

[www.upec.ua](http://www.upec.ua)

## FORGINGS AND CASTINGS

- for bearing units of various types of bogies (both with cylindrical and tapered cartridge bearings)
- for automatic couplers
- for draft gears
- stop valves for railway cars
- for other assemblies of railway cars

UPEC is ready to provide outsourcing services in the production of components for various industries:

- production of hot forged and turned semi-finished products and components (for bearing and automotive industries, industrial production)
- castings of any complexity weighing from 500 grams to 20 tonnes of grey cast iron and from 500 grams to 1 tonne of high-duty cast iron



### OUR CAPACITIES FOR PRODUCTION OF COMPONENTS FOR OUTSOURCING:

#### Kharkov Bearing Plant HARP [www.harp.ua](http://www.harp.ua)

- modern high-performance horizontal forging lines with force of 800 and 1500 kN
- annealing furnace ELTERMA (Poland)
- HARP is ISO 9001:2008 and ISO/TS 16949:2009 certified. It is also a certified supplier for SKF - the world leader in bearing production. HARP has recently commenced the process of certification according to the International Railway Industry Standard (IRIS).

#### Lozova Forging-Mechanical Plant LKMZ [www.lkmz.com](http://www.lkmz.com)

- full range of forging and stamping equipment with application of advanced with unique technologies, providing the manufacture of hot forged parts with any configuration weighing from 0.22 to 200 kg, enhanced accuracy and high metal utilization factor
- equipment for machining

LKMZ is ISO 9001:2008 certified. It is also an approved supplier for SKF. LKMZ is preparing for the ISO/TS 16949 certification.

#### Ukrainian Casting Company ULK [www.ucco.com.ua](http://www.ucco.com.ua)

- Applied casting processes:
  - sand-clay mixtures for castings weighing from 0.5 kg to 25 kg
  - liquid-glass mixtures for castings weighing from 25 kg to 2 tonnes
  - cold-hardening mixtures for castings weighing from 0.5 kg to 100 kg
- Main technological equipment:
  - melting equipment: induction furnaces EGP (Turkey)
  - molding and core making equipment: automatic molding line Omega (Great Britain)
  - thermal equipment: furnaces Kerammash (Slavyansk), annealing furnace OTTOM
- ULK is ISO 9001:2008 certified.

The **UPEC Industrial Group** is one of the largest private industrial companies in Ukraine, which was established in 1995. UPEC is one of the leading CIS manufactures of components, units and equipment for railway, automotive, agricultural, engineering and metallurgical industries.

### Products for railway vehicles:

- **HARP bearings** for railway cars and locomotives
- **draft gears** with enhanced energy absorption
- energy efficient and environmentally friendly **climate control systems** for passenger railway cars, commercial and industrial buildings
- **forgings and castings** for axlebox units, automatic couplers, draft gears and stop valves
- **electric vibrators** for track tools



# DRAFT GEAR PMKP-110



The UPEC Industrial Group companies have mastered the production of cast housing and full range of forged parts for PMKP-110 draft gear.

The PMKP-110 draft gear is a new highly efficient shock damper with increased capacity of T1 grade, which is designed for the protection of multipurpose versatile freight cars against axial load impact and widely applied in the railway industry of the CIS countries (Kazakhstan, Russia, Belarus, Ukraine). This device was developed on the basis of the commercially produced draft gear PMK-110, which contains a retaining return device represented by a set of polymer elastic blocks instead of a spring set.

