PANOLIN®
Swiss Oil Technology

Content

- While regulations help guide environmental awareness, they can also indirectly help your financial bottom line

- Regulations (EAL's)
- Benefits of the EAL Regulations

Topics

- **Technically advanced lubricants** increase equipment longevity and efficiency
- Reduce labor cost, equipment down time, and eliminate disposal cost
- Spillage concerns / cleanup cost
- Testing existing oil
- Filtration

Regulations



- National and Regional
- Permits
- Equipment limitations and materials (like EAL's)

- EPA Vessel General Permit
- 2.2.9 All commercial vessels **must use** "environmentally acceptable lubricants"
- "**biodegradable**", "**minimally-toxic**", not "**bioaccumulative**"
- "**technically infeasible**"

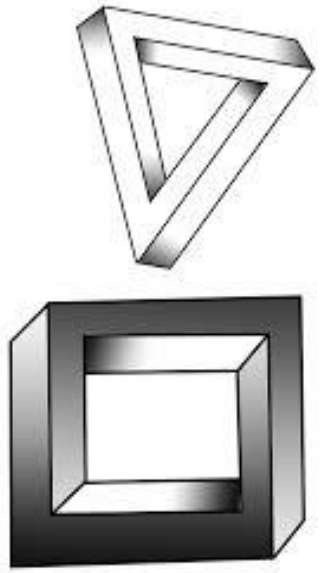
Regulation Benefits

- Improves our quality of life
- Drives you to look at **current technology**
- Helps with **best business practices**
- Can **eliminate competition**
- Can save you time and **money**
- Use compliance to **win bids**

Why do we use lubricant?

- Prevent wear (save our equipment)
- Reduce friction (save energy)
- Remove heat
- Prevent rust and corrosion
- Remove contaminants

Don’t get fooled



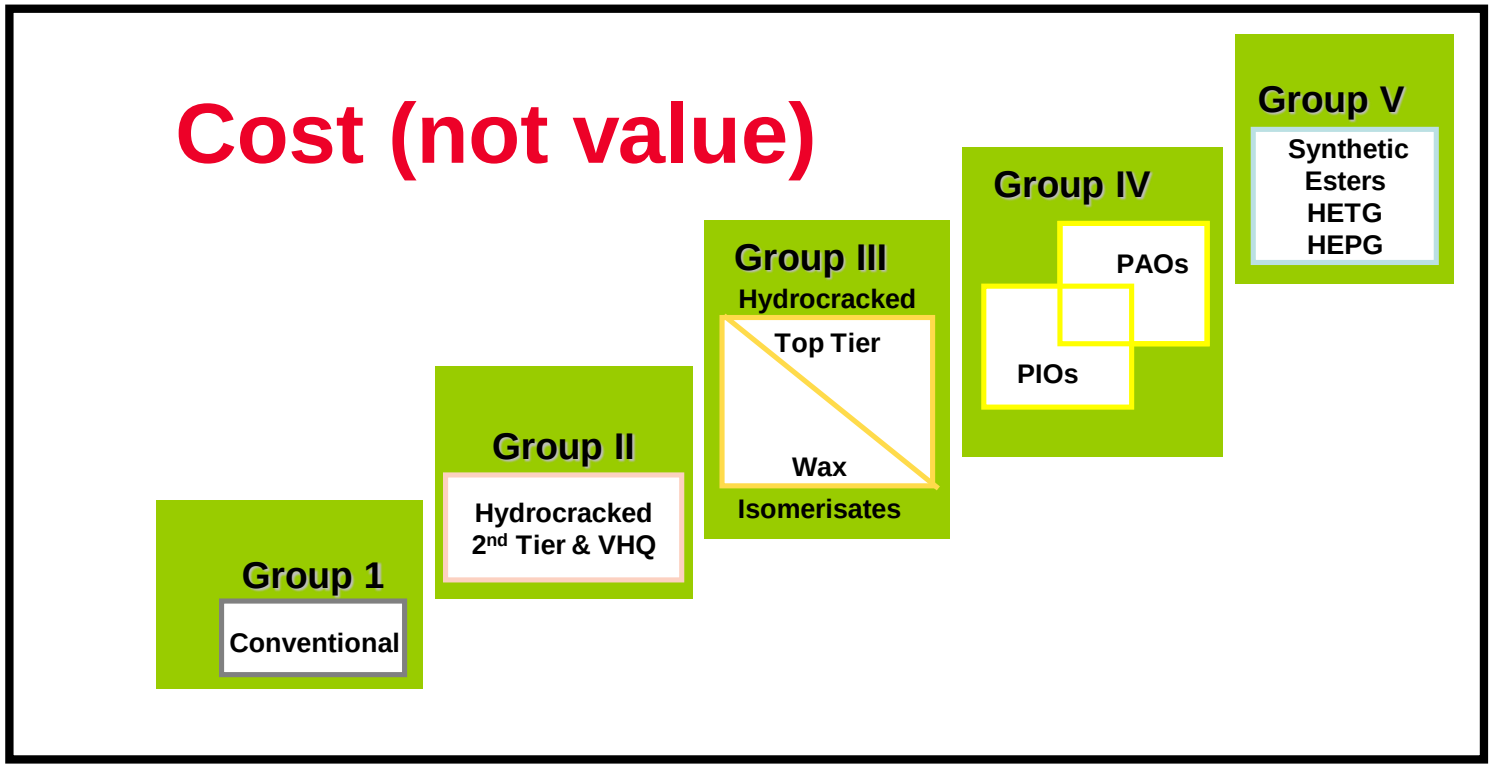
HEPR PAO’s use the word (**synthetic**)
HETG Vegetable use the word (natural **ester)**
HEPG PAG’s use the word **(synthetic)**
HEES (**un**saturated **synthetic esters)**

