

## Pump Performance Datasheet

Customer :	Quote number :
Customer reference :	Size : LCR45-09
Item number : Default	Stages : 9
Service :	Based on curve number : LCR45-09-2-50
Quantity : 1	Date last saved : 20 Nov 2023 7:39 PM

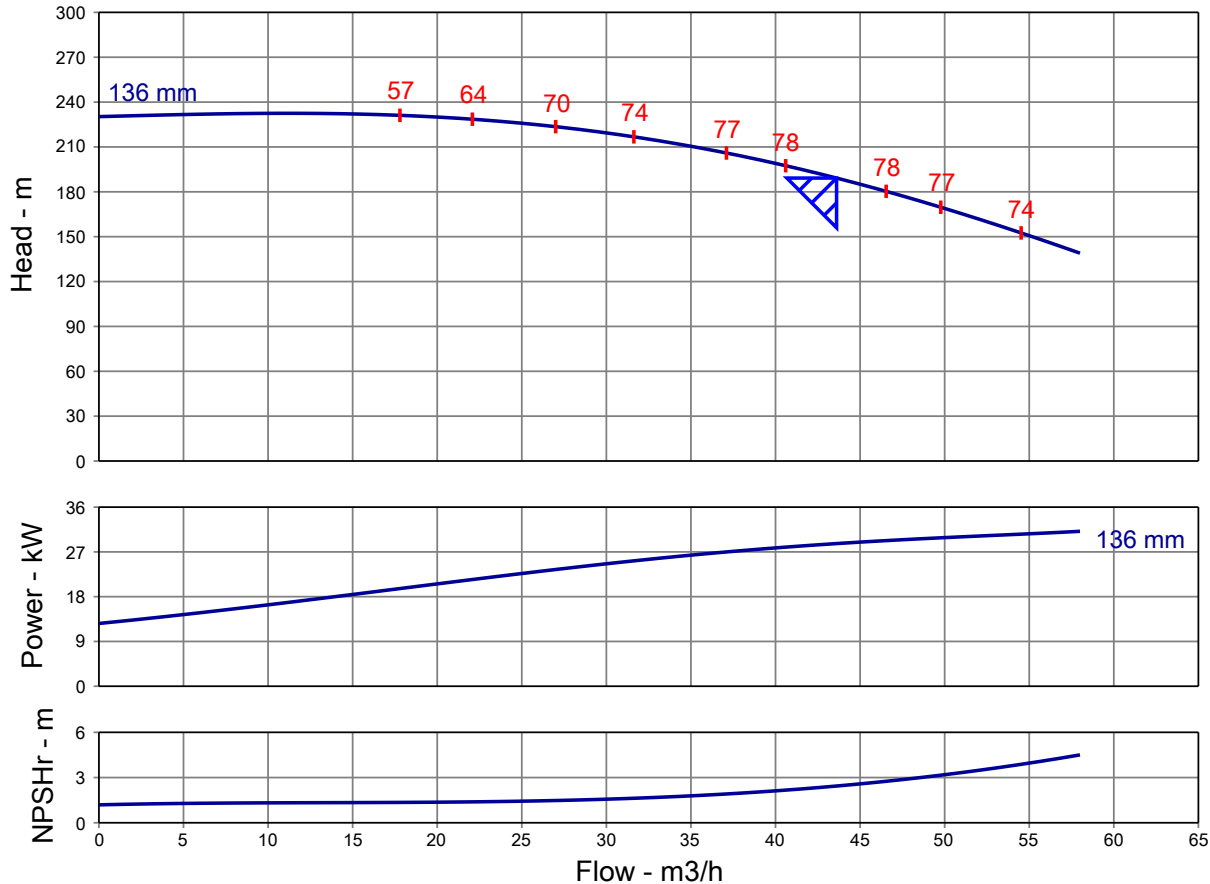
Operating Conditions	Liquid
Flow, rated : 43.61 m3/h	Liquid type : Water
Head, rated (requested) : 189.2 m	Additional liquid description :
Head, rated (actual) : 189.2 m	Solids diameter, max : 0.0 mm
Suction pressure, rated / max : 0.00 / 0.00 bar.g	Solids concentration, by volume : 0.00 %
NPSH available : Ample	Temperature : 20.00 deg C
Site Supply Frequency : 50 Hz	Fluid density : 0.999 / 0.999 kg/dm3
	Viscosity : 1.00 cSt
	Vapor pressure, rated : 0.00 bar.a

