Ferris Wheel Collection

SARTORI
AMUSEMENT RIDES

Rides manufacturer since 1957

Sartori Rides Wheels are designed and manufactured in different size and model.

Portable version fit all on one semitrailer, this means a faster set up and dismantling, no extra costs for transport.

They are unique in their design and decoration. The manufacturing is according European Standard, by using high quality materials and certified procedures.
Cabins are confortable, if necessary they are fully equipped of air conditioned and heating system, wheelchair friendly.

Sartori Wheels are not only a amusment rides, but touristic attractions.

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PROJECT

Project

The structural and dynamic calculations are based on the standards EN 13814 for temporary structures. Among others, the FEM (Finite Element Method) program and the computer wind simulation test are used for the design of the Ferris Wheel. Wind and weight calculations will be performed in accordance with EN 13814.

The Ferris Wheel is completely designed, calculated and built according to EN 13814 standards. Upon request, the standards will be adapted to meet local standards and requirements.

Parameters

- In operation:

The wind pressure q in the project (up to 20 m / sec) is 0.245 kN / m2.

The general strength on the design area of the structure is 0.045 x 1 x 0.75 x 2 =

0.368 kN / m2.

- Not in operation:

The wind pressure q in the project (up to 68 m / sec) is 0.245 kN / m2.

The general force on the design area of the structure is 3 x 1 x 0.75 x 2 = 4.5 kN / m2.

STRUCTURE

It is composed by:

- Columns

- Main Axle

- Spokes

- Support Ring

- Cabins

Support shafts

The base of the building is made up of supports, made from circular tubes. By placing water tanks at the end of the supports, it is possible to connect the support trees up to here. These trees are assembled in a way called "A-structure" facing each other.

The A-structures will be connected to the main axle of the wheel at the highest point of the A-structure by means of a special hub due to particular needs of the positions of the support shafts.

Storage / Coating Systems

Support poles, spokes, ring parts and main axle are sandblasted SA 2.5, grounded twice and painted once with a last coat of paint. Storage will take place via a guarantee certificate from the paint supplier.

The support poles, spokes, ring parts, main axle have a:

First state:	70 µm
Intermediate state:	70 µm
Upper layer:	40 µm

ICG subjects will have an extra top layer, specially designed for extreme environmental conditions:

First state:	80 µm
Intermediate state:	40 µm
Upper layer:	50 µm

Painting frequency: every 5 - 10 years (according to the maintenance frequency).

To confirm the frequency of this painting, please review the below.

Technical information on the coating system.

General description

Polyurethane coating with good water resistance and colour stability. Suitable for painting of polyester nacelles, tanks etc ... Water resistance and short contact with organic and inorganic acids and alkalisers. Application as chemical resistance, resistant coating with polyurethane - or pre-treated epoxy steel and galvanized steel. As a final paint, high ecstatic properties have been required in chemical industries, on oil platforms, containers, etc. ...

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Product information

Coating type:	Two acrylic coating components with aliphatic isocyanate
Final polishing:	RAL colours
Mass density:	about 1.2 kg / L (mixed product)
Solid contents:	about 50% of the volume (mixed product)
VOC:	about 450 gr / L (volatile organic compound)
Recommended film thickness:	40 micrometers d.f.t. per layer 80 micrometers w.f.t. per layer (undiluted)
Theoretical distribution speed:	At 40 micrometers d.f.t. 12.5 m2 / L
Practical distribution speed:	It depends on various factors such as the shape of the object, profile of the surface, method of application, application of circumstance and experience.
Some of the guiding principles are:	
	Brush / rollers 85-90% of the theoretical distribution speed. Treatment 50-70% of the theoretical distribution speed.
Flash point ISO 1523:	Base 23 ° C Hardener 30 ° C 2V1 Thinner JJ 22 42 ° C Heat resistance 120 ° C

Application instructions

Mixing percentage: Weight:	Volume: Base - Hardener 2V189: 11 Base - Hardener 2V1 90:10
Mixing Instructions:	Base and hardener should be mixed and applied at a temperature above 10° C. At lower temperatures an extra thinner is required, which gives a slight resistance to failure and which delays hardening.
Feed-in time:	At 20 ° C not necessary At 10 ° C at least 10 minutes
Melting time after mixing:	20 liter packaging: about 16 hours at 10 ° C about 6 hours at 20 ° C about 4 hours at 30 ° C
Application conditions:	During application and storage, the temperature should be above 5 ° C, to obtain maximum resistance against chemical mechanical factors. The surface should remain dry and the surface temperature should be at least 3 ° C above the condensation temperature. During application and hardening in small and closed spaces, it is necessary to continuously refresh the air to remove the solvent vapors, this for conservation, health and safety.

