

OUTPUT SPECIFICATION

AMMANN Asphalt mixing Plant GLOBAL 160
discontinuous batch-mix type, capacity 160 t/h

Dryer T 2290 B

Aggregate capacity	180	180	161	143 t/h
Moisture content (based on the dry weight of aggregates)	3.0	4.0	5.0	6.0 %

- Capacity indication for minerals with ordinary drying behavior	
- Standard asphalt formulas	
- Max. content of fine particles 80 microns	max 10 %
- Bulk density	1,6 t/m ³
- Entering temperature	10 °C
- Discharge temperature	190 °C
- Temperature increase	180 °C
- Remaining moisture content	< 0,5 %
- Output tolerance	+/- 5 %
- Max. dryer output	180 t/h

Mixing unit GLOBAL 160

Asphalt capacity	160 t/h
Batch	2,0 t
Batch rate	80 B/h
Cycle	45 sec.
Gradation capacity H 1840	180 t/h
Number of classifications	max 5
Sand part 0-2 mm (mesh size 3.15 mm)	28 %
Sand part 0-4 mm (mesh size 5.5 mm)	40 %
Granular size	max 45 mm
Max. batch for easily mixable asphalt with a bulk density of	min 1,8 t/m ³

Max. output at max. batches, 5 mineral-weighing or bypass-operation, continuous mixing with the same formula, granted supply of materials and delivery of asphalt

For asphalt with lower bulk density (top layer), batches and batching rates have to be decreased in consequence

- Bulk density filler	1.0 t/m ³
- Bulk density minerals	1.6 t/m ³
- Bulk density mixed asphalt	1.8 t/m ³

Electric design

Power supply	3 x 400 V/AC - 50 Hz
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Specification Asphalt mixing plant Global 160 Q Type 2 HEL
Project Qatar

01 Cold feed system 5 x 10

The cold feed system serves as an aggregate intermediate storage, each component is stored in a dedicated hopper according to fraction size. They are fed via proportioning belts in the correct proportion to the collection belt according to the mix recipe. Bulk storage systems are fitted with a proportioner directly under the silo, stockpile systems consist of a hopper with a proportioning belt, these are normally charged by a shovel loader. The material is then transported via collection and transfer belt to the drying and heating unit.

01.01 Cold feeder ADL

Metering range mechanically adjustable in 3 stages	
Regulation range per stage (via frequency converter)	1 : 25
Metering capacity stage I	3.2 - 80 t/h
Metering capacity stage II	5.6 - 140 t/h
Metering capacity stage III	8.0 - 200 t/h

5 Hopper

Capacity	10 m ³
Dump width	3600 mm
Dump height	3100 mm

Hopper with 3 position adjustable discharge opening supports and integrated frame for the collection belt.

5 Hopper discharge belt

Belt width	650 mm
Distance between conveyor centers	1350 mm
Belt quality	EP 250/2
Drive	1.5 kW

Hopper discharge belt with drive, corrugated side wall belt, galvanized belt frame, flow control via inductive aggregate starvation switch and flag.

1 Hopper vibrator

Connected load	140 W
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5 Protection grill for feeder

mesh size	100 x 200 mm
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01.02 Collection and transfer belt

Conveying capacity	180 t/h
Belt width	650 mm
Belt quality	EP 400/3

Belt conveyor fitted with emergency stop and hand guards.

1 Drive unit

Drive	5.5 kW
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Drive station with geared motor, rubber coated drive roller, galvanized frame, safety guards, discharge chute and hardened metal belt scraper.

1 Belt tensioner with return roller, threaded tensioner and internal V - scraper.

10 Meters of intermediate construction, horizontal

Intermediate construction with conveyor belt and roller stations for cold feeders with integral belt frame.

6 Meters of intermediate construction - inclined

Intermediate construction with conveyor belt, roller stations and galvanized belt frame with supports.

1 Rotation monitor fitted on the tension roller, inductive

01.03 Collection and transfer belt

Conveying capacity	180 t/h
Belt width	650 mm
Belt quality	EP 400/3

Belt conveyor fitted with emergency stop and hand guards.

1 Drive unit

Drive	5.5 kW
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Drive station with geared motor, rubber coated drive roller, galvanized frame, safety guards, discharge chute and hardened metal belt scraper.

1 Belt tensioner with return roller, threaded tensioner and internal V - scraper.

13 Meters of intermediate construction - inclined

Intermediate construction with conveyor belt, roller stations and galvanized belt frame with supports.

