



Fluid Solutions

A Good Dose of Innovation



Oil Recycling System



Composition of lubricants

Motor oils	Base oils	Additives
Diesel motors	Vacuum cuts, SN-350, -40 ... 90-98%	1-10%
Universal all season	Vacuum cuts, SN-150, 350, - 20 ,40 , PAOM (10-60%) 85-95%	5-15%
Small bensin engines	Vacuum cuts, oil component residue, PAO (10-60%) 60-80%	20-40%
Industrial oils	Base oils	Additives
Turbine, gear oils	Vacuum cuts, SN-350, Bright St., -20A, 40 , viscous components 90-98%	2-10%
Hydraulic oils	Base oils	Additives
Various	Vacuum cuts, SN-150, 350, - 20 ,40 , Oil component residue 85-98%	2-15%





Synergy of Partnerschaft for your success

JK-GRUPPE
 JK Holding
 Mother Company
 Employee: 1.200
 Founded: 1959
 Turnover: 250 Mio. €
 Head office: Köln

Zeller+Gmelin
 Mineraliä - Druckfarben - Chemie
 Z+G Holding
 Mother Company
 Employee: 2.500
 Founded: 1866
 Turnover: 185 Mio. €
 Head office: Eislingen

Fluid Solutions
 A good dose of innovation
 Fluid Solutions
 General Contractor
 Engineering Company
 EPC Contractor
 GM: Michael Krapalis

SÜDÖL
 Südöl Recycling
 Waste Oil Recycling
 Refinery Plant
 Reference Plant R&D
 GM: Rolf Schneider

40%

60%

ORS
 Oil Recycling Solutions
 ORS Oil Recycling Solutions
 GM: Rolf Schneider
 and Michael Krapalis





Fluid Solutions



Oil Recycling plant in Germany - 100.000 t/year





Fluid Solutions

Engineering
 Basic and Detail Engineering
 3D
 APCS

Construction
 Turn-Key chemical and petrochemical plants

Equipment
 Productivity-
 Automation-
 Quality –
 Reliability –
 Safety

Ink & Painting

Paint & Coating

Lubricants & Greases

Synthetic Resins

Oil recycling

Chemical Blending





Fluid Solutions

CycloPlasmaTubereactor

ORS GmbH is an owner of the trademark CPT.

ORS GmVH has patented the technology CPT.



CPT – CyclonPlasmaTubereactor®

BUNDESREPUBLIK DEUTSCHLAND



URKUNDE

über die Eintragung der Marke

Nr. 30 2014 009 043

Az. 30 2014 009 043.0/42



CPT – CyclonPlasmaTubereactor

Markeninhaber/in:

ORS Oil Recycling Solutions GmbH, 22301 Hamburg, DE

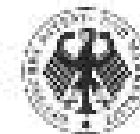
Tag der Anmeldung: 17.12.2014

Tag der Eintragung: 21.07.2015

Die Präsidentin des Deutschen Patent- und Markenamtes

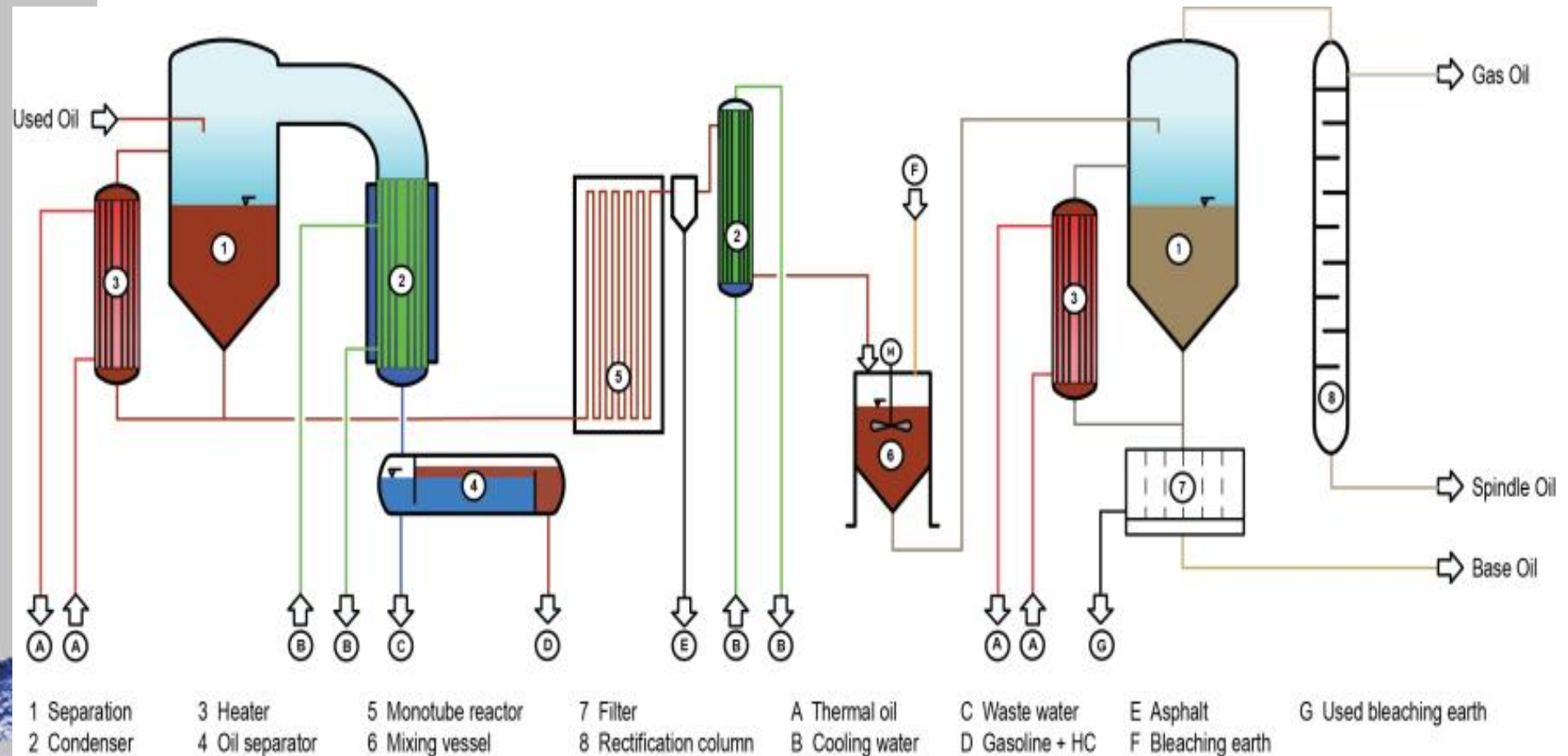
Th. Rüchhoff-Schlüter

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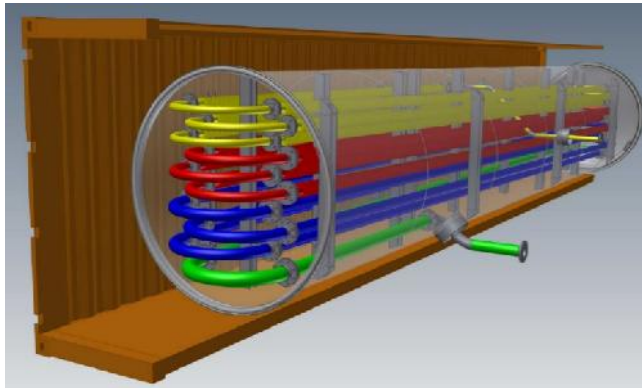


Functional Process Diagram in CPT





Cyclo Plasma Tubereactor Total evaporation / Distillation



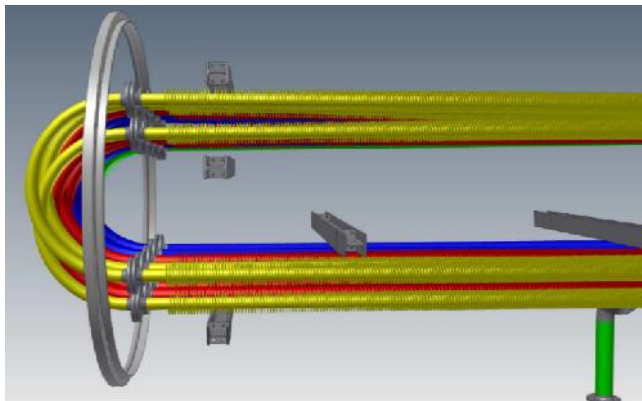
Alkaline Base 1,7%

Feed
90 % Dryoil
+ ca. 1 % Esters
+ ca. 1 % Unvaporables

Plasma Tube
Reactor

ca. 51,0 % Lubeoil 1
ca. 37,9 % Lubeoil 2

4,8 % Residue (Bottom Product)





Comparison of CPT spindle oil with SN150

Phys.-Chem. characteristic	Test method	PTR oil	SN150
Colour	ASTM D1500	1.5	1.0-3.0
Pour point, °C	ASTM D 97	-16	-15
Flash point in open cup, °C	ASTM D 92	220	200
Kin. viscosity at 100 °C, mm ² /s	ASTM D 445	6.2-7.0	4.5-5.5
Viscosity index	ISO 2909	>105	>95
Density at 20 °C, kg/m ³	ASTM D 4052	865	860-900
Ash, % max	ASTM D 482	0.001	0.005
Sulphur content, %	ASTM D 4294	<0.2-0.4	0.8
Water content, ppm max	ASTM D 6304	100	100
Conradson C residue, % max	ASTM D 189	0.02	0.05
Noack evap. loss, % max	ASTM D 5800	9-12	12-14





Advantages of CPT

Reactor construction	Tubular, made of structural steel with length of 10 to 1000 m and diameter of 5 to 300 mm Compact size: 12,5 7,5 13
Safety	Low risk of fire or explosion due to small volume of reactor: 20-500 l
Versatility	Easy to change process conditions in case of products with different properties
Operation	High automatization level of control system by simple operation and repetitive accuracy
Energy	Current consumption for 1 t of dry oil: 43 kWh Heating oil demand for 1 t of dry oil: 50 kg





Advantages of CPT

Fast Evaporation	Feed is accelerated up to >1700 km/h and heated up to 360 °C at 10 mbar abs.
Reactivity	High level of turbulence ($Re > 10000$) and high-speed friction against reactor walls ensure transition of practically complete oil to reactive gas phase or so called condition of kinetic plasma
Additives	Direct injection of Na^+ or K^+
Durability	absence of general maintenance over 5 years
Profitability	ROI < 5 years