Surface conditions

They can be applied primarily Polyfinish SF-Duplex, Monopox SF-HB or Monopox ZF universal, this depends on the manufacturer's advice.

Repair and maintenance

Clean the surface thoroughly with a suitable cleaning preparation or with a water vapor based cleaning. Remove salts and other impurities using high pressure running water jets. Remove rust with abrasive jet (water) Sa 2 ½ or mechanically remove it up to St. 2-3. Apply the recommended painting system on the clean surface.

Removing the rust mechanically or by hand gives a lower quality than cleaning with an abrasive jet (water) and will result in less protection than the applied painting system.

Description of safety

Transport classification:

Base	ADR / VLG	IMCO	UN
Hardener 2V1	ø	3.31c	3.31c
Thinner JJ 22	3.3	3.3	3,3
	1263	1263	1263

Labeling according to EC principles:

Symbol Xn:	harmful
It Contains:	xylene
R10:	Flammable
R20 / 21:	harmful if inhaled or in contact with skin
R38:	if inhaled or in contact with skin
S23:	irritating to the skin
S38:	do not breathe gas / fume / vapor / spray
P93:	in case of insufficient ventilation, wear the equipment for adequate breathing. contains isocyanates, read the manufacturer's directives

Ventilation rules — A minimum amount of air is required to adapt to:

Polyfinish ZA	MAC	10% LEL
Thinner JJ 22	1510 m3 / L	66 m3 / L
	1745 m3 / L	108 m3 / L

MAC = Maximum acceptable concentration
LEL = Minimum explosion limit
See also the safety information data

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CONTROL SYSTEM

Transmission description & control system

A PLC digitally controls the fully automatic transmission and the loading system.
This system is connected to the PC with a touch screen colour screen, which is also able to connect to the Internet and E-mail for an online backup service (*).
The software is designed and developed specifically to support the entire Ferris Wheel for every technical aspect. The control system is supplied with a power indicator, a fault indicator, and a logbook. The full control system is already available for a central information system on central maintenance.

The Ferris Wheel rotates thanks to self-cooling direct current (DC) motors, which are controlled by a PLC and a converter (Pn = 23.5 kW, IP 23 with SEW pinion). The chosen transmission system is a friction transmission system made up of individual motor units that use rubber tires. This way of operating the wheel allows perfect synchronization. In order to ensure the adequate friction of this system, the outer rim of the wheel will be covered with a special material.

The adequate standard power supply required for the transmission system is 380/415 V, 50 / 60Hz. The control system has an evacuation mode with battery power system, in case of power failure. This battery system ensures that the wheel can be locked and unlocked safely by handling the safety locks, which are constantly at a voltage of 24 Volt.
Passengers will descend safely, and will not have to wait for the power to be restored, even when 24-volt safety locks cannot be used.

Technical details

Operating voltage of the electrical equipment:	400V +/- 10%, 3 ~ / N / PE, 50 Hz
Control voltage:	230V AC / 24 V DC
Standard:	VDE / DIN / IEC
Control unit ambient temperature:	Max. 30 ° C

* optional

Engines

With the use of three-phase alternating current technology, we proceed with the use of static frequency converters with brake resistors. This avoids problems with network supplies and network reactions. In addition, there is the possibility of also completing the action of the motors at the generator level.

However, consumption is increased through:
- Supply of brake blades and resistors
- Wiring of protected lines for a better performance of the motor lines
- Adaptation of the change in consumption of the three-phase alternating current circuit diagram

Speed

Movement:	Circular
Maximum speed:	1.5 rpm - 4 m / s
Maximum acceleration:	0.087 m / s2
Maximum deceleration:	- 0.087 m / s2

LIGHTING

LED
- Each feet contains 12 individual lights.
  Different colours are available such as red, green, yellow, blue etc ...
- Possibility to integrate the system of circuit lights that run with lively movements and or projections of figures.
- The lighting effect is powered by LED technology which offers:
  - Ultra long bulb life
  - Minimum maintenance
  - Low heat emission
  - Low energy consumption

