



FLUID TALK

March 2005
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The Official Newsletter of the
Fluid Power Society of Western Australia Inc.

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The Society's first technical evening for 2005 was held at the Fluid Analysis Laboratory of the WesTrac South Guildford Equipment Management Centre (EMC). WesTrac Area Manager, Paul Searle, had invited the Fluid Power Society members to a tour of the laboratory that contains about three million dollars worth of highly specialised mineral oil, fuel and engine coolant analysis equipment.

After everyone had signed the visitors' book, the FPS members moved to WesTrac's outdoor entertaining area where The Society had arranged some light food and refreshments. Once peoples' thirst and hunger had been attended to, Paul welcomed everyone and gave an overview of the services that WesTrac provide.

The tour commenced with a short visit to the parts warehouse and spare parts centre. Paul said that WesTrac are currently importing used machines and rebuilding them to CAT specifications due to the world shortage of earthmoving equipment caused by the current global demand for earthmoving machinery and shortages of steel. He said that WesTrac have just spent two million dollars on technology and refurbishing equipment upgrades that included a new paint shop facility to better serve their customers.

Paul said that in parallel with the equipment and steel shortages is the inability of the world's tyre manufacturers to keep up with the demand for very large tyres – currently costing in the order of \$60,000 to \$80,000 each! Paul also commented that the very large tyre shortage is so severe in Australia that some mining companies are digging up discarded used tyres from dumps and putting them back in to service.

When the tour arrived back at the Equipment Management Centre (EMC) where the oil analysis laboratory is located, Paul explained that the laboratory is part of the EMC and the EMC also provides a variety of other services to WesTrac clients through specialised staff. Technical representatives look after customer inquiries and the other technical staff looks after the recording and analysis of computerised data that is automatically transmitted from mobile plant and equipment all over Australia

This latter service is achieved by fitting a modem device to the piece of plant. The modem then continuously transmits information using wireless transmission to onsite base stations. The information is then immediately on-forwarded to the EMC through the Internet system. This allows WesTrac's technical staff to analyse the data and report back to the client on unusual trends such as declining oil pressures or escalating coolant temperatures in almost real time. The system has the ability to warn equipment owners of impending problems quite often even before the plant operator is aware of any malfunction.

Before entering the oil analysis laboratory, Paul gave a verbal description of the equipment and processes that would be displayed and also said the laboratory analyses over 200,000 oil and fuel samples each year which averages out at about 770 oil analyses a week over a 52 week year! The samples come from a huge variety of plant and machinery - nationally and internationally.

Paul explained the sample tracking system used in the laboratory saying that accurate control of the tracking of the samples is of paramount importance as hundreds of samples are in process at any one time. The time taken from the time a sample arrives at the EMC until the electronic report is sent to the client is usually only 48 hours. As each analysis is accompanied by an individually considered report, it was very apparent that the laboratory is a highly efficient operation given the multiple tests conducted on each sample.

Paul showed members four types of oil and two types of coolant sampling kits that can be purchased from the WesTrac spare parts department. The oil sample kit cost is \$21.00 that includes postage and an oil analysis report. WesTrac oil analysis lab will analyse samples from any company regardless of the machine brand name, location or country.

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Presidents' Prologue

By Tim Bailey

Welcome to the first edition of The Society's newsletter for 2005!

It is with great pleasure that The Fluid Power Society of Western Australia Inc. (FPS WA) general committee announces the formation of the **International Fluid Power Society of Australia (IFPSA)** as a chapter of the International Fluid Power Society (IFPS) that is based in the United States of America and was known as the Fluid Power Society of America until recently.

All financial members of FPS WA as at December 2004 were advised of the substantial benefits available to members of FPS WA through the formation of IFPSA in a letter included with their subscription invoice for 2005.

The letter also detailed the requirement for at least ten people to subscribe to IFPS as individual members to allow the formation of IFPSA and sought members' opinions on the proposal.

