CUSTOMER CASE HISTORY

SASOL

Sasol is an international integrated energy and chemicals company that leverages the talent and expertise of more than 30,300 people working in 33 countries. Founded in South Africa in 1950, Sasol entered the USA markets in 2001 with the Purchase of CONDEA Vista's assets. In 2004, Sasol moved its North American Research and Development resources to their
Lake Charles, Louisiana Chemical Complex. And significant growth and investment is planned at the Louisiana complex with the addition of an $8.1 Billion world-scale ethane cracker and a Gas-to-Liquids project over the next 3-5 years.

It was early 2009 when Delta first approached the Sasol Refinery in South Africa regarding steam traps and performing a steam study for the facility. By September 2009, Sasol had agreed to a trial run utilizing eight Delta traps in a pilot facility. At about the same time, Sasol contracted with Delta to perform a steam trap study for the FTDR plant; that survey revealed over 237 traps (46% failure rate) that were not performing as they should be. Delta was able to calculate a steam loss of 41,200 pounds of steam annually from these leaking traps. Delta also set up an energy efficiency "bucket test" to demonstrate the operation and savings, through better efficiency, from the Delta traps.

As with any established manufacturing process, especially one that runs continuously 24/7, the engineering and business management teams must approach changing the process with extreme caution. The changes need to be well understood, modelled mathematically if possible, tested extensively, and before/after performance results captured and examined. Only then can radical changes be approved for implementation. Even then, the implementation schedule is often very slow at the beginning and allowed to proceed in phases. This is exactly what happened at Sasol. And finally, after nearly two years of running with Delta venturi steam trap technology, and after reviewing all the trial period data, Sasol decided to convert the entire FTDR
plant to Delta venturi steam traps.

By the time the approval to implement was received in 2011, Delta Steam Systems had been producing the new DSV model of steam trap. The DSV design incorporates a dual strainer configuration and an inverted cone insert that deflects

blockage materials. The approval was given to install the new model in the 237 positions that had been identified in the survey in late 2009. Since those traps were replaced, Delta has continued to supply DSV steam traps to Sasol and to date, over 900 traps have been installed at the refinery.

Several additional benefits have been realized with this project that should be mentioned. Besides the fact that there have been ZERO failures of the Delta steam traps, Sasol has eliminated the need for steam trap surveys on their FTDR plant and with the 20-year warranty from Delta, spare parts or replacement traps are no longer required in their maintenance inventory. With no steam trap failures, Sasol has not had to spend any time worried with new steam traps. Finally, the process engineering team are reporting reliable process temperatures given that there are no leaking or blocked Delta venturi steam traps.

In conclusion, Sasol reports that they are very pleased with the Delta steam traps and have provided a letter of reference from their Senior Manager.

REFERENCE:
Mein Faling – mein.faling@sasol.com

Delta Steam Systems Pty Ltd
11 River's Edge Business Park, Stikland, Bellville, Cape Town, South Africa, 7530
Tel: +27 21 948 9677
Email: info@deltasteamsystems.com
Web: www.deltasteamsystems.com

CUSTOMER CASE HISTORY

Engen Petroleum (A Member of the Petronas Group)

Engen Petroleum, established in 1897 as the local affiliate of the Vacuum Oil Company, is a petroleum products company with a rich and meaningful history. From 1961 until late 1989, the company was the local affiliate of the Mobil Oil Company. In 1993, the company changed its name to Engen Petroleum Limited, and is a member of the Petronas Group of Companies, which has a presence in more than 20 countries, focusing on the downstream refined petroleum products market and related businesses. The company's core functions are the refining of crude oil, the marketing of their primary refined petroleum products and the provision of products to over 1,500 service stations and to over 600 convenience services via their extensive retail network. In addition, refinery products are exported to more than 30 other countries, mostly in Africa and the Indian Ocean Islands. With a nameplate capacity of 135,000 barrels per day the refinery produces approximately 40 tons of product per hour, totalling 320,000 litres per day.

Engen's refinery in Durban, South Africa was approached by Delta Steam Systems in 2012 with a proposal to replace all steam traps in the refinery.
When first approached by Delta, the refinery was experiencing massive steam leakage resulting in water losses, excessive use of fuels for boilers, wastage of water treatment chemicals and ongoing maintenance of failing steam traps. Mechanical steam traps from the major manufacturers were failing at a rapid pace. Engen was looking for solutions that would save energy and ongoing operational expenses.

Recognising that replacing all steam traps in the refinery would be a massive effort, Delta Steam Systems offered a staged program of steam trap survey and complete steam trap documentation across various sections of the refinery monthly to identify key problem areas for immediate steam trap replacement. After each survey, Engen Petroleum's staff verified the findings. The cost of the surveys was built into the price of the new Delta venturi steam trap.

The surveys to date revealed a failure rate of 20-30% in each section surveyed, most of the failed traps had failed open, resulting in severe wastage of steam, water treatment chemicals and boiler fuels.

The remaining mechanical steam traps had failed closed, which allows condensate to accumulate and results in water hammer (a severe safety issue) and many processes that were not heating properly.