Technical Details

Voltage:	110 / 120V
Lights / LED:	150-300mcd
Energy consumption:	1.0watt / ft
Replacement parts:	2.5ft / 76cm
Leds per ft:	12
UV resistance:	Yes
CSA approval:	Yes
Ce Approval:	Yes

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CABINS

General details

- The capacity is 8 people per subject
- Each subject is composed of an operator safety light above the doors to confirm the closing status with the appropriate locking system of the carousel control system
- Painting in one of the UV resistant colors inside and out
- Gray painted windows with polycarbonate polish
- Progressive numeration
- Supply of all symbols, writings and systems required (numbering, no smoking, maximum effective weight, etc ...)
- Two selected cars will be designed and intended for people with disabilities, with access through doors with a maximum opening of 780-800 mm on each side of the subject.
- Ramps with small steps for a simple and safe entrance (*)
- Standard door opening 600 mm
- Mechanical forced ventilation through grates in the floor (no power needed)

Internal general description

- Liftable benches
- Resistant checkered floor strip
- Ceiling finished with a soundproofing plastic (to prevent condensation)
- Each person with a ceiling with soundproofing plastic must be in a non-combustible material.
- Each subject will be supplied with internal LED lights inside the car including passenger access switch (optional)

* optional

External general description

- Windows that reflect light, painted blue or grey
- Aerodynamic shape
- Each subject can be supplied with an externally mounted access step
- External LED lighting *
- Water and wind resistant construction
- colour: to be agreed with the buyer

- Optional

Heating / Cooling / Ventilation (optional)

- Heating / AC unit

Doors

Mechanical doors on one side (manually) with redundant mechanical locking devices (optional: door on both sides).

Intelligent wireless communication (optional)

Each subject can be supplied with a voice system (microphone, two speakers), a panel with buttons (as seen in the elevators) for operator call and double intercommunication, an individual PC unit and a radio broadcast which includes a pair of antennas. The antenna is integrated into the floor of each subject.

All functions are controlled by a central PC unit in the operator's cabin, where the other pair antenna is installed. The central unit is connected via Ethernet to the Simatic PLC and to the visualization system, which allows for example to see the individual temperature of each subject, the AC unit whether in use or not, any specific booth that calls the booth of the operator, doors not properly closed on each subject, etc.

The systems provide music and voice programmed by radio transmitter with the possibility for the passenger to choose between 4 different languages.

INSTALLATION

Installation

It depends on local conditions; the installation time will be approximately 7 working days.

Testing

The test will be performed by the Sartori Rides.

A qualified engineer will provide instructions and explanations on maintenance and operator staff and the wheel systems will be checked by one of our staff (maximum 7 working days).

The engineers will hold theoretical seminars before the buyer's employees start working with the carousel.