1 Rotation monitor fitted on the tension roller, inductive

01.04 Collection and transfer belt

Conveying capacity	180 t/h
Distance between conveyor centers	13 m
Belt width	650 mm
Belt quality	EP 400/3

Belt conveyor fitted with emergency stop and hand guards.

1 Drive unit

Drive	5.5 kW
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Drive station with geared motor, rubber coated drive roller, galvanized frame, safety guards, discharge chute and hardened metal belt scraper.

1 Belt tensioner with return roller, threaded tensioner and internal V - scraper.

7 Meters of intermediate construction, horizontal

Intermediate construction with conveyor belt and roller stations for cold feeders with integral belt frame.

6 Meters of intermediate construction - inclined

Intermediate construction with conveyor belt, roller stations and galvanized belt frame with supports.

01.05 Scalping screen

2 Support frame with platform and outlet chute

02 Drying and heating system T2290B

The mixed aggregates supplied from the cold feed unit are dried in a direct-fired drum and heated to the temperature required for their further treatment. The drum operates according to the counter flow method, which means the mixed aggregates are conveyed towards the flame.

The drum is usually charged by a feeder belt. The drum cylinder is inclined towards the drum discharge, the drum is friction driven by drive trunnions and running rings. Flights and lifters assure that the aggregates are split up and fed through the pre-heating, evaporation and heating zones to the drum discharge opening. The shovels in the firing area guide the aggregates around the flame in order not to disrupt the burner combustion.

02.01 Drum feed

1 Feeder belt, reversible

Distance between conveyor centers	3800 mm
Belt width	650 mm
Belt quality	EP 400/3
Drive	4.0 kW

Belt conveyor with galvanized frame, drive at the deflection roller, hardened metal belt scraper, emergency pull rope and safety guard.

- 1 Rotation monitor fitted on the tension roller, inductive

02.02 Drum

Type	T 2290 B
Drying capacities:	
- with aggregate input moisture 4 %	180 t/h
- with aggregate input moisture 5 %	161 t/h
- with aggregate input moisture 6 %	143 t/h
These capacities are valid under the following conditions:	
- Burner capacity	13.9 MW
- Aggregate temperature raise	180 °C
- Aggregates with the usual drying behavior	
- Grain curves according to standard recipes	

- 1 Drum chassis

- 1 Drum cylinder with running rings, flights and lifters

Diameter	2200 mm
Length	9000 mm
Wall thickness	10 mm

Drum coat made of boiler plate (1.0425), flights and lifters made of St52 (1.0570) or, in the heating zone, of 16Mo3 (1.5415). Running rings made of rolled steel.

- 1 Insulation with rock wool and aluminum cover

Insulation thickness	50 mm
Insulation density	80 kg/m ³

- 1 Drum front wall, feeder side

- 1 Drum front wall, discharge side

- 1 Friction drive with carrier rollers and guide rollers

Required power	4 x 15 = 60 kW
Driven rollers	4

- 1 Supporting frame for drum chassis

- 1 Burner platform

- 1 Manufacturer's assembly of burner and fuel pump

02.03 Burner device

- 1 Single fuel monobloc burner, heating oil EL

Burner type	AMB-453
Max. burner capacity	13.9 MW
Heating oil consumption (lower cal. value 42.7 MJ/kg)	1170 kg/h

Integrated ventilator with silencer	
Flow volume	17400 m ³ /h
Drive	30 kW

- 1 Burner pump unit for heating oil EL

Output pressure	34 bar
Output capacity	2900 l/h
Drive	5.5 kW

Screw pump with built-in filter, manometer, pressure safety valve and fittings.

- 1 Oil meter for heating oil EL

02.04 Measuring devices

- 1 Negative pressure sensor system in dryer drum burner wall

- 1 Aggregate temperature measuring system in the drum outlet

Fe-Ko sensor, max. measuring range	500 °C
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02.05 Fuel supply

- 1 Transfer pump unit for heating oil EL

Output pressure	3 bar
Output capacity	1700 l/h
Drive	0.55 kW
Supply pipe, max. length	30 m

Screw pump, mounted on oil sump, with tank discharge pipe, foot-actuated valve, and filter on the suction side, manometer, pressure keeping valve and single-wall pipe to the burner.

03 Dust collection system AFA 43000

The Ammann filter system Ameco is a dust collection plant for the asphalt industry. The filter reduces the dust emissions to a low level according to today's state of the art.

The separation of dust and gas is performed in the double-oval shaped filter bags that are hanging in the baghouse. The filler is building up as a coating on the outside surface of filter bags. Bag cleaning is achieved by a rotating reverse air valve mechanism. Section by section, it allows an amount of atmospheric air through the bag thus inflating the bag.