Since the beginning of the project in 2012, approximately 1200 traps have been replaced with Delta DSV Venturi Steam Traps. The project is expected to continue through 2018 due to the size of the refinery. Engen estimates that each phase has carried a simple ROI of 4-6 months (based on the cost of producing steam and the reduced amounts of ongoing maintenance labour) and has resulted in noticeable reductions of steam usage at the refinery overall.

To date, there have been ZERO recorded blocked steam traps. Since the Delta Venturi traps have no mechanical parts, they cannot fail open, so all of the steam, water and water treatment chemical wastage in the completed sections has been eliminated.

ENGEN CONTACT:
Chris Saran – chris.saran@engenoil.com

CUSTOMER CASE HISTORY

Kruger Canada

Kruger Products is Canada's number one tissue products manufacturer. They are manufacturers and distributors of tissue products for both consumer, in-home use and commercial, away-from-home use in Canada.

Kruger manufactures such consumer brands as Cashmere®, Canada's best-selling bathroom tissue brand, and Purex®, Western Canada's #1 bathroom tissue brand. They also manufacture some of Canada's favourite brands, including SpongeTowels®, Scotties®' facial tissue and White Swan® products.

In December of 2015 DSS won the tender to supply over 200 steam traps to Kruger's Tissue Plant in Quebec, Canada.

Project engineer Michel Houde says, "We replaced roughly two hundred steam traps throughout the Mill and the majority of the sizing worked right out of the box. I would estimate at less than 5 % the ones we needed to change the orifice size."

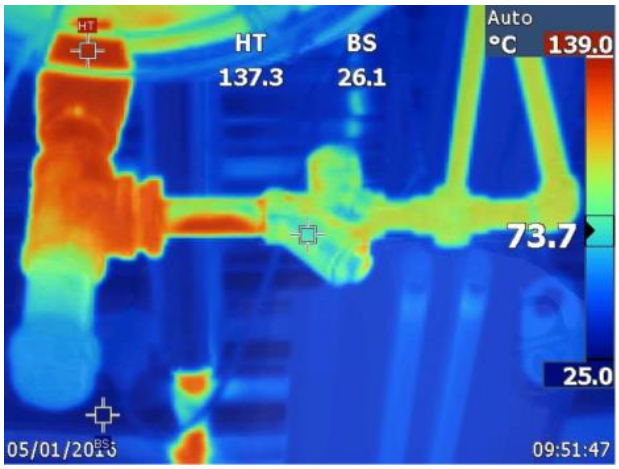
Houde continues, "We had estimated that roughly 20% of our mechanical steam traps had either failed fully or partially open. The project was submitted for approval with an estimated 28 000 M lb steam saving. On record, the best year for steam consumption was in 2012 where we produced 364 000 M lb of steam. In the first complete year of use, we consumed 302 000 M lb, a difference of 62 000 M lb on the historical best."

"Though one other steam project was done over the same fall shutdown, half of the steam savings can be attributed to the replacement of the steam traps alone".

Houde ends off saying, "The traps have worked worry-free since their installation. We've had the first annual inspection early this year, and we had to clean no more than 10 units, well under the industry accepted failure rate for mechanical traps.

Overall, we have nothing but good things to say about our Venturi steam traps."

Typical Delta venturi steam trap fitted on steam system.



Temperature readings clearly showing the Delta steam trap working well.

REFERENCE:
Michel Houde – Michel.houde@krugerproducts.ca
Tel: 819-595-5314

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CUSTOMER CASE HISTORY

DANONE DAIRY – NEW ZEALAND

Danone ordered a steam trap for a 10MW heat exchanger for hot water at one of their New Zealand dairy factories. The dairy factory had already installed a number of our steam traps and they were happy with them, so when this application arose, they directed the consultant to specify a venturi orifice steam trap for this new application.
The consulting firm was originally looking to use an 80mm ball float mechanical steam trap for this application as they did not have any experience with venturi orifice steam traps.

The brief was for the heat exchanger to reach temperature quickly and the consultants were doubtful that the Delta venturi steam trap would be able to respond to the turn up speed they required to meet the design conditions. An agreement was made that stated that if the trap did not meet the design criteria, we would pay for a trap of their choice to replace it. The consultants were doubtful, and what caused even more scepticism was that a 40mm Delta venturi steam trap was supplied for the application with a written guarantee of performance instead of the 80mm steam trap specified.

During commissioning the control loop had to be slowed down because the response was too fast. The result: The dairy factory is happy with the performance of the unit and the consulting firm is entirely happy with the trap's performance as well as the lower cost of the trap compared to that of an 80mm mechanical ball float trap. Needless to say, the consulting firm has confirmed that they will be looking to specify Delta venturi steam traps going forward.

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CUSTOMER CASE HISTORY

SHENZHEN YIXING LAUNDRY - CHINA

Shenzhen Yixing Laundry specialises in providing laundry services for hotels, swimming clubs, restaurants, and catering companies. Due to the environmental emission requirements of the Shenzhen Municipal Government, the industrial park has centralised the supply of natural gas-fuelled boiler for steam supply, and the unit price of steam has increased considerably, resulting in reduced profits for the company.

In October 2018, in response to the energy saving needs of the company, the local brand thermodynamic (TD) type steam traps and inverted bucket type steam traps that were fitted on six of their dryers were replaced with Delta model DSV venturi steam traps, with the aim of reducing steam consumption.

