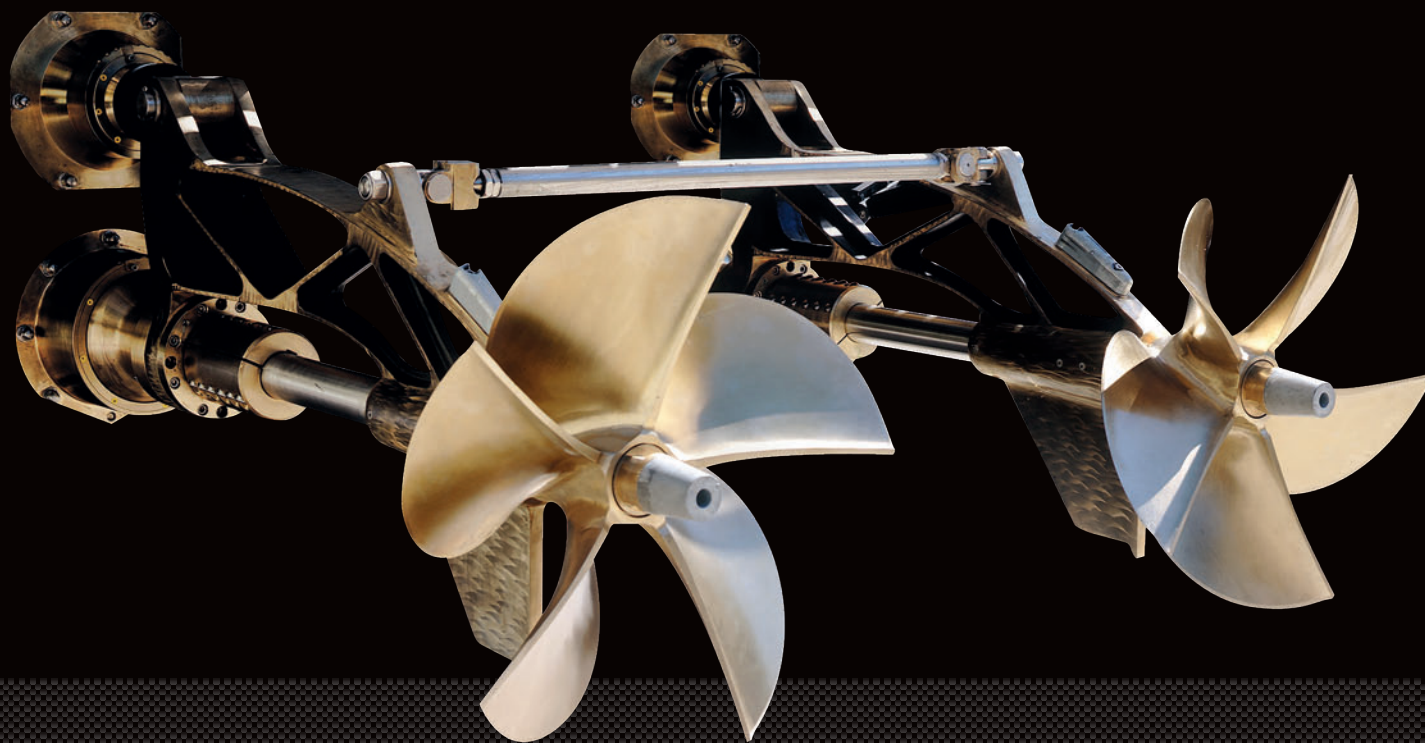




SURFACE DRIVE SYSTEM®

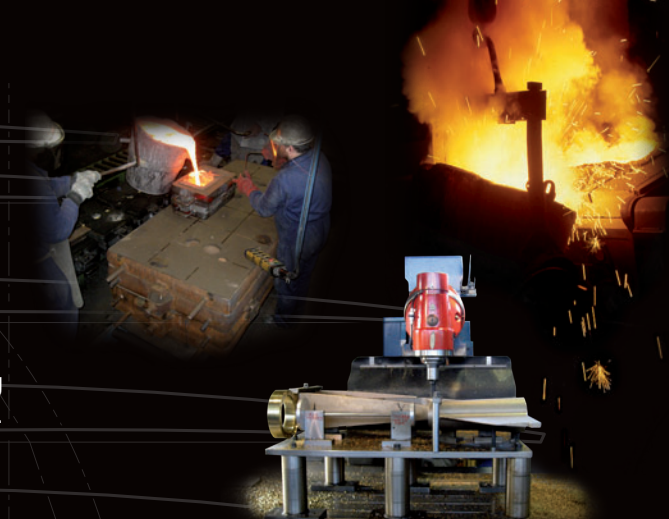
LEADER IN MARINE PROPULSION

HISTORICAL BACKGROUND

Since its foundation in 1977, FRANCE HELICES has become one of the world's leading authorities in marine propulsion systems.

