Heavy Mineral Sands

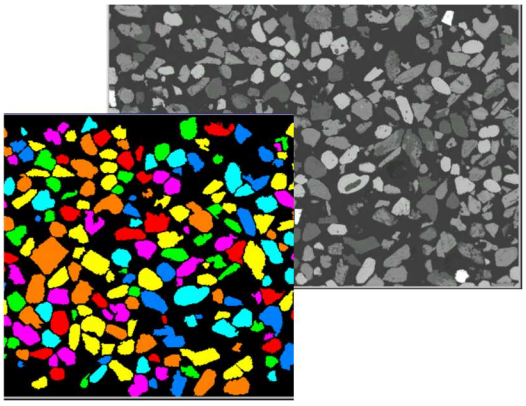
- Services and Field of Expertise-

An independent mineral services laboratory - PMC is well equipped to provide mineralogical characterization, data evaluation and bench-scale separation and concentration testing for the mineral sands industry. Our team of highly experienced mineralogists and metallurgists, having >30 years of experience in Mineral Sands, will find a custom solution to fit the needs of your project.

Global Experience – Australia, USA, Canada, South Africa / Madagascar

Mineral Characterization: TIMA & AMICS or THMScan

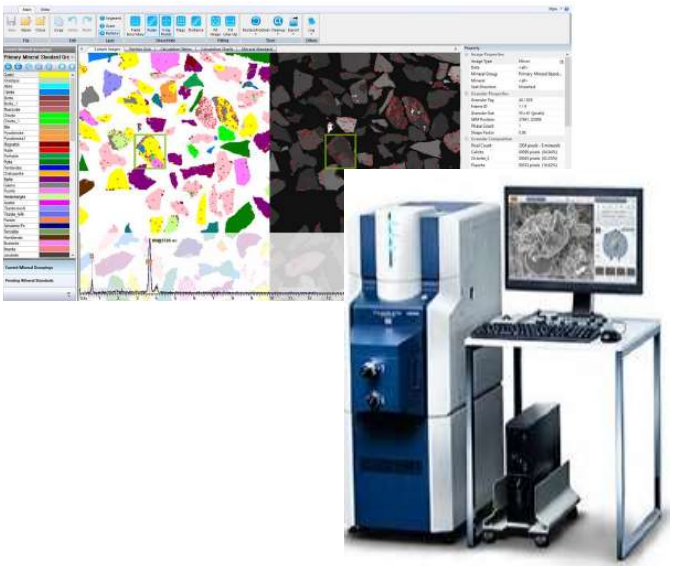
TIMA & AMICS



What it is

- Provides detailed mineral mapping of individual particles to represent components, associations, alterations and textures
- Newer technology using similar methods to QEMSCAN / MLA

THMScan



How it behaves

- Whole particle chemistry measure for individual particles providing elemental averages
- Textural variances and inclusions are lost and only overall particle is provided

Separation & Concentration: Gravity, Magnetic, Electrostatic, Flotation

PMC has a variety of techniques for separation and concentration of valuable minerals.

Gravity

- Traditional "Sink/Float" test using Heavy Liquid Separation
- Wilfley-Holman shaking table to separate into heavies or lights based on density and particle size. Provides basis for gravity circuit design
- Magstream Concentration for High density split points

Magnetic and Electrostatic

- Induced Roll and Frantz Isodynamic separators utilizing natural discrepancies in magnetic susceptibility or conductivity

Froth Flotation

- Utilize differences in surface chemistry properties to remove sulphide particles like Pyrite

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Classification Criteria

- **Rutile:** $TiO_2 \geq 95$
- **Leucoxene:** TiO_2 70 - 95
- **Altered Ilmenite:** TiO_2 55 - 70
- **Ilmenite:** TiO_2 43 - 55 and CaO < 15
- **Low Ti Ilmenite:** TiO_2 33 - 43 and CaO < 15
- **Ti-Magnetite/Hemoilmenite:** FeO ≥20 and Cr_2O_3 < 15 and TiO_2 3 - 33
- **Zircon:** $ZrO_2 \geq 15$ and $SiO_2 \geq 15$
- **Monazite:** $Ce_2O_3+La_2O_3 \geq 15$ and $P_2O_5 \geq 15$
- **Chromite:** $Cr_2O_3 \geq 15$, $SiO_2 < 15$
- **Silicate gangue:** $SiO_2 \geq 15$ and $ZrO_2 < 15$, CaO < 15, $TiO_2 < 15$
- **Titanite:** $SiO_2 \geq 15$ and CaO ≥ 15 and $TiO_2 \geq 15$
- **Other:** All other grains