

FERROMIN - Tailor Made High Density Aggregates

Ferromin's high density aggregates answer the call when a design requires low-volume, high-weight concrete or loose ballast. Our high quality aggregates have been used successfully in Cancer Treatment Buildings, Medical Research Reactors, Nuclear Reactors and Spent Fuel Canister production.

Ferromin's Dense-AGG is produced from a high-quality deposit of a natural iron oxide called magnetite. Having access to reliable supplies of magnetite, ilmenite and hematite allows Ferromin to produce aggregates in a range of densities, while maintaining concrete gradation specifications.

Reliable Supply from In-House Resources

Ferromin acquired the Tomclid Iron mine in Eastern Ontario in 2005. The Tomclid is a high-grade magnetite mine with substantial reserves allowing us to provide reliable, long term supply of consistent quality products. We are able to produce medium-density aggregate with a specific gravity of 3.0 – 4.0 and high-density aggregates from 4.0 to 5.2.

Applications

Dense-AGG is available as standard grades or tailor made to unique and precise specifications. It can be used as loose ballast, or as aggregate to produce high-quality, high-density concrete that is easily produced and placed using standard equipment.

Loose Ballast

- Offshore ballasting of rigs and caissons
- Scour protection for underwater structures or pipelines
- Ground stabilisation - to reduce piling

High Density Concrete

- Underwater concrete (tunnels, pipeline mattresses)
- Counterweights (bridges, locks, sluices, elevators, excavators)
- Coastal protection (breakwaters - precast antifer cubes)
- Pipe Coating (negative buoyancy coatings)
- Radiation Shielding (medical & nuclear) – Ready mix, concrete block, masonry sand, pre-cast

With its outstanding properties and compliance with ASTM and CSA standards Dense-AGG continues to gain ground in many new and varied applications and industries.

Special Properties

The high density of Dense-AGG results in decreased volume for a given weight, or alternatively, an increased weight per given volume, offering a better overall economy.

The excellent particle characteristics of Dens-AGG enable the easy production of high quality, high strength concrete with a density of up to 240 lbs./ft³, some 65% denser than standard concrete which is typically 145 pounds per cubic foot.

Dense-AGG has a long history of use as a construction material for both in-situ and precast applications. It is one of the few “environmentally friendly” materials available: it is a naturally occurring iron oxide which is harmless to the environment, and non-toxic in all its forms.

Concrete made with high density aggregates is favoured over other shielding technologies as it is also a structural material.

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High particle density is the Dense-AGG advantage:

- Reduced volumes = less excavation/transportation/reinforcement and time
- Increased weight for a given volume
- Reduced heat of hydration
- High submerged / saturated density
- High radiation shielding characteristics
- Space saving
- Noise and vibration dampening
- Thermal energy storage

Physical Properties:

Specific Gravity - 3.0 – 5.2 (medium to high density)
 Bulk density (lbs./ft³) 120-240
 Hardness (Moh.s) 5.0 - 6.0
 H₂O absorption (%) <0.5%
 Particle shape Angular
 Surface texture Rough

Standard Construction Grades

Dense-AGG is supplied from strategic stockpiles in Ontario, Canada and is available in grades from 28mm down to powder fineness. Dense-AGG grades can be customized to specific customer requirements.

Coarse – Dense Agg	Fines
28mm – 5mm (SG – 4.3-4.4) & (SG 4.6-4.7)	0-5mm
5mm – 1mm	0-1mm
Coarse – Medium Density	
19mm – 5 mm (SG 3.4)	
Specular Hematite (SG 5.0- 5.2)	10-50 Mesh
Concentrated Ilmenite (SG 4.25-4.4)	1-5mm