We are the only manufacturer in the market to control every aspect of production. FRANCE HELICES' facility is equipped with an in-house foundry, where machinery is digitally operated and where research teams continue to study new propellers in cavitation tunnels.

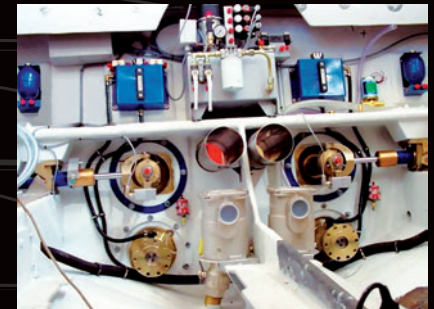
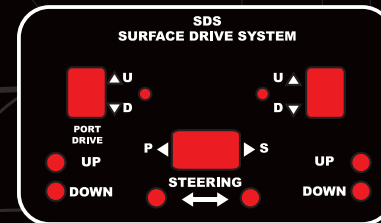
The state of the art equipment allows the different production sites to manufacture everything from the coupling flange to the complete electronic dashboard, including the CNC machined 5 bladed surface piercing propellers.



WHAT IS SDS ?

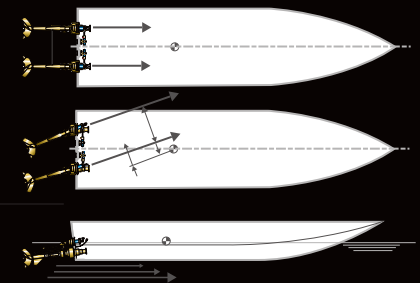
- SDS IS A COMPLETE PROPULSION PACKAGE THAT INCLUDES :

- Drives
 - Propellers
 - Integrated control panel
 - Hydraulics and steering equipment
 - Emergency back up system
 - Cardan shaft
 - Coupling flanges
 - Indicators and sensors
- **Option : FRANCE HELICES can provide you a complete surface drive propulsion package with Auto-trim feature.**



WHAT ARE THE ADVANTAGES OF SDS SURFACE DRIVE compared to other conventional propulsion systems ?

- 15 % speed increase
- Tremendous steering capacity at high speed
- U turn in 2 boat lengths
- The ability to use the boat in shallow water
- Guaranteed performance
- Reduced maintenance cost
- The opportunity to carry out the maintenance by oneself without qualified engineering
- The small amount of spare parts to keep in the inventory
- A worldwide assistance in 24 hours for spare parts and technicians



Tremendous steering capacity at high speed. The ability to use the boat in shallow water.

SAFETY

With the SURFACE DRIVE SYSTEM, all of the vital components are protected from salt and water corrosion. All of the cables, sensors, hydraulics, hoses, and electric connections are situated inside the engine room, away from the harsh marine environment. All of the bronze aluminium and stainless steel materials are casted and machined with NATO classification.

EFFICIENCY

Years of research, development and rigorous testing have resulted in the development of SDS, the most reliable surface drive transmission package.

Each piece used in its construction has high safety factor rates.

