

Thermal Optimisation (Understanding And Applications)

HYDAC unit number: ST-T10-1
Duration: 16 hours (2 days)

Outline

Maintaining a cool oil temperature is a vital first step when it comes to system design. This course highlights the importance of thermal optimisation, and highlights choices in system design.

Program

Day 1

Welcome, introductions and overview

Overview of cooling in fluidic systems – ST-10-0

Why cool?

Overview of expected temperatures within different fluidic systems.

Overview of different temperatures in systems. Gearboxes, transmissions, bearings etc.

Industrial fluid degradation mechanisms.

Discuss the effects on fluid life ~ system life

Oxidation, primary and secondary.

Thermal degradation mechanics, including electro-static discharge, micro dieseling and hot spots.

Overview of cooling in fluid systems (continued)

Discussions highlighting the increased running costs of hot systems. The effects on:

- Hoses
- Seals
- Fluid (Varnishing & Silting)
- Fluid replacement, including cleaning and flushing.

Types of coolers - Quick overview of construction.

- Air blast CO99-T01-0
- Shell & tube CO99-T04-0
- Brazed plate CO99-T05-0
- Plate and gasket CO99-T06-0
- Chillers CO99-T07-0

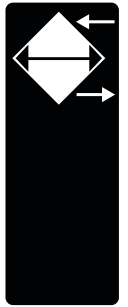
Sizing exercises - Manual calculations.

- Industrial applications
- Mobile applications

Day 2

The anatomy of a high quality cooler

- Plate and bar construction - Videos
- Turbulators
- IBP & IBT
- The use of computational fluid dynamics when designing components.



- Design limitations
- BSPP ports (No BSPT adaptors are to be used)
- Vibration
- Pressure spikes and surges

Fan theory.

- Shape
- Fan speed
- Direction
- Variable speed drives
- Driving methods - AC motors, DC motors, Compact AC motors, Hydraulic motors, Belt drive
- Tip clearance - Load, noise and efficiency

Kuli - Thermal simulation

Interaction from fan, core and tip clearance.

Air resistance from grids, walls and plates.

Combi coolers; Cooling diesel, transmission, hydraulic, coolant, charge air, expansion tanks

Fluid problems

Alternatives (UKF)

Sizing with software, Industrial and mobile.

Practical examples. Hands on with air blast, UKF, brazed plate heat exchangers and chillers. Using thermal cameras and sensors.

Prerequisites

There are no prerequisites for this course.

It is designed for those with little or no experience in hydraulic technology.

This course can only be provided for those fluent in English. Participants must be able to read and write, and to follow instructions.

Clothing and equipment

Pens, paper, tools and training resources are provided.

Clothing should be neat casual, or cotton drill work clothing is fine, but they must be clean.

Dirty work boots are not to be worn, fully covered footwear such as runners are acceptable. Open toed footwear must not be worn.

Lunches

Morning tea, lunch and afternoon tea are provided. If you have any special dietary needs, please contact HYDAC beforehand to arrange alternatives.

Course dates, times and venues:

We are offering the majority of our courses around Australia and New Zealand. They are subject to

availability and minimum numbers.

The prices listed in this document are for training courses conducted in Australia only. Please contact HYDAC Training Centre for more information.

Times: 8:30AM to 5:00PM

Dates: Please check our website (www.hydac.com.au/hydac-training) for information on available dates.

Course fee

Course fee is AUD \$860 per participant, plus GST.

Maximum class size is 12 people.

Flights, accommodation and taxi charges are not included in the course fee.

Unique Student Identifier (USI)

If you are interested in applying for the nationally recognised statement of attainment, you will need to come to the course with a USI, (Unique Student Identifier). A nationally recognised statement of attainment cannot be issued to an individual without a USI to match it to.

Information about the USI initiative can be found at the Australian Government website: www.usi.gov.au

A USI is linked to the National Vocational Education and Training (VET) data collection. This means that an individual's nationally recognised training and qualifications gained anywhere in Australia, from different training organisations, will be kept all together.

If you are a New Zealand resident, you will not be able to create your USI with your New Zealand passport as identification until you have crossed through customs into Australia. This is because New Zealand nationals do not need a visa to enter Australia.

If you are an international student from elsewhere, you will be able to create a USI by using your Australian visa as identification.

Contact

Technical Training Officer



109 - 111 Dohertys Road

Altona North

VIC 3025

Phone: (03) 9272 8935

E-mail: training@hydac.com.au