VacuDry®
21st Century Thermal Desorption

One technology for all types of oily wastes

www.econindustries.com
About us

- Owner-managed family business
- Over 20 years of experience in delivering hazardous waste recycling plants – worldwide
- Turn-key, skid-mounted, mobile or stationary custom-made solutions
- Contracts executed in over 30 countries
- Equipment designed and produced in Germany
- Headquarter in Munich, Germany

Our Philosophy

- Zero industrial waste
- Recover resources do not destroy them
- Setting hazardous waste recycling standards of the 21st century
- Enable hazardous waste business to grow green – making a profit and saving the environment
- Provide the most flexible treatment technologies to cope with any current or future hazardous waste stream

Recent Experiences

**Drill cuttings treatment in Azerbaijan**

- **Feed material:** Drill cuttings, contaminated soil
- **Throughput:** 10 mt/h
  - 80,000 mt/year
- **Oil recovery rate:** > 99 %
- **Oil quality:** Synthetic oil in product quality
- **In operation since:** 2016

**Heavy oily waste treatment in Australia**

- **Oily waste, refinery waste, centrifuge cake**
- **Throughput:** 5 mt/h
  - 38,000 mt/year
- **Oil recovery rate:** > 99 %
- **Oil quality:** Secondary fuel
- **In operation since:** 2014

Thermal desorption technology able to deal with all types of oily wastes
What Kuwait needs

**Soil remediation**
- A budget of approx. US$1.9 bil. is reserved for soil remediation projects (UNCC funded)
- Approx. 26 mil. m³ of highly/visually oil-contaminated soil in an area of 114 km²
- Objective to reduce the overall landfill capacity to less than 5 mil. m³
- Combination of flexible technologies required to achieve the Total Remediation Solution (TRS)

**Oil-based mud cuttings treatment**
- KPC expects to spend over US$ 500 bil. to boost its crude oil production capacity to 4.75 mil. bpd
- In line with this ambitious plan, KOC plans to publish tenders for treating OBM cuttings in the second half of 2019
- Several contracts are expected to be awarded, each with a treatment capacity above 100 mt per day

VacuDry® – most flexible solution to meet Kuwait’s goals

- Wet drill cuttings
- Weathered drill cuttings
- Oil lagoon sludge
- Refinery waste
- Contaminated soil
- Oily waste from industrial production

Kuwait needs VacuDry® to handle oily wastes for the next 20 years
Capabilities

› **Flexibility:** Suitable for all types of oily wastes, such as tank cleaning sludge, refinery sludge, drill cuttings and contaminated soils.

› **Adaptability:** Different wastes can be processed in the same plant without modification – batch process

› **Consistency feed material:** No limitation for oil, water and solid content

› **Oil recovery rate:** > 99 % (TPH C10-C36)

› **Final oil content of treated solids:** < 0.5 % (TPH C10-C36)

VacuDry® process

Health and Safety

› ATEX (explosion protection) certificate, approved by German TÜV

› External HAZOP conducted for each plant as part of the engineering

› Safety Integrity Level (SIL) for safety relevant loops

› Control philosophy with safety focus, implemented by control logic, automated safety routines, interlocks, and set points for alarm and warning triggers

› Plant automatically reaches safe mode if required, independent of operator action

Zero accidents in our plants in over 15 years of operation
Financial Mechanisms

- Extensive network with German and EU based first-class banks
- Access to international financial institutions and development funds
- Pay-as-you-earn credits available
- Lower interest rates and long term financing for our clients in comparison to local banks
- Evaluation of financing models together with our team of highly skilled business engineers

Low Operational Expenditures

- Easy operation due to self-adapting batch process
- No expert knowledge required for pre-blending or mixing of wastes required
- Staff required for operation: 2 - 3 per shift
- Typical energy consumption: 300-400 kWh/mt
- Typical operating hours per year: > 7,500
- Permanent plant supervision and joint operation by econ industries possible

Full service approach

Your profit

- Reduced CAPEX due to depreciation times of 15 or 20 years – possible due to long-life and flexibility of equipment
- Feasible to combine with other treatment processes
- Recovery of valuable resources rather than incineration
- Min. 4x higher energy efficiency compared to other desorber types (e.g. rotary kilns)
- Lowest process emissions below 100 m³/h due to vacuum operation
- Localisation possible

Profitable from the first day – Lucrative for the next 20 years
**Key Facts**

**Input material:** All types of contaminated soils, oily wastes, and sludges  
**Output material:** Oil (secondary fuel), water, solids (TPH C10-C36 below 1%, < 0.1% possible)  
**Plant design:** Fixed or mobile execution 0.5 … > 10 mt/h throughput capacity  
**Heating system fired by:** Fuel oil, diesel, natural gas, electricity, biofuels, recovered mineral oil fraction

**Benefits of VacuDry® oily waste plants**

- Highest flexibility regarding different feed material; no restriction on composition and consistency  
- Possible to combine with other pre-treatment technologies e.g. centrifugation or soil washing  
- Defined separation of reusable hydrocarbons through gradual heating  
- Emission and dust-free system by encapsulated treatment of exhaust vapours and solids  
- Reuse of the condensed, clean water for re-moistening of treated mineral solid output  
- High operational availability due to self-cleaning dryer

**INPUT | CLEAN SOLIDS | OIL | WATER**

Any feed material  
Any solid, water and oil content
Oil-based mud cuttings treatment – Category (59)

Key Facts

- **Input material:** OBM / SBM cuttings (no limitation on oil, water, solid content)
- **Output material:** Highest quality of recovered high price drilling oil
- **Plant design:** Fixed or mobile execution 0.5 … > 10 mt/h throughput capacity
- **Heating system fired by:** Fuel oil, diesel, natural gas, electricity, biofuels, recovered mineral oil fraction

Benefits of VacuDry® cuttings plants

- Product-quality of recovered drilling oil – ready to sell
- No limitation on oil, water and solid content
- High oil recovery rate: > 99 %
- Precise control of the recycling process
- Low thermal energy consumption
- Low wear and tear

Only indirect heated thermal desorption unit recovering
> 99 % of oil in product quality
Move towards sustainable hazardous waste recycling in Kuwait and establish yourself as long-term provider of environmental services

Cash in on this one-time opportunity!

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