PROPULSION ANALYSIS

FRANCE HELICES will provide you full calculations for :

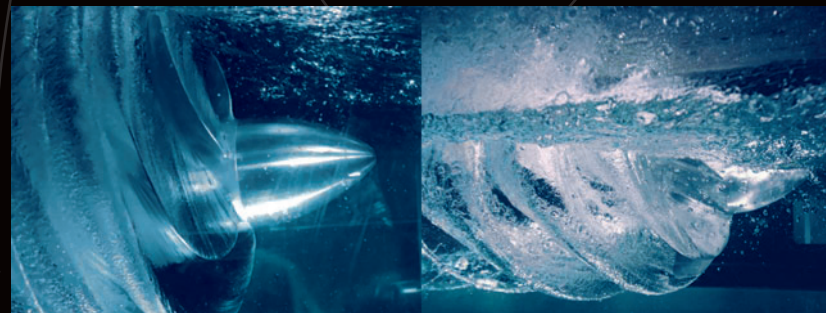
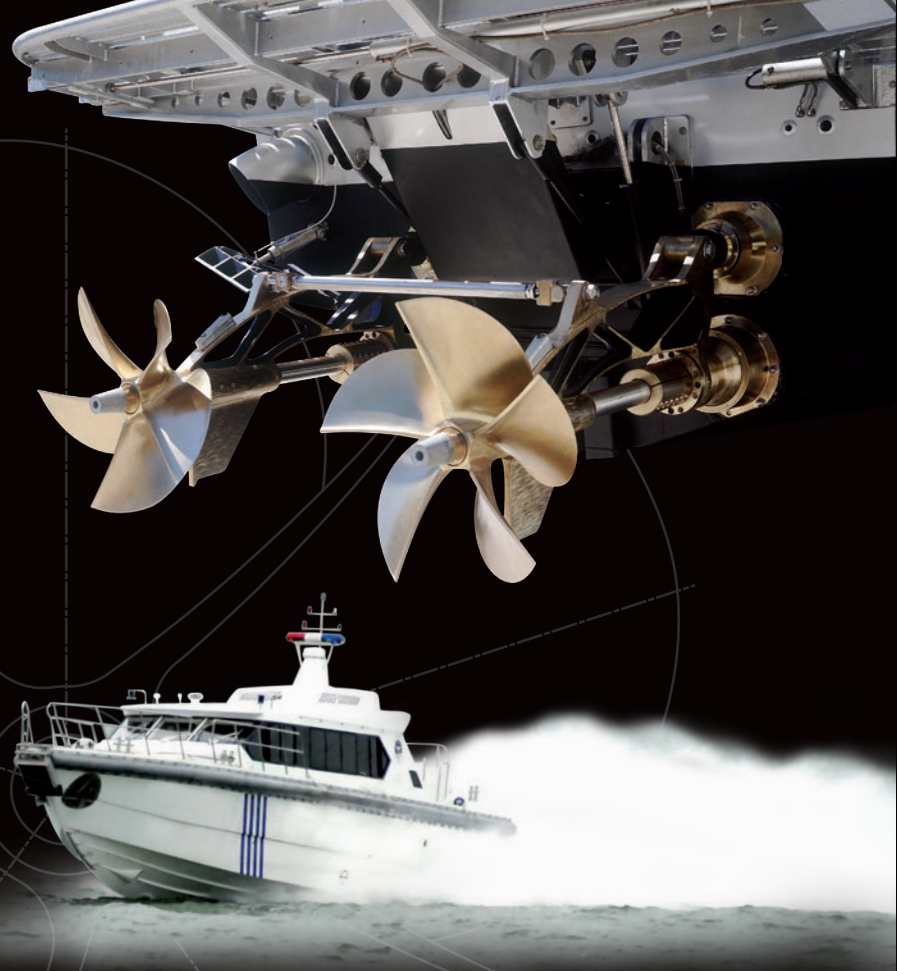
- Target speed
- Time life
- Safety calculation according to classification rules.

RESEARCH

- The constant effort in research and development by FRANCE HELICES has improved the efficiency of the surface propellers up to 10% during the last decade.
- The total overall propulsive coefficient can reach up to 70% when the application is under the control of the FRANCE HELICES engineering team.
- The new serie FH5SSP show an efficiency above 75% in cavitation tunnel tests.

Typical K_t , K_q , η curves issued from cavitation tunnel for the FH5SSP series

WITH PERFORMANCE RELIABILITY LOW MAINTENANCE COST



HOW TO DETERMINE WHICH MODEL IS SUITABLE FOR YOUR APPLICATION

- ENGINE TORQUE CALCULATION

All engine manufacturers supply the engine power curve, look at the maximum power and maximum revolution.

Example : 420 horsepower @ 3300 rpm.

