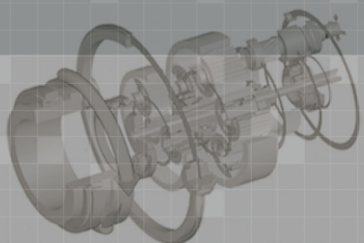


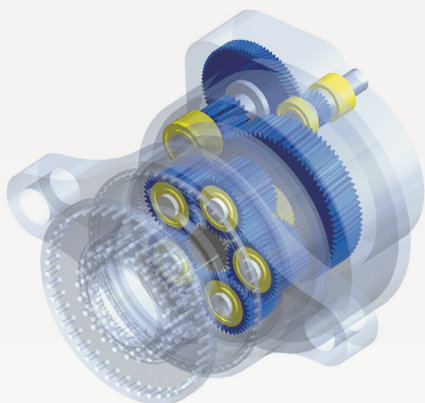


Wind Turbine Powertrain System

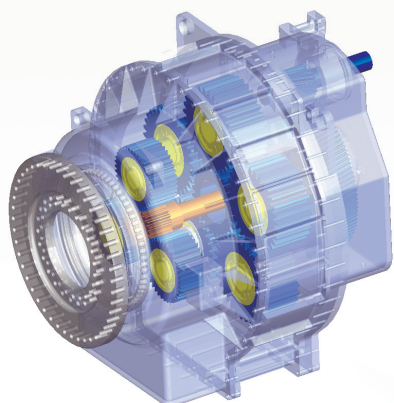


II Wind Turbine Product

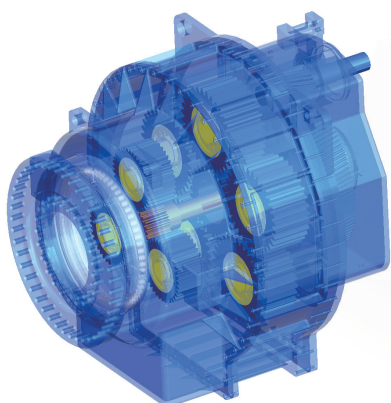
■ Gear Box



SW-C 2.0/2.5	One-Stage Planetary with Two-Stage Parallel Shaft
Power	2,0 – 2,5 MW @ 14 – 16 RPM input speed
Input Torque	1,400 – 1,800 kNm
Ratio	50 : 1 – 120 : 1
Output Shaft Location	550mm Centerline Distance
Approx. Weight	19,000 – 22,000 kg
Overall Length	2,700 mm

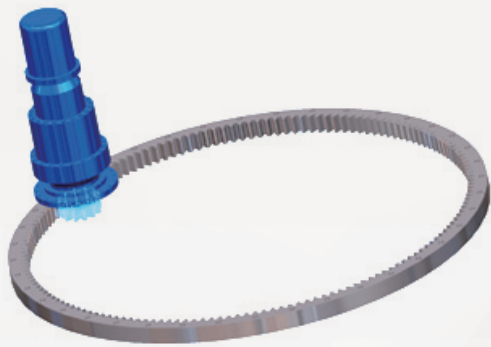


SW-D 2.0/2.5	Two-Stage Differential Planetary with One-Stage Parallel Shaft
Power	2,0 – 2,5 MW @ 14 – 16 RPM input speed
Input Torque	1,400 – 1,800 kNm
Ratio	72 : 1 – 103 : 1
Output Shaft Location	550mm Centerline Distance
Approx. Weight	20,000 – 24,000 kg
Overall Length	2,700 mm



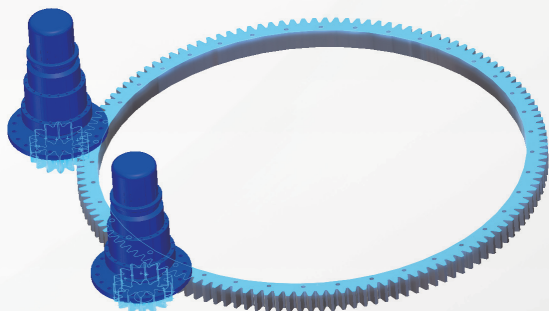
SW-D 5.0	Two-Stage Differential Planetary with One-Stage Parallel Shaft
Power	5,0 MW @ 14 – 16 RPM input speed
Input Torque	3,500 – 3,700 kNm
Ratio	97 : 1 – 115 : 1
Output Shaft Location	825mm Centerline Distance
Approx. Weight	60,000 kg
Overall Length	3,010 mm