No objections were received which vindicated the general committee's opinion that the proposal would greatly benefit all FPS WA members and that it had the full support of the membership.

At the FPS WA general committee meetings of February and March, all committee members agreed to individually pay the IFPS subscription fee from their own pockets resulting in the minimum number of ten members being easily achieved. On behalf of FPS WA, I sincerely thank committee members for their generous contribution to the betterment of the fluid power industry in Australia.

By the time that FPS WA members receive this newsletter, each member whose e-mail address is known to the secretary, should also have received a forwarded e-mail that Raymond Hanley, IFPS vice president of certification, sent to Barry Catanach, FPS WA vice president, when Barry advised IFPS of the formation of IFPSA.

In the e-mail, Raymond congratulates FPS WA in setting up IFPSA and mentions the international interest that is being generated in the IFPS certification programs. These programs will now become available to FPS WA members to complement the curriculum matrix and the High Pressure Hose Assembler (HPHA) Registration Program developed by FPS WA.

With respect to the HPHA Registration Program, you will read elsewhere in this newsletter that **Pirtek Pty Ltd** has embraced the program by running a successful pilot project in Western Australia to bring all of their appropriate employees up to a training level where they can apply for HPHA registration.

Pirtek Pty Ltd is to be congratulated on their forward thinking in carrying out the project and their obvious commitment to improving industrial safety by ensuring that **Pirtek** staff is trained to externally recognised levels.

Following on with comments that have consistently appeared in this column in previous newsletters, FPS WA is continuing its efforts to bring about improvements in the quality and quantity of National Training System (NTS) recognised, fluid power training in Australia. To this end, Barry Catanach and I attended three workshop sessions held in conjunction with the recent Perth Oil and Gas Expo that resulted in us meeting Nigel Haywood, project director, Australian Centre for Energy and Process Training (ACEPT).

Subsequently, Nigel was invited to address the March meeting of the FPS WA general committee on the TAFEWA Challenger campus project to establish a sophisticated oil and gas-training centre at Henderson near Perth in the next two years at a nominal cost of about \$14 million. As fluid power is an important part of oil and gas production, The Society is keen to be involved in setting up fluid power training as part of the facility and discussions with Nigel will hopefully lead to a mutually beneficial result.

As also mentioned in earlier newsletters, FPS WA has registered an interest in being involved in the new Federal TAFE College to be established in Perth and is pursuing that interest through all possible channels for the same purpose mentioned above.

Included in this newsletter is an article on the TAFEWA sponsored **WorldSkills** competition that is to be held in the middle of this year. **I strongly commend the competition to anyone in the fluid power industry** who fits the entry criteria and ask that all fluid power industry employers make their best efforts to ensure that their qualifying employees are advised of and given every opportunity to enter the competition.

Fluid power industry companies can benefit by being sponsors of the event at whatever level they choose and, as in the last WorldSkills event, FPS WA will be assisting by providing judges. Please contact Barry Catanach and volunteer your services.

The FPS WA annual general meeting has been tentatively scheduled for Friday July 22nd in the magnificent President's Room venue at the Western Australian Cricket Association grounds in Perth. Your committee is considering having a prominent sporting personality speaker at the AGM for your entertainment. Please put the date in your diary and be sure to attend!

Whilst FPS WA has a full and very active general committee - all of whom contribute well to the operation of The Society, my concern is that the committee really needs to have at least two more 'young' committee members - meaning that I would be very pleased to see nominations for committee from young people who are in the first ten years of their fluid power career.

I think that it is very important for the younger members of the fluid power industry to be exposed to the vast experience of the older members at the general committee level of The Society so that they can maintain and improve the standards and ensure that The Society keeps up with a rapidly changing world. If you are interested in assisting with the management of The Society, please contact me.

Whilst on the subject of the FPS WA general committee, I take this opportunity to welcome **Trevor Pitcher**, managing director of **Transcals WA Pty Ltd** who was invited to join the general committee by unanimous agreement of the committee. Trevor is a very well known and respected member of the fluid power industry and will enhance the knowledge and depth of The Society's management.