The dust coating on the outside of the bags breaks up, drops into the collecting hopper and can be used as reclaimed filler in the asphalt process. The clean air is let out into atmosphere through the stack.

03.01 Raw gas ducting and pre-separator

1 Raw gas ducting

Suction hood working as sediment chamber for the coarse filler
 Ducting dryer to filter
 Connection branch for screen dedusting
 Sheet metal construction welded and bolted
 Max. 6m straight ducting and 1 x 90° bow with leading vanes and flange connections

1 Pre-separator, with thermal insulation

Cascade-separator with drop-out chambers
 Terminals for measuring instruments
 Inspection door
 Material: St37 (1.0038), St52 (1.0570) und Resist440 (1.8714)
 Thermal insulation of pre-separator:
 - Insulation plates 50 mm; material: mineral wool at 60 kg/m³
 - Cladding sheets profile shaped; material: steel

1 Fresh air damper

Mounted on raw gas ducting
 Driven by geared motor

03.02 Filter upper part with cleaning mechanisms

1 Filter upper part with cleaning mechanisms

Extraction volume in working-m ³ /h	63000 m ³ /h
Extraction volume	43000 Nm ³ /h
Filter area	663 m ²
Number of cleaning compartments	36
Number of cleaning mechanisms	3
Max. dust burden onto plant	500 g/Nm ³
Max. emission of dry particulate	0.010 g/Nm ³
Filter type	3x87.5/3962.5 DuO-3m
Number of filter bags	396

- Filter top section with plenum plate for the filter bags and hatches for the access
Material: CorTen (1.8962)
Insulation hatches top section (30 mm rock wool)
- Cleaning mechanisms type "Rotor Step" to clean with impulsed reverse air
- Filter bag section
Material: St37 (1.0038)

1 Thermal insulation of filter upper part

Insulation consisting of:

- Insulation plates 50 mm; material: mineral wool at 60 kg/m³
- Cladding sheets profile shaped; material: steel

1 Fan platform

- Fan platform to be mounted on filter upper part
Material: St37 (1.0038)

03.03 Filter equipment

1 Filter bags and cages

Max continuous temperature	160 °C
Max. peak temperature	170 °C
Number of bags	396

1 set

- Filter bags type DuO 2.5 m
Material: 400 g/m² Acryl
- Cages type DuO as bag holder and clamping element
Material: Aluminum

1 Pre-cabling

03.04 Bottom section (hopper) and leg extensions

1 Bottom section (hopper) and leg extensions, prismatic

- Bottom section (hopper), prismatic shaped
Material: St 37 (1.0038)
Flanges for internal screw conveyor and for discharge device
Hatch for internal access to internal screw conveyor and discharge devices
Legs upper part welded on hopper
- Leg extensions

1 Thermal insulation of bottom section

Insulation consisting of:

- Insulation plates 50 mm; material: mineral wool at 60 kg/m³
- Cladding sheets profile shaped; material: steel

- 1 Internal screw conveyor for fine filler
 - Power 4 kW
 - Internal screw conveyor for fine filler
 - Sealing and external bearings. No inner support bearings
 - Gear motor
- 1 Ladder top ventilator platform and filter top
 - Ladder with safety back guard.

03.05 Clean gas ducting, exhaust fan

- 1 Clean gas ducting, for fan platform
 - Clean gas ducting between filter and fan on fan platform
 - Material: St. 37 (1.0038)
- 1 Fan with drive and radial damper, for fan platform
 - Power 90 kW
 - Exhaust fan, narrow version
 - Fan with cooling disk, directly driven
 - inspection / clean-out door, drain port in scroll
 - Impeller statically and dynamically balanced
 - Support structure for direct mounted stack
 - Fan drive motor fitted with thermistor
 - Motorized radial damper for energy-saving volume control
 - Electr. actuator with integrated end limit switches and potentiometer
 - Flexible inlet connection

03.06 Stack

- Height 14 m
- 1 Stack access platform with ladder
 - Stack access platform with handrails, to be fixed on the stack
- 1 Stack, for fan platform
 - Thick film coated inside
 - Stack diameter 1000 mm
 - Adapter piece from rectangle to round
 - 2 Test ports

03.07 Discharge devices and filler conveying

- 1 Weight-operated single flap valve for pre-separator
 - Flap housing with inspection opening

- 1 Weight-operated double flap-valve for filter

Flap housing with inspection opening

03.08 Sensors and controls

- 1 Standard set of temperature sensors and controls

Standard set consisting of:

- 1 safety temperature switch at filter inlet
- 1 temperature sensor at filter inlet
- 1 temperature sensor at filter outlet

04 Mixing tower GLOBAL 160 Quick

The hot elevator conveys the dried and heated aggregates to the screen. The vibration screen reclassifies the aggregates according to their grain sizes and feeds them into the appropriate hot mineral silo compartment. The dosing flaps proportion the aggregate components according to the selected recipe. The mineral scale then registers their weight. Bitumen and filler are weighed out in the same manner. Further additives are added according to their weight or volume. The complete batch is discharged into the mixer. During this operation, the plant control system manages the batching sequence.

