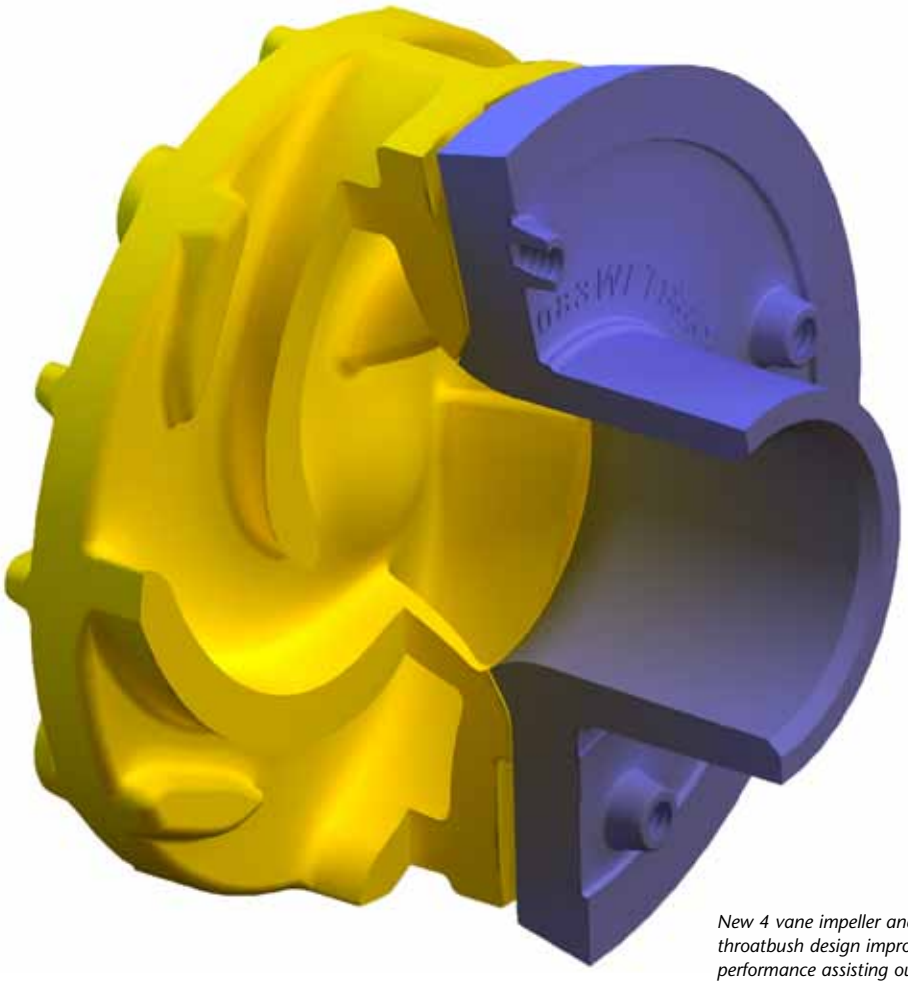
WARMAN®
Centrifugal Slurry Pumps

WRT®
Wear Reduction Technology

Excellent
Minerals
Solutions

WEIR MINERALS

The new Warman® WRT® is a superior upgrade for your existing Warman® AH pump designed to enhance efficiency and improve wear performance



New 4 vane impeller and matching throatbush design improve wear performance assisting our customers in reducing their total ownership cost

Warman® WRT® advanced technology

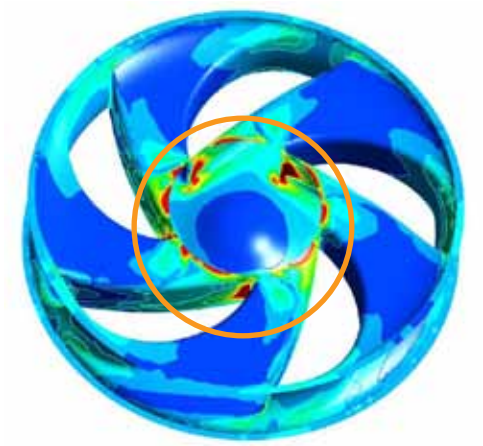
- Increased wear life – the impeller throatbush combination will increase wear life between 30% and 50%
- Power savings – lower pump power consumption
- Cost reduction – higher pump efficiency sustained over a longer pumping operation time
- Retrofit – new design parts retrofit to your current Warman® pump
- Lower NPSH requirements – results in enhanced hydraulic performance and extended wear life
- Material combinations – rubber or metal part combinations available

After extensive research and development Weir Minerals offers advanced technology to reduce total cost of ownership

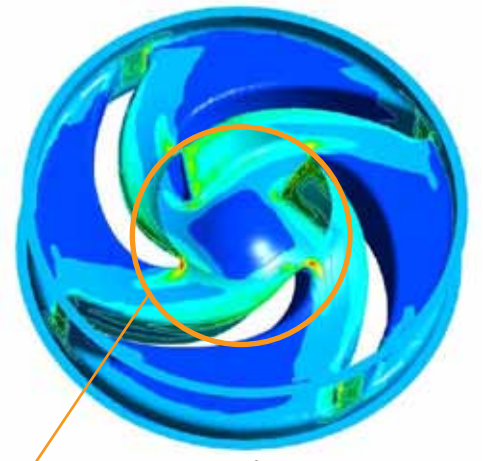
Years of actual wear data on the popular Warman® AH pump design has enabled our design engineers to use a novel integrated design approach, comparing this "real world" data with our Computational Fluid Dynamics (CFD) simulation to obtain correlation between predicted and actual results for the standard 5 vane slurry impellers.

This has resulted in the introduction of the new WRT® impeller and throatbush design. The new impeller design incorporates a unique vanelet on the back shroud which streamlines the flow through the impeller. This new combination provides significant improved wear life, with rigorous field testing showing increases in wear life of up to 50% on the previous design. This improvement also gives higher efficiency and therefore lower absorbed power and improvements in the NPSH performance.