Lastly, **please make it your personal business to introduce at least one new person as a FPS WA member by June 30th this year.** In this way The Society is strengthened and FPS WA/IFPSA members' personal status in industry is also elevated, as the achievements of both organisations become more widely known through programs such as the existing certification and registration systems.

With best wishes..... Tim Bailey

Inside Technical Training

By Barry Catanach

This year marks a milestone for our Society. It has taken over five years to establish the registration process for the high-pressure flexible conductor industry including alignment to the prerequisite HPHA Certificate II in Engineering. Interest in the HPHA registration process is obviously spreading all over Australia as indicated by the number of enquiries received to date. These enquiries are coming from major fluid power industry companies requesting copies of The Society's general information on the registration process.

During the initial development of the Certificate II in Engineering (HPHA) a critical element was to gain first hand experience within the hose and fitting industry to ensure that relevance was established for the qualification.

Pirtek Fluid Systems Pty Ltd approached my company to trial a pilot project in Western Australia that included Pirtek's metro and regional centres. The pilot project was a milestone on its own and it took two years to complete with my company providing the RTO services.

The project consisted of 3 stages. Stage 1 encompassed an alignment of the Pirtek training program to the MEM98 training package competencies as determined by The Society. This is now in place so providing Pirtek with a training program that aligns all elements to the Certificate II in Engineering (HPHA).

Stage 2 encompassed observation of on-the-job practices in order to document the tasks carried out on a daily basis. This process provided matching of the competencies and the development of a skills recognition tool. This 'tool' was then implemented to identify any shortcomings in matching the competencies.

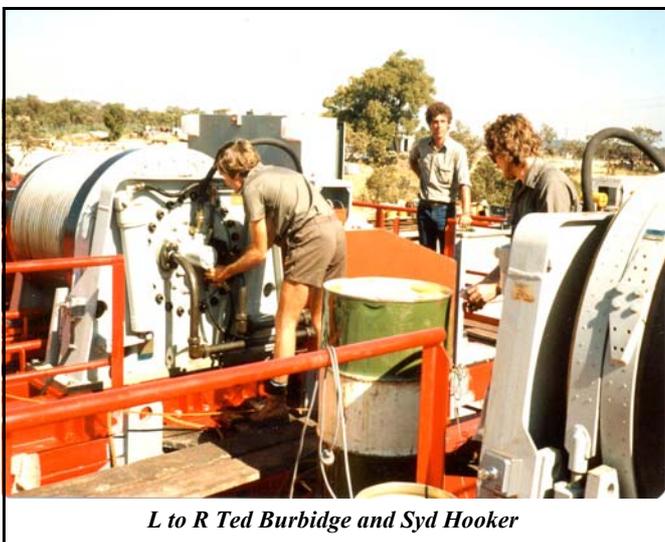
As a result of the Stage 2 development programme Pirtek now have a Recognition of Current Competency (RCC) system in place.

Stage 3 encompassed the implementation of the RCC program in all Pirtek Centres in Western Australia. This was successfully completed in early December 2004.

The pilot project has been successful for Pirtek and they are now the first hose and fitting supplier in Western Australia to have all of their branch and mobile technicians qualified with the Certificate II in Engineering (HPHA). Each qualified Pirtek person can now apply for registration under the Society's HPHA registration program.

Pirtek's lead should be considered by all hose and fitting suppliers as it sets a benchmark industry standard and provides a direct pathway to registration with The Society.

Remember! Learning is life long.



L to R Ted Burbidge and Syd Hooker

All Our Yesterdays

Taken in 1982 during commissioning of the John Holland Rock Crane Winches used in construction of the original North West Shelf Gas Pipeline.

This was a tough time-driven project with various personalities surfacing as each member of the project was put under pressure. Syd's body language on this photo illustrates this point precisely!

