

Steam and Process Control Solutions

Solvent Extraction Industry

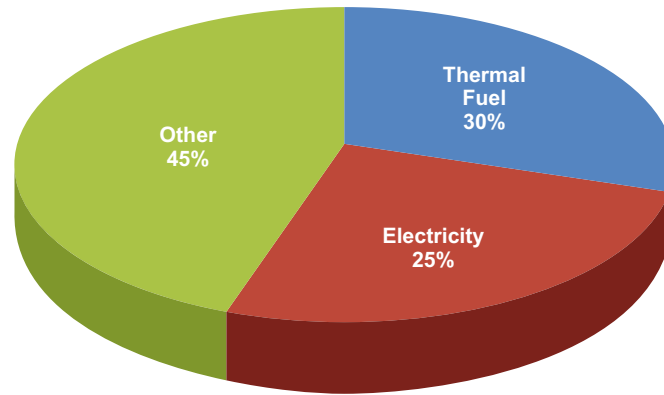


Solvent Extraction Industry

The cost of steam accounts for 30% of total processing cost of this industry and electricity consumption forms 25%.

For over 70 years, we have partnered the industry in providing solutions in control instrumentation, energy conservation and environmental monitoring. Our teams of the finest engineers are dedicated to serve the process industry across diverse sectors. World class manufacturing facilities and technology enable us deliver quality solutions globally. Our unique complimentary expertise enables us engineer customised systems that improve manufacturing processes, conserve energy and are environmentally sustainable. We partner customers with our knowledge, comprehensive range of services, products and solutions for utilities and process control.