Results provided by the customer after installing the Delta traps, showed a steam saving of 20% immediately. Drying temperatures were easily achieved and production was able to run at full capacity.

The customer is extremely satisfied with the results from the steam trap replacements and has put a plan in place to replace all steam traps in the laundry with Delta venturi steam traps within the next 6 months.

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4 March 2015

RE: DELTA VENTURI STEAM TRAPS

Steam tracing systems, both the design and equipment used, are crucially important to the reliability and stability of any operating plants that require process lines or equipment to be kept warm/hot. Research and Technology (R&T) Operations have investigated alternatives to the conventional thermodynamic steam traps during 2009.

One of the alternatives that were piloted in R&T operations was the Delta Venturi steam straps. The findings were that the delta venturi steam traps worked well in our particular environment, requiring no maintenance yet and proving to be equally efficient to a well maintained conventional thermodynamic steam trap. It is important to note that correct sizing of a Delta Venturi steam trap and strainer system will ensure good efficiency and reliability for its application.

R&T has since installed over 500 venturi steam traps on the 12 bar steam tracing system of its plants.

Mein Faling

Acting Snr Manager R&T Projects

Group Technology R&T Operations& Analytics: Projects
(+27) 016 960 2373 www.sasol.com

Jacques Verwey

From: Mienie, Ansie (JM) [ansie.mienie@sasol.com]
Sent: 16 October 2014 09:59
To: Bryan@delta-industries.com
Subject: Ref on delta steam traps

Dear Bryan

In March 2011 we converted our site to Delta Venturi Orifice Steam Traps with great success.

Since installing the Delta steam traps, we have noticed the following results:
- Improved heat transfer and higher production temperatures than we have ever achieved
- Water hammer on the plant has been completely eliminated
- We have not done any maintenance on our steam traps since installation

We are completely satisfied with the Delta venturi orifice steam traps that you supplied to us and would not hesitate to recommend these steam traps for refinery process, main line and trace heating applications.

Kind Regards,
Ansie

sasol
reaching new frontiers

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P.O. Box 1, Sasolburg, 1947
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Ansie Mienie
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Environmental awareness starts with each of us – think before you print this page

Bryan Anderson

From: Mienie, Ansie (JM) <ansie.mienie@sasol.com>
Sent: 24 July, 2018 10:16 AM
To: Bryan Anderson
Subject: RE: Steam Traps

Good day Bryan

We are still using the Delta steam traps. I have no problems, they have been working since we have installed them without any problems. I have not replaced even one steam trap since we installed them.

Regards
Ansie

From: Bryan Anderson [mailto:bryan@deltasteamsystems.com]
Sent: 23 July 2018 14:44
To: Mienie, Ansie (JM) <ansie.mienie@sasol.com>
Subject: Steam Traps

Hi Ansie,

I trust that you are well.

Would you mind please sending me an email stating if our steam traps are still in on your site and if they are still working at your site and if you are still satisfied with them since they have been installed in 2011?
I would really appreciate if you could assist me with this so we can clarify once and for all the status of our steam traps.

I apologise if this is an inconvenience to you and would appreciate your feedback.

Kind regards,
Bryan Anderson

DELTA STEAM SYSTEMS
Steam Traps. That. Work!
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Web: www.deltasteamsystems.com

TEXCARE
LAUNDRY AND DRY CLEANING SPECIALISTS

02 October 2019

Dear Mr Anderson,

Thank you for the professional and high standard of service you have provided to our company.

I want to take this opportunity to share the great outcome we experienced from using your venturi steam traps.

As you know, we installed one sample venturi steam trap to test in June 2018. We ran the test for two months with monitoring going on constantly. After the two months were up, we decided to convert all our steam traps in our laundry to Delta venturi steam traps.

We noticed a difference immediately. The hot well vent pipe which had been venting large amounts of live steam stopped blowing immediately, and only a small amount of flash steam was visible; this is clear evidence that there was an immediate steam saving from using Delta venturi steam traps.

Production on our equipment went off without a hitch, and we have experienced constant high levels of production efficiency since converting steam traps. The heating efficiency of all our machines is excellent, and no problems arose whatsoever from fitting the Delta venturi steam traps.

All our steam using equipment runs on varying steam loads, and the Delta steam traps handle the varying loads without any problems whatsoever. I would go so far as saying that they Delta steam traps handle varying loads better than the original conventional mechanical steam traps that were on the laundry equipment.

The Delta steam traps have been running in our laundry for over a year now without any problems at all allowing us to focus on our core business and not having to worry about replacing faulty steam traps. The 20-year guarantee, furthermore, gives us peace of mind and confidence in the Delta steam traps.

Our experience with the Delta steam traps has proven that the negative comments from other well known conventional mechanical steam trap suppliers such as Spirax Sarco and TLV are unfounded and baseless.

I would be happy to recommend Delta venturi steam traps to any steam using company looking to replace their steam traps.

Please feel free to recommend any potential customers to me if they would like to discuss anything.