Editorial Note. Each future edition of Fluid Talk will feature photographs of fluid power people and projects from the past. If you have any similar photographs that would be of interest to our readers - please email them to secoleman@inet.net.au

Events Calendar

First Wednesday of Each Month

General Committee Meeting

AMTC Wembley

The Fluid Power Society general committee meets on the first Wednesday of each month except January. Members are always welcome! Contact the President, Tim Bailey, for details of the meeting location and time. Contact details are on the last page of this newsletter or on our website: www.fluidpowersociety.com.au



Notification of forth coming events and site visits. Members will be advised specific dates by email or by post.

May 2005

WesTrac Cat Institute Haulpak Driver Simulator Site Visit

July 2005

Canning Vale Waste Disposal Digester Site Visit

August 2005

Olaer Fawcett Christie Legislative Requirements of Accumulator Maintenance and the Responsibilities of the Maintenance Technician Under Worksafe Legislation.

September 2005

Sunday 11th

Annual Golf Day at the Peninsula Golf Club Maylands

Forthcoming Worldskills Competition (WA)

The Department of Education and Training (DoET) is again funding the Worldskills competition in Western Australia and is seeking the support of the Fluid Power Society (FPS) and members.

The FPS has been invited to provide a representative on the newly appointed Industry Advisory Committee (IAC) replacing the now defunct Program Managers Committee. The IAC consists of representatives from industry, unions, DoET, MERSWA, CCI, and other training providers. The role of the IAC is to direct the Worldskills State competitions in metals and engineering.

The first IAC meeting was held Friday 18th March where topics such as categories, dates, times and sponsorship were discussed.

This year, the competition will have regional centres and these centres will complete the regional competitions by June 30th. The winners of these competitions will then take part in the Perth based competition.

The proposed date for the Perth based competition is Friday 15th July but the location of the Perth based competition has yet to be decided although it will probably be at one of TAFE training centres.

The names of the winner and place getters will be announced at the presentation breakfast in mid-November. The winner of the Perth based competition will go to Melbourne to compete in the national finals.

The Society will be part of the supporting group for the state Perth based fluid power category. The last competition was well supported and it is hoped that the same level of support will be forthcoming again this year. The Society will be seeking members to act as judges as was the case in the last competition where FPS members made a major contribution to the success of the fluid power section of the competition.

Sponsorship opportunities are available for organisations, companies or individuals who would like to contribute. Sponsorship includes in-kind contributions, cash donations or gift vouchers for the winner and place getters. Also, the provision of products such as consumables (hose, tube and fittings) would be of great assistance and will be publicly recognised.

The department will issue letters to all organisations supplying items so that donors can claim taxation exemption on the contribution. DoET is registered with the Australian Taxation Office as a donor recipient.

The Society strongly encourages all 3rd year apprentices and new tradespersons in fluid power disciplines, who were born on or before July 1982, to enter and take part in this exciting event. The competition is an excellent way to demonstrate individual skills and an individual opportunity to receive recognition and some desirable prizes.

Companies that encourage suitably qualified personnel to enter will benefit from the publicity generated by the event as competitors automatically become ambassadors for the FP industry and their employers.

Company sponsorship packages will be sent to the FPS so please get in touch with Barry Catanach, whose contact details are listed at the back of this newsletter, to take up the opportunity to enter the competition or to get your company name and logo in the various advertising and editorials that will result from the competition.

Assessor Registration

People who are listed as 'Registered' workplace assessors with the MERSITAB should note that the expiry date for current registrations is March 31st 2005.

All 'Registered' workplace assessors should have received a renewal invitation by now but, if not, they should contact the MERSITAB (Bob Patton) to arrange for the paperwork to be sent. There is a recently introduced renewal registration cost of \$49.50 to cover administration and printing.

Announcement & Call For Papers – 8th Flucome 2005

The 8th International Symposium on Fluid Control, Measurement and Visualization (Flucome) 2005 will be held on August 22nd-25th, in Chengdu, Sichuan Province, China.

