RETROFIT

# ASPHALT-MIXING PLANT MODERNISATION


AMMANN

# **RETROFITTING:**
# IMPROVING OLDER PLANTS TO MEET MODERN STANDARDS

**It can be a challenge for asphalt producers to keep up with ever-changing industry codes and standards. Regulations are frequently updated for noise and dust emissions, sampling options, the production of foamed asphalt and the feeding of additives into mix.**

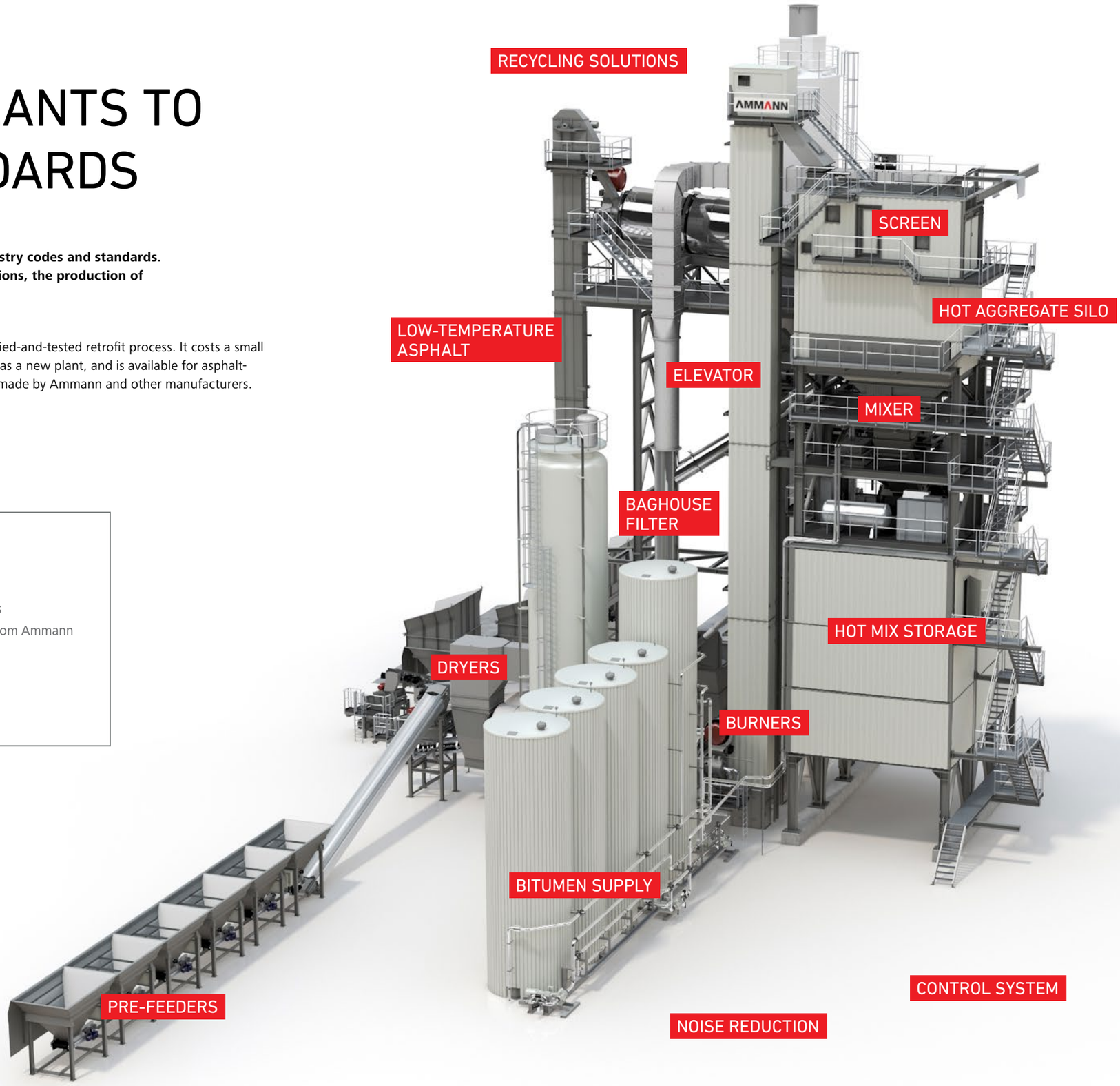
Your business has no choice but to meet the revised standards. While buying a brand-new plant would accomplish that, it might not fit in your budget.

