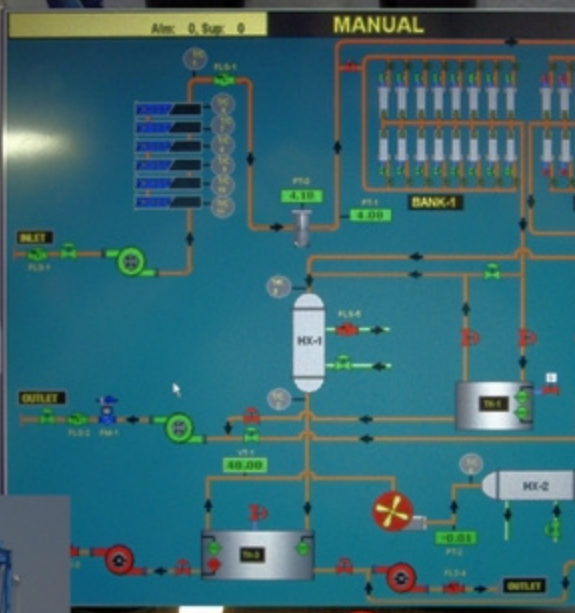
CLAY POLISHING SYSTEM



ADDS VALUE TO RECLAIMED OILS BY IMPROVING COLOUR AND REDUCING OR REMOVING ODOURS

The CPS-series of clay polishing systems from Redragon provides an economical alternative to hydrogen-treatment plants as a means of adding value to a re-refined lube oil.

Designed as an add-on or retro-fit to wipe-film evaporators these units are equally applicable to other types of oil refineries as a final polishing stage.

The CPS is based upon banks of active columns that contain an adsorptive clay. The physical characteristics of the clay allow it to be reactivated once saturated, and thereby permitting several hundred cycles to be run before being replaced. Once exhausted, typically after 6 months to a year of continuous operation, the clay is disposed off in a conventional landfill site as a dry non-hazardous waste. Average lifetime cost of clay per gallon of oil processed is US$ 0.02 at 2009 prices.

Processing oil through the CPS results in an oil that is stable against oxidation over any measured timescale – this increase in shelf-life is an added benefit of the clay polishing system. Furthermore the Viscosity Index is not degraded by the clay polishing system.

SUMMIT
ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

Date Collected: 12/31/2008
Date Received: 01/07/2009
Project #: Trophy
Client ID #: 300n Base Oil
Laboratory ID #: 0900161-01
Matrix: Liquid

Parameter	Method	Results	Date of Analysis
Appearance	ASTM D4176-2a	*	01/20/2009
		*Free of suspended matter, undissolved water and sediment	
Pour Point	ASTM D97	-23°C	01/16/2009
Specific Gravity @60°F	ASTM D1298	0.8571	01/08/2009
Viscosity, cSt @40°C	ASTM D445	32.67	01/08/2009
Viscosity cSt @100°C	ASTM D445	5.68	01/08/2009
Viscosity Index	ASTM D2270	113	01/08/2009
Sulfur	ASTM D2622	0.2029%	01/07/2009
Nitrogen	ASTM D3228	<0.5%	01/20/2009

Virtual multi-pass operations can be achieved by a single pass through the CPS as it is designed to switch from parallel to series mode operation via the custom SCADA supplied with every system. This allows the plant owner to easily switch between different processing modes for each oil stream reclaimed through the front-end system. Integration with existing front-end systems and/or tank farms is easily achieved with the Redragon CPS.

CPS-SERIES

REDRAGON
Oil & Gas Systems International Inc.

FEATURES

- Flow rates from 30 USGPH to 7,200 USGPH (100 LPH to 27,000 LPH)
- Single-bank, dual bank, triple banks and quad-bank versions
- Parallel mode operation is single-pass, least contact time, fastest processing
- Series mode operation simulates triple-pass, most contact time, better quality oil
- Modular system ensures no skid is larger than can be shipped inside a 40-foot high cube container for reduced shipping and handling costs
- All global voltages and frequencies available
- Onsite training, commissioning, start-up and custom process optimisation is included with each CPS
- Full client involvement during the manufacture, from engineering approval through to start-up
- Flexible footprint allows placement in unusual shape locations
- Dual gas scrubber allows for integration of exhaust into front-end refinery to minimise points of emission for environmental permit
- Low oil losses as waste created is becomes feedstock for front-end refinery

TYPICAL MODELS

Model	No. of columns	Flow rate - Parallel	Flow rate - Series	No. of skids	Footprint
CPS 30/100	20	100	30	1	7' x 30'
CPS 100/300	60	300	100	2	7' x 45'
CPS 300/900	180	900	300	7	40' x 45'
CPS 400/1200	240	1200	400	13	60' x 45'
CPS 1400/3600	720	3600	1400	27	60' x 90'

CPS-SERIES

REDRAGON
Oil & Gas Systems International Inc.