The organisers have requested we advise our members of the above symposium and call for technical papers. For detailed information about the technical scope, important dates, venue, organizers, programs, travel, submission of papers online, contacts and links etc please refer to the organisers web site at: www.8flucome.org.

The web site also has downloadable MS-Word symposium documents in English and Japanese together with recently updated program and travel information.

On entering the laboratory, members noted the typical ‘medical look’ of a testing laboratory - definitely not the place for heavy work boots covered in grime!

He said that clients supply a sample of used oil, coolant or fuel (unused!) and one of the most important tests conducted on an oil sample is that of spectrographic analysis. The sample is put through an Infrared Spectrophotometer that performs an Infrared Spectral analysis using new oil references to determine used oil condition. The test allows technicians to determine the extent to which the oil has deteriorated during use and to verify that the oil is performing up to specification over the oil service period.

Paul showed members the two new viscometer machines that are used to measure oil viscosity that is, the resistance of the oil to flow at a given temperature. The viscometers were commissioned in January this year at a cost of \$100,000.

Members were then shown the inductively coupled plasma mass spectrometry (ICP) equipment. ICP spectroscopy allows technicians to identify and quantify component metal wear. It is capable of identifying and quantifying the presence of metal particles in parts per million. The ICP spectrometer produces quick and precise measurements at an average rate of one sample per minute. The process can measure the quantity of matter present over a range of 22 individual wear elements and additives in particle up to 3-5 micron (0.0001 - 0.0002 in.) in size. The presence of large ferrous particles is initially determined with a visual test using a magnet to attract the particles.

Paul then showed members the Automatic Laser Particle Counters that also provide measurements of particle sizes. Results are shown in ISO codes. The ISO Code counts the number of particles present in a sample and grades them in two groups: 5 micron and larger and 15 micron and larger.



Members listen intently as Paul Searle explains the operations of WesTrac’s Equipment Management Centre

The particle counters will quantify particles from 2 to 100 microns in non-engine oil. Particle counts used in combination with ICP results permit a comprehensive evaluation of hydraulic and power transmission systems oil samples and the combination of the two can detect potential equipment failure indicators that may not be identified by wear analysis alone.

To gain an accurate measurement of ferrous particles the samples are put into a Particle Quantifying Index Machine (PQI). This reports the amount of ferrous material measured in the sample, as an index number with the higher the index number the more ferrous material is present in the sample.

The next machine shown was an Auto Titrator that measures the *total base number* (TBN) and the *total acid number* (TAN) of a sample. The TBN indicates the level of useful additives left in the oil to neutralise corrosive chemical attack and the TAN is an indication of oil acidity resulting, usually, from the presence of combustion products in engines.

Following the auto titrator, Paul showed members the Fourier Transform Infra-red Machine (FTIR) that is used to measure oil condition. FTIR shows levels of soot, oxidation, nitration and sulphation – all usually associated with oils working in engines and in contact with combustion products.

Finally, Paul took members into a separate room that was set up for Microscope Analysis (patch testing). He explained that in the event that particle counting identified a large amount of material in a sample, the sample is further analysed under a microscope to help identify the source of the contamination. The Microscope is used to examine oil if the ISO Code counts are high or if there is a high PQI result.

The tour concluded with Paul explaining how the information from all of the testing is provided to the customer. He said that once the oil has been analysed and the technical report reviewed and released, the information is made available to the client through a web based program called ‘Oil Commander’. The program allows the customer to directly access the information on the Internet.

The visit to WesTrac was very helpful to everyone attending as it gave members a good insight into the huge operation that WesTrac have established to service the mining/earthmoving industries in Australia.

The oil analysis laboratory tour was particularly informative as it gave the FPS members a good understanding of the process of oil condition analysis that is critical to the efficient performance of oil hydraulic systems.

At the conclusion of the tour, The Society’s President, Tim Bailey, thanked Paul and WesTrac for providing The Society’s members with a very interesting evening.