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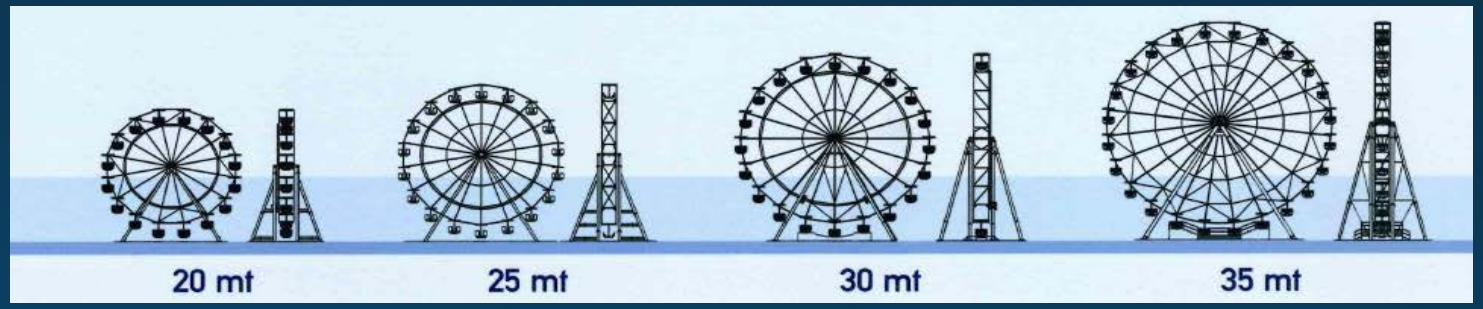
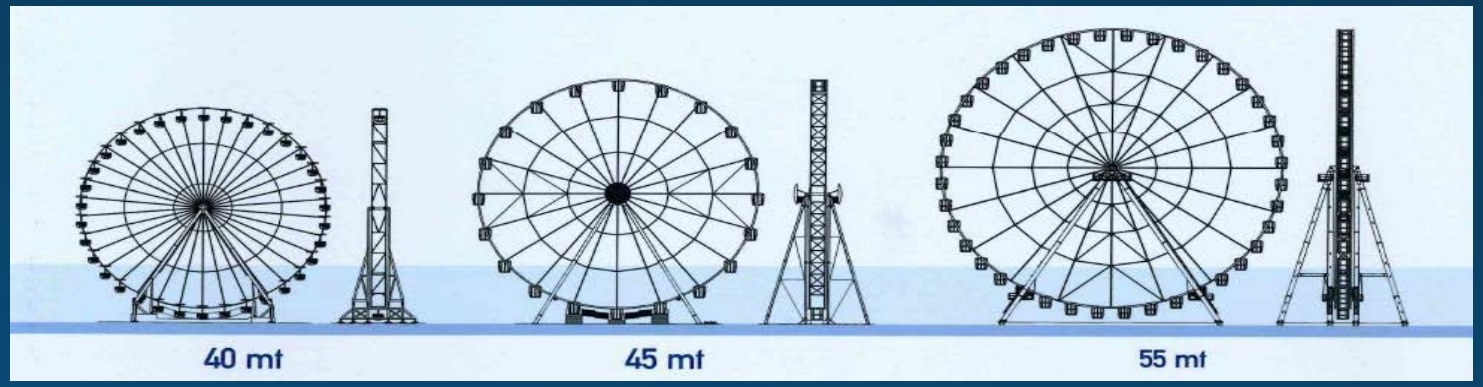
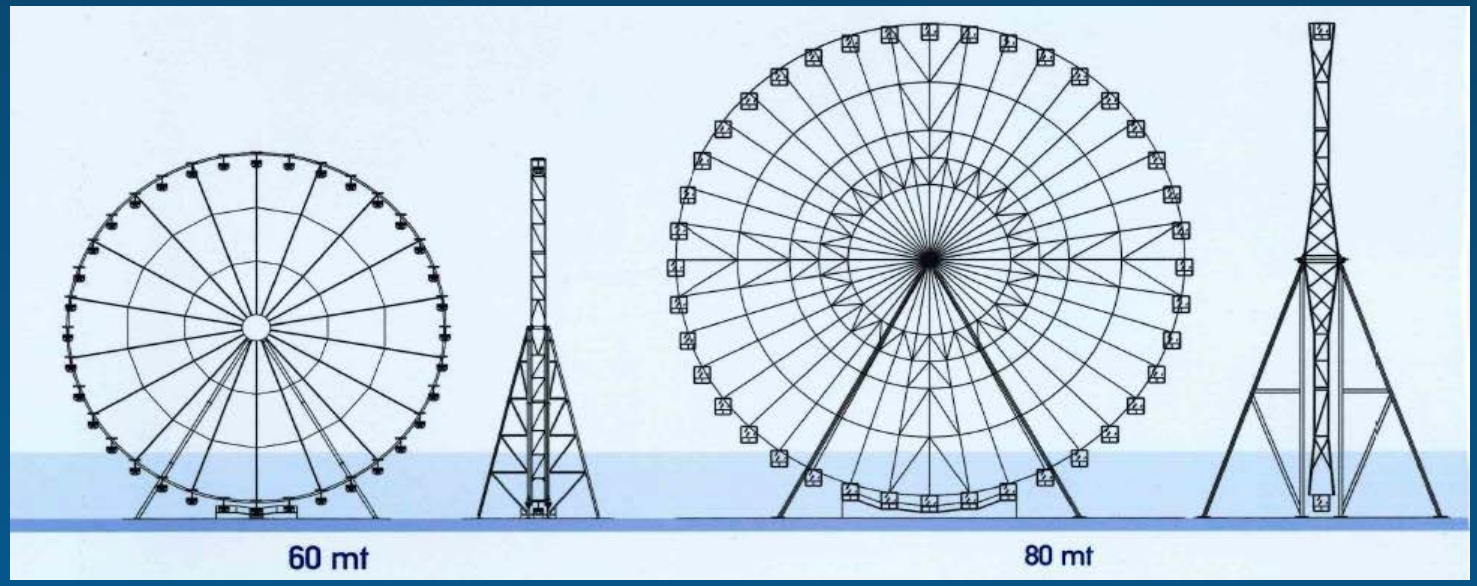
FERRIS WHEEL FOR EVERY SIZE