Pitch Gear



Type	Output Torque (Nm)	Gear Ratio
PG01	3,000	13.3 : 1
PG02	5,000	17.0 : 1
PG03	7,000	19.0 : 1

Yaw Gear



Type	Output Torque (Nm)	Gear Ratio
YG01	15,000	9.57 : 1
YG02	25,000	12.3 : 1
YG03	35,000	13.7 : 1

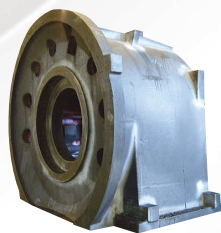
Housing

Rotor Hub Housing



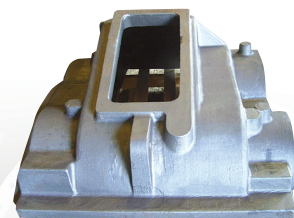
Standard	EN-GJS-400-18U-LT
Tensile strength	370N/mm ²

Gear Box Housing

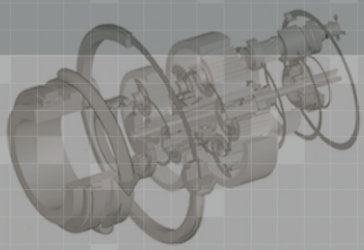


Standard	EN-GJS-400-18U-LT
Tensile strength	370N/mm ²

Gear Box Cover



Standard	EN-GJS-400-18U-LT