A plant retrofit could be the answer. Retrofitting is a much more cost-effective approach, centered on improving an existing plant to meet the same standards as its newer counterparts.

Ammann has a tried-and-tested retrofit process. It costs a small fraction as much as a new plant, and is available for asphalt-mixing products made by Ammann and other manufacturers.

### WHY A RETROFIT FROM AMMANN?

- Meets all environmental standards
- Costs much less than purchasing a plant
- Tailored to customer needs
- Reduces energy consumption
- Maximizes recycling
- Improves plant safety
- Delivers efficiencies through an updated control system
- Reduces maintenance needs
- Improves overall performance
- Enables access to new functions
- For all asphalt-mixing plants – from Ammann or another manufacturer



A REJUVENATED PLANT

# PRE-FEEDERS

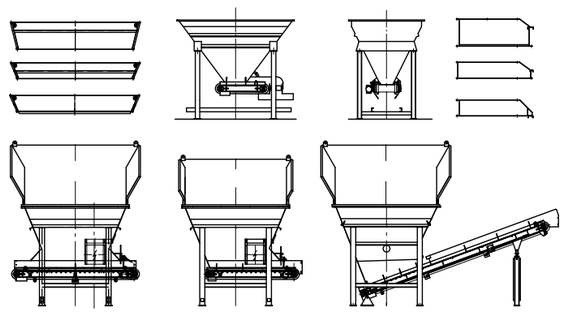
**The Ammann pre-feeder system is fully modular with multiple options, making it highly adaptable to the environment, aggregate and space constraints.**

**The Ammann cold feed system conveys precise proportions of raw materials to the plant. It ensures a steady supply of aggregates to eliminate waste and production interruptions.**

**The design of the pre-feeders for asphalt recycling material takes into account its poor flow properties, stickiness and abrasiveness.**

## HIGHLIGHTS

- Precise feeding through volumetric or gravimetric control, with or without frequency converters
- Low maintenance due to robust design and sidewalls that prevent material spilling
- Minimal operating costs through lower electrical consumption and reduced aggregate waste quality and easy exchange of wear parts
- Smart calibration system for feed accuracy
- Easy relocation thanks to low tipping height; no ramps required
- Special tailor-made solutions to meet all customer needs



**Modular, flexible cold feed configuration that can be upgraded with a variety of sizes and features including filling level probes, visual and sound alarms, vibrators and safety fencing**



A REJUVENATED PLANT

# DRYERS

**Ammann dryers heat and dry raw materials of various compositions, material properties and moisture contents. They have exceptional wear resistance and are easy to maintain and highly efficient. Dryers play a significant role in a plant's financial and ecological performance. Optimal heat transfer, low thermal loss and stable process temperatures are their most important functions.**

## HIGHLIGHTS

- The entire drying/heating/exhaust systems come from a single manufacturer for perfect coordination of all processes
- A wide range of dryer sizes for plant capacities of 80 to 400 tonnes per hour to meet varied needs
- Optimised heat transfer stages and dryer insulation for maximum efficiency and fuel savings
- Low-wear, low-maintenance design with high material quality and easy exchange of wear parts
- Adaptable internal dryer design for use of varied aggregates and fuels
- Optional speed control for fine tuning of heat transfer in case of varying operation modes (for example, a switch between low- and high-temperature asphalt production)
- Optional middle ring dryer (RAH50) for addition of up to 40% cold RAP

## RAH50 MIDDLE RING DRYER

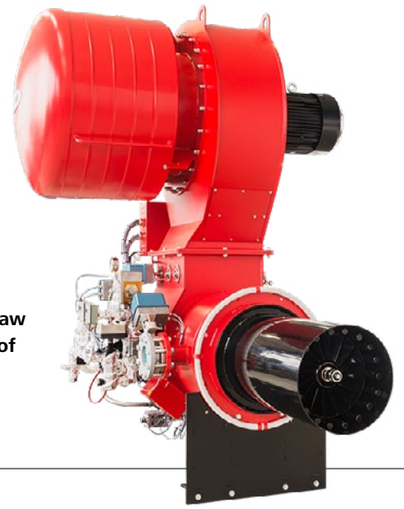
The RAH50 system enables processing of up to 40 % RAP into the virgin aggregate dryer. This technology prevents problems associated with bitumen aging, sticking and emissions.