PARSONS

Kind Regards
Chris Parsons

12-22 Berkley Road
Maitland/Ndabeni
Cape Town. 7405

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Reg no: 2004/007125/07 | VAT No: 402 502 16340 | Director: L. Parsons

RADIAN
Engineering Solutions with Unique Technologies

TO WHOM IT MAY CONCERN

Radian Oil & Gas Services Company as the sole distributor for Delta Steam Systems in Kingdom of Saudi Arabia has supplied Delta Venturi orifice Steam traps to the following companies:

1. SIPCHEM (private Petrochemical Company)
2. Aminat (Private Petrochemical Company)
3. Eastern Petrochemical Company (Sharq), Sabic Company
4. Saudi Aramco Abqaiq Plants (stabilizer and NGL plant)
5. Saudi Aramco shedgum plant
6. Al Marai Dairy
7. Marafiq (Power Plant)

If there are any questions regarding this, please feel free to contact us.

Sincerely

شركة ريديان لخدمات النفط والغاز
س.ت: ٢٠٥٠٠٧٠٦٢٦
قسم المبيعات
RADIAN
SALES DEPT.
C.R: 2050070626
RADIAN OIL & GAS SERVICES CO.

Mansoor Khan
General Manager

Radian Oil & Gas Services Co.
Dammam
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Mobile : +966550572778

مـــرافـــق
MARAFIQ

Ref : TS-Y-13-0494 الرقم :

Date : 13 MARCH 2013(G) التاريخ :

To : Radian Oil & Gas Services Co.
Dammam, Kingdome of Saudi Arabia

From : Manager, Technical Services Department, Yanbu

Subject : Delta Venturi Orifice Steam Trap

We would like to express our appreciation to Radian Oil & Gas for the prompt and courteous service that we installed Delta Venturi Orifice Steam Trap in condensate return line of heavy fuel oil heater in STG 4, that solve the chronic problem of dumping condensate at high temperature and environmental affect.

Mr. Syed Parvez Wali of Radian Oil and Gas introduced us Delta Venturi Orifice Steam Trap after survey the site in Marafiq Plant, Yanbu and advised us to replace the existing steam trap with Delta Steam Trap. MARAFIQ installed Delta Steam Trap on 15th July, 2012. We found its performance satisfactory.

We wish Radian to keep on providing such services to us to save our operation & maintenance cost.

Best Regards

13-3-13

Yarbah Al-Shangiti
Manager, Technical Services Dept.
Marafiq – Yanbu

Maher Baflah

شركة الأمينات العربية
Arabian Amines Company
Limited Liability Company - شركه ذات مسئوليه محدوده

أمينات
Aminat

To : Radian Oil & Gas Services Company
: Dammam, Kingdom of Saudi Arabia

Dated : 22/12/2013

From : Maintenance Manager, Aminat Company

Subject : **Delta Venturi Orifice Steam Traps**

This is to acknowledge that Radian Oil & Gas Services had in agreement with Aminat to install eleven pieces of Delta Venturi Steam traps on our D-1540 heating system on 17th April 2013 for a testing period of six months.

Since installation till end November 2013 the traps were performing satisfactorily meeting our severe expectation. The full stainless steel construction with maintenance free concept together with constant discharge principle had reduced substantial the loss of energy and the water hammering effect too.

Aminat will not hesitate to replace any other faulty steam traps in the plant to Delta types.

Please do hesitate to contact me for any query. Thank you.

Regards,

Andy Tan
Maintenance Manager
AAC EA Plant Jubail Industrial City
Kingdom of Saudi Arabia
Email : andy_tan @huntsman.com
HP +966 506364 990

12 September 2016

To whom it may concern,

In the past we were experiencing problems with our tube heat exchangers splitting and float traps failing on our plant, along with slow heat up times.
Since meeting with Derek from Steam and Process, we replaced 2 traps with the new Delta venturi traps.
The changes were noticeable straight away, no water hammer and everything seemed so much smoother.
Also heat up time was a lot faster.
At the moment we have converted about 90 percent of our plant.
In my view the venturi steam trap outclasses the old technology of a float trap.
Despite what other manufactures say about this product, I have found them to be excellent.
I would fully recommend converting any steam equipment to Delta Venturi Orifice Steam Traps.

Grant Sorenson

Canterbury Woolscourers
A Division of Cavalier Woolscourers Ltd
PO Box 2048
Washdyke
Timaru 7941

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www.swartland.co.za
e-mail: mail@swartland.co.za

SWARTLAND
GUARANTEED WOODEN WINDOWS & DOORS

31 March 2013

Delta Steam Systems
11 River's Edge Business Park
Winelands Close
Bellville

Mr. Anderson

I would like to take this opportunity to thank you for the good service that your company has provided us with, and the professional approach that has been taken throughout our dealings.

We are very happy with the Delta Venturi steam traps that you have installed on all of our kilns and have experienced exceptional performance and durability since installing them over five years ago.

In the past, water hammer was a constant problem on our site which would regularly damage the floats of our ball float traps resulting in the use of costly spare parts and labour as well as unwanted down-time and steam losses. After the installation of Delta Venturi steam traps, we have not had one single problem with water hammer resulting in any damaged traps.Water hammer to a large degree has been eradicated through operator training, but where it has occurred there have been no problems. Thermodynamic (TD) traps which were failing regularly on steam line drip legs but since replacing them with Delta Venturi steam traps we have not needed to replace or repair these traps at all over the last 5 years.