Utility Costs, Gaps and Opportunities in Steam system



Energy Savings Potential

31%

Improving Steam Fuel Ratio
10%

Improving Specific Steam Consumption
21%

Optimising Boiler Efficiency
6%

Steam Leakages
2%

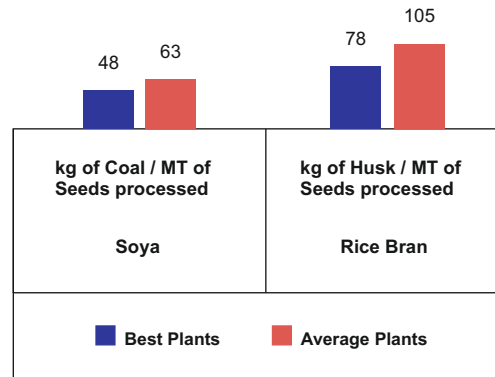
Steam Distribution Utilisation
6%

Condensate Recovery
4%

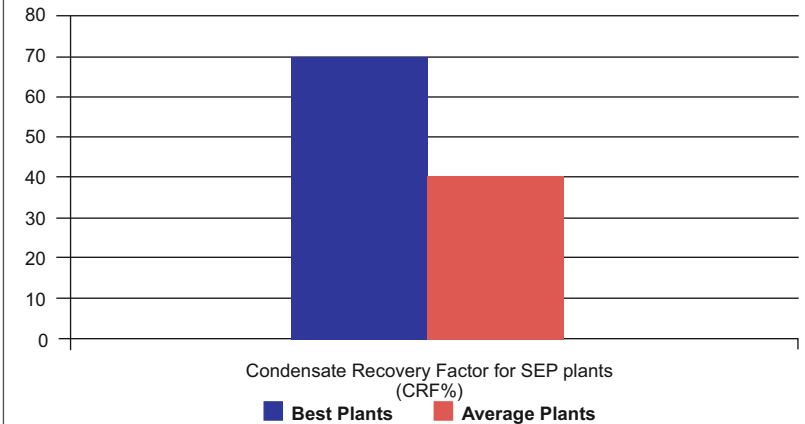
Waste Heat Recovery System
5%

Capacity Utilisation
8%

Specific Energy Consumption Norms



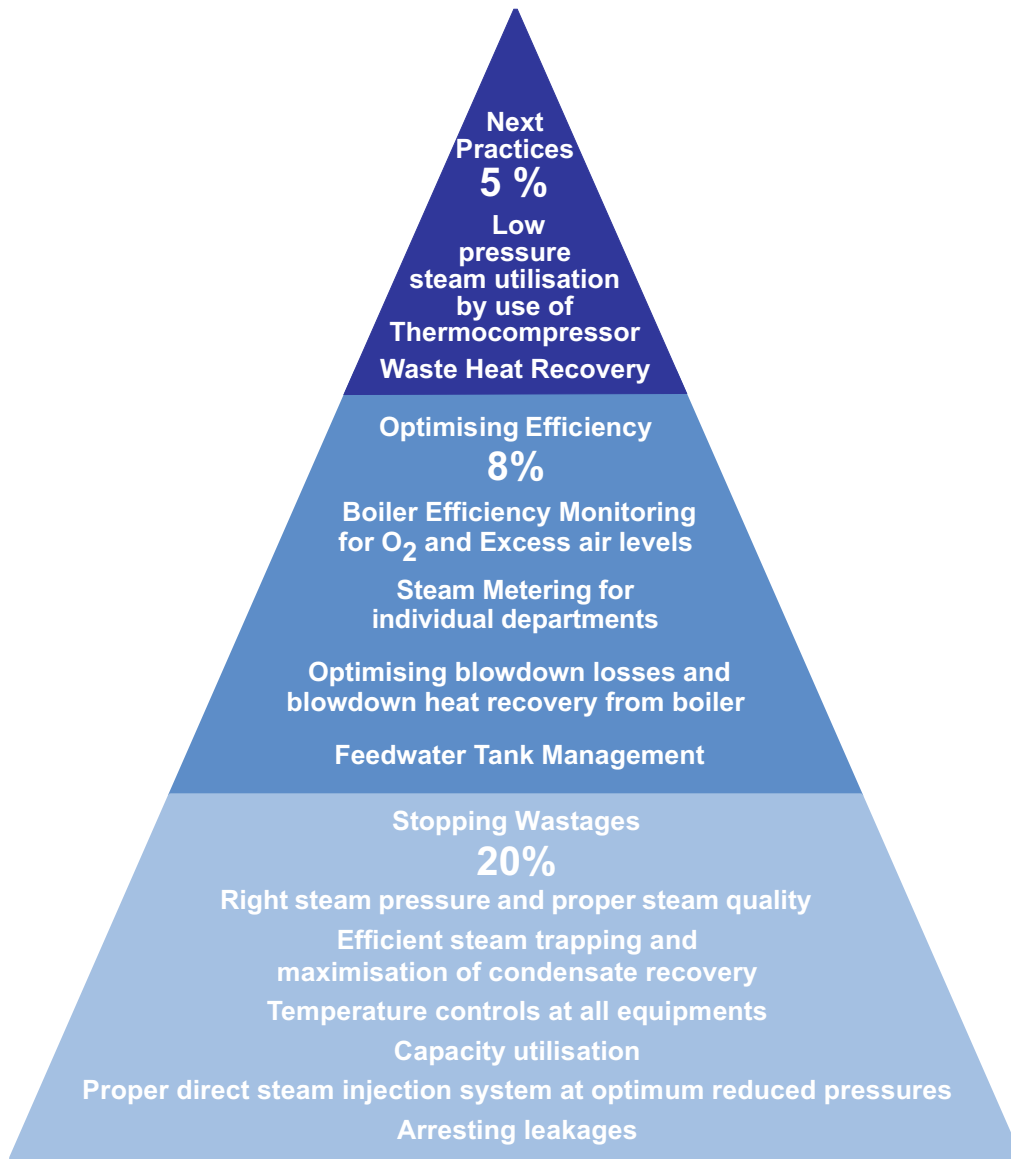
Condensate Recovery Factor



Potential to improve the CRF across the solvent extraction industry segment by 25 – 30% by bridging gaps in condensate recovery system.









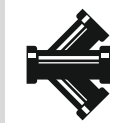



- Right design of condensate and flash steam by separating high and low pressure condensate
- Use of thermocompressor system to recover flash steam

Improving Steam Systems in the Solvent Extraction Industry



Energy Services for the Solvent Extraction Industry

Forbes Marshall provides services to help build reliable, energy efficient utility systems for the process industry thereby achieving new benchmarks.

- | | | | | | |
|---|---|---|----|---|---------------------------------|
| 1 |  | Basic and Detail Engineering | 7 |  | Steam System Training |
| 2 |  | Project Management | 8 |  | Energy Audits |
| 3 |  | Steam System Design Hazop | 9 |  | Safety Audits |
| 4 |  | Cogen Feasibility and Engineering | 10 |  | De-bottleneck Audits |
| 5 |  | Stress Analysis | 11 |  | Energy Management System Audits |
| 6 |  | Process Energy Optimisation with Automation | 12 |  | Steam System Management |

Forbes Marshall Helps Reduce Energy Consumption

Steam system automation of Desolventising Toaster (DT) has enabled improve hexane recovery and precise control of moisture levels at 10% in DOC. This has helped us achieve the best in industry specific fuel consumption of 282 kg of Husk / Ton of Rice Bran Oil produced.