## HIGHLIGHTS

- 40% RAP utilisation achievable
- Easy to retrofit on most plants produced by Ammann or other manufacturers
- Can be combined with cold RAP system for greater flexibility during plant operation
- High Recylcing addition rates with low-cost installation

TECHNOLOGICAL IMPROVEMENTS

# BURNER



**The Ammann burner provides the thermal energy used to heat and dry raw materials. Cutting-edge technology enables highly efficient combustion of a wide range of fuel types. Low emissions and high safety standards are basic principles behind the burner's development.**

## HIGHLIGHTS

- A single manufacturer provides all drying/heating/exhaust management processes, ensuring perfect attunement
- Multi-fuel firing with simultaneous or alternating combustion of up to three fuel types for maximum flexibility
- A highly effective combustion process for low fuel consumption and emissions
- Combustion of solid pulverised fuel without the need of a supporting flame
- Integrated soundproofing for reduced sound; further reduction possible through a frequency converter
- Safety concept meets regulations of all countries
- Available for varied liquid, gas and solid fuels

## ALTERNATIVE FUELS

Ammann burners can be retrofitted to various fuels of the future: liquid, solid or gas.

- Light oil
- Heavy oil
- Waste oil
- Bio oil
- Kerosene
- LPG fluid/ gaseous
- Natural gas
- Tall oil
- Brown coal dust
- Wood dust

Fuel selection is driven by local availability, enabling cost optimisation and ecological considerations. The share of renewable fuels continues to grow.

.



A REJUVENATED PLANT

# ELEVATORS

**Ammann builds bucket elevators for all solid media (hot aggregate, filler, RAP) to be conveyed with product- and capacity-specific modifications to match the plant.**

## HIGHLIGHTS

- Variable conveying and drive capacities
- Variable shaft thicknesses adapted to customer requirements
- Varied chains and conveyor belts
- Shaft and/or head station insulation to reduce sound and prevent heat loss
- Maintenance drives for easy and safe maintenance (also for existing elevators)
- Different bucket types available:
  (rim reinforced with Amdurit, rubber bottom, different plate thicknesses)


ENVIRONMENTAL UPGRADES

# BAGHOUSE FILTER

**The Ammann baghouse filter is designed to provide maximum efficiency and minimal pressure and heat loss. Thanks to this design, our customers can be assured that the filter performance meets the lowest exhaust particulate emission levels. Ammann baghouse filters are offered in a wide range of sizes, with the air-cloth ratio available for customization.**

## HIGHLIGHTS

- Proprietary rotor step mechanisms gently clean the filter bags, greatly reducing wear when compared to pulse jet systems.
- Filtration efficiency of 99.9 % ensures compliance, even with the strictest emission standards.
- The largest possible surface provides optimal filtration efficiency, even during the cleaning cycle.
- Minimal moving parts reduce maintenance and improve reliability.
- High-quality aluminium supporting cages are acid resistant and ensure convenient filter bag exchanges.
- The CFD-supported baghouse design reduces temperature and pressure losses and therefore minimises operational costs.
- Options include exhaust fan frequency control and automated differential pressure cleaning.
- Cleaning can be completed without compressed air.

## FILLER SYSTEM

The filler system plays an essential role in the asphalt manufacturing process. It provides between 60 %–70 % of the material surface that will be coated with bitumen. Ammann filler systems are designed so that hot filler is always primarily used. Filler that is preheated makes the bitumen coating process easier and more consistent. Ammann understands the importance of this procedure and has a sophisticated system to help ensure success.

## HIGHLIGHTS

- Hot, reclaimed filler is immediately re-used in the process.
- Coarse and fine filler is separated.
- Energy and space are saved.
- Various reclaimed and imported fillers can be used.