Paul Searle can be contacted on phone number (61) (8) 9377 9436 or email paul.searle@westrac.com.au for more information on oil, fuel and coolant analyses and other services such as the remote equipment monitoring facility that are offered by WesTrac.

Selecting Environmentally Friendly Hydraulic Fluids

Many successful companies now have a growing business commitment to environmental protection. This coupled with political and legal demands for environment friendly lubricants has resulted in a recent proliferation of environment-friendly hydraulic fluids EFHF. These products are used in applications where hydraulic systems operate using fluids whose primary attribute must be 'environment friendly', this area now includes most mining and marine applications with industrial users quickly adopting EFHF fluids as the workplace laws change.

The claims and counter claims regarding the 'environment friendliness and bio-degradability' of various commercially available lubricants make it extremely difficult for the user to determine the best option for their requirements. Like petroleum based hydraulic fluids there is no ideal universal EFHF fluid suitable for all areas of application. Therefore it is important to study all aspects of the application in order to guarantee hydraulic system reliability and component longevity using EFHF fluids.

The selection criteria for EFHF fluids are more stringent than those for selection of petroleum based hydraulic fluids. The systems engineer not only has to consider the normal fluid requirements, such as, good lubricating and anti-wear properties, resistance to mechanical shear and oxidation, elastomer compatibility, low heat expansion and anti-foaming characteristics etc, but also the requirements dictated by the environment legislation. These are high bio-degradability, non-toxic to flora & fauna, non-contaminant to food, soil and water, does not constitute an irritant to skin and mucous membranes and is easily disposed of.

It is important to fully understand the physical and chemical properties of different EFHF fluids to avoid misapplication that could arise in new applications, component repairs and upgrades of hydraulic systems.

Water Contamination Categories and Index

In order to simplify the user's decision of which hydraulic fluid to select, the following chart of Water Contamination Categories (WGK) and a Water Contamination Index (WGZ) has been used in Germany for many years to assist with fluid selection. This chart is based on current toxicity data and is designed to protect marine life, mammals & bacteria from the damaging effects of toxic pollution.

WGZ	WGK	ASSESSMENT
0-1.9	0	Generally not a water contaminant
2-3.9	1	Slight water contaminant
4-5.9	2	Water contaminant
> 6	3	High water contaminant

This assessment results in the following ratings:

Mineral Oil Based Hydraulic Fluid

WGK Rating 2 HL Series – Refined mineral oil with anti-oxidant and anti-rust properties.

WGK Rating 2 HLP Series – HL hydraulic oil with anti-wear properties

WGK Rating 3 HLP-D Series – HLP hydraulic oil with detergent and dispersion properties, there are no requirements for water or air separation capabilities.

WGK Rating 2 HVL Series – HLP hydraulic fluid with improved viscosity/temperature characteristics.

Fire Resistant Hydraulic Fluids

WGK Rating 3 HFA-E Series - Oil in water emulsion

WGK Rating 3 HFA-M Series - Oil in water emulsion.

WGK Rating 0-1 HFA-S Series - Solution

WGK Rating 1 HFA-V Series - Thickened high water based fluid.

WGK Rating 3 HFB Series - Water in oil emulsion.

WGK Rating 0-1 HFC Series - Water glycol solution.

WGK Rating 1-2 HFD-R Series - Phosphate ester.

WGK Rating 1 HFD-U Series - Polyolesters.

Environmentally Friendly Fluids

WGK Rating 0-1 HETG Series - Vegetable Oil (Triglycerides)

WGK Rating 0-1 HEPG Series - Poly-Glycol Synthetic (eg Polyethyl – Glycol PEG)

WGK Rating 0-1 HEES Series - Synthetic Esters

Biodegradable

Hydraulic fluids are described as biodegradable when they can be absorbed and decomposed by substances and organisms occurring naturally in the environment, without leaving any harmful residue.