Furthermore, drying times are steady and timeous and we are experiencing excellent results through well dried timber.

Where in the past we were repairing or replacing between 5 and 10 mechanical type steam traps per month, we now do not have to perform any maintenance on the Delta Venturi steam traps at all and do not replace any of these traps at all.

We have also dispelled all the malicious rumours that Spirax and the other mechanical steam trap companies are spreading about the Venturi traps not being able to work on varying loads.

We strongly recommend that not only all sawmills and kiln operators, but also all steam users consider converting to the Delta Venturi Steam Trap System.

Yours faithfully,
For, **Swartland Boudienste**

Hans Hanekom
Technical Director

Date/Datum: 04/05/2009

Our Reference/Ons Verwysing:

Your Reference/U Verwysing: DELTA VENTURI ORIFICE STEAM TRAP SYSTEM

TYDSTROOM
Fresh farm chicken

TO WHOM IT MAY CONCERN

DELTA VENTURI ORIFICE STEAM TRAPS WERE INTRODUCED TO THE COMPANY AS A TEST PROJECT ON A SINGLE COOKER, DUE TO SCEPTICISM. INITIAL TRIAL RUNS SHOWED THAT THE DELTA TRAPS WERE OUT-CLASSING THE OLD SPIRAX FLOAT TYPE UNITS, AND IT WAS DECIDED TO REPLACE ALL STEAM TRAPS IN THE PLANT WITH DELTA VENTURI ORIFICE STEAM TRAPS.

SAVINGS WERE QUICKLY REALISED AND ONCE ALL THE UNITS WERE IN PLACE A COST SAVING OF +/- R6000.00 PER SHIFT X 20 DAYS WAS REALISED WITHIN THE FIRST MONTH, DUE TO EXTRA THROUGHPUT OF PRODUCT IN THE SAME SHIFT TIME. THIS EQUATED TO A MONTHLY PRODUCTION SAVING OF R120 000.

THE AVERAGE MONTHLY SAVING ON COAL IS 14% LESS THAN LAST YEAR'S AVERAGE. THIS MEANS AN ADDITIONAL SAVING OF R 26,000.00 PER MONTH ON FUEL ALONE. THIS DEFINITELY SHOWS THAT INSTALLING DELTA STEAM TRAPS, WITH AN IMMEDIATE PAYBACK HAS BEEN A VERY WORTHWHILE EXERCISE.

MAINTENANCE MANAGER
D. WHEELER

PIONEER

2nd December 2010

Delta Industries
Unit B3 Bellville Business Park
DJ Wood Way
Bellville

Dear Mr. Verwey

CONVERSION OF CLOVER PAROW PLANT TO THE DELTA VENTURI ORIFICE SYSTEM

I would like to thank you for your good service and professionalism that your company has provided us over the past nine months.

The Delta Venturi Orifice steam traps that you installed throughout or plant about six months ago are performing exceptionally well and we have had no problems to date.

We have noticed improvements in heat- up times and all water hammer in our system has been eliminated since we converted to Delta traps. Also, our pasteuriser performance is significantly better.

The biggest benefit has been the financial one. We have compared our boiler fuel to production volume output ratio for a period after the conversion. Our average monthly fuel saving is 17.1% as a result of changing to the Delta System. At the current oil price, this is a saving of R286, 000 per year. The actual payback on our initial investment in the Delta Venturi Orifice Traps was only 2.1 months.

We are also aware that other mechanical steam trap companies are making claims that Venturi Orifice Traps do not work over varying loads. Varying loads in the steam system is a normal part of our process and the Delta Venturi Orifice Traps are working extremely well in these applications with no backing- up of condensate and no leaking of steam.

Based on our own good experience, we can only recommend that not only all dairies, but also all steam users consider converting to the Delta Venturi Orifice Steam Trap System.

Yours faithfully

Francois van Eeden

Clover S.A. (Pty) Limited **Roodepoort Head Office**
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F A L K E

F A L K E EUROSOCKS P O BOX 228 BELLVILLE 7535 SOUTH AFRICA

22nd February 2011

Delta Steam Systems
Unit B3, Bellville Business Park
DJ Wood Way
Bellville

Dear Jaques

INSTALLATION OF DELTA VENTURI ORIFICE STEAM TRAPS

When we were first introduced to your energy saving steam traps, we were a bit skeptical as to whether they actually worked as efficiently as you claimed. After receiving feedback from other textile references, we opted to replace only the failed mechanical type traps in our plant with the Delta Traps.

About 50% of our traps in the factory have been replaced with the Delta Venturi Orifice steam traps and we have been running extremely well for about 7 months now.

We have seen improvements in process temperatures, heat- up times and we have no more water hammer in our system. All of the new Delta traps are performing extremely well and we have had no problems to date. We have also not needed any maintenance on any of the new Delta traps.

The most astounding result is the saving of HFO which is in the region of 15 % month on month, with production volumes being fairly constant over the 4 month period. This immediate saving equates to about R 350,000 per year based on the current oil price. The payback on our investment in Delta traps was about 1 month only.

Thanks for the professionalism and excellent service you have provided us with up till now, and we have decided to replace all our old mechanical traps with Delta Venturi Orifice traps as they wear out and fail.