CFD Software Simulations



5 vane design

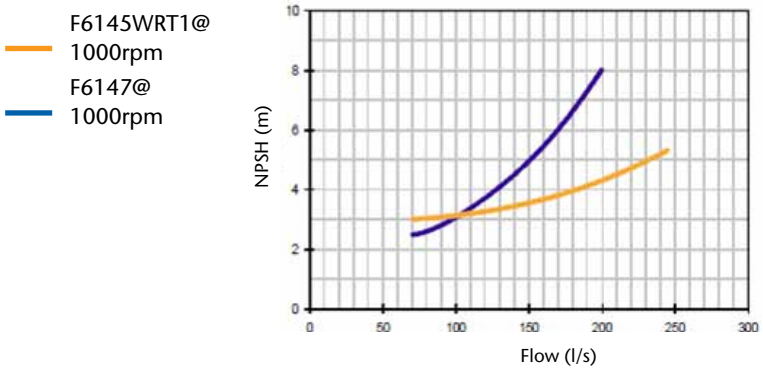


AH WRT® design

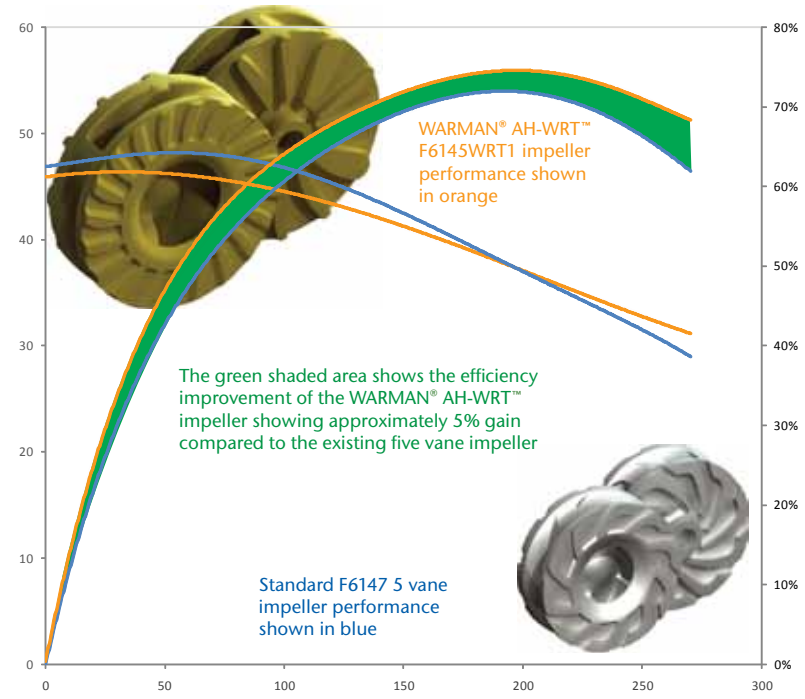
Noticeable hot spot reduction with new WRT® design

CFD Software used to predict hydraulic performance was used to simulate wear hot spots and develop the new WRT® designs.

8/6 AH™ NPSH test comparison- standard vs WRT® impeller



Impeller performance test data



Case Study

Location:
New Zealand

Industry:
Gold mine

Duty:
Mill discharge

Result:
54% increase in wear life on same duty

Standard impeller *1300 hrs*

AH WRT® Impeller *2000 hrs*

Case Study

Location:
Australia

Industry:
Alumina refinery

Duty:
Bauxite to slurry digestion

Result:
85% increase in wear life on same duty

Standard impeller *4200 hrs*

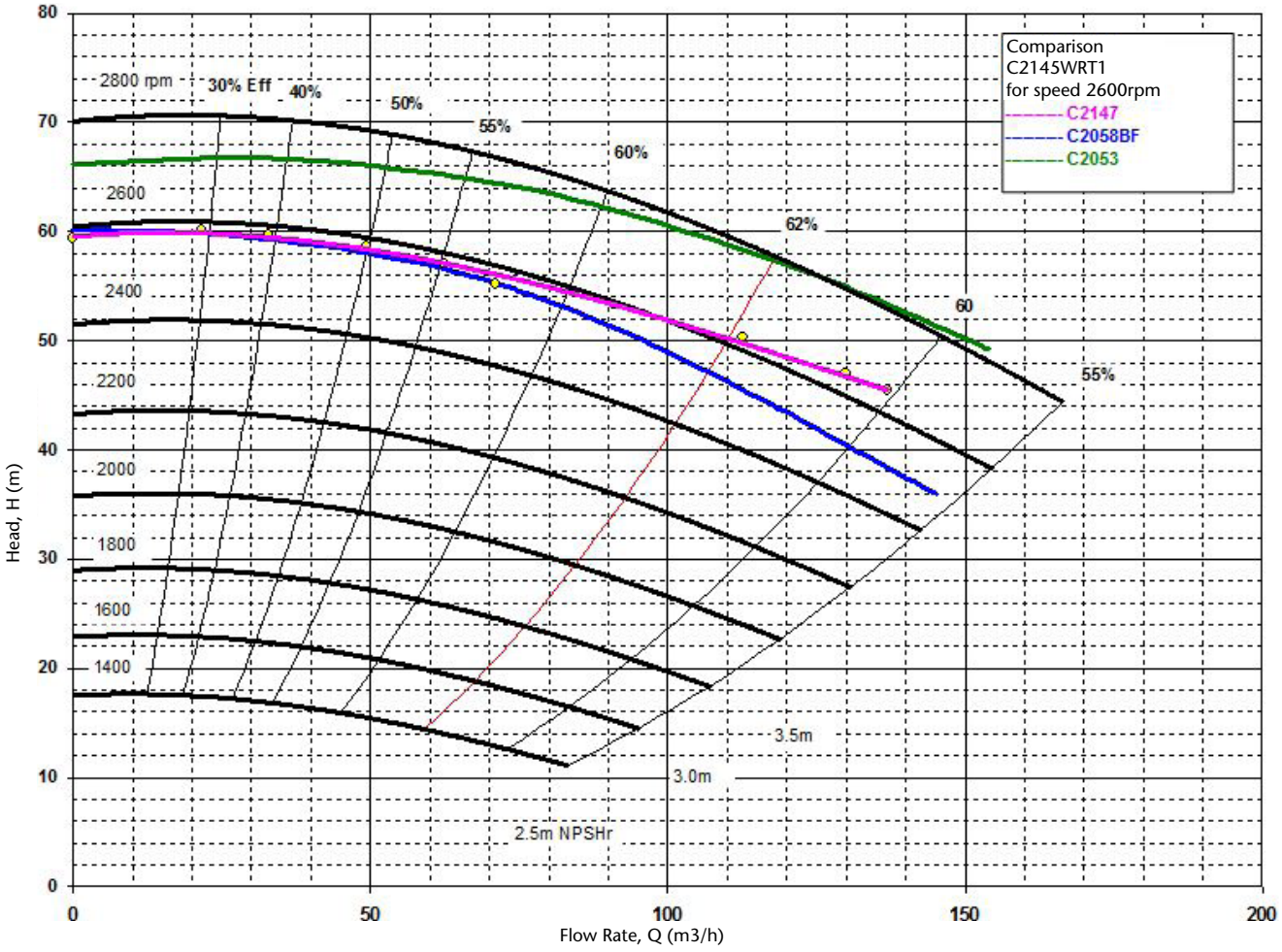
AH WRT® Impeller *7800 hrs*

Standard throatbush *4200 hrs*

AH WRT® Throatbush *7800 hrs*

Warman® 3/2 AH - WRT® Impeller Data and Part Numbers

Description	New Component				*Replaces			
	Part number	Number of vanes	Diameter	Passage size	Part number	Number of vanes	Diameter	Passage size
Impeller	C2145WRT1	4	230	18	C2147 C2058BF C2053	5 6 8	214 225 223	25 25 12
Volute CP Liner	C2110WRT1 C2017WRT1				C2110 C2017M			



