

CLASS TOWER

THE CUSTOM MADE PRODUCT



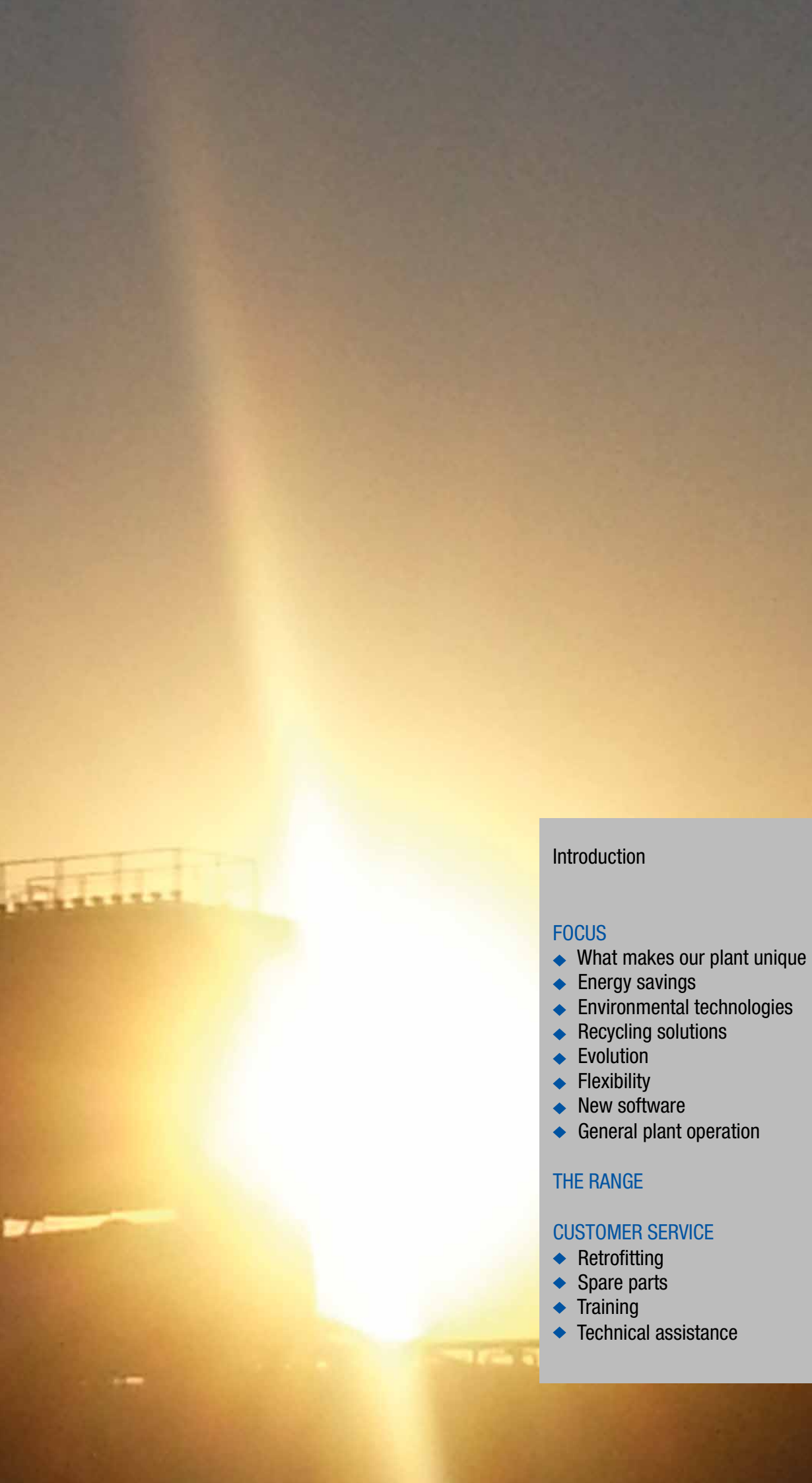
CLASS TOWER

The background of the page is a photograph of an industrial tower structure, likely an asphalt plant, silhouetted against a bright, hazy sky at sunset or sunrise. The tower is tall and cylindrical, with several horizontal walkways and ladders attached to its side. The lighting is warm and golden, creating a dramatic contrast between the dark structure and the bright sky.