Stairs and platforms ensure that the mixing tower is easily and safely accessible. All parts subject to wear and tear are, whenever possible, made of wear resisting materials and can easily be exchanged.

04.01 Hot elevator

Type	KE II
Capacity	170 t/h
Distance between axes	25 m

- 1 Head station with drive unit and maintenance platform

Drive	15 kW
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Head station consisting of housing with inspection flaps and removable hood, drive shaft with external roller bearings, drive unit and three sided maintenance platform with stairs from the roof of the screen box.

- 1 Foot station with feeder chute

Foot station consisting of a housing with inspection doors, shaft with slide bearings made of white cast iron and aggregate feeder chute with lining protecting from wear and tear.

25 m of shaft with chain and buckets

Dust-proof shaft with heavy duty single strand steel link chain and buckets with wear resisting edge.

- 1 Transfer chute from the hot elevator to the screen

The chute is equipped with wear-resistant ribs, distribution angles, inspection flap and compensator to the screen inlet.

04.02 Reclassification

- 1 Screening machine VA 1840-5

Number of screened aggregate components	5
Max. aggregate temperature	350 °C
Total screen area	27.8 m ²
Area of sand deck	5.6 m ²
Drive	2 x 7.5 kW

Screening machine consisting of vibrating screen, driven by 2 external unbalance motors, and screen box with access ladder, accessible roof, railing, 270°-doors on both front walls, change-over flap at the screen inlet for screen feed or bypass, change-over flap at the screen outlet to guide the oversize grain into the last component bag or into the overflow channel of the hot mineral silo, and pivotable guide plates which lead the aggregates into the compartments of the hot mineral silo.

- 1 Set of screen meshes

Mesh sizes acc. to customers' requests (not confirmed):

Component 1	6.0 mm
Component 2	12.0 mm
Component 3	16.0 mm
Component 4	22.0 mm
Component 5	30.0 mm

- 1 Pneumatic drive for the change-over flap screen/bypass
- 1 Pneumatic drive for the change-over flap coarse overflow/last component
- 1 Suction pipe for screen and mixing tower

Suction pipe with adjustable slide and connection to the crude gas channel of the filter.

04.03 Hot mineral storage

The mentioned contents of the hot mineral silo are calculated for a specific weight of 1.6 t/m³ and an angle of repose of 37°.

However, the actual weights and angles of repose will differ from this values by up to 25%, depending on the material. It must furthermore be considered that a part of the silo content serves as a natural padding against wear and tear and can thus not be evaluated as dischargeable content.

The emergency overflows of the component compartments flow together and lead to a collective duct leading out of the tower.

Each component compartment has an electro-pneumatically activated outlet door.

The hot mineral silo has an integrated filler compartment for intermediate filler storage.

1 Hot mineral silo 31 t

Silo contents:

Bypass	6 t
Compartment 1 (sand)	9 t
Compartment 2	5 t
Compartment 3	4 t
Compartment 4	4 t
Compartment 5	3 t

1 Dosing unit with electro-pneumatically operated flaps

Number of flaps	6
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2 Continuous level sensor in sand compartment

4 Maximum level sensors in component compartment

1 Aggregate temperature sensor for bypass compartment

1 Aggregate temperature sensor for sand compartment

1 Intermediate filler silo for reclaimed filler

Content:	400 kg
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Intermediate silo integrated in the mixing tower, with cellular wheel sluice and electro-pneumatically operated shutting flap at the outlet, minimum level sensor and pneumatic filler disintegrator.

1 Intermediate filler silo for imported filler

Content:	400 kg
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Intermediate silo integrated in the mixing tower, with cellular wheel sluice and electro-pneumatically operated shutting flap at the outlet, minimum level sensor and pneumatic filler disintegrator.

1 Channel for oversize grain and overflow

Channel with inspection flaps and wear resisting ribs at the deviation parts.

04.04 Weighing and mixing level

1 Chassis

Steel construction to bear the aggregates of the mixing and weighing level.