Pump (mm)	Discharge	51
	Suction	76
Frame (Rating- KW)	C	30
	CC	55
Seal	Gland Seal Pump	
Liner (Norm Max r/min)	Polymer	2280
	Metal	3200

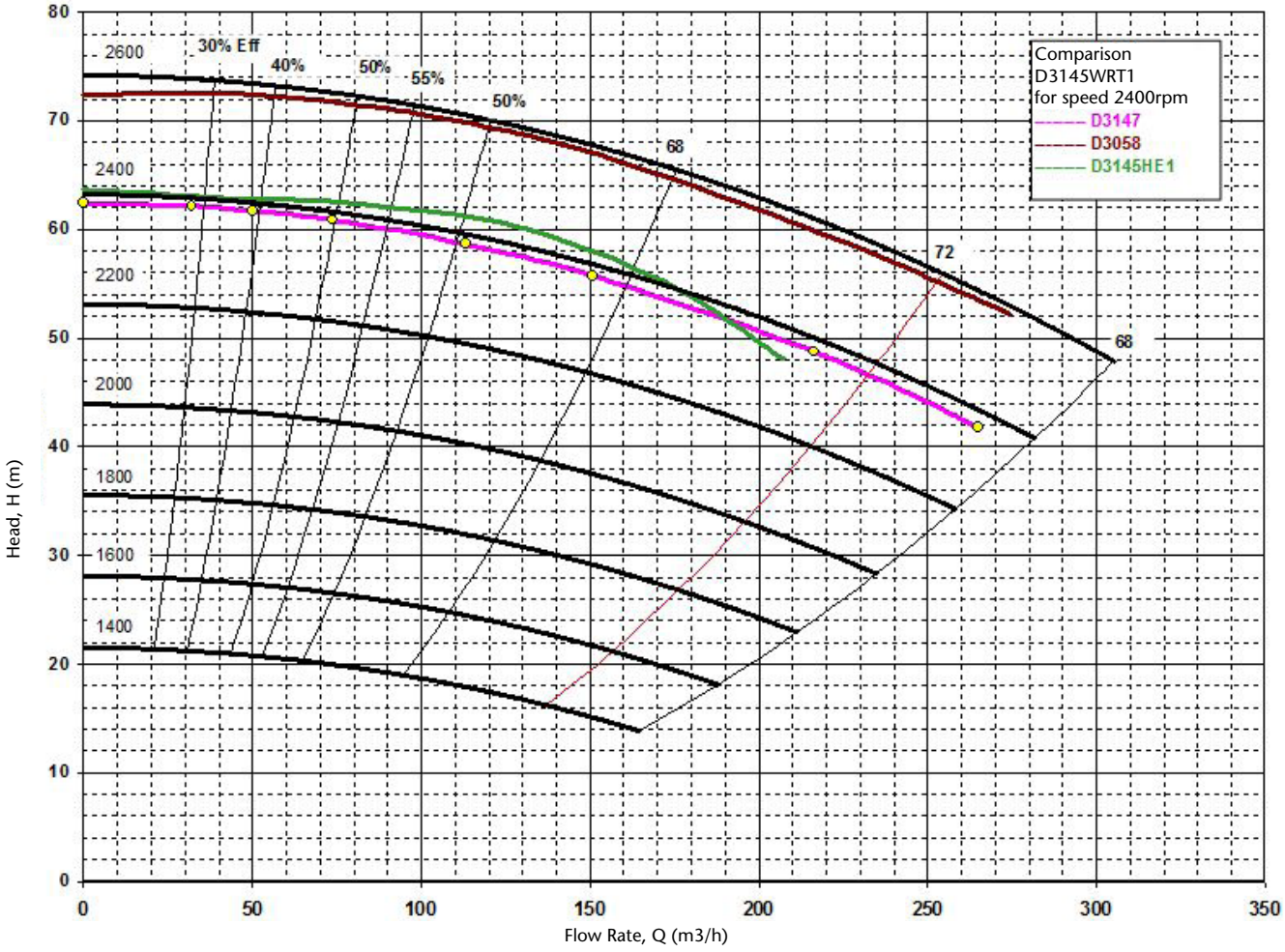
Typical Pump Performance Curve ET1232

**Other impeller and throatbush combinations may also be replaced, subject to duty conditions*

Curve shows approximate performance for clear water. (To international test standard ISO9906:1999-Grade 2 unless otherwise specified) For media other than water, corrections must be made for density, viscosity and/or other effects of solids. Weir Minerals reserves the right to change pump performance and/or delete impellers without notice. Frame suitability must be checked for each duty and drive arrangement. Not all frame alternatives are necessarily from each manufacturing center.

Warman® 4/3 AH - WRT® Impeller Data and Part Numbers

Description	New Component				*Replaces			
	Part number	Number of vanes	Diameter	Passage size	Part number	Number of vanes	Diameter	Passage size
Impeller	D3145WRT1	4	260	25	D3147 D3058 D3145HE1	5 6 4	245 260 265	36 28 35
Volute CP Liner	D3110WRT1 D3017WRT1				D3110 D3017M			



Pump (mm)	Discharge	75
	Suction	102
Frame (Rating KW)	C	30
	CC	55
	D	60
	DD	110
Seal	Gland Seal Pump	
Liner (Norm Max r/min)	Polymer	1985
	Metal	2800