Thank you also for your willingness to share your expertise and experience relating to the overall steam reticulation system and we certainly recommend you to our other business partners.

Regards

Jesko Serrer

MARS
africa

MARS CONSUMER PRODUCTS AFRICA (PTY) LTD
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5 November 2014

To Whom It May Concern

Mars Africa has been using Delta venturi orifice steam traps on our steam system since March 2013.

We have converted our main line traps as well as our main dryer from old type thermodynamic and ball float type traps to Delta venturi orifice steam traps with great success.

While there are no steam flow meters to measure steam usage, we are confident to say that the Delta steam traps have assisted in reducing our boiler fuel usage.

The Delta steam traps are hassle free and are efficient in keeping our saturated steam system dry and at the same time restricting steam from passing.

Our steam system is a fluctuating system with variations in pressure and load. We have found that the Delta venturi steam traps are easily able to cope with these fluctuations with no adverse effects at all.

Finally, our main steam line from the boilers to the factory is over 120m long, it is outside and exposed to large temperature fluctuations as experienced in Cape Town. The Delta traps have no problem in managing any additional condensate loads that may occur from summer to winter seasons.

I would definitely recommend that Delta venturi orifice steam traps be fitted, not only in the food industry but on all steam trapping applications.

Kind regards

Danie Hattingh
Site Engineer

René Santhagens
OUDE MOLEN
DISTILLERY

12 January 2011

Delta Steam Systems performed a steam system survey on our plant in April 2010 where they went about testing all steam traps to determine the amount of leakage through our steam traps and how much money could be saved by replacing these traps with their Delta venturi orifice steam traps.

The results of the survey indicated that our steam traps were wasting over 530 tons of steam per annum which translated to a massive yearly financial loss. Based on these figures it was decided to replace not only the leaking steam traps on the plant, but also the functioning steam traps, so that any future leakage could be eliminated.

Delta engineers converted our full plant over one weekend without the slightest problem and when we started up on the Monday morning the results were startling:

- We had absolutely no more water hammer
- We achieved much faster start up times
- We no longer had to refill the hotwell tank during the course of the day
- Still temperatures were constant and batch times were shortened

Over the 8 months that the Delta steam traps have been running we have certainly experienced a saving and the 10 months payback predicted by Delta was achieved well within this time frame.

It has been a pleasure working with the Delta team over the last 8 months and not only have they dramatically improved our system through their steam traps, they have also pointed out and corrected numerous other problems on our steam reticulation system, which when fixed has improved our process and saved us money.

Delta Steam Systems is a professional, well managed company that is never afraid to go the extra mile to help solve a problem, and through this exemplary service I am confident that their business will grow from strength to strength.

Yours faithfully

Eddy Beukes
Production Manager
Oude Molen Distillery
eb@oudemolen.co.za

permoseal®

CAPE TOWN:

JOHANNESBURG:
46 Forge Road, Spartan 1619

DURBAN:

27th February 2012

Delta Steam Systems
Unit B3, Bellville Business Park
DJ Wood Way
Bellville

Dear Mr. Verwey

INSTALLATION OF DELTA VENTURI ORIFICE STEAM TRAPS

When we were referred to your Company by our boiler supplier, we had never heard of, or seen venturi orifice steam trap technology. The results of the comprehensive survey that you did made the decision to convert our entire plant, very easy.

For the full year we have been running on Delta traps, we have seen improvements in process heat- up times, no more water in our live steam and absolutely no more water hammer in our system. Without exception, all Delta traps are performing extremely well and we have not done any maintenance on steam traps at all for a whole year.

We have seen a significant saving in our HFO consumption (35% - R 200000.00), despite production volumes that have increased.

We appreciate the professional approach and great service you have provided us with over the past year. Thank you also for your willingness to share your technical know-how and experience relating to steam systems.

Looking at our own success story, we can only recommend the Delta Venturi Orifice Steam Trap System to any steam user.

Yours faithfully

Erlend von Maltzahn
OPERATIONS MANAGER

DELTA VENTURI STEAM TRAPS ENABLES BYK CHEMIE TO REDUCE STEAM USE BY 10%

BYK Chemie Gmbh of Wesel, Germany, a company whose name is synonymous with the manufacture of quality additives for the paint, printing ink, plastics, adhesives and paper industries, is enjoying a 10% saving in energy usage on its heating cabinets after changing the mechanical traps to the Delta Venturi orifice steam traps from Delta Steam Systems, South Africa. Now the company is looking at replacing mechanical traps on other steam applications with the Delta Venturi design.

Steam is the primary energy source at the company's facility in Wesel and is used for a wide range of applications. The new heating cabinets have been installed to increase capacity at the Wesel plant. Despite only being installed for six months using mechanical traps, Project Engineer, Michael Hoch decided to investigate the energy saving of the venturi orifice designed steam traps.

"We had conducted some small scale tests and wanted to see how much energy we could save, so despite the fact that the heating cabinets had only recently been installed, we decided to conduct a trial of the new conventional mechanical traps against the Delta venturi steam traps using steam measurement equipment", said Michael Hoch.

The trial, carried out on the heat cabinets, was monitored by a flow meter to verify the steam consumption. It not only established that the Delta Venturi steam traps were totally reliable but also that they had achieved steam savings of 10%.