Tensile strength	370N/mm ²

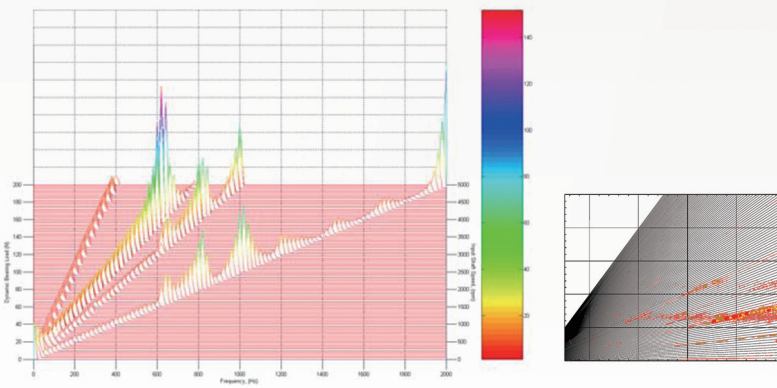


Advanced Design of Gearbox

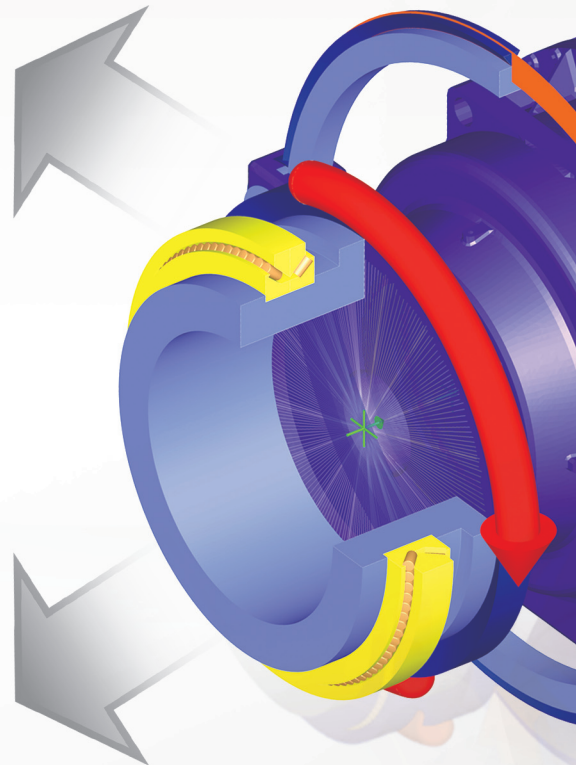
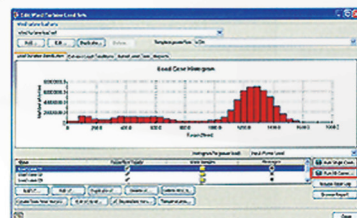
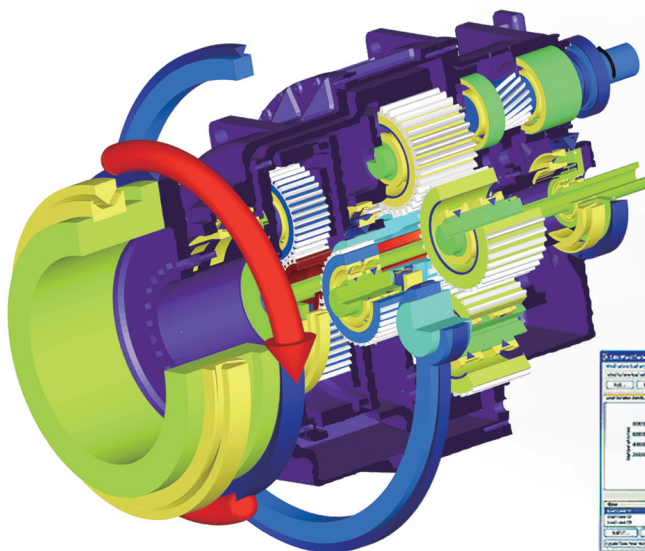
Design

- Power-flow
- Gear Ratio & Arrangement
- Gear Macro & Micro Geometry
- Bearing Selection

NVH



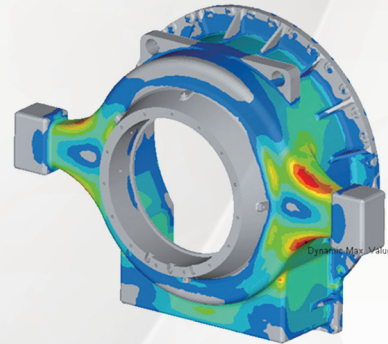
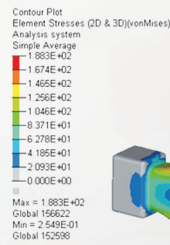
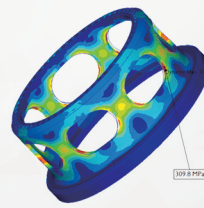
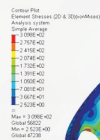
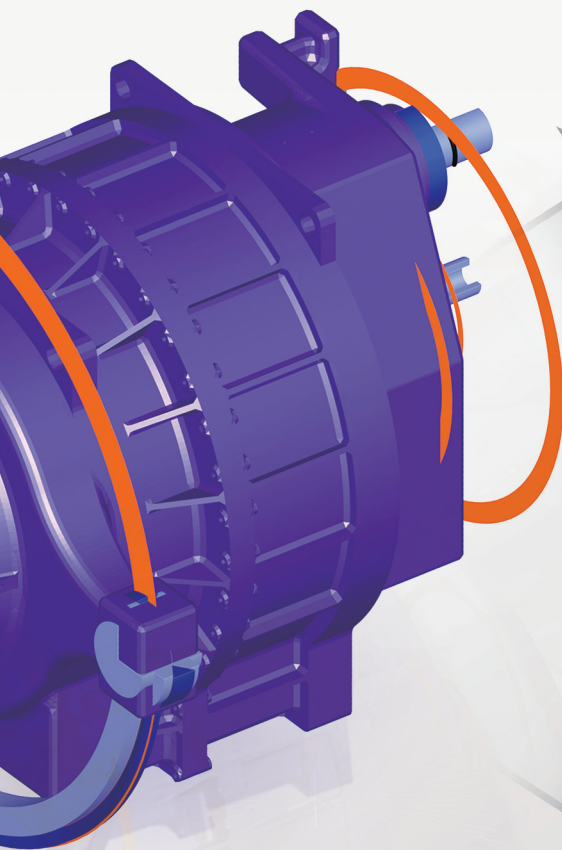
System Dynamic Analysis