Asphalt plants in the Marini CLASS TOWER series offer a top quality finished product. All component parts have been designed to guarantee high level performance with low energy consumption and emissions which respect even the strictest legal regulations.

With production up to 400 t/h, hot storage capacity up to 200 t, screen surface 58.5 m² and mixer capacity up to 6,000 kg, the plant lay-out can be designed to meet every need, from the traditional solution with dryer and filter on ground to the configuration with filter above the dryer.

Thanks to the range of technologies available for use with this plant, mixes containing up to 100% RAP can be produced.



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What makes our plant unique

ENERGY SAVINGS

Our technology is your profit

Specifically developed and designed for keeping the operational costs at the lowest level.

High efficiency motors equipped with frequency inverter, optimum insulation, no heat loss, energy savings, CYB-\$AVE software for consumption control – these are some of the innovative solutions for making energy savings.

ENVIRONMENTAL TECHNOLOGIES

Ready for all challenges

The new EvoDRYER and the AeroFILTER are only a few of the new proposals together with the WMA technology which can be installed at any time.



RECYCLING SOLUTION

The widest range of recycling solutions available on the market

A correct balance between ecology and profit thanks to four different solutions for use with RAP. Quality and high performance with the right investment. RAP technology can be easily implemented with low expenditure.



ADVANCED PROCESS CONTROL SYSTEM

New and innovative control system

The new operational system simply and easily communicates all necessary information to the operator and manages the plant automatically and with maximum efficiency and security.



Energy savings

Compact plant structure designed to reduce TCO (Total Costs of Ownership) to a minimum.

Environment

- the innovative concepts present in CLASS TOWER allow substantial savings in electric power and fuel consumption; in fact this plant results in a considerable reduction of CO₂ emissions
- the emission of fines into the atmosphere is lower than the most recent environmental specifications
- the mixing tower is insulated and cladded to eliminate heat loss, fines emissions and noise pollution

Energy savings with dryer-filter tower solution

- gas and recovered fines circuits are optimised thanks to the positioning of the filter above the dryer drum and the new dryer tower concept
- reduced heat loss of exhaust gases thanks to shorter dryer-filter connection; burner consumption is significantly reduced
- the fines are recovered by gravity in the hopper under the filter, near the weigh hopper with consequent reduction in screw conveyor length and in required electric power. The recovered fines fall into a warm air environment and are fed into the final mix at the highest possible temperature
- the screen with insulated and panel-lined hoppers underneath to cut down on heat loss



Environmental technologies



Regard for the environment is essential in our society. MARINI is especially sensitive to eco friendliness, which can be seen in the development of their new fumes treatment system (capturing, filtering and heat treatment).



Fumes cleaning and treatment

MARINI has developed and successfully fitted AeroFILTER, a new filtering system for fumes and blue smoke produced at certain points of the plant, such as the mixer discharge or along the skip track if the plant is fitted with a lateral storage bin plus the truck discharge points.

Filtering takes place in a series of steps and the oils are recovered in the lower part of the hopper before being evacuated through special tanks, without any external dispersion.

The treated fumes can be sent to the stack of the plant or receive further heat treatment in the MARINI EvoDRYER.

The new technology, combining the AeroFILTER with the use of the EvoDRYER system, is called ZEROVOC and results in effective and efficient fumes management plus treatment of VOC emissions.

This product, which is available at a very affordable price, is compact in terms of space but extremely effective in terms of filtering capacity and performance, making it an essential part of the plant.

Heat treatment of the fumes

Beside the benefits and improved performance with RAP use, the new EvoDRYER system also provides heat treatment of the fumes which could contain classified substances such as VOC. The conveyed air is fed behind the burner flame through a special cylinder entrance.

This patented system means the air is distributed around the external periphery of the combustion chamber where the fumes are quickly and effectively treated and the residual organic composites of the gases are eliminated.