Systeme

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1 Mineral scale

Max. batch quantity	2000 kg
Number of load cells	3

Weighing container, resting on load cells, with lining protecting from wear and tear, fabric compensator, electro-pneumatically operated bottom flap and mechanical device to hold standard weights needed to adjust the scale.

1 Filler scale

Max. batch quantity	250 kg
Number of load cells	2

Weighing container, resting on load cells, with lining protecting from wear and tear, fabric compensator, electro-pneumatically operated bottom flap and mechanical device to hold standard weights needed to adjust the scale.

1 Bitumen scale with bottom discharge

Max. batch quantity	185 kg
Number of load cells	2
Heating for scale and outlet flap	1.6 kW

Insulated weighing container, resting on load cells, with electric floor heating, electro-pneumatically operated, and heated outlet flap and mechanical device to hold standard weights needed to adjust the scale.

1 Bitumen feeding pipe into the mixer with additional PT 100 for temperature measuring

Additional heating	300 W
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Pipe socket insulated and electrically heated, with labyrinth sealing towards bitumen scale.

1 Mixer MA 2 with wear protection

Max. batch quantity	2000 kg
Min. batch quantity	500 kg
Drive	2 x 30 kW

Twin shaft compulsory mixer, driven through V-belt and synchromesh transmission.

Mixer trough with electro-pneumatically operated outlet flap. Lining consisting of staggered and screwed wearing plates.

Stirring arms with honeycomb shovels.

Mixer shafts with antifriction bearings and labyrinth sealing.

1 Asphalt temperature measuring device at the mixer outlet

Infrared sensor, max. measuring range	500 °C
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- 1 Mixer hood
Hood with inspection flap and all necessary connecting flanges.
- 1 Mixer outlet shaft
Shaft used for the asphalt transfer into the movable chute of the asphalt storage silo.
- 1 Buffer container for compressed air
Content 250 l
Buffer container with pressure control device and manometer, located on the mixer platform.
- 1 Inlet chute for the manual addition of additives in bags
Chute with cover and electro-pneumatically operated shut-off flap at the mixer outlet assuring that the bag having the correct quantity for the relevant batch is called by the mixing process.
- 1 Preparation of hot mineral silo and mixer hood for RAC-system
consisting of connection flanges and deflectors inside hot mineral storage silo for water steam extraction line and connection flange with temporary cover on the mixer hood for RAC inlet chute.

04.05 Supporting structure, stairways and platforms

- 1 Platform for weighing and mixing level
Platform consisting of catwalks with stud plate covering and galvanized railings.
- 1 Maintenance platform for dosing flap
Platform consisting of catwalks with galvanized railings, located on the two lateral sides of the dosing flap, and a movable ladder allowing an access from the mixing level.
- 1 Platform for screen level
Platform consisting of catwalks with stud plate covering and galvanized railings.
- 1 Stairway from mixing platform to screen platform
Step width 600 mm
Inclination 45 °
Galvanized notch-boards, gridiron steps and railings.

1 Additional platform for weighing level

Platform with stud plate covering and galvanized railings, suitable for the storage of 2 pallets sized 800 x 1200 mm.

04.06 Compressed air supply

1 Pneumatic pipe to the consumers

1 Screw compressor with cold air dryer and compressed air tank

Output capacity	2.2 m ³ /min
Pressure	10 bar
Content of compressed air tank	500 l
Drive	15 kW
Pressure dew point of dryer	3 °C
Drive capacity of dryer	550 W

Items mounted on frame, pre-cabled, pneumatically connected and equipped with weather protection.

05 Filler supply 2 x 40

The reclaimed filler which was recovered by the dedusting system of the filter during the drying process is first conveyed mechanically (by conveyor screws, elevator) to a buffer silo in the mixing tower from where the filler scale can take it out again. Excess reclaimed filler is stored in the reclaimed filler silo and can be re-circulated to the filler cycle, if required.

The imported filler silo is filled by the delivery trucks own pneumatic fill system. The displaced air in the silo as well as the conveying air is vented into the atmosphere via an exhaust filter. The transport to the filler scale is either affected directly through a screw conveyor or through an intermediate elevator and buffer silo.

05.01 Double filler elevator

Type	FG 2x36
Capacity	2 x 36 t/h
Distance between axis	21 m

1 Head and foot station

Drive	5.5 kW
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Head station consisting of housing with inspection flaps and removable hood, drive shaft with external roller bearings, drive unit, three sided maintenance platform and outlet chutes.

Foot station, every train consisting of a housing with inspection doors, bottom shaft with slide bearings and filler inlet chute.

21 m of shaft with belt and buckets

Dustproof shaft with parting wall, conveyor belts and screwed buckets.