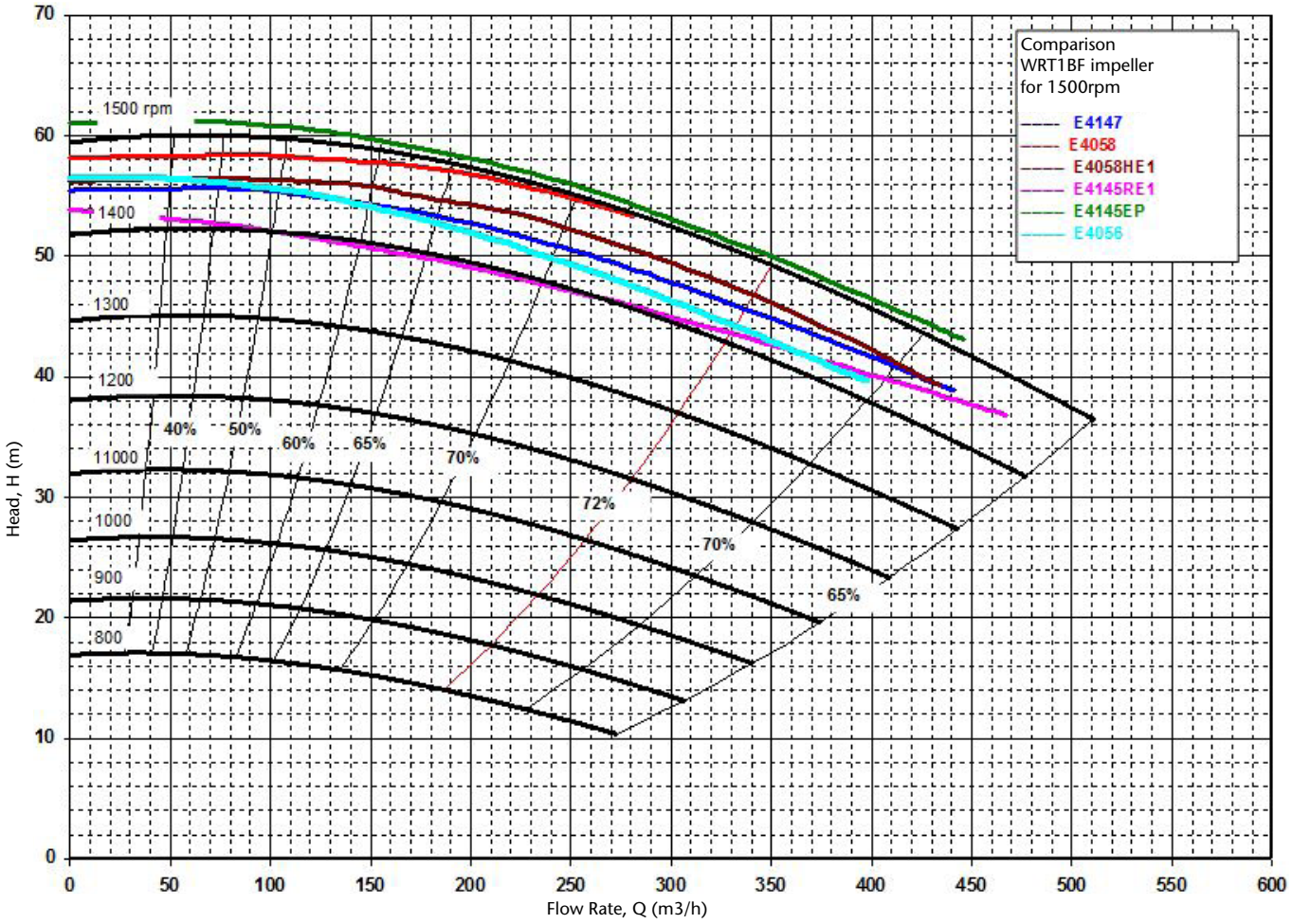
Typical Pump Performance Curve ESY9004

**Other impeller and throatbush combinations may also be replaced, subject to duty conditions*

Curve shows approximate performance for clear water. (To international test standard ISO9906:1999-Grade 2 unless otherwise specified) For media other than water, corrections must be made for density, viscosity and/or other effects of solids. Weir Minerals reserves the right to change pump performance and/or delete impellers without notice. Frame suitability must be checked for each duty and drive arrangement. Not all frame alternatives are necessarily from each manufacturing center.

Warman® 6/4 AH - WRT® Impeller Data and Part Numbers

Description	New Component				*Replaces			
	Part number	Number of vanes	Diameter	Passage size	Part number	Number of vanes	Diameter	Passage size
Impeller	E4145WRT1	4	386	41	E4147 E4058 E4056 E4145HE1 E4145RE1 E4145EP	5	365	51
Throatbush	E4083WRT1				E4083 E4083HE1 E4083RE1			



Pump (mm)	Discharge	102		
	Suction	152		
Frame (Rating KW)	D	60	EE	225
	DD	110	R	300
	E	120		
	Q	150		
Seal	Gland Seal Pump			
Liner (Norm Max r/min)	Polymer	1325		
	Metal	1800		