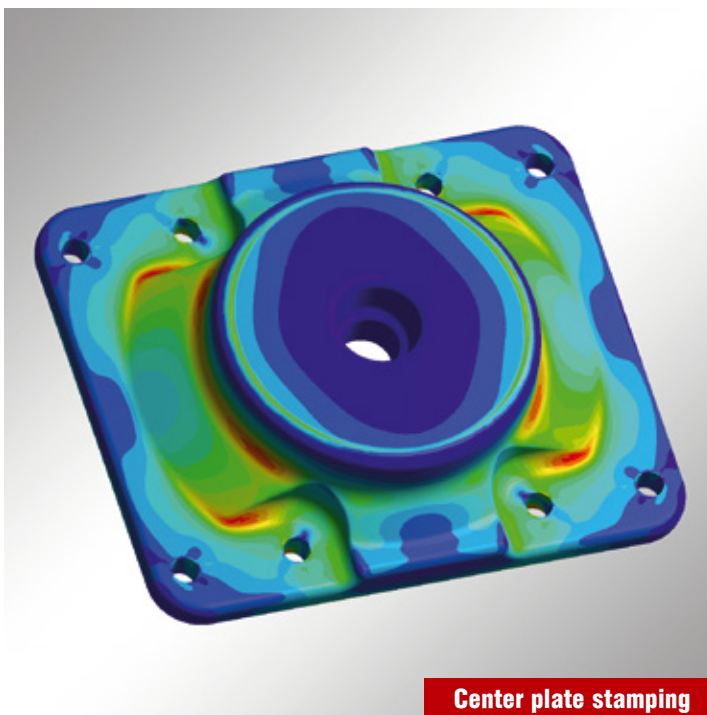
The production of the PMKP-110 cast housings applies the technology of casting in the cold-forming mixtures. Such technology provides the required surface quality, absence of burning-in while casting and dimension accuracy of the cast housing.

The ULK (Ukrainian Casting Company) casting shop, where the PMKP-110 housings are manufactured, is equipped with a molding line OMEGA (UK) and induction melting furnace EGES (Turkey). This device is certified according to the UkrSEPRO System and Certification System for Federal Railway Transport.

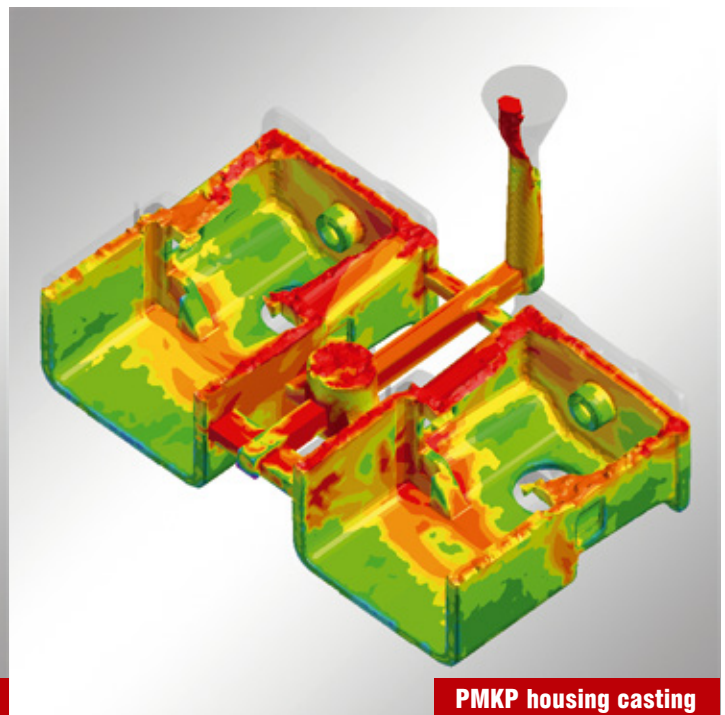
Designation	Description	Material	Weight, kg
 PMKP-110.00.00.002 (ПМКП-110.00.00.002)	Draft gear housing	30GSL-B (30ГСЛ-Б)	67.00
 PMKP-110.00.10.001 (ПМКП-110.00.10.001)	Fixed plate	38KhS (38XC)	4.70
 PMKP-110.00.00.003 (ПМКП-110.00.00.003)	Slide plate	38KhS (38XC)	5.20
 PMKP-110.00.00.004 (ПМКП-110.00.00.004)	Wedge	38KhS (38XC)	5.80

Designation	Description	Material	Weight, kg
 PMKP-110.00.00.005 (ПМКП-110.00.00.005)	Pressure pipe	38KhS (38XC)	11.60
 PMKP-110.00.00.006 (ПМКП-110.00.00.006)	Support plate	38KhS (38XC)	6.10
 PMKP-110.00.00.008 (ПМКП-110.00.00.008)	Plate	Steel 5 (Ст. 5)	0.70
 PMKP-110.00.00.011 (ПМКП-110.00.00.011)	Coupling Bolt	40Kh (40X)	2.80

## MATHEMATICAL SIMULATION



Center plate stamping



PMKP housing casting

Distribution of von Mises equivalent stresses

