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MONTHLY MAGAZINE, THAT DEALS WITH SCIENTIFIC, TECHNICAL, INDUSTRIAL AND ECONOMIC TOPICS

Established in 1925

Published by Ministry of Energy of Russian Federation

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UGOL is the leading magazine of Russia’s Coal Mining Industry. The main subscribers are Russia’s coal mining enterprises (coal companies, underground and surface mines, machine manufacturers, research establishments and others). Apart from Russia the magazine is also distributed to foreign subscribers in 15 countries and the CIS.

The magazine publishes industrial and social issues of coal mining companies. Furthermore, it provides economic information, statistical data, outlooks, regional reports, news about progress in mining technologies and equipment, underground and surface mining, coal processing and utilization, articles on environmental issues, miners’ safety and health. Also included are experiences in other countries, short news items, mining exhibition and congress reports, official documents, notes on history of mining.

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www.ugolinfo.ru
Igor TARAZANOV
Deputy Chief Editor of «UGOL» Magazine,
Director General «UGOL Magazine Edition» Ltd,
Mining Engineer, Corresponding Member
of Russian Academy of Energy-Journalism (RAE)

ANALYTICAL REVIEW
RUSSIAN
COAL INDUSTRY
(diagrams)

SOURCE:
Ministry of Energy of Russian Federation, CDU TEK, Rosinformugol,
SUEK, SBU-Coal, Raspadskaya, EVRAZ, Mechel, Belon, Severstal,
Stroy-service, the long-term strategy of development of the coal industry
Russian coal industry today is a market segment of the Russian economy fully, practically 100 percents of coal mining organizations have a private pattern of ownership.

For 1994 – 2007 the difficult period of restructuring is mainly passed, industry was transformed from unprofitable in the effective sector of fuel and energy complex of market economy and on this basis attained the first positive results on the stable providing of country coal products.

In the period of the last decade considerable changes happened in the conditions of work of enterprises of coal industry. Greater part of assets of coal enterprises passed to property of financial groups, metallurgical and coal-energy holding.

About 4 trillions of tons of prognosis supplies are concentrated in the bowels of the earth of Russia, it is approximately 30 % from world supplies, that much more, what in any other country of the world.

Balance supplies of coal of category of found out A+B+C1 make more than 190 billions of tons, and preliminary appraised for the categories of C2 – 79 billions of tons.

Russian coal is consumed practically in all subjects of Russian Federation, and booty is produced in 26 subjects. The basic regions of booty it is been Western and East Siberia. Primary development gets the leading coal region of country is Kuzbass, high potential for development has the Kansko-Achinsk coal region.

In 2011, coal mining was carried out 111 surface mine and 82 underground mine with a total annual production capacity of more than 380 million tons. Coal is produced by 49 concentrators and 2 enrichment plants with total capacity of coal processing above 170 million tons.

Average monthly labor productivity in coal mining in 2011 accounted for 197 tons per month (102 % by 2010).

Russian coal mining in 2011 production 337 million tons, that up 13 million tons (+4 %) more than in 2010 and 8 million tons (+2 %) more than the results of the most successful for the coal industry in 2008 (329 million tons), including thermal coals production 270 million tons, coals for coking is 67 million tons. By 236 million tons are an surface mining, by an underground is 101 million tons of coal.

Forecast coal production for 2012 is 350 million tons. For the first half-year of 2012 it was production 167.7 million tons.

Russian coal export 117 million tons in 2011 (+12 million tons or +11 % to 2010). Volumes of supplying with coal in the countries of near abroad were 10.2 million tons (-6 %). Dominant part of export of Russian coal is on a few countries-importers among which — Ukraine, Great Britain, Turkey, China, Japan, Netherlands, Poland and Korea Republic (their stake makes more than 70 % from all foreign trade shipping of country).

Russia already exports 61.4 million tons of coal in the first half-year of 2012.
RUSSIAN COAL PRODUCTION DYNAMICS

TOTAL, million tons


SURFACE MINING, million tons


UNDERGROUND MINING, million tons

COAL PRODUCTION BY THE BASIC ECONOMIC REGIONS OF RUSSIA IN 2011
Total – 336.7 million tons

COAL PRODUCTION BY THE BASIC COAL MINING REGIONS OF RUSSIA IN 2007-2011,

- Eastern Siberian Region: 88.6 Mt (26.3%)
- Far East Region: 31.6 Mt (9.4%)
- Central Region: 0.26 Mt (0.1%)
- North Western Region: 13.5 Mt (4%)
- Southern Region: 5.2 Mt (1.6%)
- Ural Region: 2.4 Mt (0.7%)
- Western Siberian Region: 195.1 Mt (57.9%)

Total coal production by regions in millions of tons:

- 2007: 12.8, 12.9, 11.9, 13.6, 13.4
- 2008: 7.1, 4.9, 4.7, 5.2
- 2009: 181.7, 184.5, 185.1
- 2010: 37.5, 36.6, 40.9
- 2011: 192

