AMMO PRODUCTION

122 mm Rocket „GRAD“ for RM-70 / BM-21

MSM GROUP Ltd. was established by transformation of MSM Martin Ltd., which dealt with construction, development, production and sales mainly with military material. MSM Martin Ltd. in the last few years took over several military companies located in the middle of Slovakia, and built up its traditional manufacturing activities in military and civil production. Due to ZVS inclusion into the group structure we can state that the origin of MSM GROUP Ltd. comes back to 1927 when then Škoda Works in Plzeň, as monopoly producer of ammunition, decided to build so called “spare factory” in Slovakia. The company was totally destroyed during the World War II, and it took several years while the production was restored to such extend, that its products were supplied not only for the Ministry of National Defence, but for many countries worldwide as well. Today the MSM GROUP Ltd. makes use of rich experiences from the past and know-how of highly qualified workers and vast archive of technical documentation for all necessary procedures. In 2009 the biggest Czech military holding EXCALIBUR ARMY entered MSM as a co-owner.

WHY TO COOPERATE WITH US:

More than 70 years experiences in the ammunition development, production and complete services in this field.
Long tradition in the MSM locations for the ammunition production processes with significant effects as the deep skilled personal, support industries, development fields, education etc.

More information at
www.msm.sk
**122 mm Rocket „GRAD“ for RM-70 / BM-21**

- **Technical data:**
  - **Caliber:** 122 mm
  - **Length of missile with fuse:** 2060 mm (in old design)
  - **Weight of missile with fuse:** 24.5 kg
  - **Min. range:** 20 km
  - **Max. range:** 32 km
  - **Type of warhead:** High Explosive (HE)
  - **Fuse:** MRV-U (with immediate, short and long delay)
  - **Rocket motor:** Double-based solid propellant
  - **Weight of propellant:** 122 kg
  - **Max. storage temperature:** -32°C / +50°C
  - **Technical line for inspection of artillery rockets 122 mm JROF RM70 is designed for repair, modernization and inspection in order to extend the lifespan.

At the inspection procedures is performed:
- modernization, which is caused by the requirement to increase the safety of rockets and resistance against unintentional initiation of induction or action of static electric charges
- repair of damaged parts, which affects its function, internal and external ballistics
- check of alignment of centering ring and the warhead, high of locating pin, position of locating pins to the longitudinal axis, position of the contact cap, geometry of the open stabilizer, circuit and resistance of rockets, air tightness of the tin for fuses
- complete repair of packages

**Technical data:**

<table>
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</table>

**Warhead Modernization**

- **Basic warhead:** High Explosive (HE)
- **Possibilities for warhead modernization:**
  - **Number of fragments:** 1050 pcs
  - **Radius = 32 m Thickness 6 mm
  - **Radius = 15 m Thickness 10 mm
  - **Armour penetration:**
    - Number of fragments (shrapnels): 1050 pcs
    - Number of fragments (balls): 9100 pcs
  - **Number of fragments:** 10500 pcs

**Fuse Modernization**

- **Possibility for fuse modernization:**
  - **Number of fragments:** 10500 pcs
  - **Radius = 32 m Thickness 6 mm
  - **Radius = 15 m Thickness 10 mm
  - **Armour penetration:**
    - Number of fragments (shrapnels): 1050 pcs
    - Number of fragments (balls): 9100 pcs

**Engine Modernization**

- **Possibility for engine modernization:**
  - **Min. range:** 20 km
  - **Max. range:** 32 km
  - **Min. storage temperature:** -40°C / +60°C

**Reference**

- **Germany**
- **Turkey**
- **Vietnam**
- **Egypt**
- **Germany**
- **Italy**

**For the production line:**

- **New rockets**
- **Revision costs**
- **Warranty for technology and equipment:**
  - **Life-span:** 10 years
  - **Revision costs:** approx. 1/3 of total costs of provision of new rockets

**Technical line for the destruction of ammunition:**

- **Mobile line model for the ammunition disassembly**
- **AMMO PRODUCTION”**