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# ADVANTAGES OF FORTCEM CEMENT

## Compared to Portland Cement

# PORTLAND CEMENT IS MANUFACTURED

- Energy Intensive
- Labor Intensive
- Depletes Natural Resources
- Scars Planet

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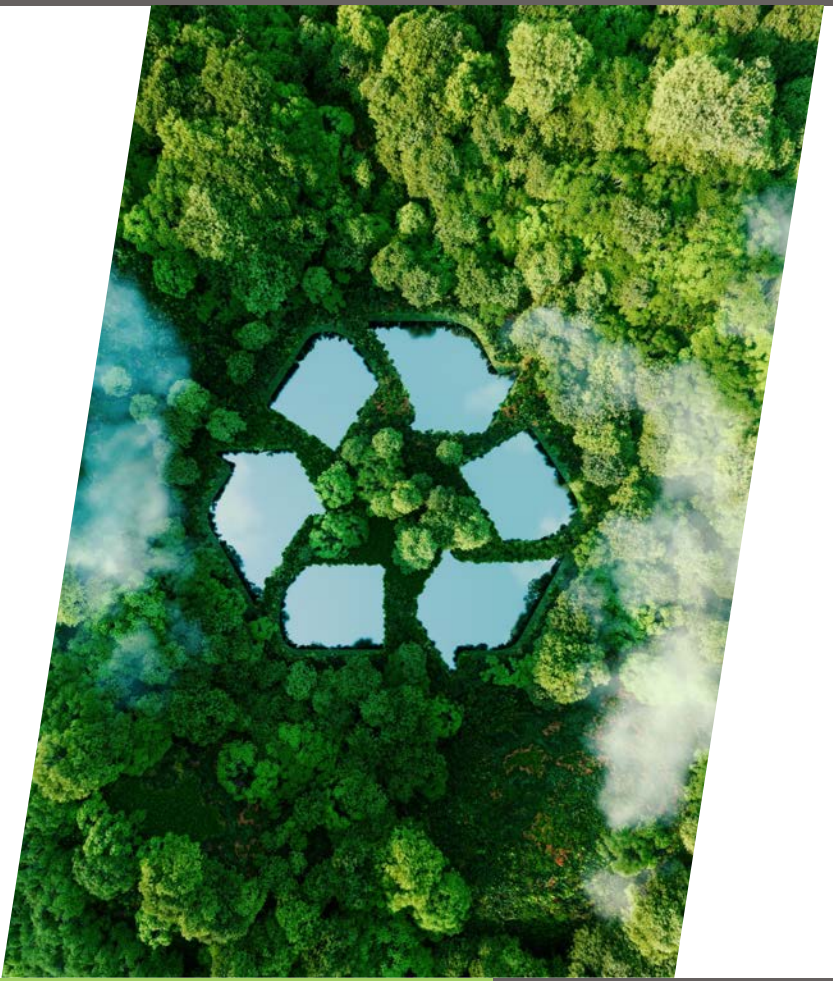

# FORTCEM CEMENT IS NOT MANUFACTURED

- No Energy to Produce
- Not Labor Intensive
- Recycled Material
- Planet Friendly

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# PORTLAND CEMENT IS ENERGY INTENSIVE

## USES UP TO 6,000,000 BTU TO PRODUCE ONE TON

Which Requires

5.882 Cubic Feet

of Natural Gas

Or

1.082 Barrels

of Oil

Or

476 Pounds

of Hard Coal

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# FORTCEM CEMENT USES LITTLE ENERGY

BENEFICIAL REUSE OF INDUSTRIAL BY-PRODUCTS

AND

AGRICULTURALLY DERIVED COMPONENTS

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# PORTLAND CEMENT IS LABOR INTENSIVE

CEMENT

PLANTS

NEED

- ~ 150 Employees 24/7
- Quarry Equipment
- Transport Equipment
- Grinding Mills
- Blending Raw feed
- Preheaters
- Kiln
- Finish Grinding Mills
- Silo Storage
- QA/QC On All Phases

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# FORTCEM CEMENT

- Ships Direct From Power Plant or Storage
- Chemical Reagents Ship Direct From Fortcem
- Only Loaders or Unloaders are Necessary