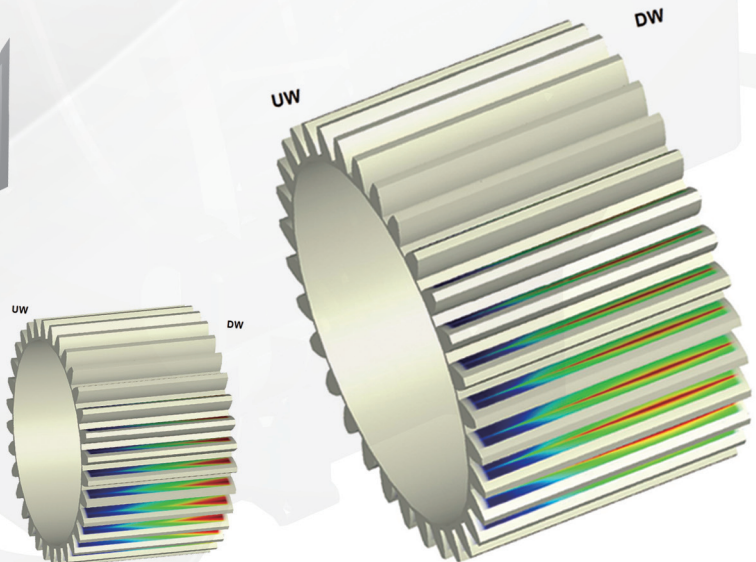
Simulation

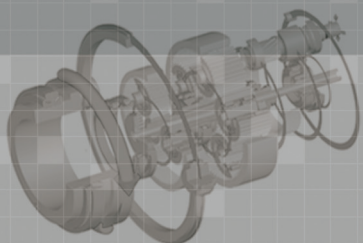
- Analysis of System Deflection
- Transmission Error
- Tooth Contact Analysis
- NVH

