NEODYMIUM MAGNETS

Neodymium belongs to the lanthanoid series of chemical elements that comprises metallic chemical elements with atomic numbers from 57 to 71. All the lanthanides are silvery-white and very soft metals, along with scandium and yttrium known as rare earth elements. From alloys containing neodymium or samarium are made extra STRONG PERMANENT MAGNETS.

The neodymium magnets (also called NdFeB) are manufactured by sintering in vacuum (the powder of rare earth ores is magnetically aligned into dense blocks) and by right rank among the most advanced products on the market. Thanks to their high magnetic performance these magnets caused a revolution in the up-to-date technology and influenced in a radical way the magnet applications (and that is no wonder as a neodymium magnet is capable to lift a thousand times its weight). For example, thanks to the neodymium magnets the computer hard disks work nowadays ten times faster than in the past. That is why it is evident that the rare earth ores are of strategic importance and absolutely indispensable to the advanced technologies (as computer monitors, batteries for electric vehicles, mobile phones etc.).

Nowadays the rare earth ores originate above all from two big deposits in China, however e. g. Japan is evaluating the possible extraction of this raw material on its own territory (in spite of the fact that it will be very expensive to extract the material from the depth of 3000 meters and the raw material would be available only in 5 years). The first neodymium products got demagnetized at the temperature above 80°C and therefore their application fields were quite limited, however nowadays the limit climbed up to 230°C what also considerably widens the application options. Owing to the new surface treatment technologies there were solved also corrosion problems (nickel, zinc, copper plating or synthetic resin coating are the standard methods to prevent exposure to the atmosphere).

Neodymium magnets improve the performance of electric motors, if applied in loudspeakers the dimensions are reduced but the output substantially increased. Commercial manufacturing of neodymium magnets started in 1990s, and although the properties of these first products were not so advanced as the qualities of the present magnets, already from the very beginning the magnetic field generated by neodymium magnets exceeded seven times (achieving 35 MGO) the strength of the traditional ferrite magnets. No wonder that due to the nearly unlimited application options of neodymium magnets we can chance on these products everywhere. At school, at home as well as in the office there are used colored magnets, strong magnets in plastic cases, magnets in metal cases, magnetic numbers, magnets in wooden cases (for children), magnetic self-adhesive foils, magnetic nameplates, ledges, flipcharts etc.

With regard to the INDUSTRIAL USE OF NEODYMIUM MAGNETS, there are really no limits at all. In the furniture industry the neodymium magnets are needed for furniture door locks, the manufacturers of handbags and briefcases use magnetic closures, a magnetic foil can serve as a visual advertisement carrier, with the aid of a magnetic pocket (pouch) or label you can easily place a stock card, the neodymium magnet are absolutely indispensable to industrial metal detectors (for liquid mixtures, overband magnets etc.), recycling and waste separation could not be carried out without neodymium magnets, the lifting magnets are considered by engineering companies as a very effective way of manipulation with heavy loads etc.

And the application of the magnetic separators is also multipurpose. They can be used for separation of either liquid or dry materials (of better or worse bulk properties), they can serve for separation of magnetic particles from materials transported on conveyor belts or in pipelines. It is possible to place these separators into the hoppers of moulding machines as well as to construct a complete separation line equipped with various kinds of magnetic separators. And the evolution has not stopped, whereas at the moment the MAGNETIC FORCE generated by neodymium magnets achieves 52 MGO, physicist suppose that in the future we could get till 80 MGO (what, logically, would result into even more intensive and sophisticated industrial use of neodymium magnets).