ENVIRONMENTAL UPGRADES

# BITUMEN SUPPLY

**There is a global trend toward electrically heated bitumen systems. Our “E Bit” tank system is extremely cost-effective thanks to high energy efficiency and reliable technology. E-Bit tanks also require little maintenance. Intelligently controlled heating circuits and the utilisation of low-cost power rates enable the systems to be operated economically. After only a few years, fuel savings cover the cost of replacing thermal-oil heated systems. The process also improves operational safety.**

## E-BIT TANKS SET NEW STANDARDS

Electrically heated bitumen tanks are simple to install and economical in terms of procurement, operation and maintenance. Ammann E-Bit tanks negate the need for periodic pressure testing of the thermal-oil system and emission measurement.

| Heat system | Advantages | Disadvantages |
|---|---|---|
| Thermaloil | • Little power limitation<br>• Overheating above set temperature isn’t possible | • Maximum stocking temperature approx. 180°C<br>• High investment and installation costs<br>• Annual pressure test<br>• Annual thermal oil check<br>• In case of improper operation tendency to get clogged |
| Electric heating | • Good efficiency factor in all ranges of capacity<br>• Lower operating costs than for themal oil heaters<br>• Very constant heating<br>• All required stocking temperatures can be realized | • Limited capacity due to electrical connection facilities |

A REJUVENATED PLANT

# HOT AGGREGATE SILO

**Ammann hot aggregate silos stockpile the heated and screened aggregate fractions so they can be delivered to the mixing process as required. This is accomplished with minimal heat loss and segregation.**

**A wide range of sizes and configurations, including optional double-row silos, ensure the optimal arrangement for every plant.**

## HIGHLIGHTS

- State-of-the-art hot mineral silo
- No more plant downtime due to repair work on the partition walls (grain mixing)
- The elimination of complaints about incorrect grain size in recipes due to worn partition walls
- Less maintenance work during the winter overhaul
- Maintenance access in each component pocket enables regular checks of the HMS pockets/chambers, thus avoiding unplanned downtime

Trouble-free production thanks to continuous level probes.

Easier maintenance thanks to side entrances into the hot mineral silo (according to DIN EN 536).



A REJUVENATED PLANT

# SCREEN

**Ammann asphalt screens sort hot aggregate into properly sized grains, essential in the creation of a top-quality mix. The screen tackles sorting while operating at high capacity and under the toughest ambient conditions.**

**Precisely controlled variables include stroke angle, amplitude, frequency, screen body design and mesh geometry. The result is screening unmatched in the marketplace.**

**Ammann offers 3 different Retrofit Kits:**

## RETROFIT KIT 1

**Replacing the balancing shaft with unbalanced drives.**

- State-of-the-art screen drives reduce maintenance
- Increased efficiency due to lower energy consumption (IE 3)
- Fast spare parts delivery

## RETROFIT KIT 2

**Replacing the balancing shaft incl. screen body.**

- Higher performance
- Optimised for high temperatures
- State-of-the-art screen drives and screen body reduce maintenance requirements
- Fast spare parts delivery

## RETROFIT KIT 3

**Complete screen replacement.**

### OPTION VA SCREEN

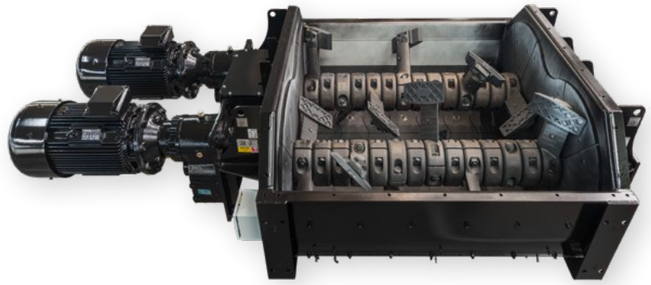

- Higher performance
- Optimised for high temperatures
- The screen is state-of-the-art
- Easy integration due to identical interfaces
- No adapters necessary

### OPTION APS SCREEN

- Central clamping bar with bolts for quick and easy screen lining replacement
- Higher performance
- Optimised for high temperatures
- The screen is state-of-the-art
- Easy maintenance due to easily accessible maintenance door with integrated bypass channels

A REJUVENATED PLANT

# MIXER



**The quality Ammann twin-shaft mixer utilises an optimal blending motion to continually adjust the intensity and direction of the force – factors essential to creating a homogenous mix. The proven Amix principle offers outstanding mix efficiency and reduced wear.**

## HIGHLIGHTS

- Minimal wear through protected components and an efficient mixing process
- Compulsory twin-shaft mixer provides highest shear forces
- Optimal homogeneity and mixing time through the unique Ammann paddle arrangement
- Maximum sequence design flexibility that enables production of special mixes
- Retrofit availalbe for all mixing-plants - from Ammann or another manufacturer

## THE MIXING PROCESS

Quality mixing is the result of a combination of circular material movement and transverse transport between the twin shafts. A systematic progressive movement and redistribution of the coated materials are achieved through a special arrangement and positioning of the mixing arms on the shafts. Positioning of all mixer arms is based on the same logic, ensuring a thorough, uniform mix over the entire length of the mixer body.