Recycling solutions



Throughout the world, specialists are increasingly using recycling for a series of reasons:

- reduction of waste resulting from the degrading of the road network
- elevated amounts of RAP with problems of storage
- reuse of raw materials, since there is a lack of aggregates due to the decreasing number of active quarries at national and international level
- energy savings, since consumption is lowered due to the reduction in aggregate quarrying, transportation and traffic hold-ups
- bitumen recycling, because not just aggregates are reutilized, but also the binder is recuperated in part

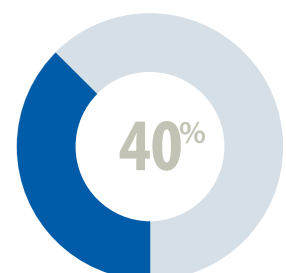
Recycling into mixer

The feeding of RAP can be made directly into the mixer through a standard feed line which consists of:

- cold feeder and belt
- cold RAP metering unit with bucket elevator, surge hopper, weigh belt with variable RAP feed management, depending on moisture content
- modular exhaust system for RAP produced in the mixer with stoppage of fumes from drum to filter

Special system for RAP metering into the mixer composed of:

- two buffer hoppers
- two extractors with variable metering speed
- feeding belt for the introduction of the RAP into the mixer with variable speed, reversible with possibility of evacuation on ground through a dedicated pipe
- steam extraction insulated ducting from mixing tower to dust collection unit
- electro-pneumatically operated flaps in the fumes ducting of the virgin dryer drum





Recycling ring

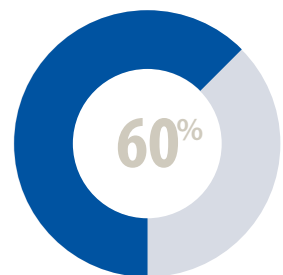
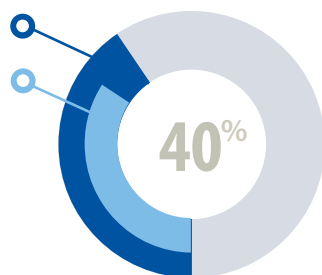
The position of the recycling ring after the flame means RAP can be fed at the ideal point of the dryer drum without any infiltration of parasitic cold air. RAP does not enter into direct contact with the hot gases of the burner flame, but is gradually heated in the drum through heat-recovery flights and mixed with the virgin aggregates which have been heated up to a suitable temperature. In this way the risk of damaging the bitumen is avoided, which is the most considerable advantage of this technology.

Combined technology: ring + mixer

A combination of the two technologies mentioned above proves to be the best technical solution in terms of flexibility and performance when using RAP.



Special EvoDRYER: up to 40%
Standard solution: up to 35%



Recycling in parallel drum

ERAC technology, RAP dryer with hot air

The MARINI ERAC system (standing of «Essiccatore Riciclato con Aria Calda» - RAP dryer with hot air) takes into account the fact that many customers are aiming to use as much as 100% RAP.

The challenge here is to bring the RAP material to the processing temperature of 160°C while keeping emission levels within the normal range and taking care not to burn the bitumen.

In order to achieve even higher RAP material rates while minimizing the level of emissions, there is only one way, already developed and installed by MARINI more than 30 years ago, by heating the RAP material by counterflow, which results in higher material usage and lower exhaust gas temperatures.

The process is based on the use of hot air generated in a separated and dedicated hot gas generator: while with direct firing, the RAP material, with its bitumen content, would «burn» in contact with a flame at >800°C, the hot gas generator only heats it indirectly at the right temperature <650°C.

The RAP is dried and heated in a specially designed drum. ERAC technology allows both the increase of RAP percentages and the decrease of plant emissions.

The line consists of:

- cold feeders and feed belt
- bucket elevator and RAP dryer drum





Evolution

The plant's innovative design allows the use of all types of additive in order to manufacture a wide range of asphalts. A special kit (optional) can be fitted to the plant at any time.

Warm Mix Asphalt - WMA

Most commonly produced at 30°C below Hot Mix Asphalt (HMA) temperatures, WMA ensures high mechanical performances similar to those of HMA, while providing a whole range of benefits:

- reduction of bitumen VOC, CO₂ and gas emissions
- reduction of fumes, emissions and odours
- faster opening to traffic, higher workability and better compaction performances and extension of paving season
- delivery of asphalt mix to longer distances
- reduction of energy consumption = low production cost
- higher plant recycling performances

Water based WMA technology is the best performing solution, especially the micro-bubbled foam bitumen solution (with high pressure water) which offers the widest range of technical and economical advantages.