05.02 Filler silo

2 Probe for continuous level indication

Measuring principle: rope guided microwave

1 Squeeze valve for feeder pipe

1 Exhaust filter for imported filler silo

Filter surface	14 m ²
Drive dedusting	0.18 kW

Filter with mechanical dedusting, weather protection roof and housing with inspection doors.

1 Reclaimed filler silo

Content	40 m ³
Diameter	2900 mm

Silo consisting of supporting frame, silo body with manhole and overpressure/negative pressure protection in the roof and pneumatic filler disintegrator and emergency discharge muff with blind flange in the discharge cone, exhaust pipe and basket ladder or transition piece to the silo roof.

1 Imported filler silo

Content	40 m ³
Diameter	2900 mm

Silo consisting of supporting frame, silo body with manhole and overpressure/negative pressure protection in the roof and pneumatic filler disintegrator in the discharge cone, internal feeder pipe and basket ladder or transition piece to the silo roof.

05.03 Reclaimed filler transport

1 Screw conveyor, dedusting unit / hot elevator

Conveying capacity	25 m ³ /h
Length	max. 6000 mm
Drive	5.5 kW

1 Screw conveyor, dedusting unit / filler elevator

Conveying capacity	25 m ³ /h
Length	max. 6000 mm
Drive	5.5 kW

- 1 Shutting flap at the silo discharge, manually operated
- 1 Cellular wheel sluice underneath silo discharge

Conveying capacity	20 m ³ /h
Drive	0.55 kW
- 1 Shutting flap at the sluice discharge, pneumatically operated
- 1 Filler return pipe, elevator discharge / silo
- 1 Screw conveyor, silo / filler elevator

Conveying capacity	25 m ³ /h
Length	max. 6000 mm
Drive	5.5 kW
- 1 Screw conveyor, silo / filler elevator

Conveying capacity	25 m ³ /h
Length	max. 6000 mm
Drive	5.5 kW
- 1 Shutting flap at the screw discharge, pneumatically operated
- 1 Screw conveyor, silo / filler elevator

Conveying capacity	25 m ³ /h
Length	max. 6000 mm
Drive	5.5 kW

05.04 Imported filler transport

- 1 Shutting flap at silo discharge, manually operated
- 2 Screw conveyor, silo / filler elevator

Conveying capacity	25 m ³ /h
Length	max. 6000 mm
Drive	5.5 kW
- 1 Shutting flap at the silo discharge, manually operated

05.05 Additional equipment for filler supply

- 1 Discharge device for reclaimed filler

Output capacity	50 m ³ /h
Length	max. 6000 mm
Drive	5.5 kW

Device consisting of manually operated shutting flap, conveyor screw and loading hose made of filter cloth.

06 Integrated asphalt storage silo 100/2

The asphalt storage silo is integrated in the mixing tower and situated directly beneath the mixing module. It is used to store the finished asphalt and to load it onto vehicles. There is a number of chambers to store the asphalt, and the feeding is effected either by a movable chute or by a transfer skip. The asphalt can also be loaded directly from the mixer onto vehicles. For this purpose, the asphalt storage silo is equipped with a direct loading bag which is in the position to retain one or several batches in order not to disturb the mixing operation by changing vehicles. It furthermore has an integrated collection bag to collect oversize grain and overflow from the mixing tower.

06.01 Asphalt storage silo GLOBAL

The content of the mixed material compartments are calculated at a density of 1.8 t/m³ and an angle of repose of 27°.

1 Supporting frame

Clearance height	4.2 m
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1 Silo body 100

Silo contents:

Chamber 1	45 t
Chamber 2	45 t
Direct loading bag	10 t
Oversize grain/overflow bag	3 t

Heating:

Chamber 1 and 2 with electrically heated discharge funnels and electrically heated discharge flaps.

Shutters:

Chamber 1 and 2 with 2 electro-pneumatically actuated flaps each which can be operated through the plant control system. Direct loading compartment and oversize grain/overflow compartment with electro-pneumatically actuated slide gate which can be operated through the plant control system or, alternatively, by means of in situ key buttons.

Sensory mechanism:

Chamber 1 and 2 as well as direct loading compartment and oversize grain/overflow compartment with probe for maximum level measuring.

1 Insulation

Insulation thickness	50 mm
Insulation density	80 kg/m ³
Insulation lining of profiled steel sheet	

1 Movable chute

Chute with electro-pneumatic drive for the positions chamber 1 - direct loading - chamber 2.

1 Stairway from level 0 to mixing platform

Step width 600 mm

Galvanized notch-boards, gridiron steps and railings.