Pechora Region
Donetsky Region
Kuznetsky Region
Kansk-Achinsk Region

UGOL MAGAZINE
CHANGES OF REGIONAL COAL PRODUCTION STRUCTURE,

RUSSIA’S MAJOR COAL PRODUCERS IN 2011,
RUSSIAN COAL PRODUCTION DYNAMICS,  
*million tons*

<table>
<thead>
<tr>
<th>Year</th>
<th>Coking Coal</th>
<th>Thermal Coal</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>257,9</td>
<td>196,9</td>
<td>454</td>
</tr>
<tr>
<td>2001</td>
<td>269,3</td>
<td>204,5</td>
<td>473</td>
</tr>
<tr>
<td>2002</td>
<td>253,4</td>
<td>190,3</td>
<td>443</td>
</tr>
<tr>
<td>2003</td>
<td>276,4</td>
<td>207,2</td>
<td>483</td>
</tr>
<tr>
<td>2004</td>
<td>284,4</td>
<td>209,3</td>
<td>493</td>
</tr>
<tr>
<td>2005</td>
<td>299,8</td>
<td>229,9</td>
<td>529</td>
</tr>
<tr>
<td>2006</td>
<td>310</td>
<td>239,5</td>
<td>549</td>
</tr>
<tr>
<td>2007</td>
<td>314,1</td>
<td>241,2</td>
<td>555</td>
</tr>
<tr>
<td>2008</td>
<td>328,9</td>
<td>260,3</td>
<td>589</td>
</tr>
<tr>
<td>2009</td>
<td>302,6</td>
<td>241,6</td>
<td>544</td>
</tr>
<tr>
<td>2010</td>
<td>323</td>
<td>253,1</td>
<td>576</td>
</tr>
<tr>
<td>2011</td>
<td>336,7</td>
<td>269,7</td>
<td>606</td>
</tr>
</tbody>
</table>

RUSSIA’S MAJOR COKING COAL PRODUCERS  
*(coking coal production in 2011, thousand tons)*

Total – 67 055 thousand tons

<table>
<thead>
<tr>
<th>Company</th>
<th>Production (thousand tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechel</td>
<td>12575</td>
</tr>
<tr>
<td>Sibuglemet</td>
<td>7643</td>
</tr>
<tr>
<td>Severstal</td>
<td>7156</td>
</tr>
<tr>
<td>SBU-Coal</td>
<td>7026</td>
</tr>
<tr>
<td>EVRAZ</td>
<td>6765</td>
</tr>
<tr>
<td>Raspadskaya</td>
<td>6251</td>
</tr>
<tr>
<td>UGMK</td>
<td>5038</td>
</tr>
<tr>
<td>Belon (MMK)</td>
<td>4075</td>
</tr>
<tr>
<td>Stroyservice</td>
<td>3538</td>
</tr>
<tr>
<td>SUEK</td>
<td>2299</td>
</tr>
<tr>
<td>ArcelorMittal</td>
<td>2129</td>
</tr>
<tr>
<td>Koks</td>
<td>925</td>
</tr>
<tr>
<td>Others</td>
<td>1635</td>
</tr>
</tbody>
</table>

*UGOL MAGAZINE* 9
RUSSIAN COAL PREPARATION OF THE CONCENTRATING PLANTS DYNAMICS,

million tons


Total Coal Preparation

- Coking Coal Preparation
- Thermal Coal Preparation

RUSSIAN COAL PREPARATION OF THE CONCENTRATING PLANTS DYNAMICS, million tons

Concentrating plants of Kemerovo Region
- Listvyazhnaya
- Bachatskoy-Koksovaya
- Mezhdurechenskaya
RUSSIAN COAL PRODUCTION IN RUSSIAN DOMESTIC AND INTERNATIONAL COAL MARKETS IN 2000 — 2011 AND FORECAST,

million tons

COAL PRODUCTION IN RUSSIAN DOMESTIC COAL MARKETS OF FEDERAL REGIONS OF RUSSIA IN 2010,

million tons

COAL PRODUCTION IN RUSSIAN DOMESTIC COAL MARKET INTO ACCOUNT THE IMPORT OF COAL,

million tons
RUSSIAN PORTS DEVELOPMENT IN 2008 – 2011 AND FORECAST,  
*million tons*

<table>
<thead>
<tr>
<th>Year</th>
<th>North direction, Mt</th>
<th>West direction, Mt</th>
<th>South direction, Mt</th>
<th>East direction, Mt</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2010</td>
<td>2011</td>
<td>2030F</td>
<td>2010</td>
</tr>
<tr>
<td>2008</td>
<td>11</td>
<td>11.3</td>
<td>22</td>
<td>31</td>
</tr>
<tr>
<td>2009</td>
<td>54.8</td>
<td>61</td>
<td>104</td>
<td>1.3</td>
</tr>
<tr>
<td>2010</td>
<td>94.5</td>
<td>97.4</td>
<td>119</td>
<td>3.4</td>
</tr>
<tr>
<td>2011</td>
<td>100</td>
<td>100</td>
<td>123</td>
<td>3.1</td>
</tr>
<tr>
<td>2015F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2025F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2030F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Ports of Russia**
- **Ports of Ukraine and Baltic states**

