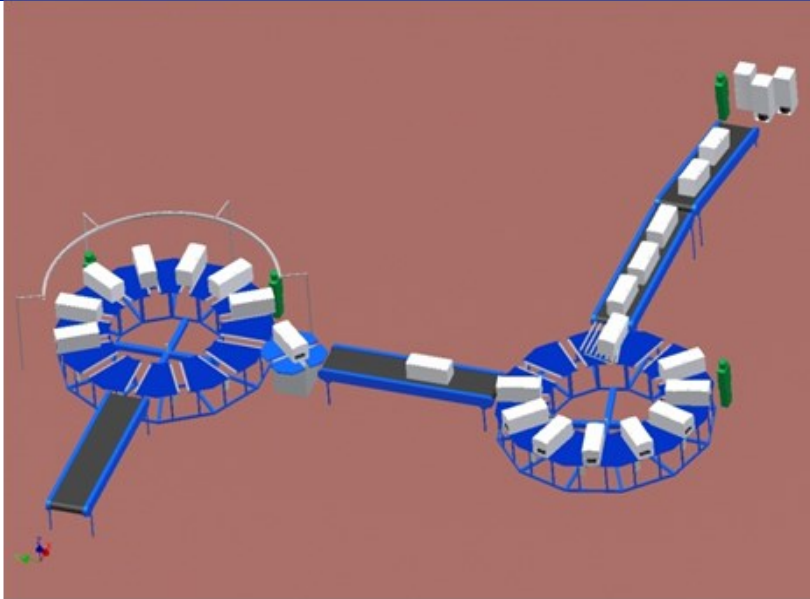
**ATN STAGE 1
WEEK REPORT**

OPERATOR NAME:.....

	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
TOTAL							
LOW PRESSURE							
R12 HIGH PRESS							
R134a HIGH PRESS							
R600a HIGH PRESS							
KG R12							
KG R134a							
KG R600a							
AVERAGE R12							
AVERAGE R134a							
AVERAGE R600a							
KG OIL							
AVERAGE GRAM OIL							
SMALL							
MEDIUM							
LARGE							
NO COMPRESSOR							

This system is used to monitor stage one degassing activities, every day. The results gives you perfect feedback and figures that prove to your contract partners that you are doing the agreed works to a very high standard.

LOGISTICS



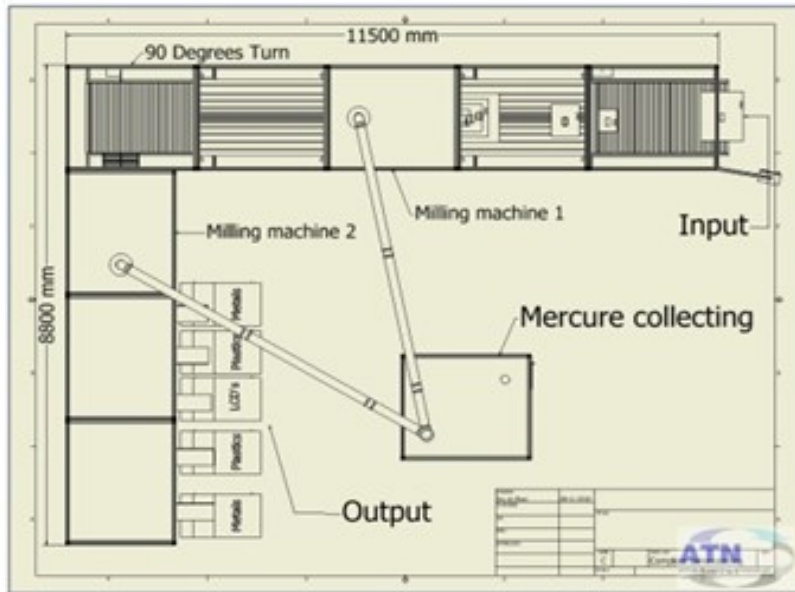
From a small conveyor up to a complete carousel system for processing more than 150 refrigerators per hour. Everything you need to make your refrigerator recycling as efficient as possible. Combined with our degassing machines, it is even possible to create semi-automatic degassing systems. Custom-made logistics systems for stage one degassing units and all kinds of systems for the manual and automatic disassembly of CRT-televisions and flat screens are also available.



ATN-CRT/FS:

Recycling systems for the disassembly of televisions as well as CRT recycling systems with capacities up to 300 CRTs per hour. We also can help you with glass recycling. For instance, among the many options it can be used for water filtration.





For instance, flat screen monitor and CRT recycling is increasingly becoming an issue. Collecting the mercury and other harmful materials in an environmentally friendly way and separating the materials has to be done in a machine, in order to avoid polluting the operators' work area. A capacity of up to 50 per hour is possible.

SECOND HAND MACHINES

ATN Engineering is also more and more able to supply second hand machines. Completely refurbished, updated and with a warranty. Installed by our own technicians.

FINANCING YOUR PROJECTS

Through cooperation with a number of financial institutes, ATN Engineering is able to help the customer with financing the machines. Rental or lease contracts and several other financial solutions are available.

ATN Engineering bv

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**Fast, easy and safe way to
recycle refrigerators!**

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