“Our process is very variable and the loads for the cabinets can change dramatically”, concluded Mr Hoch. “Despite this the Delta venturi orifice traps had no problem with the differences in steam capacity.”

The Delta Venturi orifice steam traps work by using the difference in density between steam and condensate. Steam is 1000 times less dense than condensate, so at the entrance of the trap’s orifice, the low-density steam is literally squeezed out of the condensate. The high density, low moving condensate is then preferentially discharged through the orifice, trapping the low-density steam behind it.

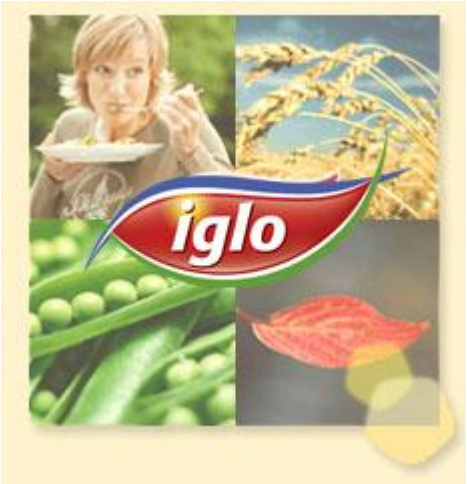
What makes the Delta trap different is its venturi orifice configuration, which works well over varying loads by using the ‘flash’ steam that comes out of condensate as it passes from high to low pressure to give a self-regulating, varying capacity. As the Delta Venturi orifice steam traps have no moving parts to wedge open or fail, it provides the ultimate in reliability necessitating only minimal maintenance and requiring no spares, testing or monitoring equipment.

Available in a wide range of sizes for a full cross section of applications, the hardwearing Delta steam traps are manufactured from corrosion resistant stainless steel and are guaranteed for 10 years, obviating the need for repair or replacement. The Delta steam traps provide a fast payback - on some processes within a matter of days - from reduced energy costs and increased equipment reliability due to a reduction in damaging condensate in steam systems.

In addition it improves product processing by enhancing the quality of steam and also reducing equipment repairs, downtime and replacement costs. **Ends**

About BYK Chemie

BYK is globally synonymous with additives of premium quality and functionality in the paint, printing ink, plastics, adhesives and paper sectors. Wherever optimized surfaces, improved optics or the facilitation of production are called for, BYK has the unique and optimized solutions on hand, or the knowledge and the technical expertise to develop new products and find tailor-made solutions for your applications.



DELTA VENTURI ORIFICE STEAM TRAPS CUT IGLO'S APPETITE FOR STEAM

Langnese-Iglo GmbH Reken plant, Germany is on track to make significant energy savings following the installation of the Delta Venturi orifice steam traps at the company's Iglo frozen vegetables and herbs factory in Redken. Since installing the steam traps the company has seen a ten percent reduction in its steam usage

During the main season, Iglo's Reken factory processes more than 25 tonnes of spinach per hour in large hot water vats. The vats are steam heated to 95^{o}C with the condensate being removed by traditional mechanical steam traps.

Martin Wieskus, Site Production Engineer, contacted Delta's local agent to trial the Delta Venturi orifice steam traps. Following a site survey, Langnese-Iglo were supplied three 50mm traps on a long-term trial during the production season.

"We had seen the traps used by other industries and wanted to see if we could obtain the same energy savings", said Herr Wieskus. "We were delighted with the results which measured a reduction in steam usage of 44Kg per tonne of spinach produced."

Langnese-Iglo has been able to determine that the Delta steam traps have reduced steam usage by over 10% lowering energy consumption as well as carbon emissions. Such has been the success of the Delta Venturi orifice steam traps that Martin Wieskus has now recommended the technology to other colleagues in the Group and will be looking to upgrade other on-site steam heating plants.

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Wirtschaftsdienste Hellersen GmbH

WIDI LAUNDRY GERMANY SEES ENERGY AND WATER COSTS TUMBLE AND CO2 EMISSIONS FALL AFTER FITTING DELTA STEAM TRAPS

Dedicated to taking an active role in reducing its carbon emissions as well as saving costs, WIDI Laundry in Lűdenscheid, Germany has seen a dramatic improvement in its efficiency after installing Delta venturi orifice steam traps throughout the plants. Supplied through a local Delta agent, the venturi orifice steam traps have reduced the laundry's CO_2 emissions and its water usage by a remarkable 20%.

Established 40 years ago, a member of the Health Märkische Holding GmbH & Co. KG, WIDI Laundry handles over 30 tons of laundry a day from 60 hospitals and 58 nursing homes. Steam is used as a primary source of energy throughout the laundry in the operation of a wide range of equipment including washers, ironers, collators and dryers.

Conscious that the laundry's mechanical steam traps were causing water vapour losses through evaporation from the hot well as well as poor condensate return, three years ago Christian Hackler, Production Director at WIDI Laundry asked our local Delta agent to undertake a complete steam audit of the plant.

"We commissioned a complete site survey and were amazed to see that steam losses were estimated at a five figure sum", said Christian Hackler. "We were also impressed to read that we would receive a payback on the Delta venturi orifice steam traps in as little as 14 months".