**Total**

<table>
<thead>
<tr>
<th>Year</th>
<th>North direction, Mt</th>
<th>West direction, Mt</th>
<th>South direction, Mt</th>
<th>East direction, Mt</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2010</td>
<td>2011</td>
<td>2030F</td>
<td>2010</td>
</tr>
<tr>
<td>2008</td>
<td>84.4</td>
<td>94.5</td>
<td>100</td>
<td>29.6</td>
</tr>
<tr>
<td>2009</td>
<td>54.8</td>
<td>61</td>
<td>66.9</td>
<td>33.1</td>
</tr>
<tr>
<td>2010</td>
<td>97.4</td>
<td>62.4</td>
<td>128</td>
<td>24</td>
</tr>
<tr>
<td>2011</td>
<td>100</td>
<td>33,1</td>
<td>136</td>
<td>140</td>
</tr>
<tr>
<td>2015F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2025F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2030F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Ports of Russia and Baltic states**

**Total**
RUSSIAN COAL EXPORT DYNAMICS IN 2007 – 2011 AND FORECAST,
million tons

MAJOR COUNTRIES — IMPORTERS OF RUSSIAN COAL IN 2010,
thousand tons

<table>
<thead>
<tr>
<th>Country</th>
<th>Import Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ukraine</td>
<td>12,942</td>
</tr>
<tr>
<td>Great Britain</td>
<td>11,802</td>
</tr>
<tr>
<td>Turkey</td>
<td>10,958</td>
</tr>
<tr>
<td>China</td>
<td>10,807</td>
</tr>
<tr>
<td>Japan</td>
<td>10,371</td>
</tr>
<tr>
<td>Netherlands</td>
<td>8,056</td>
</tr>
<tr>
<td>Korea Republic</td>
<td>7,732</td>
</tr>
<tr>
<td>Germany</td>
<td>4,179</td>
</tr>
<tr>
<td>Finland</td>
<td>2,817</td>
</tr>
<tr>
<td>Others</td>
<td>25,939</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>105,603</strong></td>
</tr>
</tbody>
</table>

RUSSIA'S MAJOR COAL EXPORTERS IN 2011,
thousand tons

<table>
<thead>
<tr>
<th>Company</th>
<th>Export Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUEK</td>
<td>29,982</td>
</tr>
<tr>
<td>Kuzbassrazrezugol</td>
<td>22,624</td>
</tr>
<tr>
<td>SBU-Coal</td>
<td>12,219</td>
</tr>
<tr>
<td>UK Zarechnaya</td>
<td>7,262</td>
</tr>
<tr>
<td>KTK</td>
<td>6,546</td>
</tr>
<tr>
<td>Mechel (Yuzhny Kuzbass, Yakutugol)</td>
<td>6,446</td>
</tr>
<tr>
<td>Sibuglemet</td>
<td>3,294</td>
</tr>
<tr>
<td>Siberian Anthracite</td>
<td>2,372</td>
</tr>
<tr>
<td>Russian Coal</td>
<td>1,795</td>
</tr>
<tr>
<td>Coal Pit Bungursky-Severy</td>
<td>1,535</td>
</tr>
<tr>
<td>Others</td>
<td>23,012</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>117,086</strong></td>
</tr>
</tbody>
</table>

COAL IMPORT IN RUSSIA DYNAMICS,
million tons

<table>
<thead>
<tr>
<th>Year</th>
<th>Import Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>25.6</td>
</tr>
<tr>
<td>2001</td>
<td>28</td>
</tr>
<tr>
<td>2002</td>
<td>20.3</td>
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<td>2003</td>
<td>25.6</td>
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<td>2004</td>
<td>21.7</td>
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<td>2005</td>
<td>21.1</td>
</tr>
<tr>
<td>2006</td>
<td>24.3</td>
</tr>
<tr>
<td>2007</td>
<td>21</td>
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<tr>
<td>2008</td>
<td>25.8</td>
</tr>
<tr>
<td>2009</td>
<td>24</td>
</tr>
<tr>
<td>2010</td>
<td>29.6</td>
</tr>
<tr>
<td>2011</td>
<td>32.2</td>
</tr>
</tbody>
</table>
Holding company “SBU-Coal” (“Siberian Business Union-Coal”)

Holding company “SBU-Coal” OJSC was founded in 2006 in order to solve the problems of effective coal production and preparation processes taking into account industrial safety standards. “SBU-Coal” is one of the three leading coal companies in Russian Federation. A wide range of coal products and high quality of coal determines a high demand for products of Holding company “SBU-Coal” in both domestic and international markets. The company is the third major Russian coal exporter (70% of coal products is exported).

Holding Company “SBU-Coal” unites enterprises located in different areas of Kuzbass. These are 7 open-pit mines with total production capacity of 14,05 million tons per year, 3 mines with total production capacity of 9,4 million tons per year, 5 coal preparation plants with total production capacity of 23,15 million tons per year and 8 service enterprises. 14 000 people work in Holding company “SBU-Coal”.


SUSTAINABLE DEVELOPMENT STRATEGY

The Company develops in accordance with sustainable development program which was elaborated in 2011. The primary goal is to ensure competitiveness in the world coal market on the basis of company’s sustainable development strategy. The task of each enterprise is an uninterrupted long-term development. All enterprises are provided with resources for more than 20 years.