The above are not equal to Saturated Esters:

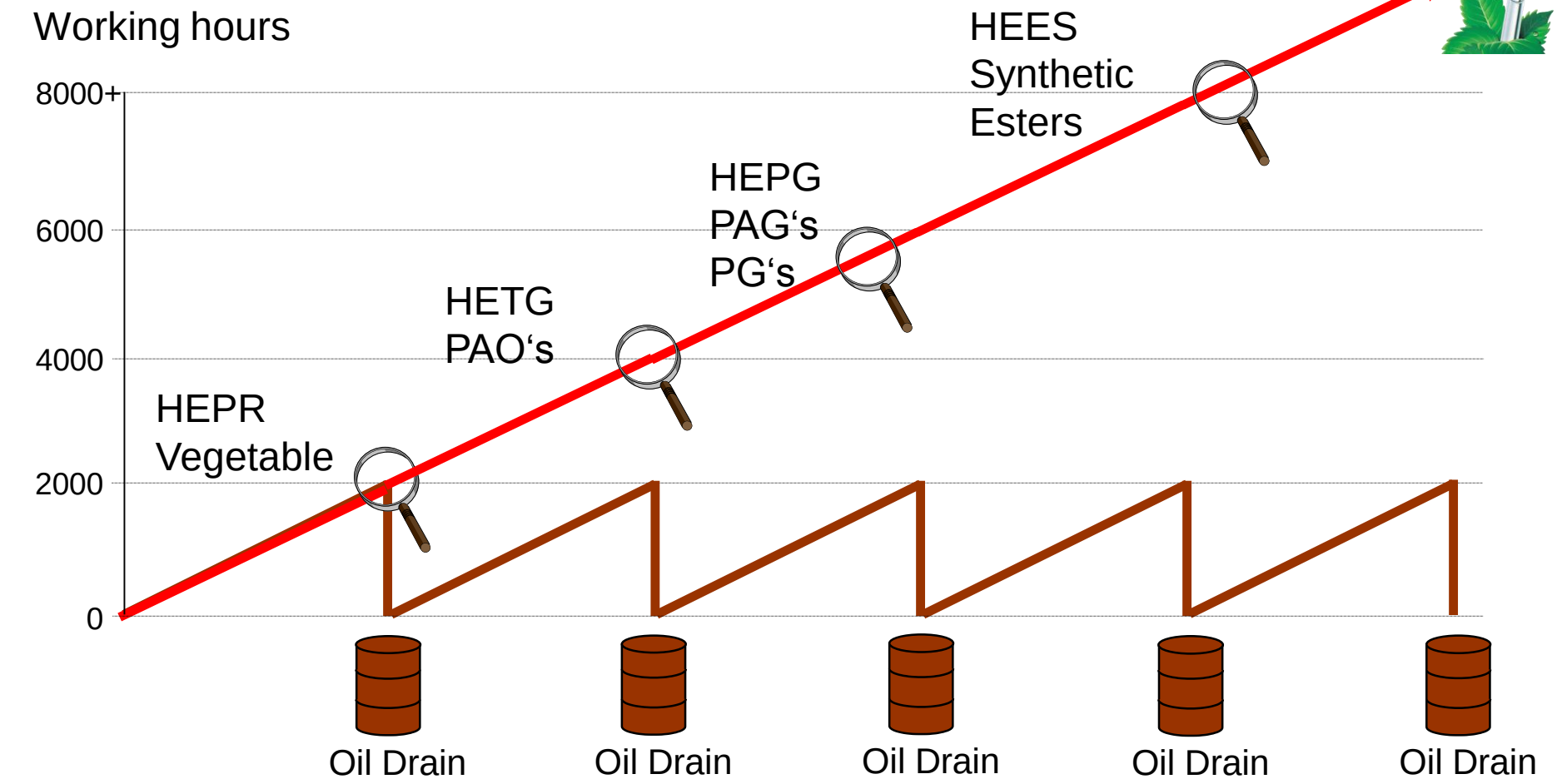
HEES (saturated **synthetic ester)**

Synthetic = compounds formed through a chemical process. Ester = acid and alcohol

As we move up in **groups**, the number of impurities are reduced. As the complexity for removing impurities rises so will the cost of the base oil.



Base oil EAL Value Chart



WEDA 2015

KLIMA- OG FORURENSNINGS-DIREKTORATET

Staatstoezicht op de Mijnen

Approvals / specs based on **current formulation**!