Structure Analysis



Tooth Contact Analysis





Machine Tools for Wind Turbine

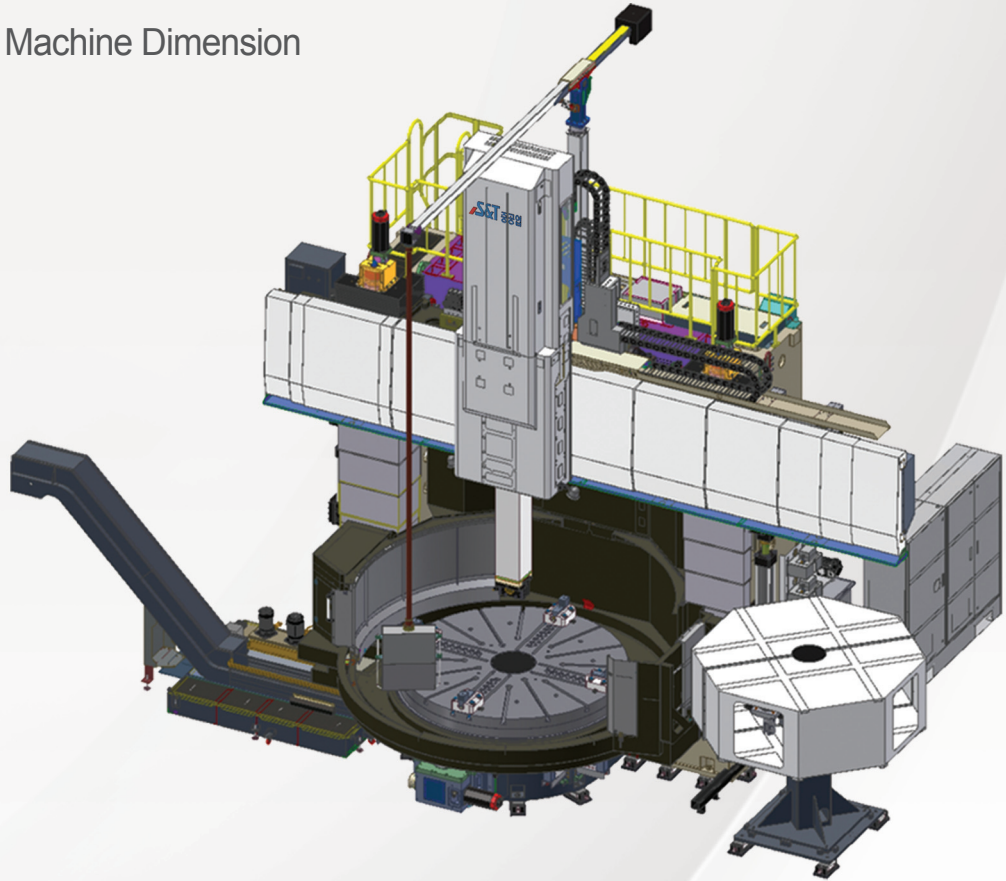
SGM-40/36 Machine Dimension



Machine Specification

Description		Unit	Internal gear	External gear	Description		Unit	Internal gear	External gear
Machining Capacity	Max. diameter of a structure	mm	Outer ø 4,000	Outer ø 3,600	Area of machining	X-axis transportation distance	mm	2,050(1,550)	
	Min. diameter of a structure	mm	Inner ø 1,050	Outer ø 800		Z-axis transportation distance	mm	1,000(750)	
	Max. height of machining	mm	500(250)	600(350)	Transportation speed without loading	X-axis	m/min	5	
	Max. module	-	M25			Z-axis	m/min	5	
	Rotation angle of Head	deg	MAX ±15		Tools	Max. diameter	mm	ø 430	
TABLE	Diameter of table	mm	ø 2,500			Thickness	mm	90	
	Diameter of sub-table	mm	ø 3,500			Bore	mm	ø 90	
	Table bore	mm	ø 500		Installation space	Length	mm	12,000	
	Max. loading weight	kg	15,000			Width	mm	6,000	
	Max. rotational speed	rpm	5.68			Height	mm	5,400	
Main spindle	Rotational speed	rpm	50 ~ 160		Weight of machine	kg	110,000		
	Power of motor	kW	AC 37/45(30min) / 60(15min)		NC controller	-	FANUC 31i		

ST-40/55V(C) Machine Dimension



Machine Specification

Description		Unit	ST-40/55VC	ST-40/55V	Description		Unit	ST-40/55VC	ST-40/55V
Capacity	Max. Turning dia.	mm	5,500	5,500	Feedrate	W-axis travel	mm	1,750	1,750
	Max. Swing	mm	5,500	5,500		X/Z-axis feedrate	mm/min	1~2,000	1~2,000
	Max. Turning height	mm	2,600	2,600		X/Z-axis rapid feedrate	m/min	8	8
	Max. Torque	kgf·m	15,000	15,000		W-axis rapid feedrate	m/min	1	1
	Max. Work. Weight	kgf	45,000	45,000		ATC	Tool holder spec.	-	-
Table	Table Dia.	mm	4,000	4,000	No. of tool on ATC		EA	16(8/8)	12(12)
	Speed range shift	step	Auto 2	Auto 2	Max. Tool weight		kg	70	70
	Max. Speed	rpm	20/60(70)	20/60(70)	Motor	Table Motor	kW	AC 60/75	AC 60/75
C-Axis	Min. Index angle	deg	0,001	-		Milling Spindle motor	kW	AC 22/26	AC 22/26
	Max. Speed	rpm	0,3	-		X-Axis servo motor	kW	9	9
Spindle Head	No. of tools	EA	1	1		Z-Axis servo motor	kW	9	9
	Tool size	mm	40 x 40	40 x 40		W-Axis servo motor	kW	9	9
	Tool taper spec.	-	ISO7/24 No.50	-	C-Axis servo motor	kW	Combined use table motor	-	
	Ram section size	mm	400 x 400	400 x 400	space	L x W x H	m	14X9.95X11	14X9.95X11
Milling speed	rpm	15~1,500	-	Machine weight		Kgf	90,000	90,000	
Feedrate	X-axis travel	mm	-200+4,450	-200+4,450	CNC controller	-	FANUC31i-A	FANUC31i-A	
	Z-axis travel	mm	1,500	1,500					

*S&T Dynamics exists solely
for our Customers and Market*



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