By 2018 coal production is planned to reach the level of 50 million tons per year, and coal preparation is planned to amount to 30 million tons per year.
STAGES OF PROGRESS

In 2012 it is expected to produce 28 million tons of coal. The company continues to invest in complex modernization of mining companies and coal-preparation plants, in implementation of automated control system and enterprises’ dispatch system, in automation of control systems of all production processes. In 2012 the total projected investment in enterprises’ technical re-equipment is USD 500 million.

IN HARMONY WITH THE ENVIRONMENT

Holding company “SBU-Coal” concentrates greatly on environmental conservation activities on production sites. In order to minimize the production processes impact on natural surroundings the company performs environmental conservation activities yearly and implements the best available technologies.

PERSONNEL AS A SPECIAL CAPITAL

The program “Personnel” is implemented in holding company “SBU-Coal”. The primary goal is to provide the company with highly qualified personnel on the permanent basis.

In order to achieve this goal the following activities are performed:
- Personnel training and education
- Social programs
- Social partnership

INDUSTRIAL SAFETY AND LABOR PROTECTION

The Company focuses on modern and high-technology safety systems application. The financing of labor conditions improvement is the most important issue in investment policy of Holdin

OJSC Holding Company “SBU-Coal”
650066, Kemerovo,
Oktjabrsky st. 53/2
Tel./fax.: +7 (3842) 68-08-40,
E-mail: office-sdsugol@hcsds.ru
Mining equipment has been manufactured since 1992 and this activity is given the highest priority. Today Yurmash is an engineering center for coal mining in Kuzbass and a major manufacturer and supplier of coal mining equipment in Russia. The company manufactures a complete range of mainly in-house design machinery and equipment for longwall mining:

- Roof support designed for operating in seam heights of 0.8 — 5.5 m, with a support resistance of up to 1400 kN/m², unit installation spacing within 1.5 — 1.75 m and advance increment 0.63 m and 1 m;
- Different modifications of armoured face conveyors with a line pan width of 0.63 — 1 m for operating in longwall of up to 300 m;
- Longwall shearsers K500YU with a rated capacity of 605 kW;
- Roadheaders KPYU-50 with a rated capacity of 270 kW;
- Face-end supports, mine roadway roof support sections;
- Crushers with a driven rated capacity of up to 300 kW;
- A variety of stage loaders with a line pan width of 0.7 to 1.1 m.

Our machinery bearing the mark «YURGA» efficiently works in mines and open pits over Russia and CIS countries. Manufacturing of mining equipment meeting the requirements of international standards is possible thanks to the highly qualified staff, efficient project solutions as well as modern technologies used in production.

The company carries out the improvement and modernization programme, and installs unique high-precision machinery equipment of the international leaders. The company’s quality control department performs the required testing by means of advanced gauges, measuring units and devices to achieve and approve compliance with various product requirements and customer’s needs.

Equipment made by Yurginsky machine engineering plant provides a combination of high performance, high efficiency and quality and was awarded medals and diplomas many times at the international exhibitions and fairs in Russia and abroad. In 2008 the company simultaneously established an integrated management system to the requirements of such three international standards as ISO 9001 (quality management system), ISO 14001 (environmental management system), OHSAS 18001 (health and safety management system).

The company acts as a Prime Contractor performing a complete range of works to deliver, assemble and install mining systems and accepts full responsibility for their operation.
Quality of our products is a source of your success!

- roadheaders
- longwall shearsers
- roof supports
- conveyors
- stage loaders
- crushers
- chain cable handlers

More detailed information on Yurginsky machine engineering plant is given at www.yumz.ru

LLC "Yurginsky machine engineering plant"
Ul. Shosseinaya 3, Yurga, 652050, Kemerovo oblast, Russia
tel./fax: (384-51) 7-44-99; tel.: (384-51) 7-41-15
e-mail: yumz@yumz.ru
Information System Development for the Development Forecasting of the Raw-Material Base of Coal Industry

According to the Energy Strategy of Russia Coal for the period till 2030 coal production will increase and coal will considerably replace the share of natural gas in electricity and heat of generation. Besides, gas export escalating from Russia to other countries is one of the most effective tools of foreign policy of our country. Gas demand European countries will steadily increase next decade and it will be Russia’s task to meet this demand appreciably. Thus, substitution of natural gas by increasing coal share in power generation is a strategic problem of not only domestic, but also foreign policy of Russia.

In connection with the above-stated the analysis of mining and geological conditions of coal seams winning at the operating and perspective mines as well as the estimation of coal seam qualitative characteristics. Data of 207 operating and 220 perspective coal seams has been analyzed.

The analysis of mining and geological conditions of coal seams winning has allowed to develop classifications and typifications of the coal seams, which on the one hand characterize the degree of their suitability to the effective development, and on the other hand it characterizes peculiarities of seam geological structure, their collapsibility and physicomechanical character of coal containing rocks with reference to selection of winning and hading equipment. The developed typifications have been connected into the uniform classification matrix where each element corresponds to the certain group on structure and on category of seam collapsibility and also can be accepted as a complex classification indicator.

Analysis results of mining and geological conditions of coal seam deposits have provided the basis for typification of coal seams on degree of their suitability to effective development. According to the typification the seams are conditionally divided into hi-tech (profitability of 16-30%), technological (profitability of 5-15%) and non-technological (profitability less than 5% or equal to zero).

