PLAINTIFF'S
EXHIBIT
U-733

REFINERY PROCESSES

Process	Licensor	Temperature	Comments and Possible FOAMGLAS Application
Fluid Catalytic Cracking	Standard Oil Development Co.	Regenerator & Reactor approx. 1000°F.	Nothing for regenarator and reactor. The fractionator which follows is a possible application since it is used to fractionate motor gasolines. B.P.'s 266°F.
Fluid Catalytic Cracking	Universal Oil Prods.	Same	Same comments as above.
Hondriflow	Hondry Process Corp.	850 - 925°F.	No application.
Socony Airlift T.C.C.	Socony Vacuum Oil Corp.	840 - 920°F.	No application.
Orthoflow	M. W. Kellogg Company	900 - 1000°F.	Possible application in fractionator otherwise no application.
Hydroforming	M. W. Kellogg Company	900 - 1000°F.	No application.
Atlantic Catalytic Reforming	The Atlantic Refining Company	Reactor Temp. 850 - 950°F.	Possible application in stabilizer otherwise no application.
Cycloversion	Phillips Petroleum Co.	Reactor Temp. 800 - 1000°F. Yield 150 - 400°F.	Possible application in fractionator and stabilizer (product 330-440° BP) No other application.
Fluid Hydroforming	M. W. Kellogg Company	Reactor Temp. 900 - 950°F.	Only possible application would be in fractionators and stabilizers. Approx. operating temps. 450° max.
Hyperforming	Union Oil Co. of Calif.	800 - 900°F.	No application.
Platforming	U. O. P.	850 - 900°F. Reactor	Only possible application would be in stabilizer.

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REFINERY PROCESSES (continued)

Process	Licensor	Temperature	Comments and Possible FOAMGLAS Applications
Hondriforming	Hondry Process Corp.	875 - 975°F.	Only possible application would be in stabilizer.
Thermofor Cat. Cracking	Socony Vacuum Oil Co.	950°F.	No application.
Combination Cracking	Lummus Company	Stabilizer 135-395°F. Bubble Tower 435-715°F. Evap. Tower 765-805°F. Fuel Oil Flash Tower 485-715°F. Crude Flash Tower 270-600°F. Naphtha Stripper 370-415°F.	Only acceptable application would be in stabilizer (135-395°F.)
Thermal Cracking	U. O. P.	- - - - - - - - - - - - -	Possible application in stabilizer and absorber.
Thermal Reforming	U. O. P.	- - - - - - - - - - - - -	Possible application in stabilizer.
Continuous coking and others	Lummus Co., etc.	- - - - - - - - - - - - -	No application.
California Polymerization	California Research Corp.	300 - 400°F.	Marginal application - possible use on stabilizer.
Catalytic Polymerization	M. W. Kellogg and U. O. P.	Reactor 300 - 400°F.	Best application for FOAMGLAS would be on the Depropanizers and Debutanizers. Reactor temp. is marginal.
Catalytic Dehydrogenation	U. O. P.	?	FOAMGLAS in all stages but reactor vessels.

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REFINERY PROCESSES (continued)

Process	Licensor	Temperature	Comments and Possible FOAMGLAS Applications
Hydrogenation	Standard Oil Dev. Co.	Reactors 1500 F.-800°F. Other sections 100-250°F.	Most of equipment outside of reactors operates at about 100°F. Oven exchanger system operates at 450-675°F. Good FOAMGLAS application on all but those noted.
Crude Lube Distillations	Foster Wheeler Stone & Webster	High	No Application.
Duo Sal	Milwhite Company	Mostly above 400°F.	Although this process uses propane, it also uses high pressures and relatively high temperatures. The only possible spot for FOAMGLAS would be in the extractor system (operates at 85°F.)
Furfural Extraction of Gas Oils	Texaco Dev. Corp.	200 - 500°F.	One of the lube oil treatment processes. This is probably the highest temperature process used for this purpose. All towers are within the range (140-450°F.) of FOAMGLAS.
Furfural Refining	Texaco Dev. Corp.	Up to 500°F.	Usually part of above process.
Phenol Extraction	Kellogg	100 - 600°F.	Possible applications: Absorber, phenol treating tower, raffinate tower and extract stripper, also water and phenol tower can be used. High temps are in the still before flash tower.
Copper Sweetening	Phillips	- - - - - - - - - - - -	Removes sulphur compounds from all types of feed stocks. Wide application but insulation requirements slight.
Doctor Treating	Lummus	100 - 250°F.	Same end use as above but there should be more insulation requirements.

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REFINERY PROCESSES (continued)

Process	Licensor	Temperature	Comments and Possible FOAMGLAS Application
Mercapsol Treating	Pure Oil	Approx. 100°F.	Limited application in industry.
Chemical Desalting	Tretolite Co.	Probably up to 250°F.	Small insulation requirements per unit, system has wide application.
Chemical Desalting	Visco Prod.	160 - 250°F.	Within temperature range of FOAMGLAS.
Electric Desalting Electric Distillate Treat. Electric Desaponification	Petrolite Corp.	140 - 240°F. 80 - 150°F. - - - - - - - - - -	All of these processes are similar with the difference being in the stocks treated. All should require insulation for controlling the process variables.
Electrolytic Caustic Regeneration	American De. Corp.	Ambientor 120 - 140°F.	Process can operate successfully at ambient but efficiency is improved in operating at 120-140°.
Cobalt Molydate Desulfurization	Union Oil of Calif.	1000 to 100°F.	No FOAMGLAS application before gas separator which operates at 100°F. Hydrogen feed lines also use FOAMGLAS.
Autofining	Anglo Iranican	100 - 780°F.	Slight FOAMGLAS application for product accumulator, stabilizer (380) and low temp. (100-400) heat exchangers.
Gray Catalytic Desulfurization	Texaco	550 - 850°F.	Possible FOAMGLAS application only on accumulator drum, condenser, and cooler.
Gray Clay Treating	Texaco	- - - - - - - - - -	Possible application.
Continuous Contact Filtration	Filtrol	300 - 700°F.	Limited application of FOAMGLAS here.
Percolation Filtration	Atlapulgus Clay Co.	- - - - - - - - - -	No possibility.
Absorb	Sun Oil	430 - 100°F.	For aromatics - a new process - first unit on stream in 1953 may become important in future.

REFINERY PROCESSES (continued)

Process	Licensor	Temperature	Comments and Possible FOAMGLAS Application
Extractive Distillation for Aromatics	Shell Oil Company	Up to 400°F.	For purifying B.T.X. mixture good possibility for FOAMGLAS on tower and condensers. (B.T.X. = Benzene, Tolene, Xylene).
Udex Extraction	U. O. P.		For B.T.X. Should be within FOAMGLAS range.
Ethylene Mfgr. by Cracking	Lummus	100 to 1500°F.	Possible application for FOAMGLAS only on lines and equipment handling product. It may not be feasible to insulate these lines.
Hypersorption	Union Oil Company	100 - 500°F.	Possible FOAMGLAS application.
Sulphur Recovery	Girdler	250 - 270°F.	No application.
Dehydrogenation	Houdry	1100°F.	No application.
Butadiene	Std. Oil Development Company		No application before stabilizer FOAMGLAS can be used after this stage.
Hydrocol Process	Texaco	Various	Application depends upon utilization of process. Name covers a wide variety of individual processes.

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