

OUR CLIENTS INCLUDE

ADCO - UAE

ADGAS - UAE

ADNOC - FINLAND, UAE

AIR PRODUCTS - UK

AKZONOBEL - NETHERLANDS, ITALY

ALLIED COLLOIDS - UK

ARCO - INDONESIA

ARISTECH CHEMICAL - USA

AVENTIS PHARMA - GERMANY, USA

BASF - BELGIUM, GERMANY, USA, UK

BAYER MATERIALSCIENCE - GERMANY, USA

BHP - AUSTRALIA

BOC - UK

BP AMERICAS - GERMANY

BP CHEMICALS - UK, BELGIUM

BP OIL - CANADA, UK

CABOT - UK, AUSTRALIA, INDONESIA, MALAYSIA

CELANESE - GERMANY

CHEVRON - UK, USA

CHINA PETROLEUM - TAIWAN

CONOCOPHILIPS - UK

CORPOVEN - VENEZUELA, OMAN

COURTAULDS - UK

CRODA - UK

DAICEL CHEMICAL INDUSTRIES - JAPAN

DISTRIGAZ - BELGIUM

DOW - GERMANY, NETHERLANDS, USA, UK

DSM - NETHERLANDS

ELF AQUITAINE - FRANCE

ENGEN - REPUBLIC OF SOUTH AFRICA

ENPPI - EGYPT

EPMI - MALAYSIA

EUROPEAN VINYL CORPORATION - UK

EXXONMOBIL - CANADA, MALAYSIA, NETHERLANDS, UK, USA

FARAD S.A - GREECE

FARMLAND INDUSTRIES - USA

FMC - USA

GASUNIE - NETHERLANDS

GASCO - UAE

G.E. PLASTICS - NETHERLANDS

HALCARBON PRODUCTS - USA

HENKEL - GERMANY

HERCULES - NETHERLANDS, USA

HÜLS - GERMANY

HUNTSMAN - NETHERLANDS, UK

IMPERIAL OIL - CANADA

INSPEC - UK, NETHERLANDS

INEOS - UK, BELGIUM

KUWAIT PETROLEUM - NETHERLANDS

LANGOVEN - VENEZUELA

LANXESS - GERMANY

LUCITE - UK

LUKOIL - RUSSIA

MALLINCKRODT CHEMICALS - USA

MANRO PRODUCTS - UK

MITSUBISHI CHEMICAL CORPORATION - JAPAN

MITSUBISHI GAS CHEMICAL ENGINEERING - JAPAN

MOBAY - USA

MOBIL OIL - SINGAPORE

MOHAWK OIL - CANADA

NAM (NEDERLANDSE AARDOLIE MAATSCHAPPIJ) - NETHERLANDS

NASR PETROLEUM - EGYPT

NATCO - NETHERLANDS

NATREF - REPUBLIC OF SOUTH AFRICA

NEREFCO (BP/TEXACO) - NETHERLANDS

NORSK HYDRO - NORWAY

NORTH OIL - IRAQ