Performance	Material
Speed criteria : Synchronous	Material selected : Standard
Speed : 2900 rpm	
Impeller dia. : 136 mm	
Impeller diameter, maximum : 136 mm	
Impeller diameter, minimum : 136 mm	
Efficiency : 78.28 %	
NPSH required / margin required : 2.44 / 0.00 m	
nq (imp. eye flow) / S (imp. eye flow) : 33 / 163 Metric units	
MCSF : -	
Head max. : 232.5 m	
Head rise to shutoff : 21.71 %	
Flow, best eff. point : 43.61 m3/h	
Flow ratio, rated / BEP : 100.00 %	
Diameter ratio (rated / max) : 100.00 %	
Head ratio (rated dia / max dia) : 100.00 %	
Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010] : 1.00 / 1.00 / 1.00 / 1.00	
Selection status : Acceptable	

Pressure Data	
Maximum working pressure	: 22.77 bar.g
Maximum allowable working pressure	: 30.00 bar.g
Maximum allowable suction pressure	: 15.00 bar.g
Hydrostatic test pressure	: 45.00 bar.g

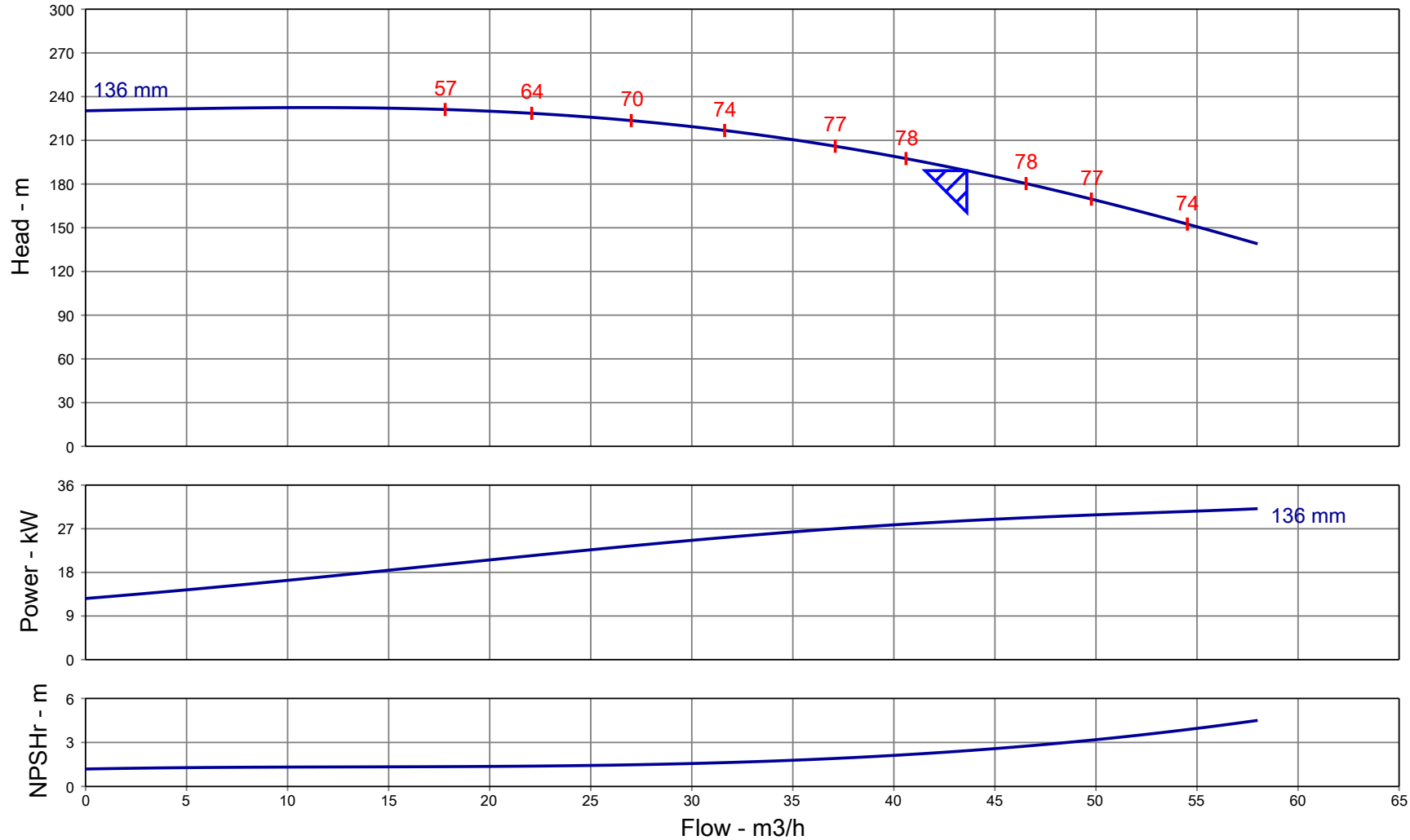
Driver & Power Data (@Max density)	
Driver sizing specification	: Maximum power
Margin over specification	: 0.00 %
Service factor	: 1.00
Power, hydraulic	: 22.44 kW
Power, rated	: 28.67 kW
Power, maximum	: 31.13 kW
Motor rating	: 37.28 kW / 50.00 hp