## MIXING PROCESS WITH THREE COMPONENTS

START

AFTER 6 SECONDS

AFTER 12 SECONDS

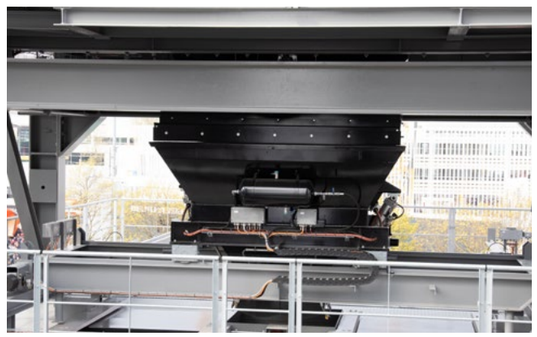


A REJUVENATED PLANT

# HOT MIX STORAGE

**The load-out silo is essential to cost-effective, efficient asphalt production. The silo stores mixed material, enabling a continuous production process without time-consuming and costly starts and stops of the plant.**

**Trucks can be loaded quickly and without interruption, preventing long waiting lines. The optimal stock control and weighing system facilitates production and efficient scheduling of transportation. Ammann offers a complete range of loading silos that can be adapted to the customer's dimension and design requirements.**

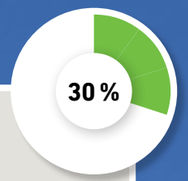


## HIGHLIGHTS

- Reduced dust and fumes emissions through encapsulation, a suction system and an optional house
- Geometries designed for minimal mixture segregation
- Overnight storage with a standard silo; optional upgrade for 72-hour storage
- Retofits adapted to the customer's needs

# CUSTOM-MADE RECYCLING SOLUTIONS

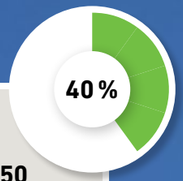
**The use of reclaimed asphalt is an absolute necessity today. We offer you custom-made solutions. Our modern plant technology guarantees you extremely high quality asphalt when using recycled asphalt (RAP).**




### 30% COLD FEED INTO THE MIXER

**BENEFITS**

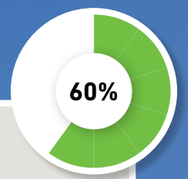
- New minerals can be screened off
- Batch quantity variable with each load
- Max. flexibility (recipes)
- Independent from rest of process




### 40% HOT FEED IN DRYER DRUM RAH50

**BENEFITS**

- Processes RAP proportions of up to 40 %
- Energy savings of up to 15 %
- Efficient processing of new material
- Protected by international patents
- Combinable with cold feed system




### 60% HOT FEED IN PARALLEL DRUM

**BENEFITS**

- New minerals can be screened off
- High feed ratio
- Gentle heating
- Combinable with cold feed system


### 100% HOT FEED IN RECYCLING DRUM RAH100

**BENEFITS**

- Recycling rates of up to 100% are achievable
- Improved efficiency – cost benefit through fuel savings
- Low emissions that lead to a better argumentation during the approval process
- Recipes are more flexible as there is no need to overheat the minerals

### HIGHLIGHTS

- Significant reduction of production costs due to lower costs of bitumen, minerals and transport
- Supported or promoted by statutory legislation (country specific)
- Less impact on natural resources (oil and virgin aggregate conservation)
- Reduction of expensive storage facilities
- $CO_2$ reductions

ENVIRONMENTAL UPGRADES

# LOW-TEMPERATURE ASPHALT

## INNOVATIVE AND FORWARD-LOOKING

Lowering production temperatures creates new opportunities for asphalt as a construction material. Reduced energy costs and minimised emissions are only part of the benefits of low-temperature asphalt. While a number of utilisation options have appeared on the market, we believe it is too early to focus exclusively on a particular method of introducing additives or foam bitumen. The entire process chain is affected – starting with drying at a reduced temperature, to specific mixing sequences, and on to the introduction of recycling. Ammann has focused its research and development on the complete manufacturing process, with an injection device being only the beginning. We would be pleased to advise you on how to best make this important step moving forward.