Leading Rice Bran SEP plant in Eastern India

We are currently maintaining 78%+ Boiler efficiency with Effimax the online monitoring system, which has helped us in improving fuel combustion efficiency in boiler with fuel savings of 5%

An American global food process company

Forbes Marshall steam systems have helped us achieve 17% reduction on annual fuel bills with a sustained specific fuel consumption of 300 kg of husk / ton of seeds crushed. Automation of DT has helped maintain consistent quality of DOC and improved hexane recovery factor. We are utilising flash steam in the distillation process unit with the thermocompressor system. Condensate and remaining flash steam is sent to feedwater tank which has improved our boiler feedwater temperature by 20 °C.

Leading Soya SEP plants in Western India

A sustained savings of 18% has helped us achieve effective production throughput of 300TPD. Forbes Marshall steam systems have helped us maintain 100% system uptime at all times.

Manufacturer of Rice Oil in Eastern India

We have achieved a reduction of specific fuel consumption from 61 kg coal/ MT to 56 kg coal/ MT. This reduction is a result of implementation and installation of the Forbes Marshall steam system.

A Leading Manufacturer of Cotton Seeds in Maharashtra

Forbes Marshall has designed and supplied our steam system. We are able to achieve specific fuel consumption of 860 kg of husk /MT of seed crushed, departmental metering enables us monitor steam consumption on sustained basis.

A Multinational Food Processing Company



Forbes Marshall Pvt. Ltd.
Opp. 106th Milestone, CTS No. 2220, Mumbai-Pune Road,
Kasarwadi, Pune – 411034 INDIA
Tel : +91(0)20-68138555 Fax : +91(0)20-68138402

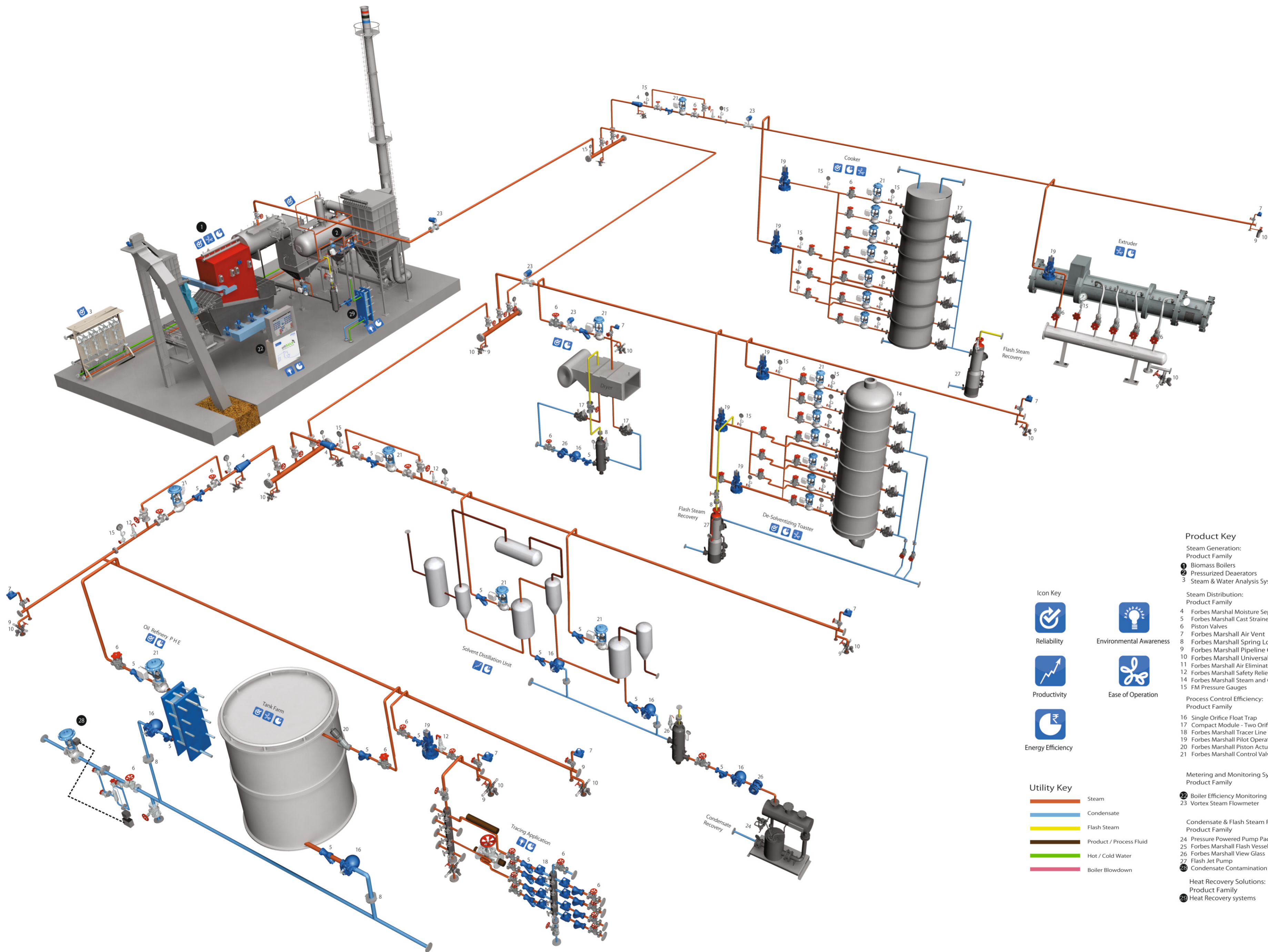
Forbes Marshall
Krohne Marshall
Forbes Marshall Arca
Codel International
Forbes Vyncke
Forbes Marshall Steam Systems