Mode of operation and flow schematic

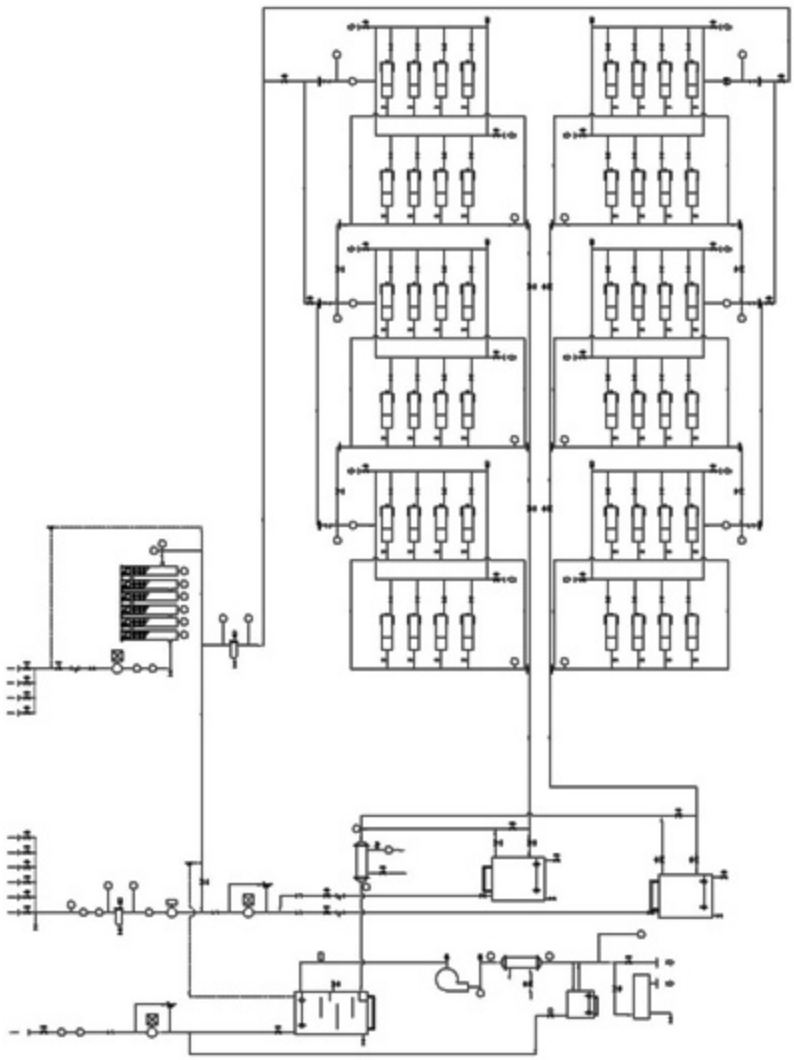
The CPS has two distinct modes of operation:-

1. Regeneration mode – the oil is pumped through the banks of columns in order to improve the colour and reduce the odour. This mode will last approximately 12 hours.

2. Reactivation mode – the saturated columns are prepared for re-use by subjecting them to a 12-hour thermo-vacuum process, allowing them to return to the regeneration mode. Typically the adsorbent media will permit several hundred reactivations before a noticeable decrease in yield is noticed and replacement is required.

A small amount of waste oil is created during the reactivation phase; this becomes part of the feedstock for the front-end refinery.

Approximately 2% of the oil processed is lost during operation of the CPS.



FOR MORE INFORMATION OR TO REQUEST A QUOTATION, PLEASE CONTACT REDRAGON OIL & GAS SYSTEMS INTERNATIONAL INC. OR AN AUTHORISED DISTRIBUTOR.

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