Performance based on test acceptance - ISO 9906:2012 3B. Performances are subject to periodic changes due to continuous improvements.



### Pump Performance Curve

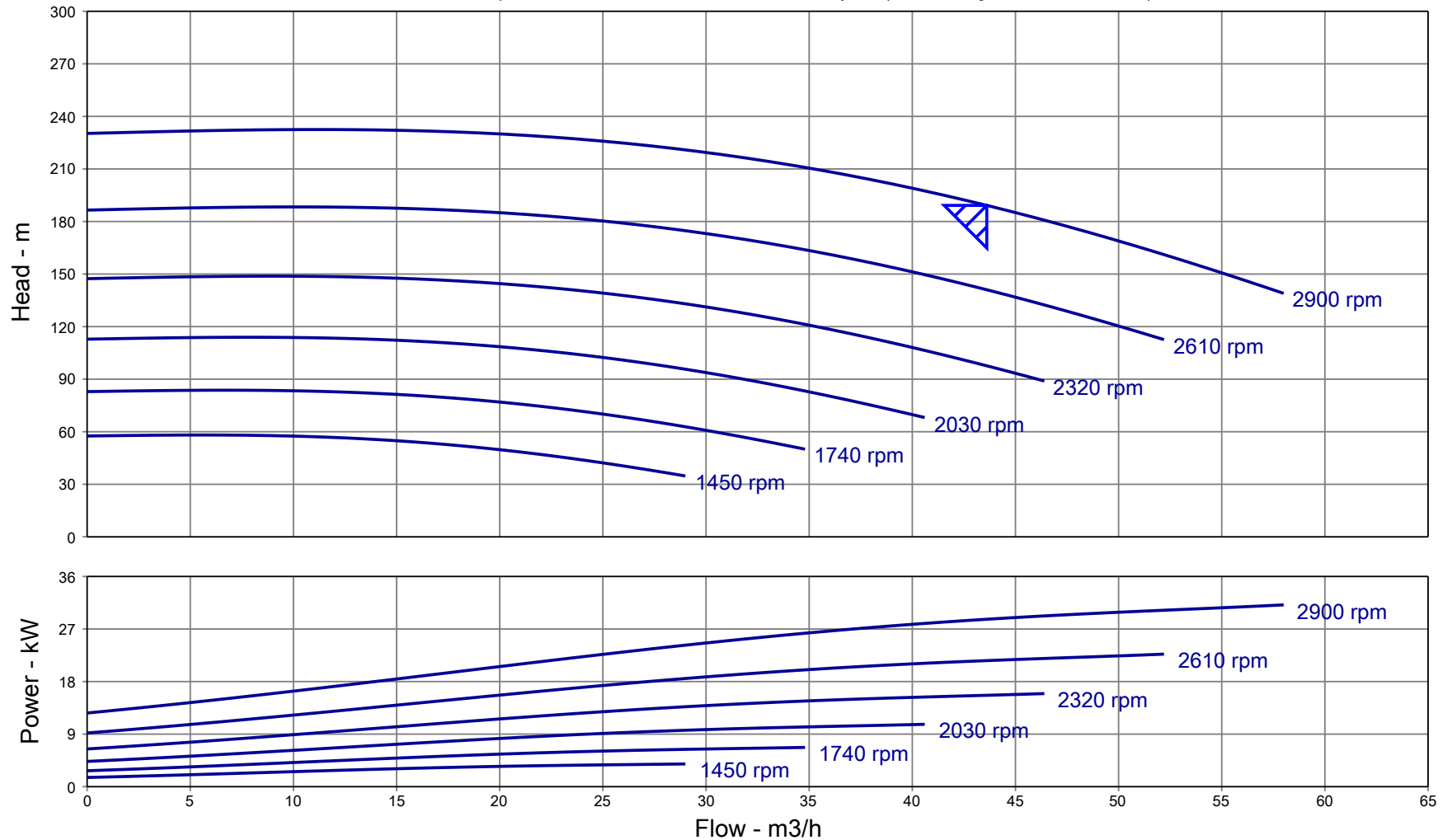
Performance based on test acceptance - ISO 9906:2012 3B. Performances are subject to periodic changes due to continuous improvements.