EATON

Rolls-Royce

Danfoss

WÄRTSILÄ

ZF

Parker

FINCANTIERI MARINE GROUP

KEMEL

FLOWSERVE

MARINETTE MARINE CORPORATION

ABB

NAVALIMPIANTI GROUP

PANOLIN® Swiss High-Quality Oil +

GREENMACHINE®

Cost Calculator:

- Operation details
- Lubricant cost
- Cost of change
- Lost production
- Repair Maintenance cost
- Energy efficiency

Total cost
Payback Period
Total life savings

Cost of power	$/kW				
Cost of labour	$/Hour		24		
Hourly value of production	$/Hour		50		
LUBRICANT		Actual	Proposed		
Product		Mobil DTE	Panolin HLP Synth		
LUBRICATION - COST OF OIL				Saving	% Benefit
Oil drain period	Hours	2,500	25,000	22,500	
Number of oil changes per year	Per Year	0.2	0.0	0.19	94%
Top-up volume per year	Litres	100.0	100.0		
Price of Oil	$/Litre	4	12		
Top-up cost per oil drain	$	400	1,200		
Annual cost of lubricant	$	32,400	6,960	25,440	79%
LUBRICATION - COST OF OIL CHANGE					
Cost of consumables per oil change	$		500		
Time for oil change	Hours		3		
Annual cost of oil changes	$	114	7	108	94%
LOST PRODUCTION					
Lost production for oil changes	Hours/Years				#DIV/0!
Cost of downtime due to oil change	$	1	1		
REPAIR & MAINTENANCE - COSTS					
Cost of replacing failed components	$				
Time to replace failed components	Hours		10		
Breakdown frequency	Per Year				#DIV/0!
Annual maintenance costs	$				#DIV/0!
LOST PRODUCTION					
Lost production due to repair & maint.	Hours/Years				#DIV/0!
Cost of downtime due to repair & maint.	$				#DIV/0!
ENERGY EFFICIENCY					
Annual energy cost	$				3%
TOTAL ANUAL COST PER MACHINE	$	32,515	6,968	25,548	79%
TOTAL ANUAL COSTS	$	32,515	6,968	25,548	79%
PAYBACK PERIOD			11.95Months		
TOTAL EQUIPMENT LIFE SAVINGS (10 yr)	$	325,154	69,679	k	79%

Direct Cost

- Premature equipment failure
- Moving equipment
- Labor cost
- New lubricant cost
- Hose & Seal cost
- Disposal cost

Indirect Cost

- Downtime
- Non-Compliance documentation
- Spill clean up & delays
- Spill documentation
- Spill fines / penalties
- Losing bids

Oil sampling

- Testing existing oil (EAL's in use)
- Zero sample (mineral oil % / TAN #)
- Make adjustments (filtration / drain % and top up)
- Ability to achieve longevity

DEME Big Boss:
8,000 gal. HLP SYNTH 68
3 decades of work
58,150 working hours

Current Oil Sample
Viscosity 63
TAN 3.6 (0.7 though >5.0)
Cleanliness 21/19/15

DEME
Dredging, Environmental & Marine Engineering

Boskalis Nordic Giant:
3,000 gal. HLP SYNTH 46
39,000 working hours

Current Oil Sample
Viscosity 45.9
TAN 1.9 (0.7 though >5.0)
Cleanliness 21/18/13

Boskalis

Heron Construction:
3,000 gal. HLP SYNTH 68
4 years
24,000 working hours

Current Oil Sample
Viscosity 65
TAN 3.7 (0.7 though >5.0)
Cleanliness 21/15/11

Heron Construction Co Ltd

Boskalis Australia Storken:
3,000 gal. HLP SYNTH 68
22,050 working hours

Current Oil Sample
Viscosity 64
TAN 2.2 (0.7 though >5.0)
Cleanliness 18/15/12

Boskalis

Boskalis Baldur:
HLP SYNTH 68
6 years no fluid change

Boskalis

GLDD Illinois:
2,000 gal. EP GEAR SYNTH 220
Horsburgh & Scott
BIOGREASE EP 2

Current Oil Sample
Viscosity 209 @ 40C
TAN 1.4 (0.7 though >5.0)

GLDD California:
550 gal. HLP SYNTH 68
Globaltech Motors

Dielectric strength
Moisture protection
Water separation

GLDD New York:
7,000 gal. HLP SYNTH 46
Liebherr 996

Current Oil Sample
Viscosity 48
Water # .055
TAN .37 (0.7 though >5.0)
Mineral content <5

Prevention

- Filtration
- Cardev systems
- Pull out contaminates / water – moisture
- Renew fluid (fluids ability)

Machiavelli:
2,400 gal. HLP SYNTH 68
7 years of work
No fluid change

Oil Samples
taken every 3K hours
2X3 Cardev Filtration Unit

Heron Construction Co Ltd

PANOLIN GREENMARINE = SUSTAINABILITY

Our credo:

Only a concept which is

- **economically viable**
- **technically mature**
- **environmentally considerate**

can be truly sustainable.

Thank you.