The torque is : $T \text{ (kg.m)} = 716,2 \times \text{Power (hp)} / \text{Revolutions (revs/min)}$

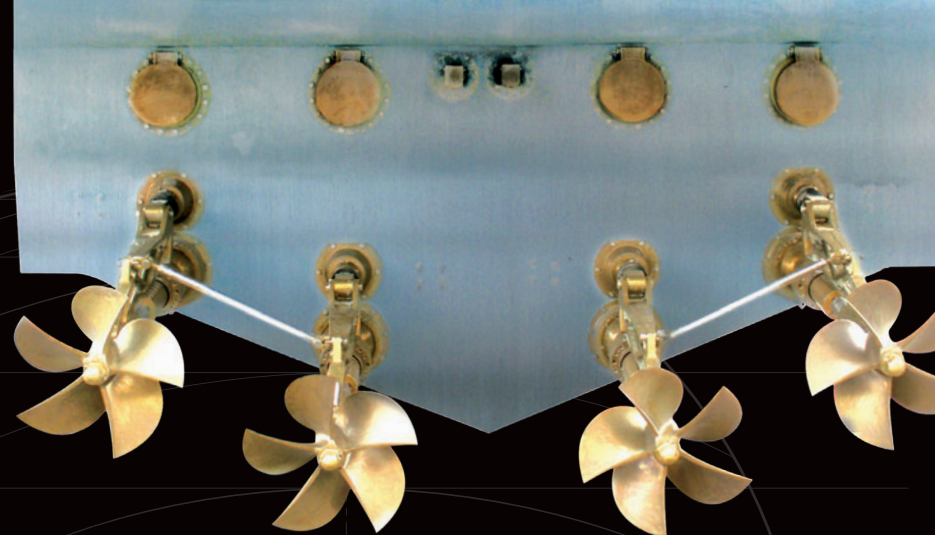
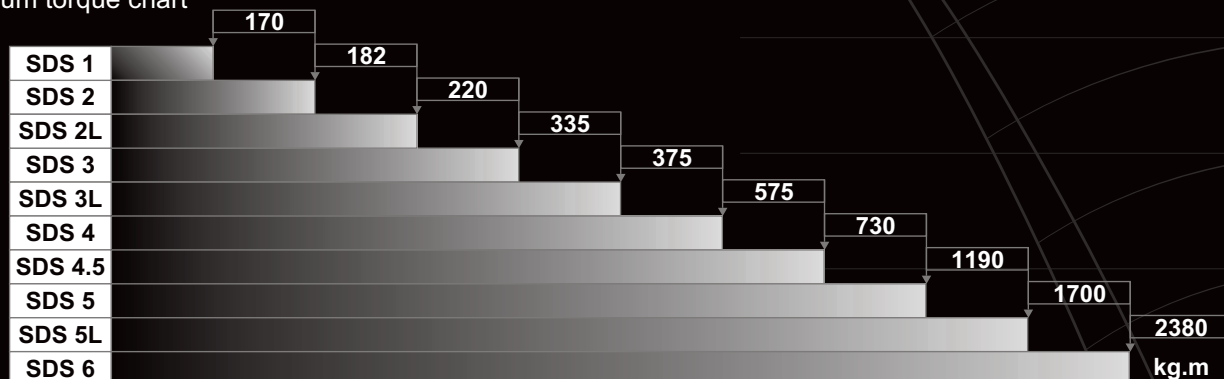
In that case the engine torque is : $T = 716,2 \times 420 / 3300 = 91,15 \text{ kg.m}$

- DRIVE INPUT TORQUE

The torque to be used for drive selection is the input torque, so the engine torque has to be multiplied by the gear ratio $T_{final} = \text{ENGINE TORQUE} \times \text{GEAR RATIO}$

- CHECK THE TABLE FOR THE SUITABLE MODEL

Maximum torque chart



SOME RULES TO GET THE FULL BENEFIT OF A SURFACE DRIVE SYSTEM

THE HULL

The hull form must be :

- Monohedron type
- Warped type

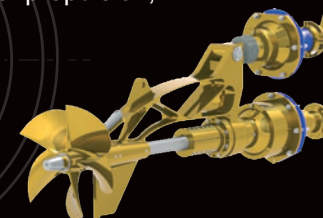
THE ENGINE (power source)