Biodegradable hydraulic oil can be applied to those fluids, which can be quickly degraded by microorganisms present in soil and water. The term 'quickly' is relative. In order to differentiate between various products carrying the 'environment friendly' label, it is appropriate to compare the technical data, properties and peculiarities of the fluids, depending the application.

The bacteria used in effluent treatment plants should degrade biodegradable fluids. For rapid biodegradation the base fluids must be naturally occurring or be structurally closely related. Synthetic fluids with simple structures, linear or aromatic, may also be acceptable. However, petroleum hydrocarbons are usually highly branched and tend to be only slowly degraded.

Advantages & Disadvantages Of Mineral Based Hydraulic Oil

- Lower cost
- No special seals required
- High Viscosity Index can operate in wide temperature range
- Will separate from water if spilled
- Environmentally less acceptable

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Vegetable Based Fluids

Hydraulic fluid derived from vegetable, fish and animal oil and fats have been widely used for many years. Forestry, farming and building machines which operate with total loss lubrication, eg. Chains saws, air compressors and greases, are increasingly using formulated rapeseed oils.

Rapeseed oil has a triglyceride (ester) structure and because of the inherent oxidation and hydrolytic instability of triglycerides, a higher concentration of stabiliser is needed to inhibit aging.

Vegetable oil degrades in the same way as mineral oils but oxidises at a faster rate and is also stabilised by the same types of additives as mineral oils. The presence of current antioxidant technology (mineral oil insoluble phosphorus and sulphur free metal inhibitor) in vegetable oil formulation can produce hydraulic oils of similar oxidation stability and deposit forming tendency as that of mineral oil.

When using these products, it is important to consider the aspect of oxidation stability and the low temperature performance characteristics. Some vegetable oils will oxidise rapidly when subjected to high temperature resulting in higher acidity. This reaction will be compounded if the fluid has high moisture content.

Polyglycol Synthetic

Polyglycol fluid has been around for more than 100 years and its use in lubricants dates back at least 50 years. Today these man-made petrochemicals are bidding for a stronger role in lubrication as gear, bearing and circulating oils, in compressor fluids and as metalworking fluids and hydraulic oils.

The best known polyglycols include polyglkylene glycols (PAG) and polyethylene glycols. The use of polyglycols in the pharmaceutical and food industry demonstrates two of its most valuable benefits: biodegradability and low toxicity. In the US polyethylene glycols are even registered as foodstuff additives.

The biodegradability of polyglycol has been examined intensively during the last few years and its importance as lubricant will increase more in the future due to their good biological degradability.

By fine-tuning the variables mainly the oxide and the chemical initiator used to create the glycol, it is possible to create the glycol - it is possible to create tailor-made products that meet all desired requirements such as wetting, emulsification, anti-foaming and lubricity making it suitable for many lubrication applications.

Currently, the most common use of polyglycol is with water as a fire resistant hydraulic fluid. In conventional lubrication technology, common water glycol fluids have an unenvied reputation for poor lubricity resulting in the operating pressure being limited to below 150 Bar, although some water glycol fluids with advanced chemical technology will operate successfully at pressures greater than 350 Bar.

Today, it even is possible to create polyglycols that are completely soluble in water (water glycol) or oil soluble.

The new generation oil soluble polyglycol hydraulic fluid is used in applications where extreme and/or critical conditions apply providing a shear stable, thermally stable and clean running "fill for life" oil. This product is engineered to give exceptional anti-wear performance, rust and oxidation protection over a wide temperature range. It also has excellent viscometric properties and good lubricity.

Synthetic Esters

Polyol esters, also known as oleate esters, are organic esters of 'polyols', eg trimethylolpropane or neopentyl glycol. These fluids contain a stabiliser package and, frequently a polymeric thickener to improve fire resistance.

These esters have similar properties to polyglycols and are commonly used as lose flammability hydraulic fluids.

High Water Based Fluid/Thickened High Water Based Fluid.