OCCIDENTAL OIL - COLOMBIA

ONGC - COLOMBIA, INDIA, PAKISTAN

PETROLEUM DEVELOPMENT - OMAN

PEMEX - MEXICO

PETRONAS - MALAYSIA

PETROVIETNAM - VIETNAM

QGPC - QATAR

REPSOL - SPAIN

ROSNEFT - RUSSIA

SASOL - REPUBLIC OF SOUTH AFRICA

SAUDI ARAMCO - KSA

SEVALCO - UK

SHELL - BRUNEI, GERMANY, MALAYSIA, NETHERLANDS,

NEW ZEALAND, NIGERIA, OMAN, UK, USA

SABIC - UK

SINGAPORE REFINING - SINGAPORE

SINOPEC - CHINA

SIRTE OIL - LIBYA

SOFREGAZ - ALGERIA, SYRIA

SONATRACH - ALGERIA

SONELGAZ - ALGERIA

STEPAN - USA

THAI PETROCHEMICAL - THAILAND

TOTAL - INDONESIA, UK, FRANCE, USA

TRANSOIL - CANADA

UBE AMMONIA CORP - JAPAN

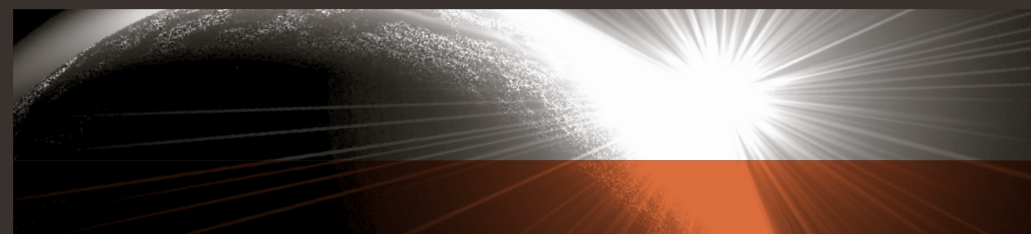
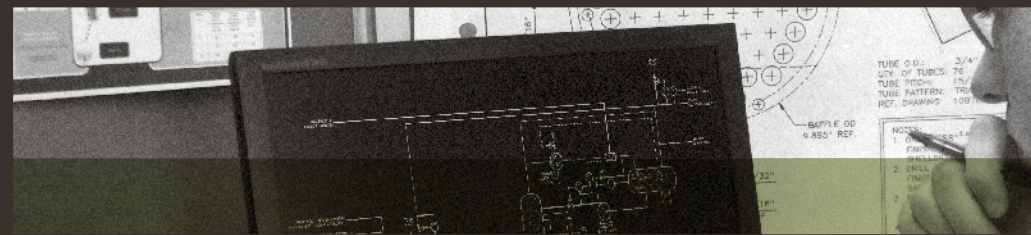
UNICHEMA - NETHERLANDS, MALAYSIA

UNILEVER - GERMANY, NETHERLANDS, UK

UNION CARBIDE - CANADA, COLUMBIA, USA

WACKER - GERMANY

WOODSIDE OFFSHORE PETROLEUM - AUSTRALIA



RESEARCH. EVALUATION. INNOVATION. SOLUTION.

_UK

CALGAVIN LIMITED, MINERVA MILL
STATION ROAD, ALCESTER
WARWICKSHIRE, B49 5ET

_TEL +44 (0) 1789 400401
_FAX +44 (0) 1789 400411
_EMAIL INFO@CALGAVIN.COM

CALGAVIN.COM

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 CALGAVIN

DELIVERING SOLUTIONS FROM STUDY TO REVAMP



FORMED OVER 30 YEARS AGO, CALGAVIN IS A GLOBAL MARKET LEADER IN HEAT EXCHANGE ENGINEERING.

With experience from more than 16,000 projects worldwide, we are able to offer you the best technical advice available. This is backed up by ongoing investment in Research & Development and our collaboration in numerous industry initiatives to improve heat transfer technology and practice.

WE WORK IN ALL AREAS WHERE HEAT EXCHANGERS ARE USED, BUT OUR CORE SECTORS ARE:

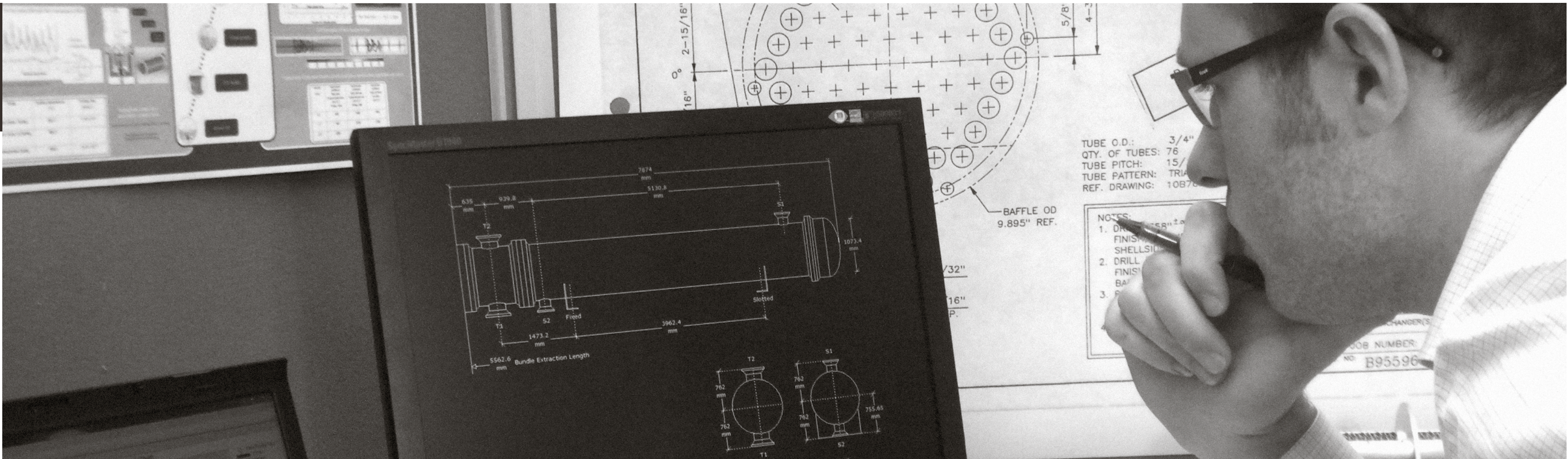
- OIL AND GAS
- PETROCHEMICALS
- CHEMICALS
- POWER GENERATION

Clients include leading processors such as **BP, Shell, ExxonMobil, Lukoil, BASF, Dow** and **Lanxess**.

Alongside our world-class enhancement product range, including market leading **hiTRAN** Thermal Systems, we provide practical and objective consultancy advice on improving the operation of your plant. As engineers ourselves we fully understand the many operating issues that you face. **CALGAVIN'S** role is to provide technical solutions specific to the needs of each unique process. Our objective is to fully support you in optimising your production.

You can be confident in our quality, which is backed by ISO 9001 certification.





ADDED VALUE ENGINEERING

CALGAVIN PLACES A WEALTH OF HEAT EXCHANGE ENGINEERING EXPERTISE AT YOUR DISPOSAL.

Working with **CALGAVIN** from an early stage of your project will bring key benefits in optimising plant performance. Our engineers use state-of-the-art heat transfer and process software such as AspenTech and always incorporate best practice in heat exchange engineering.

CALGAVIN ADDS VALUE BY PROVIDING THE EXPERT SERVICES YOU NEED, WHEN YOU NEED THEM:

- HEAT EXCHANGER RATING AND RE-RATING
- DESIGN REVIEW AND OPTIMISATION
- PERFORMANCE MEASUREMENT AND ANALYSIS
- TROUBLESHOOTING
- DEBOTTLENECKING
- PROCESS INTEGRATION ANALYSIS
- CUSTOMISED MODELLING

Whether your objectives are optimised production, improved reliability or increased energy efficiency, we will provide expert support to your project and help you to deliver your goals.

WE SOLVE PROBLEMS

A REFINERY

Limited performance of a multi-shell two phase feed/ effluent arrangement caused high fuel consumption and hindered plant capacity increase.

CALGAVIN engineers confirmed that poor heat transfer limited the performance with maldistribution, due to low pressure loss, partly to blame. Exchanger enhancement technology, tailored to suit the changing proportions of liquid and vapour through the exchangers was installed during a scheduled shutdown.

This feed/ effluent exchanger retrofit enabled higher throughput and reduced energy consumption by 4.6MW, (full flow) saving Lukoil Refinery more than US\$ 0.5M/year.