## ENERGY EFFICIENT, LOW EMISSION AND $CO_2$- OPTIMISED

New technologies enable the manufacturing of asphalt at reduced temperatures. Energy consumption per tonne of asphalt and emissions at the construction site drop significantly when utilising low-temperature mixes. While conventional asphalt is produced at around 170 °C, the low-temperature processes enables production temperatures of around 100° C. Ammann offers various technologies for this production. Depending on the application, foam bitumen, waxes and other additives, special bitumen, or alternative mixing cycles can be suitable.



# AMMANN FOAM® GENERATOR

**THE IDEAL ADD-ON FOR ANY ASPHALT-MIXING PLANT**

**Ammann is convinced that the future lies with low-temperature asphalt. In cooperation with customers and laboratories, we have developed the Ammann Foam process. Its is based on the the foaming of bitumen with water and is employed in our continuous and batch plants. Ammann foam works without any chemical additives and can be retrofitted to existing plants with minimal effort.**

## THE FOAM GENERATOR

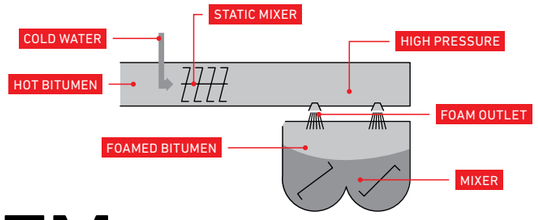
You can expand the product portfolio of your mixing plant through foam bitumen. The generator can apply foam of varied firmness to road construction bitumen and polymer modified bitumen.

The generator can also be used to manufacture cold base courses – even with 100 % recycled materials. The foam bitumen can be used to supplement the recycling feed in the mixer.

### HIGHLIGHTS

- Heating of the raw aggregate to approx. 115 °C
- Perfect mix of bitumen and aggregates
- Asphalt compaction at low temperatures
- Foam generator can be integrated into continuous and batch plants
- Retrofit to existing plants possible

## FOAM BITUMEN OF COLD OR LOW-TEMPERATURE ASPHALT




# ADDITIVE SYSTEM

**An almost infinite variety of additives is in use today for special hot, warm or cold mixes that enhance the performance, appearance and ecological footprint of asphalt mixes. Ammann plants come with a wide range of optional systems and Ammann has a standardised or customised solution to handle any type of additive – whether in liquid, granular or powder form.**

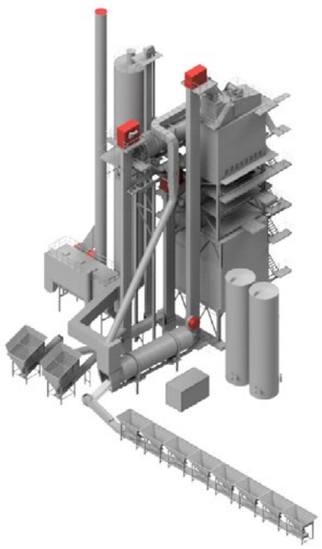
### HIGHLIGHTS

- Ammann's extensive experience and expertise in additives ensures optimal process implementation for each additive.
- A wide range of systems is tailored to each additive's specific physical and chemical properties.
- Possible additives:
  - Fibres (loose or granular).
  - Pigments (loose, granular, bag addition).
  - Rejuvenators (liquids of all viscosities and chemical properties).
  - Waxes (granular or melted into bitumen).
  - Process oils, adhesives, flux.