Customer	:	Size	: LCR45-09	Flow, rated	: 43.61 m <sup>3</sup> /h
Customer reference	:	Stages	: 9	Head, rated	: 189.2 m
Item number	: Default	Speed	: 2900 rpm	Fluid density	: 0.999 / 0.999 kg/dm <sup>3</sup>
Service	:	Based on curve number	: LCR45-09-2-50	Viscosity	: 1.00 cSt
Quantity	: 1	Efficiency	: 78.28 %	Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010]	: 1.00 / 1.00 / 1.00 / 1.00
Quote number	:	Power, rated	: 28.67 kW		
Date last saved	: 20 Nov 2023 7:39 PM	NPSH required	: 2.44 m		

### Multi-Speed Performance Curve

Performance based on test acceptance - ISO 9906:2012 3B. Performances are subject to periodic changes due to continuous improvements.



Customer :	Stages :	Nominal speed :
Customer reference :	Based on curve number :	Flow, rated :
Item number : Default	Efficiency : 78.28 %	Head, rated :
Service :	Power, rated : 28.67 kW	Speed : 2900 rpm
Quantity : 1	NPSH required : 2.44 m	Impeller dia. : 136 mm
Quote number :	Site Supply Frequency : 50 Hz	Fluid density : 0.999 / 0.999 kg/dm <sup>3</sup>
Date last saved : 20 Nov 2023 7:39 PM		Viscosity : 1.00 cSt
Size : LCR45-09		Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010] : 1.00 / 1.00 / 1.00 / 1.00

### Life Cycle Cost Datasheet

Customer :	Quantity : 1	Size : LCR45-09
Customer reference :	Quote number :	Stages : 9
Item number : Default	Date last saved : 20 Nov 2023 7:39 PM	Speed : 2900
Service :		

### Load Profiles and Energy Costs

Expected pump life: 20 years	Load Profile #1	Load Profile #2	Load Profile #3	Load Profile #4	Load Profile #5	Total
Flow: ( m3/h )	1.00	-	-	-	-	-
Operation: ( hours per year )	8,760	-	-	-	-	8,760
Energy cost, present value (\$ per kWh)	0.1	-	-	-	-	-
Speed (rpm)	2900	-	-	-	-	-
Head (m)	230.6	-	-	-	-	-
Efficiency (%)	4.84	-	-	-	-	-
Power, rated (kW)	12.95	-	-	-	-	-
Motor efficiency (%)	100.00	-	-	-	-	-
Drive/gear efficiency (%)	100.00	-	-	-	-	-
System curve	-	-	-	-	-	-
Energy, total (kWh)	2,269,592.9	-	-	-	-	2,269,592.9
Energy cost, per year	\$ 11,347.96	-	-	-	-	\$ 11,347.96
Energy cost, total present value	\$ 170,201.07	-	-	-	-	\$ 170,201.07

### Life Cycle Cost Calculation

Additional Annual Costs	Additional One-time Costs, Year 0	Interest and Inflation Rates
Routine maintenance cost : 0.00	Initial investment cost : 0.00	Interest rate, % : 6.00
Repair cost : 0.00	Installation and commissioning cost : 0.00	Inflation rate, % : 3.00
Operating cost : 0.00	Other one-time costs, year 0 : 0.00	<b>Total Net Present Value Costs</b>
Downtime cost : 0.00	<b>Additional One-time Costs, Year 20</b>	Total energy cost : \$ 170,201.07
Environmental cost : 0.00	Decommissioning cost : 0.00	Total additional annual cost : \$ 0.00
Other annual costs : 0.00	Other one-time costs, year 20 : 0.00	Total additional one-time cost : \$ 0.00
Total, present value : \$ 0.00	Total, present value : \$ 0.00	Total life cycle cost : \$ 170,201.07