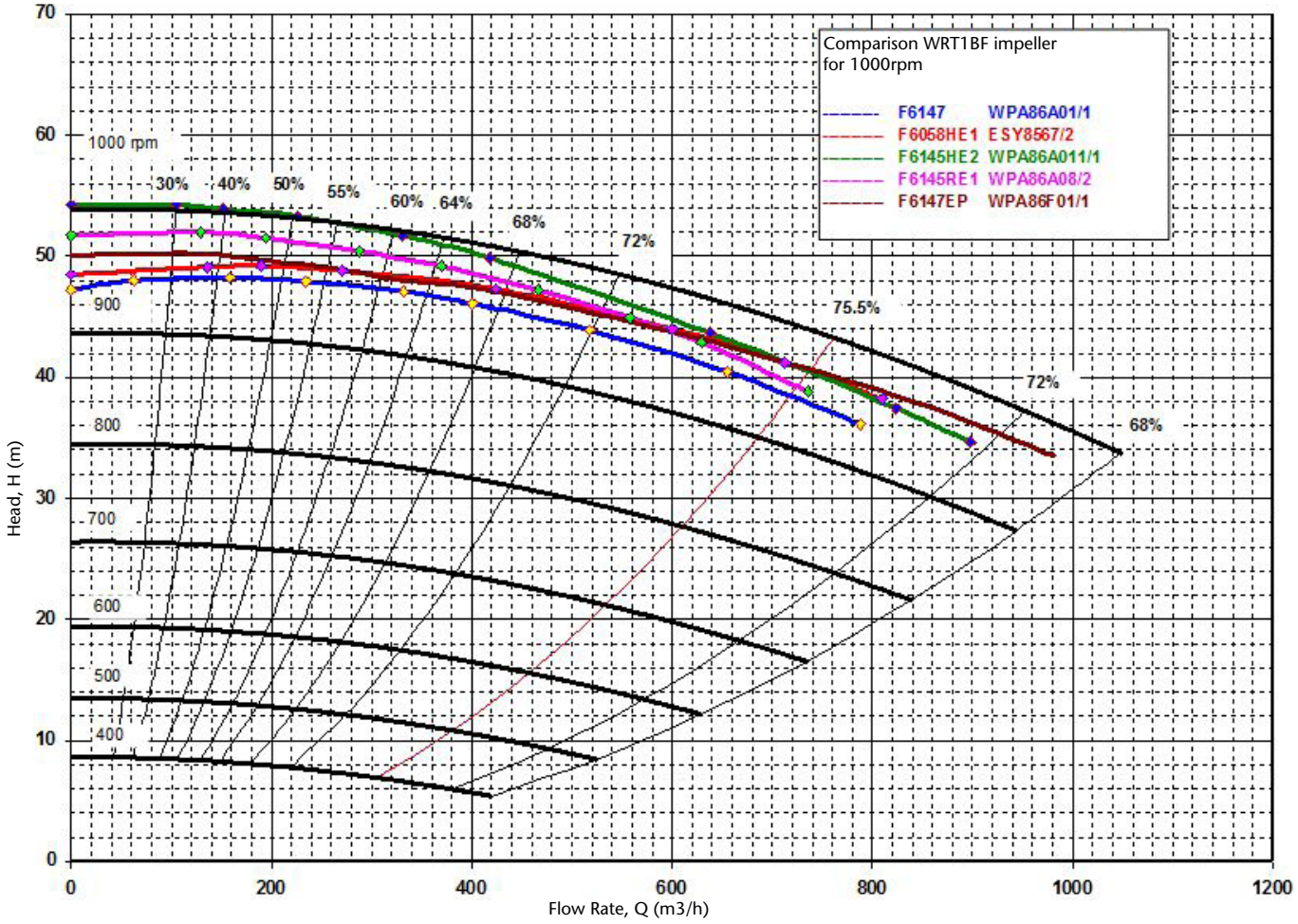
Typical Pump Performance Curve ESY8657

**Other impeller and throatbush combinations may also be replaced, subject to duty conditions*

Curve shows approximate performance for clear water. (To international test standard ISO9906:1999-Grade 2 unless otherwise specified) For media other than water, corrections must be made for density, viscosity and/or other effects of solids. Weir Minerals reserves the right to change pump performance and/or delete impellers without notice. Frame suitability must be checked for each duty and drive arrangement. Not all frame alternatives are necessarily from each manufacturing center.

Warman® 8/6 AH - WRT® Impeller Data and Part Numbers

Description	New Component				*Replaces			
	Part number	Number of vanes	Diameter	Passage size	Part number	Number of vanes	Diameter	Passage size
Impeller	F6145WRT1	4	550	50	F6147 F6145HE2 F6145RE1 F6058HE1	5 4 4 6	510 560 510 525	63 57 50 65
Throatbush	EF608WRT1				F6083 F6083HE1 F6083RE1			



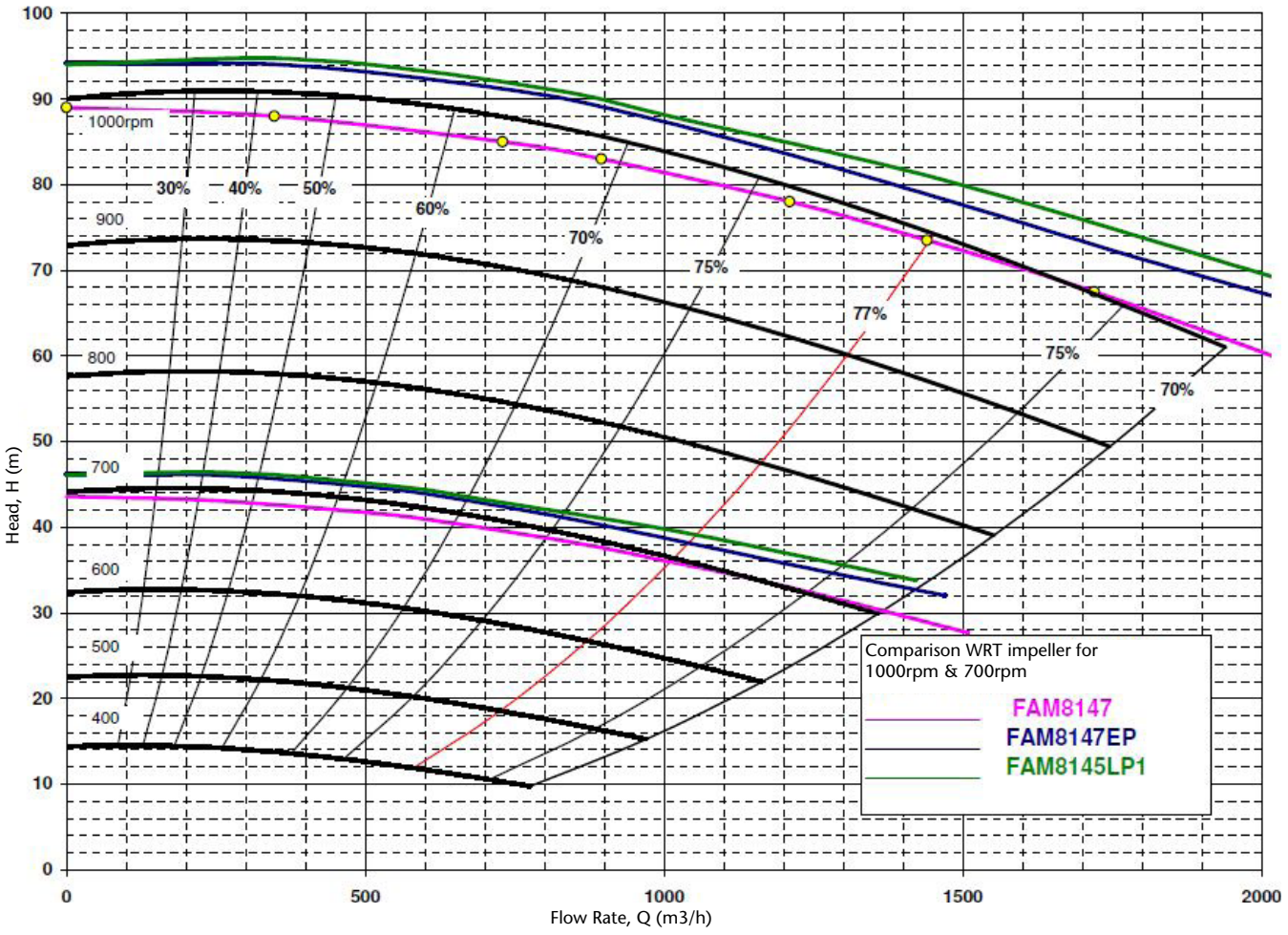
Pump (mm)	Discharge	152			Typical Pump Performance Curve ESY8645
	Suction	203			
Frame (Rating KW)	E	120	FFX	425	
	EE	225	FF	425	
	F	260	S	560	
	R	300	SX	560	
Seal	Gland Seal Pump				
Liner (Norm Max r/min)	Polymer	1325			
	Metal	1800			