ENVIRONMENTAL UPGRADES

# NOISE REDUCTION

**Ammann Asphalt-Mixing Plants provide significant noise reduction solutions. In fact, the efforts are so effective that reductions of up to 25 dB (A) are possible.  Ammann offers four levels of noise suppression.**

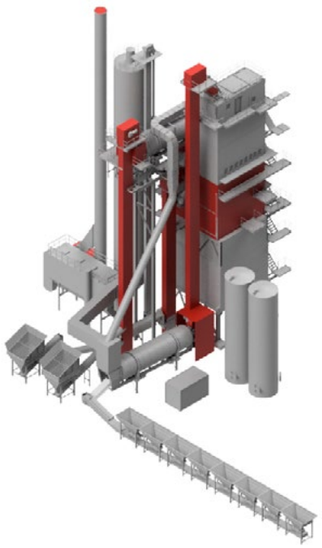


LEVEL 1

## AN ECONOMICAL, EFFECTIVE APPROACH

**Includes several basic cost-conscious efforts**

- The burners are equipped with variable speed drives so the electric motor can be slowed – and made quieter – when full power isn't needed.
- A stack silencer, which is essentially a chute inserted in the chimney, acts as a sound suppressor.
- Head stations of the elevators for reclaimed asphalt pavement (RAP) and virgin aggregates (VA) are covered with paneled cladding to reduce sound levels from the inside.
- Sound-inhibiting walls are placed around the plant exhauster to cancel noise from inside.



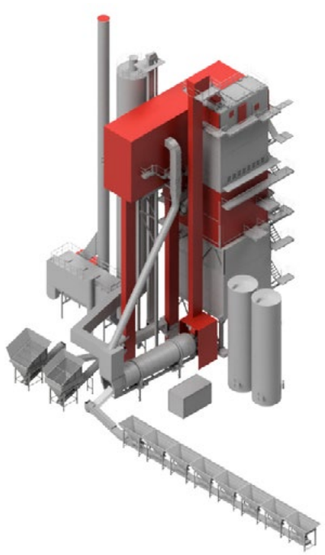
LEVEL 2

## COVERING MAIN EMITTERS

**Builds on Level 1 and then offers several additions and upgrades**

- The burners are covered with paneled cladding.
- The RAP and VA elevator shafts are insulated to minimise the sound of turning chains and falling material.
- The RAP and VA transfer chutes are insulated.
- Sound-inhibiting walls are placed around the plant exhauster to cancel noise from inside.
- A Next Generation Screen (NGS) replaces  the standard vibration screen for VA. The NGS, a premium screen, is impervious to dust and double enclosed.
- The mixer and weighing level are cladded with trapezoidal panels.
- The oversized coarse grain channel is insulated.



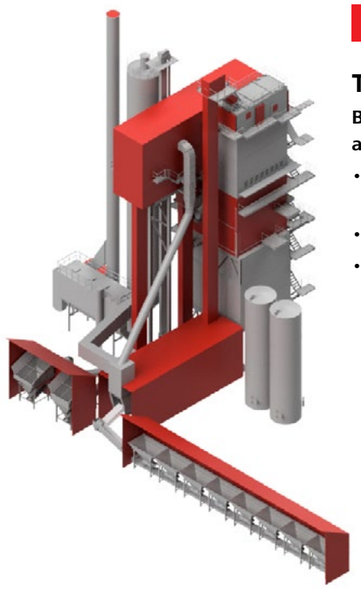


LEVEL 3

## CLADDING FOR FURTHER REDUCTIONS

**Builds on Levels 1 and 2 and then offers several additions and upgrades**

- The RAP dryer section is cladded with sound absorption panels.
- The Next Generation Screen maintenance doors and openings are sealed with sound- absorption panels.
- The mixer and weighing level are cladded with sound absorption panels  (an improvement from trapezoidal sheets in Level 2).



LEVEL 4

## THE QUIETEST PLANT POSSIBLE

**Builds on Levels 1, 2 and 3 and then offers several additions and upgrades**

- The VA dryer and the burner are fully surrounded by a housing with sound absorption panels.
- The cold feeders utilise three-sided housing.
- A sound suppression housing is placed over the bitumen pump and compressor unit.

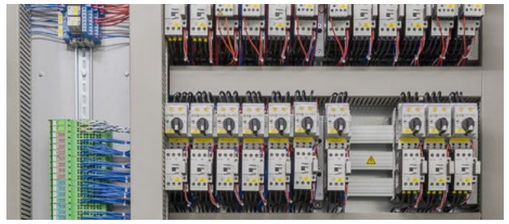
TECHNOLOGICAL IMPROVEMENTS

# AS1 CONTROL SYSTEM

**The powerful and future-oriented as1 Control System concept combines proven Ammann software with specially matched industrial hardware. The as1 computing environment has been designed and tested for use in tough environments. Its networking capability also has been optimised. Customers profit from the flexible workstation configuration, networking and administration.**

## THE FIELD BUS SYSTEM
GUARANTEED FOR RELIABLE SIGNAL TRANSFER

The proven field bus system is robust and reliable under tough operation. Faults can be detected efficiently and rectified by means of the diagnostic tools, even via remote support.