07 Bitumen supply thermal oil heated 2 x 60 m³

Every bitumen tank is insulated with mineral wool mats and protected against the effects of the environment with a metal cover. The mineral wool insulating mats are installed so as to prevent the occurrence of thermal transmission paths.

For heating and keeping the bitumen up to temperature a heating register is installed in the tanks. The bitumen temperature is controlled by a heating control unit which regulates the flow of the thermal-oil. The thermal oil is heated in the external heating unit.

The electro pneumatically controlled valves permit full-automatic operation of the bitumen tank equipment.

07.01 Bitumen storage tank

Fully insulated horizontal container with rock-wool insulation and trapezoidal corrugated sheet-metal cover, protected against overpressure and under pressure, with man hole and all necessary connection nozzles.

2 Storage tank, H 60

Nominal content	60 m ³
Diameter (without insulation)	2500 mm
Insulation thickness	200 mm
Insulation density	80 kg/m ³
Insulation covers 1mm aluminum sheets	

07.02 Heating unit for tank

Each tank has a fully installed automatic, time and temperature controlled external bottom heating.

2 thermal oil heating register

Heating surface 30 m²

07.03 Measuring devices on the tank

2 Medium-temperature sensor with immersion cover

2 Level sensor, continuous

07.04 Ventilation line with tank connection

The ventilation nozzle serves as connection of the tank internal with the atmosphere and also serves as emergency overflow.

- 2 Ventilation nozzle on the tank

Nominal width	DN 100
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07.05 Discharge and conveying line

Single-walled pipeline with auxiliary electrical heating. The discharge line includes the stop-valve at the tank connection. The conveying line to the bitumen-dosing unit includes the change-over valve controlled by the mixing process.

- 2 Discharge line between tank and discharge pump

Nominal width	DN 80
Valve activation	electro pneum.

- 1 Pump system

Capacity	480 l/min
Drive	7.5 kW
Heating performance	2.5 kW
Suction- and pressure flanges with shut-off-flaps	manual

- 1 Conveying line between discharge pump and dosing unit

Line route (system)	1 line
Nominal width	DN 80
Heating performance	approx. 3000 W
3-way change-over valve	electro pneum.

07.06 Fill line thermal oil heated

Double wall pipeline thermal oil heated . The fill line includes a stop-valve at the tank connection for under-level filling. The common fill-pump line includes an additional stop-valve to prevent bitumen leakage at the filling muff.

- 1 Fill line at the fill pump

Nominal width	DN 80
Valve activation	electro pneum.

- 1 Pump system

Capacity	960 l/min
Drive	18.5 kW
Heating performance	2.5 kW

2 Fill line between fill pump and tank

Nominal width	DN 80
Heating performance	approx. 1000 W
Valve activation	electro pneum.

1 3-way valve for pumped transfer thermal oil heated

Nominal width	DN 80
Operation	electro pneumatic

The 3-way valve connects the discharge line with the fill line; as a result, the discharge pump can be used to pump from one tank to another. Heating is provided by the auxiliary heater for the discharge line.

07.07 Pipeline insulation

The pipelines are insulated with rock wool and have a weatherproof sheet-metal cover. The cover for stop-valve and pumps is designed to permit easy removal for maintenance and repair.

10 Insulation discharge line between tank and discharge pump

Insulation thickness	100 mm
Insulation density	80 kg/m ³
Sheet metal cover	aluminum sheet

1 Insulation discharge pump and conveying line (1 line)

Insulation thickness	100 mm
Insulation density	80 kg/m ³
Sheet metal cover	aluminum sheet

1 Insulation for fill pump and pump line

Insulation thickness	100 mm
Insulation density	80 kg/m ³
Sheet metal cover	aluminum sheet

2 Insulation for fill line between fill pump and tank

Insulation thickness	100 mm
Insulation density	80 kg/m ³
Sheet metal cover	aluminum sheet

07.08 Thermal oil heater

1 Thermal oil heater

Output capacity	9.0 kW
Heat capacity	200'000 kcal/h

08 Steel foundations

08.01 Frames for foundation-free erection

- 8 Steel frame for ADL feeder
- 3 Steel frame for conveyor belt
- 1 Steel frame for drum
- 1 Set of steel skids for dedusting unit
- 2 Steel frame for filler silo
- 2 Set of steel foundations for container
- 10 Set of steel skids for horizontal bitumen tank
- 1 Set of steel foundations for asphalt storage silo with mixing tower GLOBAL

09 Electrification & microprocessor control AS 1

Microprocessor control for the operation, control and display of the complete Ammann scope of delivery, storage of recipes, plant parameters and production and operational data. The standard equipment comprises a workstation including a high resolution full graphic monitor, keyboard, mouse, printer for production protocols and modem.