**Other impeller and throatbush combinations may also be replaced, subject to duty conditions*

Curve shows approximate performance for clear water. (To international test standard ISO9906:1999-Grade 2 unless otherwise specified) For media other than water, corrections must be made for density, viscosity and/or other effects of solids. Weir Minerals reserves the right to change pump performance and/or delete impellers without notice. Frame suitability must be checked for each duty and drive arrangement. Not all frame alternatives are necessarily from each manufacturing center.

Warman® 10/8 AH - WRT® Impeller Data and Part Numbers

Description	New Component				*Replaces			
	Part number	Number of vanes	Diameter	Passage size	Part number	Number of vanes	Diameter	Passage size
Impeller	FAM8145WRT1 G8145WRT1	4	712	82	FAM8147 FAM8147EP G8147 G8147EP FAM8147LP1	5 5 5 5 4	686 700 686 700 686	76 50 76 50 83
Throatbush	G8083WRT1				G8083 G8083HE1 G8083RE1			



Pump (mm)	Discharge	203		
	Suction	254		
Frame (Rating KW)	F	260	ST	600
	FF	425	G	600
	FFX	425	GG	900
	STX	560	T	1200
Seal	Gland Seal Pump			
Liner (Norm Max r/min)	Polymer	715		
	Metal	1000		

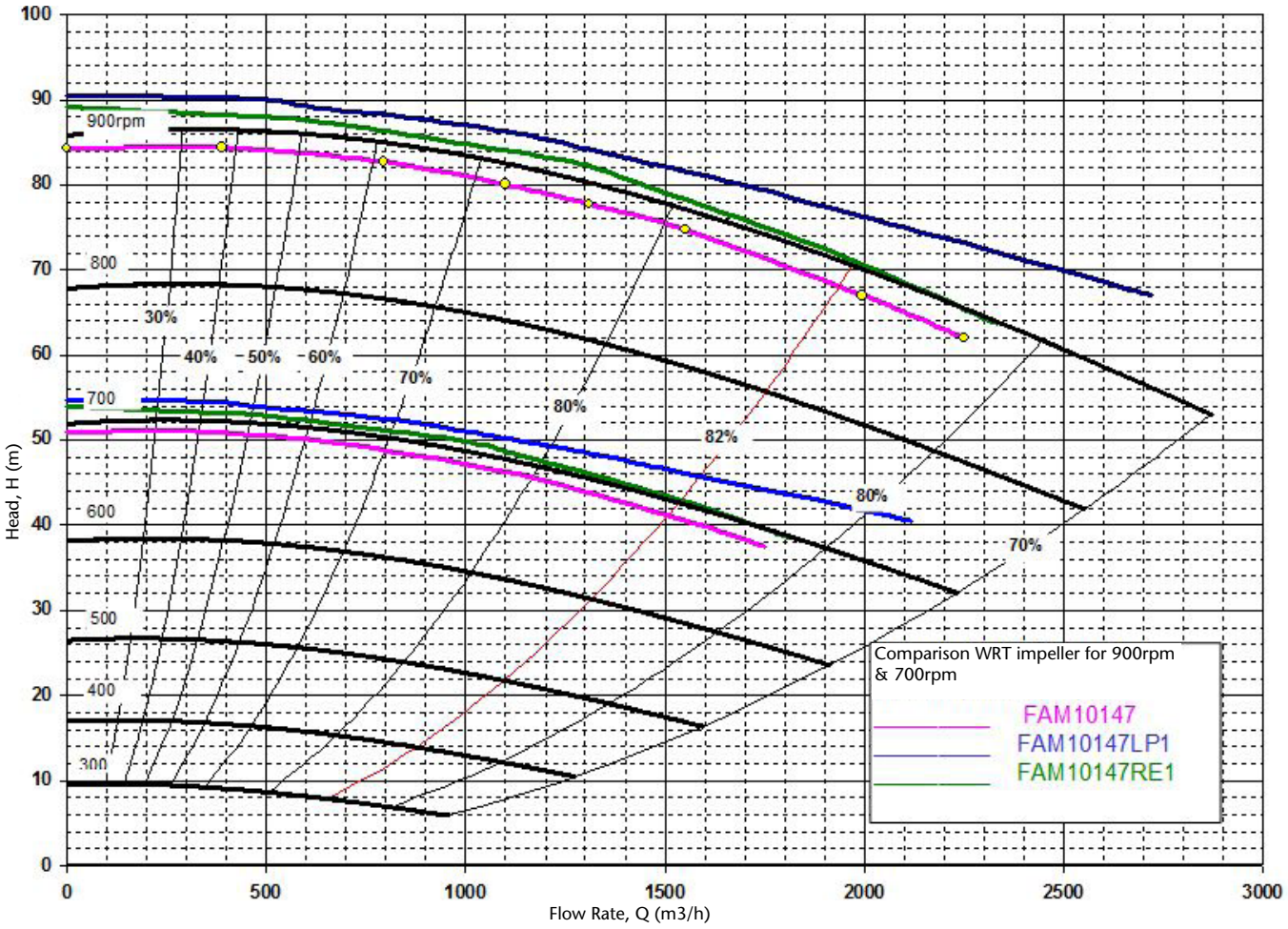
Typical Pump Performance Curve ESY8646/2

**Other impeller and throatbush combinations may also be replaced, subject to duty conditions*

Curve shows approximate performance for clear water. (To international test standard ISO9906:1999-Grade 2 unless otherwise specified) For media other than water, corrections must be made for density, viscosity and/or other effects of solids. Weir Minerals reserves the right to change pump performance and/or delete impellers without notice. Frame suitability must be checked for each duty and drive arrangement. Not all frame alternatives are necessarily from each manufacturing center.