## THE POWER CABINET'S COMPONENTS
DESIGNED FOR TOUGH, ROUND-THE-CLOCK OPERATION

The power cabinet's components have to withstand extreme stress 24 hours a day, which is why Ammann only uses tried-and-tested, globally available quality components from renowned manufacturers.

### HIGHLIGHTS
- Comprehensive system functionality
- Quick and easy to learn
- Safe to operate
- Proven, reliable field bus and load-sharing
- Automatic fault detection
- Professional hotline and support organisations ready for service worldwide

## HOTLINE AND SUPPORT
PLANT AVAILABILITY ASSURED

Electromechanical faults can be quickly resolved by the customer's own personnel with the help of the electrical circuit diagrams and the as1 diagnostic tools.
Ammann's knowledgeable customer service team staffs the hotline, which can be called for fault diagnosis or maintenance at any time. Modern telecommunications media increase the availability of the plant and reduce the need for costly on-site servicing.


### BENEFITS OF A RETROFIT
- Spare parts availability ensured
- Reduction of plant downtime
- Data to improve mix quality
- Data to reduce energy costs
- Latest process technology implemented
- Tools for plant optimisation
- Data interfaces to third-party systems
- Readiness for Industry 4.0 / digitalisation
- Efficient support ensured
- Expandability ensured
- Tools for efficient remote support via Internet

# SUCCESSFUL RETROFITS

## RAH50 MIDDLE RING DRYER

The Ammann RAH50 is a popular retrofit because it allows customers to work with recycled asphalt. These middle ring dryers can seamlessly replace either existing Ammann drums or those supplied by another manufacturer.

Christian Westphal, Head of Machine Technology MTA Mischwerke SAW Schleswiger Asphaltsplitt-Werke GmbH & Co. KG, retrofitted a plant with an Ammann RAH50 drum. He explained how his new middle dryer ring works compared to a conventional new mineral drum.

Read the story

## RETROFIT OF AMMANN CONTROL SYSTEMS GIVES TECHNOLOGICAL BOOST

As Eric Perard, Industry Director at Socogetra, explains: “Our old Ammann AS2000plus Control System has functioned superbly for many years, and it has performed excellently throughout its lifetime. Nevertheless, we needed to take advantage of the latest technological advances offered by Ammann’s as1 Control System so that we could continue to produce high-quality asphalt and anticipate our future requirements.”

Read the story

## IMPROVING CAPACITY

Meier Company turned to a retrofit from Ammann when it wanted to get more out of its existing plant. The result was tonnes of improvement – literally.

“Before we had four load-out silos with an overall capacity of 280 tonnes,” said Michael Stemplinger, Technical Manager at Meier Company, an asphalt producer located in Rotthalmünster, Germany. “Now we have eight different silos with a total capacity of 640 tonnes.”

The additional silos provided more than storage. They also greatly improved the flexibility of the business.

Read the story

## DRUM RETROFIT REDUCES ODOUR SIGNIFICANTLY

A retrofit to an Ammann Asphalt-Mixing Plant is reducing odour emissions and pleasing neighbours.

An Ammann RAH100 dryer replaced the existing component on a decades-old plant owned by Asphalt Production Ltd. (APL) in Heusden-Zolder, Belgium. It is the first RAH100 to be employed in the country.

The asphalt-mixing plant is located close to a residential area, with many neighbours nearby. The retrofit reduces odour emissions significantly.

Read the story

## PROTECTING THE ENVIRONMENT

Four years ago, Fiegl GmbH of Bavaria invested in the retrofit of an asphalt-mixing plant tower, as well as the replacement of the baghouse. The retrofit led to immediate reductions in emissions, sound levels and fuel usage.

Read the story

## AMMANN RETROFIT SOLUTIONS

For all asphalt-mixing plants –
from Ammann or another manufacturer

For additional product information
and services please visit:
**www.ammann.com**