Image courtesy of Lukoil, Volgograd, Russia



INNOVATIVE PRODUCTS & SOLUTIONS

OUR PRODUCTS ARE INSTALLED IN HUNDREDS OF PLANTS WORLDWIDE AND ARE TRUSTED BY LEADING EXCHANGER MANUFACTURERS INCLUDING:

Jord International
Doosan
Bronswerk Heat Transfer
GEA Heat Exchangers
Nuovo Pignone (GE)
Borkhimmash
Harsco Industrial Air-X-Changers
KNM
Oeltechnik

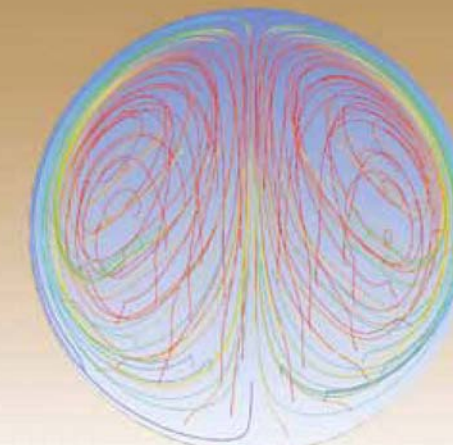
CALGAVIN'S LONG-TERM COMMITMENT TO RESEARCH AND DEVELOPMENT, AND OUR PASSION FOR INNOVATION, HAVE RESULTED IN A RANGE OF PRODUCTS DESIGNED TO MAKE THE MOST OF YOUR HEAT EXCHANGER INVESTMENT.

Our products range from simple devices which enhance heating and cooling to complex solutions which accelerate condensation and boiling processes. All our products are robustly engineered for demanding environments and are backed by many years of research and testing. CALGAVIN works continuously with respected universities and research organisations to develop new products and verify specific applications.



Temperature

342.27
327.09
311.91
296.73
281.55
(K)



0 0.0025 0.005 0.01 0M

In collaboration with University of Birmingham

WHY WE ARE CONFIDENT

"We thank Calgavin staff for their professionalism and competence"

First General Deputy Director, **Lukoil**

- Our independent approach means that we are able to offer you objective advice that is the best for your specific business.
- You are in safe hands - our proven track record includes such clients as **Total, Pemex, ONGC, Aventis, Saudi Aramco, Petronas, GE Plastics and Chevron.**
- Our ongoing Research and Development investment and our skilled and experienced engineers mean that we stay at the cutting edge of technology to support you.
- We can identify solutions, or help you implement your own plans.
- Your business needs will be met wherever you are in the world through our network of offices and partners.



- Our experience embraces many industries so we are confident that we can help with all of your heat exchange issues.
- We really do understand your needs, we have delivered solutions to the process industry for over 30 years.
- With thousands of projects successfully completed, we offer you unrivalled technical expertise.

YOUR WORLDWIDE PARTNER FOR HEAT EXCHANGE



CANADA

IMPROVED SUMMER COOLING PERFORMANCE AT GAS SWEETENING PLANT



U.S.A.

RE-ENGINEERED HEAT EXCHANGER RESOLVES CORROSION PROBLEM



MEXICO

COMPACT HEAT TRANSFER SOLUTION FOR OIL/WATER SEPARATION PLANT



ANGOLA

OPTIMISED HEAT EXCHANGERS IMPROVE CONGESTED FPSO LAYOUT



MALAYSIA

EVAPORATOR LIQUID CARRYOVER ISSUE RESOLVED - 100% VAPORISATION ACHIEVED



INDIA

PRECISE CONTROL OF WALL TEMPERATURES REDUCES FOULING AND EXTENDS RUN TIME

UK



PROBLEMS SOLVED ON REACTOR COOLER

GERMANY



15% PRODUCTION INCREASE WITH REDUCED CARBON EMISSIONS THROUGH IMPROVED HEAT RECOVERY

SAUDI ARABIA



COMPACT, LOW ENERGY, HIGH PERFORMANCE OIL COOLERS

RUSSIA



PLANT THROUGHPUT INCREASED BY 47% WHILE AVOIDING FURNACE FIRING LIMIT



CHINA

ADVANCED CONDENSER DESIGN FOR VACUUM DISTILLATION PROCESS



AUSTRALIA

DISTILLATION COLUMN PERFORMANCE IMPROVED BY RESOLVING A REBOILER ISSUE



SOUTH AFRICA

FREQUENT PROCESS UPSETS AVOIDED BY MODIFICATIONS TO CONDENSER OPERATION