Warman® 12/10 AH - WRT® Impeller Data and Part Numbers

Description	New Component				*Replaces			
	Part number	Number of vanes	Diameter	Passage size	Part number	Number of vanes	Diameter	Passage size
Impeller	FAM1045WRT1 G10145WRT1	4	776	98	FAM10147 G10147 FAM10147LP1 FAM10147RE1	5 5 5 5	762 762 762 762	86 86 100 70
Throatbush	G100083WRT1				G10083 G10083HE1 G10083RE1			



Pump (mm)	Discharge	254		
	Suction	305		
Frame (Rating KW)	F	260	ST	600
	FF	425	G	600
	FFX	425	GG	900
	STX	560	T	1200
Seal	Gland Seal Pump			
Liner (Norm Max r/min)	Polymer	650		
	Metal	1020		

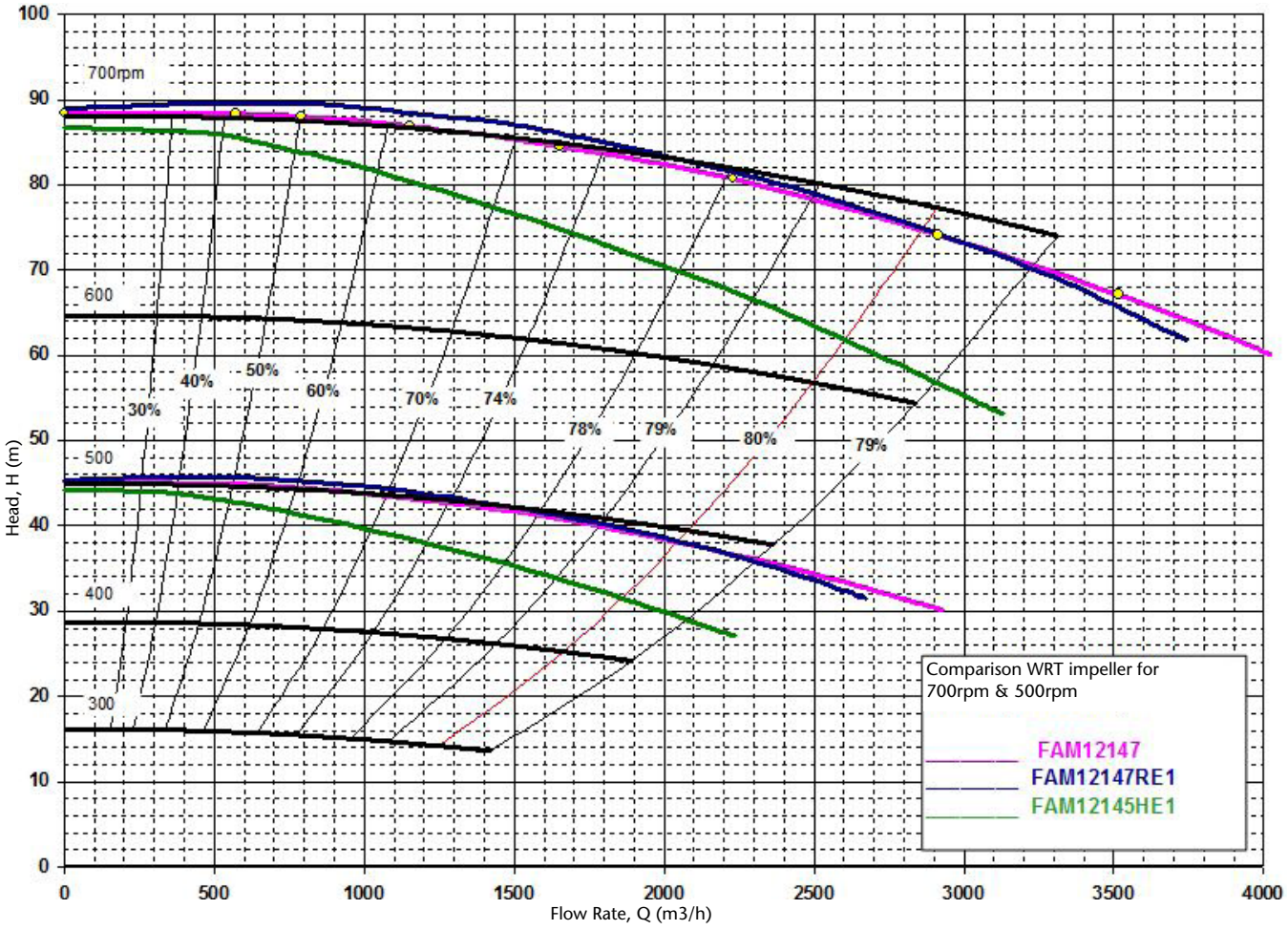
Typical Pump Performance Curve ESY8669/3

**Other impeller and throatbush combinations may also be replaced, subject to duty conditions*

Curve shows approximate performance for clear water. (To international test standard ISO9906:1999-Grade 2 unless otherwise specified) For media other than water, corrections must be made for density, viscosity and/or other effects of solids. Weir Minerals reserves the right to change pump performance and/or delete impellers without notice. Frame suitability must be checked for each duty and drive arrangement. Not all frame alternatives are necessarily from each manufacturing center.

Warman® 14/12 AH - WRT® Impeller Data and Part Numbers

Description	New Component				*Replaces			
	Part number	Number of vanes	Diameter	Passage size	Part number	Number of vanes	Diameter	Passage size
Impeller	FAM12145WRT1	4	965	115	FAM12147	5	965	104
					FAM12147RE1	5	965	114
	G12145WRT1	4	965	115	G12147	5	965	104
					G12147RE1	5	965	114
Throatbush	G12083WRT1				G12083M G8083RE1M			



Pump (mm)	Discharge	305		
	Suction	356		
Frame (Rating KW)	F	260	ST	600
	FF	425	G	600
	FFX	425	GG	900
	STX	560	T	1200
Seal	Gland Seal Pump			
Liner (Norm Max r/min)	Polymer	520		
	Metal	720		