Email : corpmtg@forbesmarshall.com

CIN No.: U28996PN1985PTC037806

www.forbesmarshall.com

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- Icon Key**
- Reliability
 - Productivity
 - Energy Efficiency

- Environmental Awareness**
- Environmental Awareness
 - Ease of Operation

- Utility Key**
- Steam
 - Condensate
 - Flash Steam
 - Product / Process Fluid
 - Hot / Cold Water
 - Boiler Blowdown

Product Key		Model Name
Steam Generation:		
Product Family		
1	Biomass Boilers	Forbes Vynke
2	Pressurized Deaerators	Oxycal
3	Steam & Water Analysis System	SWAS
Steam Distribution:		
Product Family		
4	Forbes Marshall Moisture Separator	FMSEP34, FMSEP54
5	Forbes Marshall Cast Strainers	FMSTR34, FMSTR54
6	Piston Valves	PSVAL
7	Forbes Marshall Air Vent	FMAV53
8	Forbes Marshall Spring Loaded Disc Check Valve	FMDCV, FMDCVANSI
9	Forbes Marshall Pipeline Connector Series	FMPCS0, FMPCS1, FMPCS2, FMPCS3
10	Forbes Marshall Universal Thermodynamic Trap	FMTD64-U
11	Forbes Marshall Air Eliminators	FMAE31, FMAE53
12	Forbes Marshall Safety Relief Valve	FMSRV, VSR series
14	Forbes Marshall Steam and Condensate Manifold	FMCM4X, FMSCM8X, FMSCM12X
15	FM Pressure Gauges	PG
Process Control Efficiency:		
Product Family		
16	Single Orifice Float Trap	SOFT31, SOFT53
17	Compact Module - Two Orifice Float Trap	CMTOFT
18	Forbes Marshall Tracer Line Trap	TLT53, TLT53-Y
19	Forbes Marshall Pilot Operated Pressure Reducing Valve	FMPRV41, FMPRV53, DSPRV41
20	Forbes Marshall Piston Actuated Valves	FMPAV
21	Forbes Marshall Control Valves	Ecotrol serieS
Metering and Monitoring Systems:		
Product Family		
22	Boiler Efficiency Monitoring System	Effimax 500, 1000, 2000, 3000, 4000, Xmax
23	Vortex Steam Flowmeter	Flowiirl 8700, Accuflow
Condensate & Flash Steam Recovery System:		
Product Family		
24	Pressure Powered Pump Packaged Unit	PPPPU-C, PPPPU, MV55
25	Forbes Marshall Flash Vessel	FMFV
26	Forbes Marshall View Glass	VU10, VU30, VU50
27	Flash Jet Pump	FJP
28	Condensate Contamination Detection System	CCDS-C, CCDSS-PC
Heat Recovery Solutions:		
Product Family		
29	Heat Recovery systems	Model Name BHRS, VHRS, WHRS, DHF