Indicators of seam ash content, coal moisture content, sulfur content, volatile matter and gross calorific value are estimated for the analysis of qualitative characteristics of coal seams. Summary data about all above-stated seams which are developed by deep mining has allowed giving the generalized qualitative characteristics of various coal marks on the basic coal basins of Russia.

The results of the executed researches lay in the root of the information system for forecasting of raw-material base development of coal industry. The system gives the chance for coal mining predictive assessment for the set term, and also allows stating perspective estimation on mines adaptability level on typical conditions. Only data of those mines which for the period specified by the user were operating is considered at forecasting. The list of operating mines is formed from the list of not taken out of service mines for the year which was set by the user and from the list of perspective mines which are planned to input in the set year.

The full list of the forecasting estimates is the following:
- The production forecast in the whole and in breakdown on coal marks of the whole branch and of separate regions for the specified year;
- The forecast on mines adaptability level of the whole branch and on separate regions;
- The forecast on typical conditions of the branch;
- The forecast on typical conditions of the regions.

The information system consists of two basic modules – the module of information input and editing and the module of forecasts delivery. All information is stored in a database under the control of SUBD MS SQL Server 2008. The module of input and information editing represents the interface to the database, allowing the user to fill the base with the actual information and to edit the data. The information which is entered into the base is divided into three basic groups – the data from operating mines, the data from perspective mines and directories. The information about mountain-geological conditions of development, deposit, qualitative characteristics of coal seams and also daily average coal mining volume is stored only for operating and perspective mines. Directories contain descriptions of fragile and plastic coal properties, lythotypes, structures of firm inclusions and roof types.

The typical group of structure complexity and a collapsibility category of a seam are automatically defined at the information input into the database about separate coal seam. The calculation of the given indicator isn’t carried out in a case of data lack, but possibility of the subsequent editing of the data about a seam for the purpose of information addition to a minimum which is necessary at calculation of typical conditions remains.

The forecasting module allows to receive the report on coal mining, mines adaptability level, typical conditions for the period which was set by the user. Besides, the list of operating and perspective mines is edited in the given module. Editing consists of the mines exception out of the operating list and imitation of perspective mines putting into operation. Thus, the mine is marked in a database as operating or not operating.

All further forecasts are based on the basis of mines lists which were operated in the set year. All unpromising mines which were closed till the specified year and perspective, placed into operation after year on which the forecast is under construction, are excluded from the list at calculation. The forecast is given to the user in a tabular kind or in the graph form.
ENGINEERING DOBERSEK GmbH is your specialist for planning, designing and commissioning of turnkey plants and plant components in the fields of mining, mineral processing and metallurgy, water treatment, power and environmental engineering as well as chemical and special plant engineering.

Our range of services – from consulting and operational project management all the way to aftersales service – is comprehensive and complete:

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- Consulting and project management
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- After sales services
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ENGINEERING DOBERSEK GmbH with its headquarter in Germany has more than two decades of international plant engineering experience – a result of numerous successfully completed major projects. Benefit from our specialists who possess valuable expert knowledge in process engineering, mechanical engineering, electrical engineering as well as in instrumental and control technology. Together with our partner companies in seven different countries we are able to ensure intense and productive cooperation with all our customers.

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www.ed-mg.de
Gas-dynamic Cartridge Mortar (GCM)

Mortar

The unit runs in a stand-alone mode and is intended for protection of miners and equipment against the combustion of dust and methane-air mixture in case of Class C fire (gaseous substance combustion).

It can be used for dust explosion prevention along with or instead of inert dust, water walls, artificial sprinkling of mine workings etc. The unit can be used for feeding the fire extinguishing powder to protected facilities under pressure which surmounts a thermal depression in case of an unmanned surface fire allocation and quenching method for one or more fires of Class A (solid combustibles), B (liquid combustibles), E (electric equipment).

Benefits of the unit

◆ no external power supply is required;
◆ gets activated when approached by a shock wave or fire at a distance of 25 to 100 m;
◆ fitted with stand-alone back-up systems to monitor the fire environment and presence of a shock wave front;
◆ can be used in mine workings featuring any angle of dip.

Cartridge mortar operation

The mortar operates in a continuous stand-by mode. The explosive combustion (methane-air mixture combustion; shock wave generation and movement is monitored by the methane-air mixture flash detector system (photoelectric sensor, shock wave front trap and temperature sensor). When threshold (critical) values as detected by any of the emergency sensors change an electrical pulse is automatically sent to the cartridge mortar igniter output terminals. The fire extinguishing powder is ejected under high pressure into the mine working space in form of a complex two-phase outflow of highly turbulent gas powder mixture having an antistrike influence upon the shock wave front and subsequently a retarding influence on the flame front.

Technical features

◆ time of operation: up to 10-4 s;
◆ speed: up to 10-3 s (optical sensor);
◆ fire extinguishing powder weight: up to 30 kg;
◆ charge shot range in undisturbed air: at least 45 m;
◆ methane-air mixture combustion cessation in volume at powder concentrations of at least 15 g/m³;
◆ operating temperature: $t = \pm 50 ^\circ$C;
◆ continuous operation service life: at least 5 years;
◆ maximum mortar size: up to 2 m.