The complete asphalt mixing plant including its measured values can be displayed on the screen image specific to the customer, corresponding to the material flow. This assures at any time an overview of all plant components. The plant control processes all dynamic operations of the asphalt mixing plant in real time and displays them on the monitor. Above this, it shows all status changes within a few milliseconds which enable the operator to intervene immediately, if necessary.

The software includes extensive parametric functions to adopt and optimize both the process flow and the sensory testing device. The test images in windowing technique which have been proven for many years allow the operator a quick diagnosis from the screen, and they are a convenient support during the setting-up of plant parameters.

The production data are registered in the extensive production statistics where they are processed and can be printed out. Error messages appear in an optical way, as text windows, and optionally as verbal indication.

The modular design of the software and the switch gear allow an easy expansion of the control system to future plant modifications. Through the modem which has been part of the standard scope of delivery for years, the customer has the possibility to transfer operational data for their further treatment, and our experts can quickly diagnose problems and remedy them or transfer software-updates.

09.01 Computer hardware

1 Workstation

Work station with hard disc, CD ROM drive, keyboard, mouse and network components.

1 Flat screen (TFT)

Monitor diagonal 19 "

1 Needle printer

for production protocol line-by-line.

1 Modem GSM

1 UPS, uninterrupter power supply

To bridge supply fluctuations and for a short-term maintain of the computer operation during power failure. The capacity of the UPS allows a controlled shut-down incl. data protection.

1 Workstation

Work station with hard disc, CD ROM drive, keyboard, mouse and network components.

09.02 Software

Consisting of proven modules, the software will be configured specific to the plant.

1 Cold feed module

1 Dryer module

1 Filter and filler system module

1 Mixer tower module

1 Hot mix storage module

1 Binding agent module

1 Fiber granulate addition module

09.03 Switch gear for cold feed unit

1 Basic module for cold feed unit

5 Feeder control with frequency converter

3 Conveyor belt control

09.04 Switch gear for dryer unit

- 1 Basic module for drum
- 1 Feeder belt control
- 1 Drum drive control
- 1 Basic module for burner with electronically adjustment

09.05 Switch gear for dedusting unit and filler supply

- 1 Basic module dedusting unit / filler supply
- 1 Filler elevator control
- 8 Filler screw control
- 3 Filler sluice control
- 1 Ventilator control with frequency converter

09.06 Switch gear for mixing tower

- 1 Basic module mixing tower
- 1 Hot elevator control
- 1 Screen control
- 1 Mixer control
- 1 Basic module for mixing/weighing process

09.07 Switch gear for asphalt storage silo

- 1 Basic module for asphalt storage silo
- 1 Movable chute control

09.08 Switch gear for bitumen supply

- 4 Basic module for bitumen supply E-Bit
- 1 Bitumen tank control
- 1 Feeder pump control

09.09 Switch gear for auxiliary operations

- 1 Basic module for auxiliary operations

- 4 Illumination and sockets for level in mixing tower

09.10 Low voltage distribution

- 1 Basic module low voltage distribution
incl. 2 main switches for aggregate operation

09.11 Cables and installation material Quick

- 1 Set of cables for "Quick" plug-in cabling

Cables, plug-in fittings, terminal boxes and cable conduits for over ground cableways between switch gear and the consumers of the Ammann scope of delivery.

09.12 Method of Electrical protection

- 1 Protection system (RCD)

09.13 Container

- 1 Load container

Length	8000 mm
Width	2438 mm
Height	2830 mm
Inside height	2250 mm

Container with entrance door, vent openings, illumination and double bottom for cable placing.

- 1 Control container

Length	6058 mm
Width	2438 mm
Height	2830 mm
Inside height	2500 mm
Air condition:	
- heating capacity	2.5 kW
- cooling capacity	3.5 kW

Container with entrance door, windows on at least 3 sides, air condition, illumination and the equipment to operate the plant control, consisting of a table for the computer and for the printer as well as a pivot chair.

- 3 Stairway to the load container

Step width	1000 mm
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Galvanized notch-boards and gridiron steps.

1 Load container

Length	6058 mm
Width	2438 mm
Height	2830 mm
Inside height	2250 mm

Container with entrance door, vent openings, illumination and double bottom for cable placing.

1 Stairway to control container

Step width	800 mm
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Galvanized notch-boards, gridiron steps and railings.

10 Erection supervision, commissioning

10.01 Erection

Mechanical and electrical assembly and commissioning of the Ammann scope of delivery.

80 Man day of work

1 Assurance for erection