### Pump Performance - Additional Data

Customer :	Quote number :
Customer reference :	Size : LCR45-09
Item number : Default	Stages : 9
Service :	Speed : 2900 rpm
Quantity : 1	Intellicode :
	Date last saved : 20 Nov 2023 7:39 PM

Performance Data	Stage, Speed and Solids Limits
Head, maximum diameter, rated flow : 189.2 m	Stages, maximum : 9
Head, minimum diameter, rated flow : 189.2 m	Stages, minimum : 9
Head max. : 232.5 m	Pump speed limit, maximum : 2900 rpm
Efficiency adjustment factor, total : 1.00	Pump speed limit, minimum : 1200 rpm
Power adjustment, total : 0.00 kW	Curve speed limit, maximum : 2900 rpm
Head adjustment factor, total : 1.00	Curve speed limit, minimum : 1200 rpm
Flow adjustment factor, total : 1.00	Variable speed limit, maximum : -
Flow adjustment factor, efficiency only (shift BEP) : 1.00	Variable speed limit, minimum : -
Flow adjustment factor, end-of-curve only, total : 1.00	Solids size limit : 0.0 mm
MCSF adjustment factor : 1.00	
NPSHR adjustment factor, total : 1.00	
NPSHR slope correction factor : 1.00	
User applied performance adjustment comments :	
NPSH margin dictated by pump supplier : 0.00 m	
NPSH margin dictated by user : 0.00 m	
NPSH margin used (added to 'required' values) : 0.00 m	

Mechanical Limits	Typical Driver Data
Torque, rated power, rated speed : 9.89 kW/1000 rpm	Driver speed, full load : 2900 rpm
Torque, maximum power, rated speed : 10.74 kW/1000 rpm	Driver speed, rated load : 2900 rpm
Torque, driver power, full load speed : 12.86 kW/1000 rpm	Driver efficiency, 100% load : N/A
Torque, driver power, rated speed : 12.86 kW/1000 rpm	Driver efficiency, 75% load : N/A
Torque, pump shaft limit : -	Driver efficiency, 50% load : N/A
Radial load, worst case : -	
Radial load limit : -	
Impeller peripheral speed, rated : -	
Impeller peripheral speed limit : -	

Various Performance Data	Flow (m3/h)	Head (m)	Efficiency (%)	NPSHr (m)	Power (kW)
Shutoff, rated diameter	0.00	230.3	-	-	12.61
Shutoff, maximum diameter	0.00	230.3	-	-	12.61
MCSF	-	-	-	-	-
Rated flow, minimum diameter	43.61	189.2	78.28	-	28.67
Rated flow, maximum diameter	43.61	189.2	78.28	-	28.67
BEP flow, rated diameter	43.61	189.2	78.28	2.44	28.67
120% rated flow, rated diameter	52.33	160.6	75.63	3.53	30.23
End of curve, rated diameter	58.00	139.0	70.43	4.50	31.13
End of curve, minimum diameter	58.00	139.0	70.43	4.50	31.13
End of curve, maximum diameter	58.00	139.0	70.43	4.50	31.13
Maximum value, rated diameter	-	232.5	78.28	-	31.13
Maximum value, maximum diameter	-	-	78.28	-	31.13

System differential pressure	@ Density, rated	@ Density, max
Differential pressure, rated flow, rated diameter (bar)	18.53	18.53
Differential pressure, shutoff, rated diameter (bar)	22.55	22.55
Differential pressure, shutoff, maximum diameter (bar)	22.55	22.55

Discharge pressure	@ Suction pressure, rated	@ Suction pressure, max	@ Suction pressure, rated	@ Suction pressure, max
Discharge pressure, rated flow, rated diameter (bar.g)	18.53	18.53	18.53	18.53
Discharge pressure, shutoff, rated diameter (bar.g)	22.55	22.55	22.55	22.55
Discharge pressure, shutoff, maximum diameter (bar.g)	22.55	22.55	22.55	22.55

Ratios	
Maximum flow / rated flow, rated diameter : 133.00 %	Head rated diameter / head minimum diameter, rated flow : 100.00 %



### Pump Performance - Additional Data

#### Construction

Orientation	: Standard	Curve Tolerance	: ISO 9906:2012 3B.
Construction Specifications	: Standard		Performances are subject to periodic changes due to continuous improvements.