Foaming system: easily fitted kit

Based on the long experience of the Fayat Mixing Plant division (FMP) in this field, the foaming system has proved to be the best performing equipment for producing higher quality foam bitumen with the micro-bubble method and low water percentage in the bitumen.

Additives

Asphalt modification has been practiced in many forms.

Polymers are added to asphalt for a variety of reasons. They have been found to reduce pavement problems and to result in economic, environmental, energy application and/or performance benefits.

The plant's innovative design allows the use of all types of additive in order to manufacture a wide range of asphalt. A special kit (optional) can be fitted to the plant at any time.

ADDITIVE	Description	Function
Cellulose fibers	Highly fibrillated cellulose pellets	Increase stabilization of the asphalt mix
Pigments	Iron oxide	Yellow blue and white colorant
Bitumen polymer modifiers	WAX, EVA, SBS, Latex	
Neutral binder	Synthetic asphalt binder	Special coloring flexibility
Rubber crumb	High quality recycled car and truck tires	Better binder elasticity and lower thermal sensitivity Reducing deformation, road vibration, noise pollution and moisture damage
Adhesion modifier	liquid and pellet form	Improve bitumen-aggregate bonding
Clear synthetic binder	Clear synthetic binder	Grater color flexibility and brightness of road materials

Flexibility

Fully customizable drying and filtering unit according to customer needs.

Possibility to either position the filter above the dryer drum (less thermal loss and better heating of recovered fines) or to have the filter on the ground.

The configuration with the filter on the ground allows combining any type of filter with any type of dryer drum ensuring the maximum flexibility of product configuration.

With both configurations, the chimney is positioned in the uppermost position without the need for hefty civil works.



Filter above the dryer



Filter on the ground

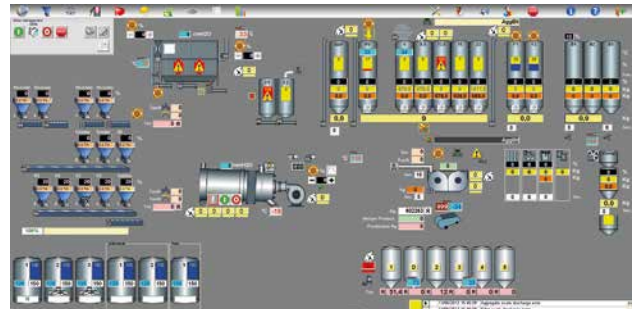
New Software

Complete solution for the management of batch asphalt plants.

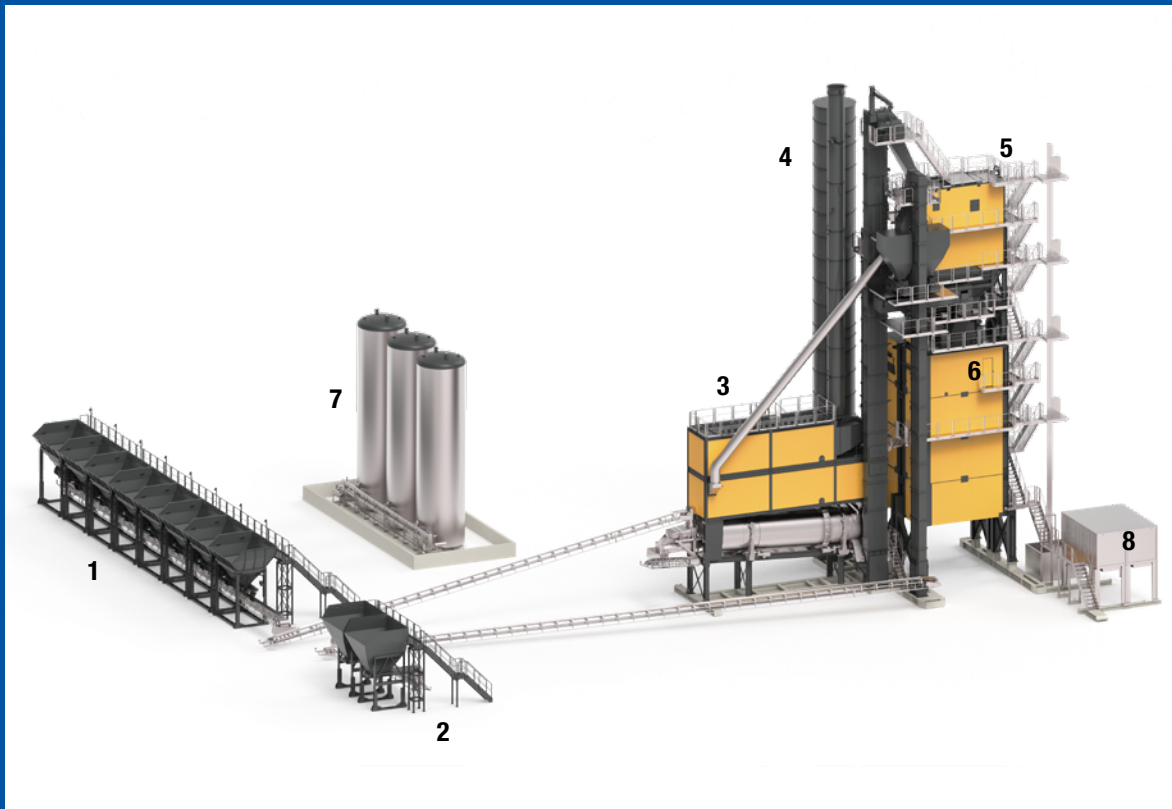
The system offers an automatic control of all the operations of the whole plant according to a series of programmed instructions, leaving however the operator the possibility to modify process parameters.

