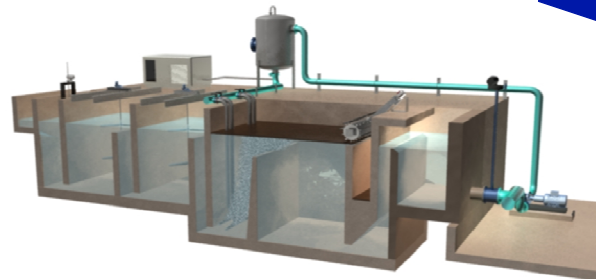




Enflo - DAF™

Product Summary Enflo-DAF™ is Doosan Enpure's patented Dissolved Air Flotation technology developed for potable, industrial and desalination pretreatment applications. The technology continues to be developed and presently offers reduced flocculation times, typically 5 - 10 mins, and enhanced treatment rates of up to 50 m/h to produce a high quality clarified water product.

Each Enflo-DAF™ system is designed to meet the specific requirements of the scheme, both in terms of process performance objectives and to fit within the area available where this is limited.



Product Variants :

In addition to high rate systems, Enflo-DAF™ incorporates a family of systems including Enflo-Filt™ - an in-filter or stack DAF system that incorporates filtration within the DAF basin, and Enflo-Sep™ which is suitable for industrial or waste applications where solids loads are significant.

Application Sizes :

Enflo-DAF™ is a modular system that can be configured to address plant throughputs between 1 and 1000 Mld. For flows up to 100 Mld, flocculation and flotation tanks can be constructed in concrete or supplied as a set of steel tanks.

Summary of Technical Parameters :

Flotation Cell (<i>comprising inlet prior to inclined baffle and separation zone</i>).		Recycle System	
Surface Loadings	10 – 35 m/h	Air	6-10 gm/m ³
Length	Typically 10-15m	Recycle	6 – 20% of feed
Width	Up to 12m	Air Release	Needle valves or fixed orifice nozzles
Depth	3 – 5m		
Sludge Removal	Mechanical or Hydraulic	Bubble Size	Determined by pressures and release device
Sludge Scrapers		Saturator	
Surface	Flight or paddle type	Operating Pressures	450-500 kPa
Bottom/Silt	Plants with high solids in feed	Efficiency :	
Sludge Dry Solids	2 – 6%	Packed	90 - 95%
		Unpacked	60 - 70%



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Key Equipment

Although Enflo-DAF™ systems can be supplied as turnkey, Design and Build contracts, Doosan typically delivers on a Design, key equipment supply and commissioning basis. Key equipment is identified as follows :

Enflo-Pi™ System



The Enflo-Pi™ modular system provides effective distribution of saturated water to the DAF nozzles whilst being straight forward to install within DAF tanks up to 12m wide. The system can be provided in either plastic or stainless steel.

Rotary DAF Scraper



The Enflo-DAF™ rotary DAF scraper provides superior process and operational performance to the traditional “chain & flight” or “reciprocating bridge” type systems traditionally used for mechanical sludge removal. Scrapers can be provided in either 316 or super-duplex stainless steel, depending on the application.

Saturator



Enflo-DAF™ saturators are typically supplied as a pack-tower design, complete with internal media to provide transfer efficiencies greater than 90%. For industrial applications, unpacked saturators are also available. Saturators can be provided as mild (painted) or stainless steel vessels with internal surfaces being offered with scotch-coat finish or rubber lined.

Enflo-DAF™ Nozzles



The Enflo-DAF™ Nozzle is a proprietary and patented design. Nozzles are configured for the particular application to provide optimum performance. Each nozzle can deliver up to 4 m³/h of recycle water. The nozzle body and spout can be provided in plastic or stainless steel.



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References

Enflo-DAF™ has been installed in more than 250 locations worldwide including Australia, Belgium, Brazil, Canada, Chile, China, Finland, Malaysia, Philippines, Romania, Russia, South Africa, United Arab Emirates, United Kingdom and the USA.

The table below provides a sample of typical installations.

Country	Plant	Featured Processes	Completion year	Capacity (m ³ /d)	Main Function
Philippines	Putatan WTP	DAF	2015	157,600	SW REF
Saudi Arabia	Ras Al Khair	DAF, DMF	2013	1,010,472	SWRO
Saudi Arabia	Ras Al Khair	DAF, DMF	2012	1,470	SWRO
USA	Lake Whatcom WTP	DAF	2011	438	SW
UK	Marchbank WTW - DAF	DAF	2009	62,000	SW
UK	Maundown WTW	DAF, RGF, GAC	2005	82,400	SW
UK	Barrow WTW	DAF, RGF, Ozone	2004	120,000	SW REF
New Zealand	Mount Grand WTW	DAF	2000	44,000	SW
Malaysia	Ipoh WTW	DAF	1999	275,000	DRI REF

Key :

SWRO Sea Water Reverse Osmosis DRI Direct River Intake
 Pretreatment REF Refurbishment/Existing Tanks
 SW Surface Water

Doosan Heavy Industries & Construction

www.doosanenpure.com



SEOUL OFFICE

Mail Code 137-920
465 Gangnam-daero, Seocho-Gu, Seoul, Korea

Tel. +82-2-513-6114 Fax. +82-2-513-6200

DOOSAN ENPURE

Doosan House, Parklands Business Park
Rubery, Birmingham, B45 9PZ, UK

Tel. +44-121-683-2800 Fax. +44-121-683-2888