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FERRIS WHEEL 20/25 MT

PARK AND PORTABLE VERSION

Technical data	
Height	20-25 mt
Ground Space Needed	18 x 8 mt
Cabins Total Capacity	14-16 380 passengers
Weight Power	440 tons 115 kW
Rotation Speed Transmission	1,3 r.p.m. Drive by friction
Emergency procedures Resistance to wind force Drive system	Autonomous According the EN Standards Full PLC System

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FERRIS WHEEL 30/35 MT

PARK AND PORTABLE VERSION

Technical data	
Height	30 mt
Ground Space Needed	19 x 11 mt
Cabins Total Capacity	21 126 passengers
Weight Power	60 tons 120 kW
Rotation Speed Transmission	Adjustable Drive by friction
Emergency procedures Resistance to wind force Drive system	Autonomous According the EN Standards Full PLC System

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FERRIS WHEEL 40/45 MT

PARK AND PORTABLE VERSION

Technical data	
Height	40 mt
Ground Space Needed	23 x 18 mt
Cabins Total Capacity	27 162 passengers
Weight Power	105 tons 120 kW
Rotation Speed Transmission	Adjustable Drive by friction
Emergency procedures Resistance to wind force Drive system	Autonomous According the EN Standards Full PLC System

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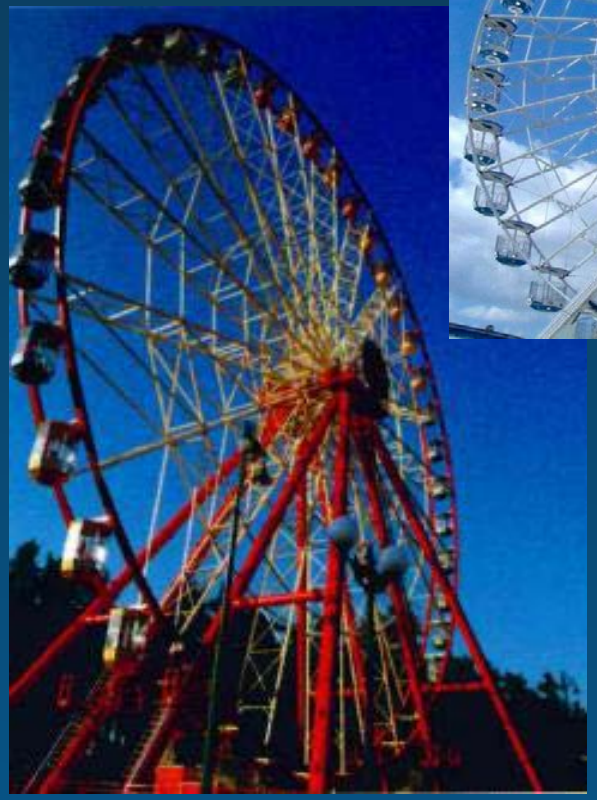
FERRIS WHEEL 50/60 MT

PARK VERSION



Technical data	
Height	53 mt
Ground Space Needed	29 x 20 mt
Cabins Total Capacity	36 216 passengers
Weight Power	150 tons 150 kW
Rotation Speed Transmission	0,15 m/sec Adjustable Drive by friction
Emergency procedures Resistance to wind force Drive system	Autonomous According the EN Standards Full PLC System

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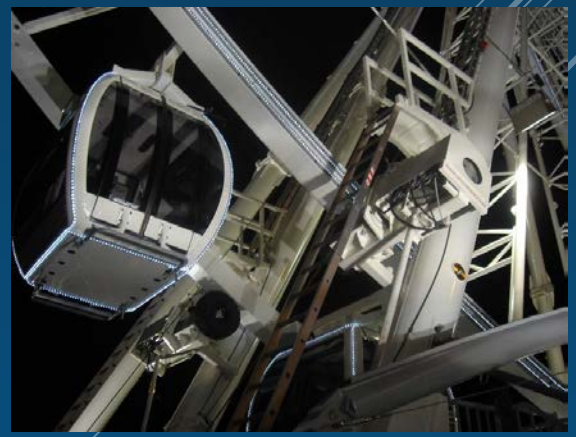
FERRIS WHEEL 80 MT
PARK VERSION



