

U.P.E.C., PJSC



4, Marshal Batitsky St.,  
Kharkiv, Ukraine, 61038  
Phone: +380 57 766 00 50  
+380 50 325 91 46  
+380 63 472 57 48  
Fax: +380 57 766 00 51  
www.upec.ua



# Technology as the Art

**T**he UPEC Industrial Group is one of the largest private companies in Ukraine, uniting a number of well-known industrial engineering companies with more than a half of century history. The UPEC is one of the leading CIS-based manufacturers of bearings, CNC grinding machines, electric motors, pumps, transmissions and chassis, climate systems with electric turbo compressors, as well as other machinery, equipment, parts and components for the railway, automotive, agricultural, general, power generation, defense and metallurgical industries.

The UPEC Industrial Group (with its Joint Engineering Centre, Ukrainian Bearing Industry Design and Technology Bureau and HARP plant) is the only independent local developer and manufacturer of new bearing products for the "1520 space" in the CIS.

The products of the UPEC Industrial Group are presented on the market by divisions: Railway, Automotive, Electro-Technical, Machine-Tool and Agricultural.

The Railway Division presents to the market the products of three manufacturing sites: Kharkiv Bearing Plant (HARP), Lozova Forging-Mechanical Plant (LKMZ) and Ukrainian Casting Company (ULK). It supplies components for the production and maintenance of rolling stock to companies and railways of the CIS countries, coordinates the development and presentation of new products for railway transport, provides services to the developed products.

The UPEC Industrial Group offers to your attention a new generation of energy efficient HARP "cartridge" bearings with extended maintenance-free periods (800 000 km - 1 000 000 km), optimized profiling, micro-

geometry and heat treatment, as well as grease and seals specially developed for the operating conditions of the "1520 space", including:

- **CRU Duplex K2**— cylindrical "cartridge" bearing unit for standard railway cars with axle load of 23.5 tones and side frame with pedestal opening of 320 mm. Its design is completely interchangeable with existing units and can be installed to replace mass produced CRB bearings (36-42726E2M and 36-232726E2M).

**Main advantages of the CRU DUPLEX K2 in comparison with the CRB:**

1. Increased maintenance periods by more than 2.5 times (800 000 km and more).
2. The design of the CRU Duplex with flange rings.
3. Unique Klüberplex HARP grease
4. Higher operational reliability for axle box units.
5. Significant reduction of labor consumption and costs during wheelsets assembling:
6. Can be mounted or dismantled on existing equipment.

- **TBU 1520** is tapered "cartridge" bearing unit for railway cars with increased load capacity and pedestal opening of 260 mm.

TBU 1520 is the only product specially developed for conditions of "1520 Space" and can be used for freight cars with axle loads of 23.5, 25 tones and higher, as well as for passenger cars with an axle load of 18 tones.

TBU 1520 cartridge is designed, based on research results from the UPEC's Joint Engineering Center.

- **CRU HARP** is a sealed (cartridge) double-row bearing unit with an outer single-part ring, greased with Klüberplex BEM 41-132 HARP, adjusted for radial and axial clearances and inner diameters of inner rings. The bearing is designed for installation in axleboxes of locomotives.



## Products

**CRU DUPLEX K2**  
(Cylindrical Roller Bearing Unit)



**TBU 1520**  
(Tapered Bearing Unit) for freight and passenger cars



**CRU HARP**  
(Cylindrical Roller Bearing Unit)



**CRB HARP**  
(Cylindrical Roller Bearing)



**Axle box bearings for the European freight and passenger cars**



**Air cycle ATT HVAC system (ATT-30/60) for passenger cars**



- **CRB HARP** is cylindrical sealed bearing unit for traction electric motors of locomotives. This new product line, unlike other well-known cartridge-type bearing units, was originally designed and optimized for the harsh operating conditions in the "1520 space" (including low-temperature resistance down to -60°C).

**The new design has the following advantages:**

1. Extended maintenance-free periods up to 1million km.
2. Significantly reduced wear and high energy efficiency, with the unique Klüberplex BEM 41-132 HARP grease.
3. High reliability, with the optimized design, improved technologies and use of the unique grease.
4. Low operating costs due to simplification of mounting and dismantling, increased maintenance periods, and no additional lubrication.
5. Reduced vibration and noise, which directly effects on the quality of the units (in particular, for traction motors and gearboxes).

Along with the new product line, HARP continues to manufacture CRB bearings with short cylindrical rollers for cars and locomotives, proven by many decades of reliable operation.

Also, HARP has started the production of axle box bearings, designed for European freight and passenger cars of "1435 space".

**Innovations of the UPEC Industrial group:**

- **Updated energy-efficient and ecological air cycle ATT HVAC systems** for passenger railway cars, industrial and commercial buildings, new benches for research and certification tests of bearing units, simulating the operating conditions of the "1520 space".

**The main air cycle ATT HVAC system advantages are:**

1. Fully environmentally friendly (no refrigerant and oil).
2. High energy efficiency with a low re-circulation rate.
3. Fully variable operation in any weather conditions.
4. High air quality in cooled (heated) premises (with temperature +20...24°C and fresh air supply of 50...100%; in summer with relative humidity 40...60%).
5. No vibration and acceptable noise level.
6. Low specific weight and dimensions.
7. Easy serviceability.
8. Low operating costs.

High energy efficiency of the **air cycle ATT HVAC system** is ensured by optimal thermodynamic air-cycle scheme, unique highly efficient heat exchanger and turbo compressor, as well as low aerodynamic resistance of its valves and ducts.

- **Adapter with elastomeric pad**, which provides minimization of dynamic loads on bogie parts (side frames and wheel flanges), therefore reducing their wear.
- **Draft gear** with increased energy consumption and optimized polymer elements.

UPEC's enterprises also produce forgings, castings and spare parts for freight and passenger cars.

**Partnership with the UPEC:**

- **Engineering services:** complicated simulations of strength & dynamics, thermo-elasticity and other R&D of railway unites, devices and components.
- **Manufacturing of hot forgings**, semi-finished products and components after machining (for bearing, automotive, railway, and other industries).
- **Castings of different complexity** from 500 grams up to 10 tons (grey iron), from 500 grams up to 1 ton (high-strength cast iron); from 300 grams up to 6 tons (high-strength steel).