Many engines are available on the market, the SDS surface drive system can be adjusted to :

- Diesel engine
- Gasoline engine
- Turbine

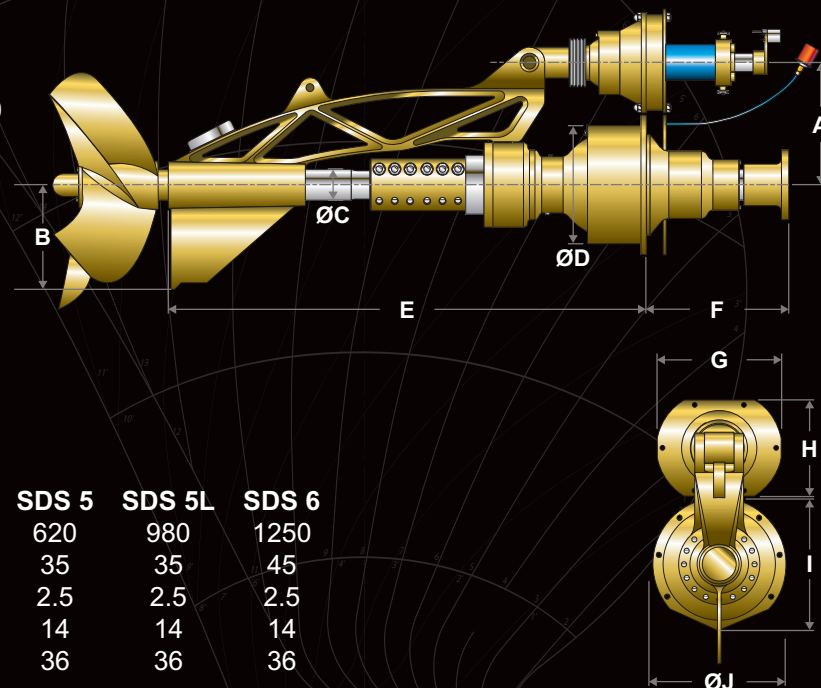
POWER / WEIGHT RATIO

To improve speed, compared to conventional propulsion, the target must be above 25 Knots and power / weight ratio must be above 50 horsepower per tons.



ALL DIMENSIONS ARE IN MILLIMETERS*

	SDS 1	SDS 2	SDS 2L	SDS 3	SDS 3L	SDS 4	SDS 4.5	SDS 5	SDS 5L	SDS 6
A	300	300	300	400	400	460	460	475	470	550
B	228	243	243	289	288	355	355	405	403	507
ØC	50	50	50	65	65	82.5	82.5	90	110	110
ØD	222	222	222	292	292	314	314	380	458	548
E	850	1100	1100	1260	1260	1550	1550	1810	1857	2000
F	272	272	272	292	292	364	364	489	557	610
G	271	271	271	400	400	400	400	464	464	600
H	240	240	240	350	350	350	350	391	391	520
I	303	303	303	397	397	400	400	465	543	548
ØJ	303	303	303	398	398	400	400	465	543	548



ALL WEIGHT ARE IN KGS*

	SDS 1	SDS 2	SDS 2L	SDS 3	SDS 3L	SDS 4	SDS 4.5	SDS 5	SDS 5L	SDS 6
DRIVE	137	150	160	252	270	435	445	620	980	1250
STEERING CYLINDER	18	18	18	18	18	35	35	35	35	45
OIL TANK	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
SHOCK ABSORBER	8	8	8	12	12	12	12	14	14	14
HYDRAULIC POWER UNIT	30	30	30	30	30	36	36	36	36	36

* Weights and measurements can vary based on project specifications

INSTALLATION

Each set of drives is supplied with a complete installation manual.

Commissioning : On request FRANCE HELICES can provide special installation team (to be quoted separately).

" LEADING EDGE TECHNOLOGY "





For further information and custom solutions,
please contact:



FRANCE HELICES
LEADER IN MARINE PROPULSION

Z.I. La Frayère - 12, Allée des Gabians
06150 CANNES LA BOCCA - FRANCE
Tél. : +33 (0)4.93.47.69.38 - Fax : +33 (0)4.93.47.08.59
www.francehelices.fr - info@francehelices.fr