Designed by:

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e-mail: wts05@mail.ru

«Metanobezopasnost» Ltd
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650070, Kemerovo
Phone/Fax: +7 (3842) 72-44-20
e-mail: noven42@mail.ru
Pauk Powder Fire extinguishing Module

The unit runs in a stand-alone mode and doesn’t require any external power supply. It is intended for feeding the fire extinguishing powder to protected facilities under pressure which surmounts a thermal depression in case of an unmanned surface fire allocation and quenching method for one or more fires of Class A (solid combustibles), B (liquid combustibles), E (electric equipment).

Operation

An electric pulse is sent automatically to the terminals 5 of the igniter output of the gas generator 1 through the command of special sensors (temperature sensors, optical sensors, smoke detectors, shock wave detectors) or manually. The operation of a chemical gas generator results in an intensive generation of gas which goes to the housing 3 of PFM where the powder gets aerated the pressure rises up to the valve opening level of the sprayer 4 and the powder is ejected into the protected zone. The powder spraying configuration is a result of a complex two-phase outflow of a highly turbulent gas powder mixture from the housing via a short spraying nozzle 4.

The unit offers the following features:

- protected area: at least 30 m²;
- protected volume: at least 52 m³;
- operating temperature \( t = \pm 50 ^\circ \text{C} \);
- module operation time: up to 1 s;
- fire extinguishing powder weight: up to 6.0 kg;
- service life: 10 years.

Extinguishing of 233 liters of A72 grade petrol in a pan from 6 meter height
Providing the mining branches with high quality equipment is an enough complicated task available for the enterprises of high qualification. In its forty-five-year history in this market segment “Production Association “Electrotochpribor” JSC from Siberian Omsk had proved its high position many times.

Range of products for extractive production is rather wide. First item to mention is the individual headlight, standard or assembled with methane sensors giving signals of gas environment condition at the miner’s work area of methane-dangerous excavations. For the period of these articles’ production they have gone the way from refilled batteries to modern Li-Pol elements and LED lamps; all that has allowed decreasing the mass and size parameters of lighter about 4 times. Now the enterprise has its own automated manufacture of thermo-catalytic sensors, popular among miners of Russia, Ukraine and Kazakhstan.

Recently on purpose of increasing labor safety the sensors are widely equipped with means of wireless positioning and noticing as well as active radio beacons switched on in emergency case.

Also the portable gas analyzers and methane meters for installation on mining machines are produced. Gas analyzers of recent generation allow controlling three kinds of gas at once, noticing the excessive concentration of any gas against the set level, storing in memory the data of measurements within 48 hours of work. Small size and weight, broad display and possibility to transfer the data to PC via wireless connection make the instrument convenient for control services.

Instruments for controlling the explosion contingencies and electric triggering them produced by our enterprise allow working with electric detonators of different initiation charge in various conditions, including drowned excavations. This allows applying them while extracting minerals and at penetration. The instruments are usable with single detonators and for mass explosion.

New direction of enterprise activity is the production of LED lights to be applied at mechanic linings, mining machines and lighting the drifts and areas. Long-term experience in development of low-explosive equipment and electronic devices has allowed us to make the lighters maximum corresponding to the requirements prescribed.

The enterprise is constantly co-operating with leading research and testing centers of Russia and Ukraine. All mining articles are produced regarding the standards of IEC 60079. All this in amalgamation ensures the advanced level of manufactured products, worthily respected in Russia and abroad.
At the meeting in June 2011 in Novokuznetsk (Kemerovo Region), the exhibition “Ugol Rosii and Mining” mine Anemometer APR-2m was awarded a diploma as the best exhibit, as presented on the stand Anemometer APR-2m directly from the show was sold to the mine «Raspadskaya».

Currently with Anemometer’s APR-2m is equipped most of the mines in Russia.
Suspended Material Concentration Control Device PKA-01

The device can be used for soaring dust mass concentration measurement of any origin in all industries. Measurements modes are chosen in depend of dust kind.

**Specification**

- Indication range: 0 – 5000 mg/m³
- Measurement range: 2 – 1000 mg/m³
- Measurement uncertainty range: 20%
- Maximum time measurement: 3 minutes
- Mass: 950 gr.
- Outline dimension: 150 x 100 x 250 mm

Mines Dust-Explosion Proofness Control Device PKP

The device is intended for a rock dusting mining quality estimation in which rock dusting by polvere inerte is provided. Measurement procedure includes coal dust sampling and the subsequent maintenance definition of the inert dust quantity in the test.

**Specification**

- Explosion proof device labeling: POExial
- Protection level: IP54
- Temperature: from 0 till 40°C
- Inert dust content measurement range: 1 – 100%
- Measurement uncertainty: not more than 10%
- Inert dust content permission: 1%
- Mass: 600 gr.

Stationary Dust Content Measuring Device IZST-01

The device is intended for dust mass concentration measurement at maximum excess permissible concentration in the atmosphere control. It is also intended for conditioning system technological control, ventilating systems and air cleanliness.