The first installation took place in the boiler house, where Sasha Kohla who is responsible for site services for WIDI Energy GmbH converted all the steam traps to Delta.

“Replacing all the steam traps was easy as they are fully compliant with all DIN standards”, says Sascha Kohla. “After the installation we saw that the operation of one of the shell and tube heat exchangers was not optimised. We were supplied a replacement insert for the Delta steam trap, which quickly resolved the problem. The overall result was very satisfactory as we no longer had live steam leaks and were even able to reduce the number of traps on some of our equipment as the previous installations had not been efficient”.

The remainder of the laundry was retrofitted with Delta venturi steam traps during 2012 and results were immediate:

“Straight after installation we noticed that the steam plume from the condensate receiver almost disappeared. The temperature of the condensate also reduced by 2-3°C, which could only be attributed to the leakage of live steam through the conventional mechanical traps.”

WIDI laundry is so satisfied with the performance of Delta steam traps that it has presented the technology to the Leivenst Laundry Group with the suggestion to other group laundries that they also improve their energy efficiency.

The Delta venturi orifice steam traps work by combining venturi technology with the orifice. The capacity of the venturi orifice traps is related to the size of the orifice and also to the backpressure generated inside the venturi. It is a combination of these factors that gives the venturi orifice trap its overall capacity.

As the condensate passes through the orifice there is a pressure loss. On the upstream side of the orifice (the heat exchanger or steam line side), the condensate has the same pressure and temperature as the steam and therefore contains a lot of energy. (It is hot). As it drops pressure across the orifice, the temperature and pressure of the condensate reduces, resulting in it containing less energy. However, energy cannot disappear. So the difference in energy between the high pressure/temperature upstream side and the low pressure/temperature downstream side (i.e. the condensate return system) is converted steam. The higher the pressure difference across a trap (and it is the same for all traps) the more condensate has to be converted into ‘flash’ steam. Venturi orifice technology uses this flash steam to create a backpressure inside the venturi. **Ends**

Less steam = lower energy costs
Reliability of mechanical condensate separators

The steam used in production at Rütgers plant in Castrop-Rauxel, Germany makes up a large percentage of the total energy expenditure. The condensate produced during the distillation process is discharged from the steam system via mechanical steam traps. To reduce costs, Delta Steam Systems, through their distributor for Germany, was commissioned to supply 10-year guaranteed Delta venturi steam traps in a distillation plant in the Aromatic Chemicals division. Significant improvements were evident after a very short period of operation.

Thanks to the use of the venturi steam traps, the steam consumption for the distillation cycle under consideration could be reduced by more than 20%, according to Thomas Reisensauer, sales manager and project manager at Rütgers.
Steam traps are used to remove condensed steam from steam systems, improving the efficiency thereof. There are several types, depending on the application. They all contain a mechanism which automatically opens the trap in the presence of condensate and closes it again as soon as steam escapes. The steam traps installed have a venturi opening and have zero moving parts. As a result, it is particularly reliable because the venturi opening allows condensate to freely pass, but not steam, through the laws of physics. It is the flash steam that is forming as the condensate moves from a high pressure to a low-pressure zone that stops the costly live steam from escaping and this regulates the amount of condensate discharged as the load changes.

Typical losses with mechanical steam traps and old orifice plate steam traps

Various mechanisms are used to ensure timely opening and closing of mechanical steam traps. For this purpose, internal floats, inverted buckets, bimetallic expansion valves and thermostatic cylinders are all used. During operation, steam traps must open and close several times per minute, hundreds of times per hour. This results in wear and leakage. According to the manufacturer, these mechanical steam traps must therefore be replaced every one to two years.

Often confused with advanced venturi type steam traps, a simple orifice plate type steam trap has only a limited application range with varying loads. It will only work if the load is relatively constant. With the venturi type steam trap, varying condensate loads are easily and effectively discharged without losing steam or backing up condensate. The orifice steam trap is also susceptible to ‘wire draw’ or wear of the orifice edges, which is eliminated with the venturi nozzle.

The condensate that is present before the opening of the venturi is under pressure and at temperature, and thus contains a lot of energy passing through the elongated nozzle, it opens up into the mouth of the diffuser and a pressure drop occurs; i.e. energy. Since this energy cannot simply disappear, it converts a part of the condensate in the opening back into steam at lower pressure, called flash steam.

The greater the pressure difference across the steam trap, the more flash steam is generated in the venturi opening. However, this also creates a counter-pressure, since this steam consumes a thousand times as much volume as the condensate from which it originated. Due to this sudden expansion, the steam generated in the orifice is accelerated and generates pressure both forwardly and equally to the rear. This limits the flow of steam through the steam trap.

Since the amount of steam generated in the venturi opening changes according to the operating conditions, the flow of the condensate regulates itself through the steam trap and therefore is able to self regulate condensate loads without the need for any moving parts.

Company Info:
Delta Steam Systems is a South African steam trap manufacturing company that offers long-term energy saving solutions for industrial manufacturers. DSS offers 20-year guaranteed steam traps based on a completely new technology, with special focus on the European market. Losses from traditional steam plants significantly contribute to boiler stack emissions and increased energy costs. The replacement of traditional mechanical steam traps with Venturi technology that have no moving parts, can lead to pay back of less than 12 months.

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