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# PORTLAND CEMENT DEPLETES NATURAL RESOURCES

VIRGIN MATERIALS USED
~ 2 TONS PER TON PRODUCT

- Limestone – Source of Calcium
- Shale – Source of Silica
- Alumina or Iron Bearing Materials

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# FORTCEM CEMENT

BENEFICIALLY REUSES
INDUSTRIAL BY-PRODUCTS

CONSERVES NATURAL RESOURCES

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# PORTLAND CEMENT SCARS OUR PLANET

LEAVES VAST HOLES REQUIRING RECLAMATION

UNDERGROUND MINES MAY CREATE SUBSIDENCE (SINKHOLES)

REPLENISH SOIL WITH BORROWED FROM OTHER AREAS

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FORTCEM CEMENT
REDUCES LANDFILL VOLUMES
LEAVES AREAS UNTARNISHED
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# PORTLAND CEMENT CREATES WASTE PRODUCTS

## CREATES GREENHOUSE GAS $CO_2$

- One Ton Portland Cement Produces One Ton $CO_2$
- Contributes About 5 Percent of Greenhouse Gas Worldwide
- Emits $SO_3$ and Nox
- Emits Hazardous Mercury and its Compounds
- Creates Solid Waste
- Produces Highly Caustic Kiln Dust

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# FORTCEM CEMENT

- No Air Emissions
- No Water Emissions
- Minimizes Landfills

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# PORTLAND CEMENT

- Globally 4,000,000,000 Tonnes Produced
- In the USA it is Produced in 107 Plants in 50 States
- These Produce About 84 Million Tons of Cement
- Current Utilization is 100%


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# FORTCEM CEMENT

- Over 550 Power Plants in 50 States
- Convenient Locations Near Metropolitan Areas
- Over 70 Million Tons Produced Annually
- Currently Only About 30 to 35 % Utilization

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# PORTLAND CEMENT FEATURES

| | |
|---|---|
| DIFFERENT TYPES OF CEMENT | >5 |
| TIME OF USE | 90 MINUTES |
| TIME OF SET | 4 TO 8 HOURS |
| MINIMUM WATER DEMAND | 0.40 W:C |
| MAXIMUM WATER DEMAND | >0.60 W:C |
| HEAT OF HYDRATION | ≥60 CAL/GRAM |
| STRENGTH MAXIMUM | ABOUT 9000 PSI* |

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* Plain with no admixtures or SCM's

# FORTCEM CEMENT FEATURES

| | |
|---|---|
| 2 TYPES FOR ALL APPLICATIONS | |
| TIME OF USE | USER CHOSEN |
| TIME OF SET | USER CHOSEN |
| MINIMUM WATER DEMAND | 0.15 W:C |
| MAXIMUM WATER DEMAND | 0.30 W:C |
| HEAT OF HYDRATION | ≤ 60 CAL/GRAM |
| STRENGTH MAXIMUM | >20,000 PSI |

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# PORTLAND CEMENT FEATURES

- EXCESS CALCIUM HYDROXIDE
- ALKALI BURN POTENTIAL
- SULFATE ATTACK
- ALKALI SILICA REACTIONS (ASR)
- ALKALI CARBONATE REACTIONS (ACR)
- PERMITS CHLORIDE PENETRATION

# FORTCEM CEMENT FEATURES

- NO EXCESS CALCIUM HYDROXIDE
- NO ALKALI BURN POTENTIAL
- RESISTANT TO SULFATE ATTACK
- RESISTS ALKALI SILICA REACTIONS (ASR)
- RESISTS ALKALI CARBONATE REACTIONS (ACR)
- RESISTS CHLORIDE PENETRATION

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# PORTLAND CEMENT

| | |
|---|---|
| BONDS TO SELF | NO |
| RESISTANT TO CHEMICAL ATTACK | NO |
| RESISTANT TO HIGH TEMPERATURES | NO |

# FORTCEM CEMENT

| | |
|---|---|
| BONDS TO SELF | YES |
| RESISTANT TO CHEMICAL ATTACK | YES |
| RESISTANT TO HIGH TEMPERATURES | YES |

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# SUMMARY

| PORTLAND CEMENT | FORTCEM CEMENT |
| --- | --- |
| Cost >=$150/Ton | <= $140 per Ton |
| Depletes resources | Saves Resources |
| Damages Environment | Preserves Environment |
| Lots of Deficiencies | User friendly |

THE CHOICE IS YOURS!!

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