New software control with:

- Integrated Diagnostic System (IDS) for simple and immediate identification of possible errors in the process
- Innovative and easy-to-understand graphical design with real-time system visualization
- Remote WEB access by MARINI
- CYB-\$AVE module: control system for containing energy consumption and limiting environmental footprint
- Control system on double screen (Opt.)



General plant operation



1 storage and metering of virgin aggregates

2 storage and metering of RAP

3 dryer tower

- dryer drum and recycling ring
- recovered fines storage under filter
- bag filter

4 Imported fines storage

5 mixing tower

- hot elevator
- fines elevator
- screen
- hopper under screen
- metering of components
- mixer

6 storage bin

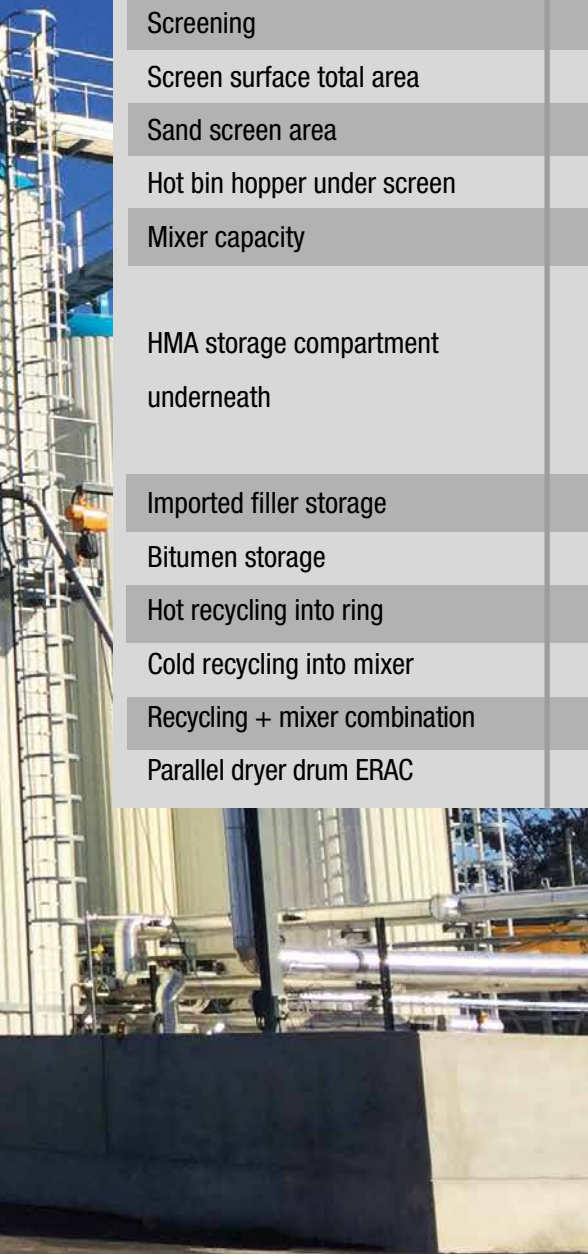
7 binder storage

8 control cabin and automation

CLASS TOWER: the range up to 400 t/h



	CT 240	CT 320	CT 400
PERFORMANCE			
MAX output capacity	240t/h	320 t/h	400 t/h
Dryer drum type	E220 (L=9 m /D=2.2)	-	
	E250 (L=10 m/D=2.5 m)		-
	-	E270 (L=11 m/D=2.7 m)	
	EvoDRYER		
Burner power output	16.8 MW	19 or 22 MW	24 or 27 MW t/h
TECNICAL FEATURES			
Cold feeders	at customer request		
Filter surface	750 m ²	1.012 m ²	1.280 m ²
Horizontal hopper for recovered fines under filter	25 or 70 t	40 or 80 t	70 t
Screening			
Screen surface total area	37 / 45 m ²	48.2 / 58.5 m ²	
Sand screen area	8.2 m ²	10.8 m ²	
Hot bin hopper under screen	80 t or 140 t or 2 x 100 t or 200 t or 230 t		
Mixer capacity	3.5 t or 4.5 t	4.5 t or 5 t or 6 t	
HMA storage compartment underneath	Minimum of 2 x 55 t Maximum of 20 x 100 t Optional long time storage Optional loading cells		
Imported filler storage	at customer request		
Bitumen storage	at customer request		
Hot recycling into ring	40%		
Cold recycling into mixer	40%		
Recycling + mixer combination	60%		
Parallel dryer drum ERAC	100%		





After sales service

Innovation. Everywhere. With you. Complete customer satisfaction lies at the heart of our job and this requires a superior after sales service. MARINI can boast a high-quality service, backed up by an expert team of professionals who are at the constant service of the customer.

Retrofitting

Retrofitting gives new life to all site components and increases plant efficiency, even with regard to the strictest of new eco standards

- **up-grading:** gradual integration of new competitive technologies into existing plants
- **replacement:** substitution of obsolete solutions / dated or well-worn components
- **ecology:** implementation of RAP / WMA technologies and treatment of emissions
- **consultancy:** expert teams of specialists ready to collaborate with customers to identify the necessary modifications
