

Technical Specification No. M-04-206

For

Second Hand ballast Bogie Hopper Wagon
(Up to 90 ton Gross)

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1. General

The purpose of the Bogie Hopper Wagons is to transport ballast and other materials of gravel type.

Unloading arrangement of the wagon must fit all gravel facilities in Israel and should be able to discharge the gravel between and outside rails.

The Bidder is the owner of at least 15 ballast bogie hopper wagons.

The second hand wagon manufacture year should not exceed 20 years (manufacture year 2000 or later).

The wagons shall be of a proven design with ample field experience. Test data of the prototype wagon shall be provided with the proposal.

The wagon shall be an open hopper wagon of welded construction equipped with two bogies type Y25 designed for an axle load of up to 22.5 metric ton per axle, preferable type Faccs.

Hopper volume should be designed based on the tare weight and the total gross weight of up to 90 ton.

The wagons shall be designed for an unrestricted circulation on the ISR network.

The wagon should be supplied after completely refurbished work which will be carried out according to applicable specifications in approved workshops for this type of service.

The supplier and/or his subcontractors provided maintenance shall be certified by valid ISO 9001/9002 / IRIS certificate or equivalent quality standard.

The rebuilt work will be carried out according to ECM or SNCF, SNCB, DB, ect. revision procedure, VPI, European regulations, standards of inspection and Israel Railways technical requirements stipulated in this specification.

The workshop should be certificated according to European regulations and approved by ISR.

2. Standards

The wagons shall adhere to UIC/ EN/ TSI prevailing Norms and Standards.

3. Prevailing Climate Conditions

3.1 See Appendix A

4. Track Data

4.1	Track Gauge.	1435 mm
4.2	Minimum curve radius (on line)	140 meter
4.3	Minimum curve radius (service branches)	75 meter
4.4	Maximum gradient	35 ‰
4.5	Minimum vertical radius	500 meter
4.6	Rail type-	UIC 60, UIC 60 320Cr, UIC 54, U 50, S 49, U 33, BS 37
4.7	Loading gauge-	G1 according to EN 15273-2.
4.8	Track classification-	Classes D2 according to UIC 700

5. Operating Requirements

5.1 Operating Speed

The wagons shall be able to run unrestricted in "S" traffic (100 km/h operating speed) according to UIC 432 OR fully loaded, or where the axle loads of the most heavily loaded bogie may not exceed 22.5 ton and "SS" traffic (120 km/h operating speed) in empty condition.

5.2 Main Characteristics

Length over buffers about.....	14.000 mm.
Length of under frame about.....	13.000 mm.
Distance between bogie centers about.....	9.000 mm.
Nominal height above rail level of automatic coupler center-line.....	1040 mm±5
Height from rail level to buffers empty wagon, new condition.....	1060 mm±5
Maximum height of wagon body	4000 mm
Maximum width of the body.....	3.200 mm
Number of discharge doors.....	4
Load capacity (volume) – not less than.....	30-35 m ³
Tare of wagon – not more than.....	24 ton
Maximum pay load – not less than.....	56 ton

Maximum axle load up to.....22.5 ton
Loading gauge according toG1

5.3 Loading characteristics

5.3.1 Gravel (Ballast) characteristics.

1. Type of stone -	dolomite
2. Bulk density -	1,4 ÷ 1,6 Ton/M ³
3. Graduation – less than	63 mm - 100%
" "	50 mm - 70-199%
" "	40 mm - 30-65%
" "	31.5 mm - 1-25%
" "	22.4 mm – 0-3%
" "	31.5-50 mm – ≥50%
4. Abrasivity -	extremely
5. Corrosivity -	none
6. Cohesion -	none

5.3.2 Loading/Unloading

Loading of the wagon will be done in two different modes:

5.3.2.1 Loading from gravel silo continuously or separately (4cones)

5.3.2.2 Loading by excavator or shoveldozer in order not to damage the upper part of the body.

5.3.2.3 Unloading of the wagon will be done from a moving train or stationary through manual operated discharge doors.
The discharge mechanism and operating system are described in the following paragraph.

5.3.3 Hopper Volume

Preference will be given to wagon design with the best nett to tare ratio. Hopper geometry and design will enable the efficient loading of the wagon to its maximum capacity.

6. Structure

6.1 Running safety

Constructional characteristics of the wagon shall be according to the conditions laid out in UIC 530-2 OR and ERRI B12/RP17, 7-th edition.

6.2 Underframe

6.2.1

During general revision the underframe should be blasted according to DIN 55926, or S.I.S. 055900, SA 2 1/2 after which a non-destructive inspection must be systematically performed to ensure the absence of fissure. The examination will be carried out visually. Penetration test or magnetic test or ultrasound, will be used in specific areas.

There must be no defects found.

Quality certificate of non-destructive test should be filled out for every underframe.

6.2.2

The support between wear plates of the wagon body and bogie is elastic and the wear plates of the wagon body will be of sufficient size to ensure under any running condition, a complete support over all the surface of the wear plates of bogie.

6.3 Hopper structure

6.3.1 Body structure

The body of the hopper consists of a rigid framework made by rolled and bent profiles to which the steel sheets of the sides and the end walls are welded.

The sides, middle partition and end walls shall be made of steel sheet reinforced by posts and sills as well as diagonal sills of

section design in such a way as to prevent the accumulation of the gravel and rain water.

The steel sheets in contact with the gravel shall be made of carbon steel.

