**PAN AFRICAN MATERIALS INSTITUTE (PAMI)**

**LIST OF LABORATORY EQUIPMENT PROCURED BY PAMI 2017**

Through the ACE program PAMI recently acquired some equipment for the upgrade of its three Focus Research Groups (FRGs) to facilitate research and ensure timely graduation of PhD students and also to ensure that PAMI meets the target of the World Bank on various DLIs. Some of the machines are available for commercial testing to the public to support industrial work and ensure sustainability of PAMI through revenue generation. The equipment procured with a brief description are listed below.

1. Breaking Jaw Crusher: This equipment is used to reduce the size of a solid mix of raw materials (such as rock ore), so that pieces of different composition can be differentiated. It can also be used for size reduction of waste materials so they can be more easily used, disposed of or recycled. The equipment is used by the multifunctional FRG for processing of rock ores and clay samples.
2. Magnetic Separator: This is used for magnetic separation of minerals. It is based on a process in which magnetically susceptible material is extracted from a mixture using a magnetic force. This separation technique can be useful in mining iron as it is attracted to a magnet. The equipment is used by the multifunctional FRG for processing of rock ores and clay samples.
3. Shaking Table: This is used for processing Gold, Silver, Lead, Zinc, Aluminum, Coal, Barite, Beach Sands, Chromite, Glass Sand, Garnet, Iron, Manganese, Mica, Phosphate, Potash, Tantalum, Tin, Tungsten, Titanium, Zircon and etc. The equipment is used by the multifunctional FRG for processing of rock ores and clay samples.
4. Gold Ore Shaking Table: This is used for separation of two or more materials of different specific gravities. The equipment is used by the multifunctional FRG for processing of rock ores and clay samples.
5. Electric drying oven: Used for drying of samples with temperature range from 0-250⁰. The equipment is used by the three research groups.
6. Magnetic Resonance Imaging (MRI) Equipment: This is a type of scanning machine that uses strong magnetic fields and radio waves to produce detailed images of the body. The MRI facility is mainly used for animal work by the biomaterials FRG to study cancer tumors and other biomaterials studies.
7. X-ray powder Diffraction (XRD) Equipment: This uses analytical technique for phase identification of a crystalline material and can provide information on unit cell dimensions. The analyzed material is finely ground, homogenized, and average bulk composition is determined. This facility is used by the three FRGs and also open to the public as a means of revenue generation for PAMI.
8. Vacuum De-wetting Unit: This is mainly used for drying of processed mineral ores.
9. 3D Printer: This machine supports PAMI’s effort towards Additive Manufacturing Technology and is used for printing various forms in which material is joined or solidified under computer control to create a three-dimensional object, with material being added together (such as liquid molecules or powder grains being fused together).
10. Sieving machine: This is used for separating materials into desired particle size for improved efficiency.
11. Robots: The robot is mainly used for teaching robotics to graduate students, and for demo in the various PAMI programmes such as the PASMAT workshop, using it for different applications in the three FRGs, and the MS4SSA programme where teachers introduce high school students to robotics
12. Glove box: This equipment is used for safe containment of hazardous materials when being processed. It is also used for the manipulation of air and water sensitive materials. The machine is mainly used by the Energy FRG for the fabrication of renewable Energy devices such as Organic Photo Voltaics (OPVs), Organic Light Emitting Devices (OLEDs) and Perovskites solar cell devices that require inert environment.