Early in the 70's, when petroleum oil embargos, shortages, rationing and availability were headline words, the world was given impetus to find alternate fluids that were not petroleum based.

Since water is perhaps the most plentiful liquid on earth, it became a logical consideration as a potential hydraulic medium. Water is almost incompressible, non-polluting, non-toxic, fireproof, readily available, and best of all, low in cost. Unfortunately, it also has some inherent disadvantages. It is low in viscosity, provides poor lubrication values, it changes from a liquid to a solid at 0 deg. C, is not compatible with the vast majority of hydraulic equipment currently in use and is notorious for promoting corrosion.

The first attempt at modifying water to make it a more acceptable hydraulic medium was a solution comprising 5% soluble oils and 95% water. The degree of success achieved with this fluid was encouraging and promoted additional research to improve characteristics of the fluids . This type of product is particularly suitable for steel mill operations where it also offers an extremely high degree of fire resistance.

In addition to the conventional high water based product, a sister product developed on a thickened high water content fluid has been introduced. This fluid has been successfully used in steel mill applications replacing the conventional water based glycols.

Cost Comparison (205 Litre Drum)

Type Of Fluid	Price/Litre
Premium Hydraulic Fluid	>\$2.00
Vegetable Oil	>\$3.50
Poly Glycol	>\$3.50
Synthetic Ester	>\$4.50
Thickened High Water Based Fluid	>\$3.50

A Word From Our Newsletter Sponsor



K-One Fluid Power is proud to be the official distributor for Kawasaki hydraulic products. We have expertise in supplying hydraulic equipment for mobile, industrial, marine and many other engineering applications where there is a requirement for reliable fluid power.

The appointment of **K-One Fluid Power** by Kawasaki to introduce their extensive hydraulic product range, which includes the Staffa high torque, low-speed radial piston motor, emphasises the **K-One** commitment to achieving a best-in-the-market-place level of service.

K-One supports a national network of recommended distributors who are able to offer the complete range of Kawasaki hydraulic equipment.

Please visit our website www.k-1fluidpower.com or contact us on phone (08) 9358 2300, fax (08) 9358 2322 or email info@k-1fluidpower.com to ensure you get "the best in the market."

Fluid Talk Sponsorship

The Society THANKS all previous newsletter sponsors and the sponsor of this newsletter, K-One Fluid Power, for their financial support in producing *Fluid Talk*.

For a small cost you can publicise your company's products and services in the newsletter you choose to sponsor. Your company sponsorship is acknowledged with an editorial in the same edition.

Over the next few months we will canvass and encourage fluid power companies to not only provide sponsorship for Fluid Talk but to promote their products and services via the Society in the form of advertising and product lectures.

The distribution of Fluid Talk will also be widened to include key decision makers in the Australian and International Fluid power industry. Moog Australia has kindly offered to sponsor the next edition of Fluid Talk.

The Committee would like to thank all eighty-one members who have recommitted to their FPS membership for 2005. Level of support from the WA fluid power community to the FPS (WA) is most gratifying.

Movers & Shakers

- Steve Carey has left Parker Hannifin and joined EPG as Sales Manager.
- Hagglunds have opened a branch in Port Hedland staffed by George Christidis and Steve Rice.
- Cross Hydraulics are moving to new Mid Vale premises built by former Hydraulic Manifolds Australia MD Richard Tweedie. One question remains - will Hydraulic Manifolds Australia's current management move their operations to the new Mid Vale premises and join Cross Hydraulics?
- Long serving Moog Australia stalwart Colin Theobald is about to retire after more than thirty years in the fluid power industry. May we take this opportunity to wish Colin a long and fruitful retirement.
- For latest information on the alleged Permco vs Dosco GPM industrial espionage saga go to www.ibis.co.za/whisn.php?irec=24#section



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The Fluid Power Society newsletter is edited by Stuart Coleman . Suggestions, ideas and information for the newsletter are most welcome - contact us on 9401 6487 or email secoleman@iinet.net.au