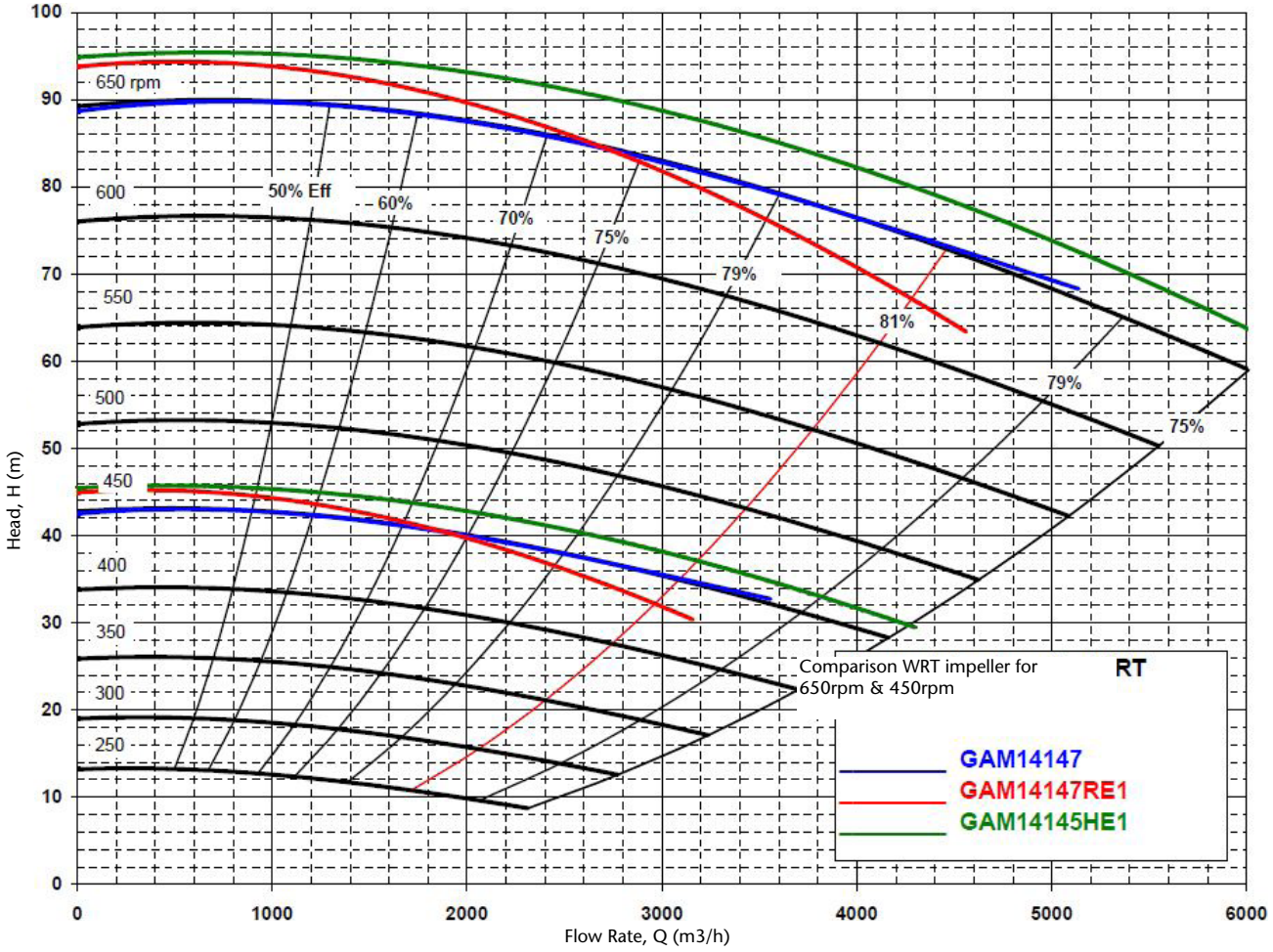
Typical Pump Performance Curve ESY8673

**Other impeller and throatbush combinations may also be replaced, subject to duty conditions*

Curve shows approximate performance for clear water. (To international test standard ISO9906:1999-Grade 2 unless otherwise specified) For media other than water, corrections must be made for density, viscosity and/or other effects of solids. Weir Minerals reserves the right to change pump performance and/or delete impellers without notice. Frame suitability must be checked for each duty and drive arrangement. Not all frame alternatives are necessarily from each manufacturing center.

Warman® 16/14 AH - WRT® Impeller Data and Part Numbers

Description	New Component				*Replaces			
	Part number	Number of vanes	Diameter	Passage size	Part number	Number of vanes	Diameter	Passage size
Impeller	GAM14145WRT1	4	1110	130	GAM14147	5	1067	135
					GAM14147RE1	5	1067	125
	H14145WRT1	4	1110	130	GAM14145HE1	4	1125	100
					H14147	5	1067	135
					H14147RE1	5	1067	125
					H14145HE1	4	1125	100
Throatbush	H14083WRT1				H14083MA05			



Pump (mm)	Discharge	356
	Suction	406
Frame (Rating KW)	G	600
	GG	900
	TU	1200
	H	1400
Seal	Gland Seal Pump	
Liner (Norm Max r/min)	Polymer	470
	Metal	650

Typical Pump Performance Curve ESY9016

**Other impeller and throatbush combinations may also be replaced, subject to duty conditions*

Curve shows approximate performance for clear water. (To international test standard ISO9906:1999-Grade 2 unless otherwise specified) For media other than water, corrections must be made for density, viscosity and/or other effects of solids. Weir Minerals reserves the right to change pump performance and/or delete impellers without notice. Frame suitability must be checked for each duty and drive arrangement. Not all frame alternatives are necessarily from each manufacturing center.

Geographical footprint

Weir Minerals has the geographical presence to service all the major minerals markets around the world. This global supply capability provides a competitive advantage in this relatively fragmented market.

Weir Minerals has operations across:

- North America
- Latin America
- Africa
- Russia
- Europe
- Australia
- Asia

Customer profile

Our customers range from the world's largest minerals and mining multinationals to single pumpset operators.

We support customer operations worldwide with consistent products and local engineering expertise. As part of The Weir Group, we have the reach and resource to build close, long term relationships with all our customers, helping them to achieve ...

The Lowest Cost of Ownership

Service and support

This global capability with our own dedicated service teams combined with the service centers of our sister companies within The Weir Group and those of our strategic partners provide support in virtually every developed market.

WARMAN® Centrifugal Slurry Pumps
GEHO® PD Slurry Pumps
LINATEX® Rubber Products
VULCO® Wear Resistant Linings
CAVEX® Hydrocyclones
FLOWAY® PUMPS Vertical Turbine Pumps
ISOGATE® Slurry Valves
MULTIFLO® Mine Dewatering Solutions
HAZLETON® Specialty Slurry Pumps
LEWIS® PUMPS Vertical Chemical Pumps
WEIR MINERALS SERVICES™

For further information on any of these products or our support services contact your nearest sales office or visit:

www.weirminerals.com

Weir Minerals North America

2701 S Stoughton Road, Madison WI 53716
PO Box 7610, Madison WI 53707
USA

Tel: 608 221 2261
Fax: 608 221 5810
www.weirminerals.com

Excellent Minerals Solutions

WEIR MINERALS