**Specification**

- Dust concentration measurement range: 0 – 1500 mg/m³
- Ambient temperature range: from +5 till +35°C
- Relative humidity range: from 20 till 98%
- Barometric absolute pressure range: from 84 till 106.7 kPa
- Dust powder: from 0.5 till 150
- Mass: 1500 gr.
SKPDS
Decontamination Net Parameters
Inspection System

The system is intended for stream speed measurement, a methane volume ratio, temperature and aeromethane mix absolute pressure. By measured data results and pipeline set parameters (nominal inside diameter) aeromethane mix expense, led to normal conditions is calculated (absolute pressure \( P = 760 \text{ millimeter of mercury} \), temperature \( T = 20^{\circ}\text{C} \)).

Mine Anemometer AR-P

AR-P is intended for air stream speed measurement in mines, at conditioning system technological control, ventilating systems and different function objects.

**Specification**

- Explosion proof device labeling ........................................ POExial
- Exposure Protection level .......................................................... IP54
- Power source ................................................................. accumulator Li-Ion
- Working time without recharge .................................................. 6 hours
- Environment working temperature range ...................... from +2 till +35\(^{\circ}\text{C} \)
- Charger Voltage maximum .................................................. 5V
- Air stream speed measurement range ......................... 0.1 – 30 m/sec.
- Indication range ............................................................ 0-50 m/sec.
- Admissible absolute uncertainty range ...................(0.1 + 0.05V) m/sec.
- Outline dimension .......................................................... 230 х 120 х 75 mm
- Mass ................................................................. not more than 1000 gr.
- Warranty assurance ........................................................... 12 month

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http://nc-vostnii.ru
Segregative Mine Self-Rescuer of Small Size with Chemical with Chemical Bound Oxygen  
ShSM-T

ShSM-T is intended for respiratory organs protection and eyes at staff evacuation from a dangerous zone with unsuitable breath atmosphere and for primary actions carrying out on emergency expansion prevention at mines, coal producer and other enterprises. Weight reduction till 1,6 kg, in comparison with existing analogs, will provide possibility of constant carrying at regular work performance.

ShSM-T provides respiratory organs protection in the atmosphere which contains: CO up to 10 %, SO₂ up to 2%, NO₂ up to 1%, H₂S up to 1%, CO₂ up to 15%, N₂ up to 100%, CH₄ up to 100%, O₂ from 0% and black and stone dust up to 10 g/m³.

### Specification

<table>
<thead>
<tr>
<th>Defensive action time at using, min., no less then:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- medium severity (lung ventilation 35 dm³/min)</td>
<td>30</td>
</tr>
<tr>
<td>- heavy (lung ventilation 70 dm³/min)</td>
<td>10</td>
</tr>
<tr>
<td>- at rest (lung ventilation 10 dm³/ min)</td>
<td>120</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exploitation temperature range, °C</th>
<th>from – 20 till + 40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature of inhaled breathing gas, °C, no less then</td>
<td>50</td>
</tr>
<tr>
<td>Breath resistance (35 dm³/min), mm H₂O, no less then</td>
<td>80</td>
</tr>
<tr>
<td>Outline dimension, mm</td>
<td>170 x 165 x 93</td>
</tr>
<tr>
<td>Self-rescuer mass, kg</td>
<td>1,6</td>
</tr>
<tr>
<td>Exploitation warranty period, years</td>
<td>till 7,5</td>
</tr>
</tbody>
</table>

ShSM-T is supplied with the tightness indicator which allows to carry out tightness visual control according display element color instead of instrument control.
Segregative Mine Self-Rescuer with Chemical with Chemical Bound Oxygen

**ShS-90**

*ShS-90* is intended for respiratory organs protection and eyes at staff evacuation from a dangerous zone with unsuitable breath atmosphere and for primary actions carrying out on emergency expansion prevention at mines, coal producer and other enterprises.

*ShS-90* provides respiratory organs protection in the atmosphere which contains: CO up to 10%, SO₂ up to 2%, NO₂ up to 1%, H₂S up to 1%, CO₂ up to 15%, N₂ up to 100%, CH₄ up to 100%, O₂ from 0% and black and stone dust up to 10 g/m³.

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**Specification**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defensive action time at using, min., no less then:</td>
<td></td>
</tr>
<tr>
<td>- medium severity (lung ventilation 35 dm³/min)</td>
<td>90</td>
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<tr>
<td>- heavy (lung ventilation 70 dm³/min)</td>
<td>30</td>
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<tr>
<td>- at rest (lung ventilation 10 dm³/min)</td>
<td>450</td>
</tr>
<tr>
<td>Exploitation temperature range, °C</td>
<td>from – 20 till + 40</td>
</tr>
<tr>
<td>Temperature of inhaled breathing gas, °C, no less then</td>
<td>50</td>
</tr>
<tr>
<td>Breath resistance (35 dm³/min), mm H₂O, no less then</td>
<td>70</td>
</tr>
<tr>
<td>Outline dimension, mm</td>
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<tr>
<td>Self-rescuer mass, kg</td>
<td>4.0</td>
</tr>
<tr>
<td>Exploitation warranty period, years</td>
<td>till 7,5</td>
</tr>
</tbody>
</table>

*ShS-90* is supplied with the tightness indicator which allows to carry out tightness visual control according display element color instead of instrument control.