- **not just MARINI:** ability to integrate MARINI technologies and components into asphalt plants of all brands

Spare parts

A quality service for all plant types, based on 120 years of MARINI experience

- **highly qualified teams:** professional MARINI staff offer their vast expertise to identify and supply the necessary parts
- **out of stock parts:** ability to trace spares which are currently out of stock or find alternative solutions
- **stock management:** optimum stock control to ensure more than 80% availability of original spare parts
- **long-life guarantee:** original MARINI spare parts designed to guarantee superior durability when compared with cheaper alternatives
- **widespread market presence:** availability of a vast sales network which is in continual expansion
- **last minute shipments:** two daily shipments (plus last minute) with express service and special transport. Special Saturday and Sunday morning shipments upon request





Training

MARINI is aware of the importance of well-prepared, competent staff who can ensure the efficiency and productivity of the plant and exploit its potential to the full.

It offers the customer a comprehensive training programme, held either in the modern Marini Training Academy or directly on site

- **foundation course for plant operators:** basic training for safe and better asphalt production with MARINI plants
- **burner management course:** basic concepts for burner management to reduce consumption and improve product margins
- **software course:** training programme for increasing awareness and competence when using MARINI software
- **maintenance course:** basic concepts for ordinary maintenance of MARINI plants with the aim of reducing down-time

Technical assistance

The “Marini Service” programme guarantees continual support for its plants worldwide. This is possible thanks to a team of constantly up-dated technicians and local Marini partners. Consultancy, support and rapid intervention, even at long distance, are at the heart of “Marini Service”, with the aim of establishing beneficial, long-lasting customer relationships based on:

- **quality:** rapid and reliable action in all services thanks to MARINI's competence and experience
- **erection:** supervision of all assembly stages to ensure total adherence to budget plans and time scales
- **testing:** customer support during final plant testing to guarantee optimum installation
- **maintenance:** regular inspections and programme planning for custom-made preventive maintenance
- **support H24/7:** long-distance customer assistance and support around the clock, with qualified staff ready to respond to all demands

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