The end walls and inclined parts shall form an angle of at least 45 ° with the horizontal. Edges shall be provided to prevent any accumulation and remaining of gravel in the body after unloading.

The proposed hopper will be of a proven design with ample field experience showing excellent flow characteristics of the gravel during unloading operations.

The body will be provided with at least four discharge chutes, two on each side, which enable discharging of ballast between and outside rails in different position .

6.4 Discharge doors and chutes

6.4.1 Discharge doors

Four discharge doors shall be of curved shapes to be held in closed position by the static pressure of the material conveyed and manual locking of operating mechanism.

Opening of each door will be done manually by a mechanical mechanism activated by levers located on the wagon platform.

The operating mechanism must be able to stop the discharging of ballast at any time.

Forces required for operation the manually operating mechanism, taking into consideration wear and tear and corrosion shall not exceed 15 kg.

6.4.2 Discharge chutes

The wagon will be provided with four discharge chutes which can be moved and fixed in different positions for distribution the ballast between and outside rail or in combination of both this

modes.

Operating of each chute will be done manually by a mechanical mechanism activated by lever located beside the discharge door operating lever

It will be possible to operate each discharge chute separately.

Forces required to operate the lever, taking into consideration wear and tear and corrosion shall not exceed 15 kg.

7. Bogies

7.1 Bogies shall be of type Y25 according Appendix C.

7.2 The bogies shall be provided with new wheels 920mm diameter according Appendix D and according to the requirements of EN 13262:2004.

8. Braking system

The bidder shall propose a KNORR compressed air type, automatic braking system acting on all brake shoes of the wagon in G-P mode.

The brake performances are those laid down in UIC 544-1-0 and 543 OR for wagons designed for S service.

The KNORR brake system shall meet the provisions of UIC 541-1 OR and shall consist of:

- Distributor KE-2A-SL or KE 1a – SL for S regime
- 16" cylinder
- Main reservoir of 125 liters
- Headstocks cocks type LH3 1 ¼"
- Coupling hoses UIC type
- Preferable Weighing valves type WM10,
- On-off device
- Change – over device G-P

The brake system distribution piping are of the heavy type steel tubes to DIN 2441, 1 ¼" and ½". The fittings shall be of VEBO type.

The coupling hoses and headstocks, as well as their location shall be in accordance with UIC 541-1 OR, with simple headstock installation.

The brake rigging shall be central type located and designed to withstand the stresses for a brake regime S and according to Leaflet UIC 542 O sheet IV.

The wagon shall be fitted with a slack adjuster made by SAB type, DRV 2A 600.

Empty-load change-over device shall be provided. Preferable an automatic type.

8.1 Hand Brake

Each wagon shall be fitted with a hand brake.
Operation is by means of hand-wheels located at end platform.

Tightening of the brake shall be activated by rotating the hand-lever clock-wise and loosening by rotating in anti-clockwise.

The transmission of the force from the hand-wheel is made by means of a gear box UIC type.

The multiplication ratio of the hand brake gear box shall be according to UIC.

The hand brake shall act on all brake-shoes.

9. Buffers and draw gears

9.1 Buffers shall be in accordance with EN 15551.

The dynamic energy absorption capacity of the buffer shall be at least 30 KJ (UIC category "A"). The preferred buffer type is U5N

9.2 Draw hooks and screw couplings shall be in accordance with EN 15566 with breaking strength of:

- 850 KN for the screw coupling
- 1000 KN for the draw hook.

10. Accessories

The wagons shall be fitted with platforms, hand-rails and steps on both ends.

Non-operating platform shall be fitted with ladder.

The longitudinal platform will be provided beside the longitudinal beam of underframe. The hand-rail will be fitted according to UIC 535-1 and 535-2.

Free access from the end platforms to the longitudinal platform will be provided as well as access between two connected wagons.

The platforms shall be designed and built in such a way that shall prevent the accumulation of gravel.

Four signal brackets shall be placed on the both fronts of wagon according to UIC 532.

Four tow hooks shall be fitted per wagon confirming to UIC 535-2-0.

11. Materials

Materials to be used in the construction of the wagons shall be according to strength requirements of UIC 577 and ERRI B12/RP17 .

12. Grounding

There will be a junction by means of a braid between the body frame and the bogies.

The minimum section of the braid will be 35 mm² and it shall comply with what is stipulated in the UIC 533 leaflet.

13. Welding

Welding shall be performed according to UIC/EN standards.

14. Corrosion protection

14.1 All outside surfaces shall be cleaned and painted

according to UIC standards.

14.2 Paint products shall be supplied in accordance with UIC 842-1R.

The paint products shall be tested in accordance with UIC 842-2R.

The painting system will be inspected in accordance with UIC 842-6 0.

14.3 The wagon shall be provided with the standard inscriptions and emblems of the ISR.

Size and location will be decided during the detail design phase.

14.4 Anticorrosion protective strip shall be provided where necessary in accordance with UIC 842-4 0

15. Testing

Every wagon will be inspected during refurbishment work and final certificate will be issued after performance of the empty and loaded running test in Israel.

15.1 All materials and components shall be provided with test certificate which will be presented before installation and will be attached to the wagons test book.

15.2 All weld and paint work shall be tested as specified in the relevant section.

15.3 Every frame shall meet the dimension stated in the dimensional drawing. A dimensions sheet shall be filled out for every frame.

15.4 Every completed wagon shall meet the dimensions stated in the dimensional drawing. A dimensions sheet shall be filled out for every complete wagon.

16. Wagon documentation:

The wagons shall be supplied with documentation according to appendix B.