*ShS-90* Has a breath circular scheme which provides absence of toxic substances suction at the breath phase.
Segregative Mine Self-Rescuer
of Medium Dimension Type with Chemical
with Chemical Bound Oxygen
ShSS-TM

ShSS-TM is intended for respiratory organs protection and eyes at staff evacuation from a dangerous zone with unsuitable breath atmosphere and for primary actions carrying out on emergency expansion prevention at mines, coal producer and other enterprises. Weight reduction till 2,3 kg, in comparison with existing analogs, will provide possibility of constant carrying at regular work performance.

ShSS-TM 90 provides respiratory organs protection in the atmosphere which contains: CO up to 10%, SO$_2$ up to 2%, NO$_2$ up to 1%, H$_2$S up to 1%, CO$_2$ up to 15%, N$_2$ up to 100%, CH$_4$ up to 100%, O$_2$ from 0% and black and stone dust up to 10 g/m$^3$.

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defensive action time at using, min., no less then:</td>
<td></td>
</tr>
<tr>
<td>- medium severity (lung ventilation 35 dm$^3$/min)</td>
<td>60</td>
</tr>
<tr>
<td>- heavy (lung ventilation 70 dm$^3$/min)</td>
<td>20</td>
</tr>
<tr>
<td>- at rest (lung ventilation 10 dm$^3$/min)</td>
<td>300</td>
</tr>
<tr>
<td>Exploitation temperature range, °C</td>
<td>from – 20 till + 40</td>
</tr>
<tr>
<td>Temperature of inhaled breathing gas, °C, no less then</td>
<td>50</td>
</tr>
<tr>
<td>Breath resistance (35 dm$^3$/min), mm H$_2$O, no less then</td>
<td>80</td>
</tr>
<tr>
<td>Outline dimension, mm</td>
<td>234 x 194 x 95</td>
</tr>
<tr>
<td>Self-rescuer mass, kg</td>
<td>2,3</td>
</tr>
<tr>
<td>Exploitation warranty period, years</td>
<td>till 7,5</td>
</tr>
</tbody>
</table>

*Self-rescuer at carrying and using*
Kuzbasskiy Technopark
as the Element of Kemerovo Region
Innovative Infrastructure

Kuzbasskiy technopark was founded in 2007. It got its name after Kuzbass, the short for Kemerovo region.

The main purpose of Kuzbasskiy technopark is to unite scientific, intellectual and industrial potential of the region for connection between science and business and for achievement of stable development of the region.

The task of Kuzbasskiy Technopark is to provide the innovative project with system of complex support (legal, patent, industrial, consulting), including the search of potential investors.

Basic types of activity of Kuzbasskiy Technopark were defined according to particular features of development of Kemerovo region. Due to the huge mineral resources (brown and hard coal, iron ore, manganese, silver, gold, mercury, tungsten, molybdenum, cobalt, nickel etc.) the region became one of the largest industrial centers in Russia where the leading coal mining, metallurgical, machine building and chemical enterprises are located.

- The development and application of new technologies in the field of coal, ore and nonmetallic minerals extraction, delivery and processing
- The development of machine building and creation of the new technological level equipment for the mining industry
- The development and application of technologies in the field of new functional and constructional materials production, usage of secondary power resources (mine methane, energy of mine waters and air), processing of production wastes, energy saving and resource saving
- The development and application of high technologies in medicine, education, environmental management, life protection
- Participation in forming of the united informational area in Kemerovo region

Innovators are supported by several means. Participants of joint projects with OJSC "Kuzbasskiy technopark" get an opportunity to use its infrastructure and service support:
- Expert evaluation of innovative projects
- Informational support of innovative activity
- Involvement of research organisations and engineering companies for projects support
- Drawing up of business plan
- Attraction of financial investments
- Involvement of qualified personnel for projects realisation
- Maintenance of premises (office, industrial), land etc. under preferential rates

Procedure of getting status of the resident of Kuzbasskiy Technopark is established by the Law "About technoparks in the Kemerovo region". Declarant is to submit innovative project corresponding to basic types of activity of Technopark. If the project gets positive conclusion of Expert council of Kuzbasskiy Technopark, application for the resident status is considered by the Board of Kemerovo Region Administration.

Residents of Technopark are given a number of privileges and preferences provided by the regional legislation: the preferential taxation under taxes to property and to profit, reception of budgetary credits and grants to realisation of innovative projects, interest rate subsidising under credits.

On April 15 the business-incubator of Kuzbasskiy Technopark was opened. It is a modern complex building with a fully equipped infrastructure and comfortable working environment. The purpose of the business-incubator is to provide favorable conditions for beginning innovative companies to make a reality of original scientific and technical ideas into business. It assumes consulting, legal and accounting support for the projects, granting office, laboratory and floor spaces under preferential rates that will allow developers to concentrate on realisation and advancement of the projects.

As for today, Kuzbasskiy Technopark set up a data bank of more than 70 innovative projects in the field of new functional and constructional materials production, usage of secondary power resources, processing of production wastes etc.

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IZ-KARTEX
NAMED AFTER P.G. KOROBKOV LTD.
OMZGROUP

LARGEST RUSSIAN MANUFACTURER OF MINING SHOVELS

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EKG-32R at Krasnobrodskiy opencast coal mine