Technical data	
Height	80 mt
Ground Space Needed	45 x 27 mt
Cabins Total Capacity	40 320 passengers
Weight Power	440 tons 120 kW
Rotation Speed Transmission	0,15 m/sec Adjustable Drive by friction
Emergency procedures Resistance to wind force Drive system	Autonomous According the EN Standards Full PLC System

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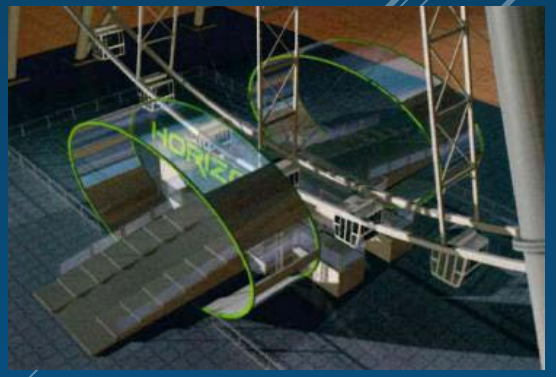
FERRIS WHEEL 100 MT
PARK VERSION

Technical data	
Height	100 mt
Ground Space Needed	45 x 30 mt
Cabins Total Capacity	52 416 passengers
Weight Power	- tons 130 kW
Rotation Speed Transmission	0,15 m/sec Adjustable Drive by friction
Emergency procedures Resistance to wind force Drive system	Autonomous According the EN Standards Full PLC System



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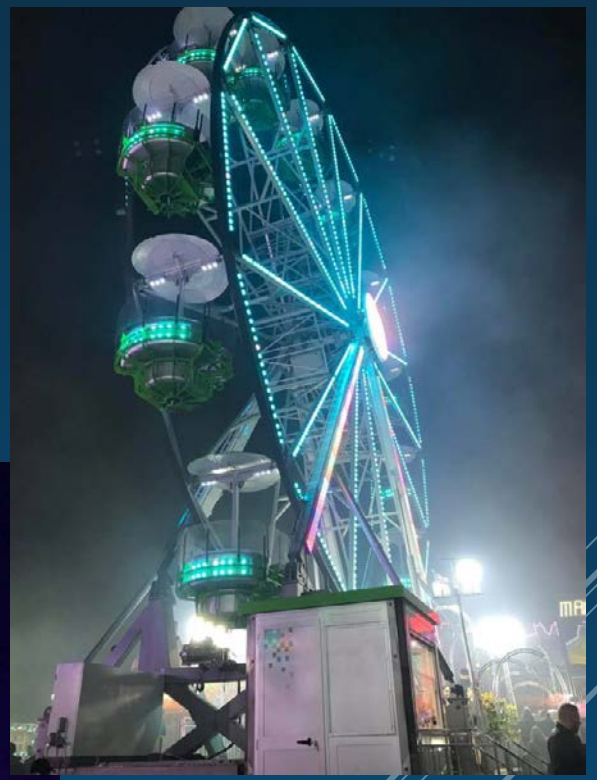
LIGHTING



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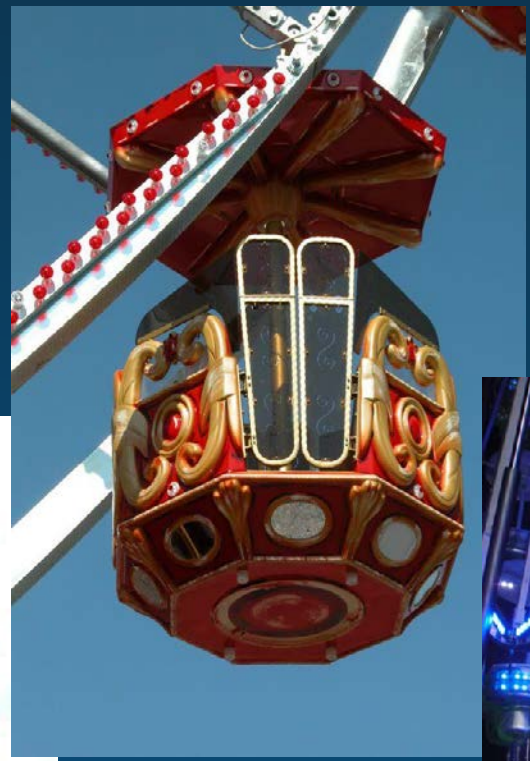
GONDOLAS



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