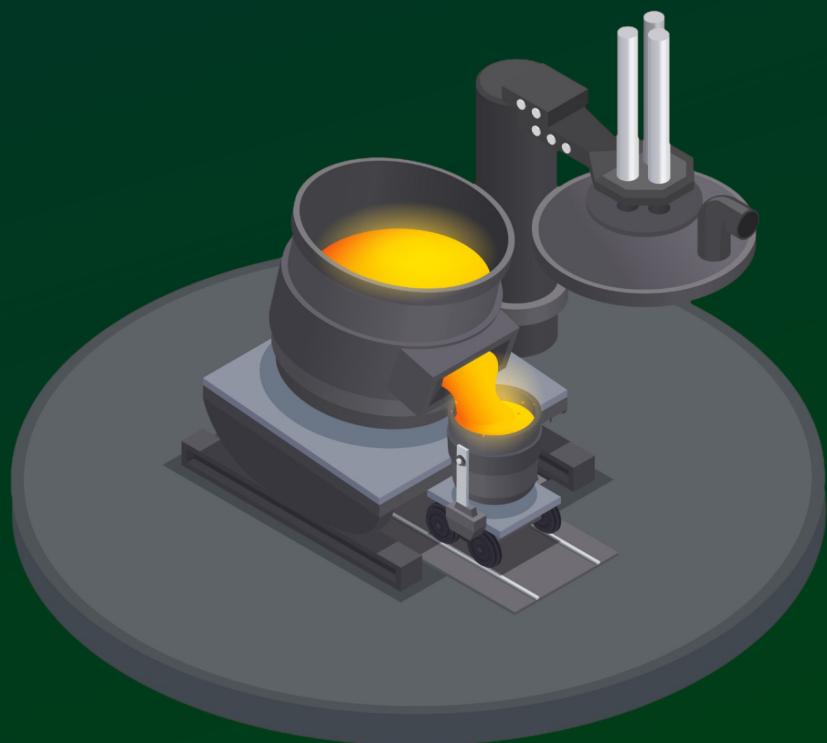




**KUNAL MINERALS
PVT. LTD.**



STEEL MAKER'S DREAM

INTRODUCTION:

We take pleasure in introducing ourselves as a prominent supplier of Noble Ferro Alloys, Synthetic Slag and metal Oxides. Founded in 2010 in Chhattisgarh, India, our facility is strategically positioned in a key area for Steel and Ferro Alloys production.

At Kunal Minerals, our aim is to enhance the cleanliness and cost-effectiveness of your steel production. We provide pre-melted calcium aluminate synthetic slags and slag conditioners, optimizing the characteristics of steel slag. Our top-notch Ferro Alloys contribute to shaping steel properties to meet specific requirements.

In 2021, we achieved a significant milestone by diversifying into the supply of raw materials tailored specifically for Lithium Ion Battery components. This strategic expansion enables us to address the growing demands of the battery industry. In addition to our existing Synthetic Slag and Noble Ferro Alloys, we are pleased to introduce Metal salts as part of our expanded product range. These Metal salts have been meticulously formulated to ensure optimal performance and reliability.

We take pride in delivering products that meet industry standards. Our dedicated team utilizes advanced technology and quality control measures to ensure consistent excellence.

Thank you for considering Kunal Mineral as your trusted partner for synthetic slag and noble ferro alloys. We look forward to discussing collaboration and forging a mutually beneficial partnership.



PRODUCT

SYNTHETIC SLAG FOR Neutral/Basic Lining

- Slag Easy
- Slag Kill 50
- Slag Kill 80

SYNTHETIC SLAG FOR Acidic Lining

- SlagMaster
- Slag Kill 100

TUNDISH COVER

- Oxyshield (Pro, Light)

BOF FLUX

- Calcium Ferrite

NOBLE FERRO ALLOYS:

- Ferro Nickel
- Ferro Nickel Moly
- CALCIUM MOLYBENDIUM
(It gives better recovery than ferro Moly or Moly oxide)
- Ferro Vanadium (V 50% & 78%)

METAL SALTS:

- Cobalt Oxide
- Nickel Oxide
- Vanadium Penta oxide V₂O₅.
- Tungsten Oxide WO₃.

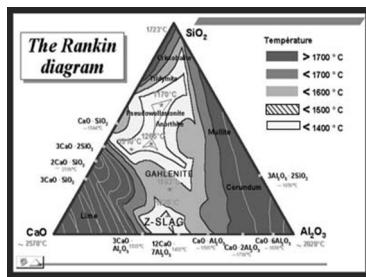


SLAG EASY

PRODUCT DATA SHEET

DESCRIPTION:

Steel making market in India is highly competitive and being cost effective in manufacturing along with good quality steel is the essence for sustainability and growth. Kunal Minerals Private Limited is happy to introduce SLAG EASY a product designed to improve inclusion removal capacity of LRF slag. By adding the given active C12A7 sulphur and Phos can be controlled to a great extent. The entire LRF slag will get fluidized and the entire slag viscosity will reduce. Making it very easy to handle the slag. No further re-oxidation of liquid steel will occur as the slag will form a tight seal between steel and atmosphere. Will help improve ladle life by avoiding CaF₂. And will help bring down the total slag volume. Making it energy efficient.



As seen in Rankin diagram, all three varieties of synthetic slag targets to make the slag in the C12 A7 phase region.

This is a win-win product where cost saving is far more than the cost of addition. It also helps preventing in reversal of metal oxides from slag to steel at the same time prevents inclusion to float around in the liquid steel.

APPLICATION:(How to use)

- Once the Liquid Steel is ready for tapping and empty ladle is placed add 3kg of Slag Easy per ton of liquid steel in the empty ladle or during the tapping.
- Take the ladle to LRF for refining process. During which lime and other flux are added as per old SOP.

- During final stages if the MnO or FeO content of slag is high add 2kg to 8kg of Easy Slag this will help improve Metal Oxide reduction back to Metal. Make sure after the 2nd addition there is sufficient turbulence in the ladle for proper slag and metal reaction at the interface.

BENEFITS OF EASY SLAG:

- Quick Melting Slag cover reduces re-oxidation.
- Narrow range of impurities and inclusion level.
- Quick desulphurization right from the tapping of molten steel.
- Saves Al- Metal consumption.
- Reduction of refining time.
- Improves refractory lining Life.
- Avoids use of CaF₂
- Reduces Calcium treatment.
- Reduces Power consumption.
- Most importantly Consistent quality of steel.
- Cost saving is more than the cost of addition.

Few of the most common SMS shortcomings we address.

- Fuming in work space.
- Crusting of slag in the ladle.
- Oxidation of liquid steel due to reaction with atmospheric Oxygen.
- Heat loss from slag zone
- Avoid use of CaF₂
- Improve Ladle life
- Reduction in time needed for Sulphur and non-metallic inclusion removal.
- We help control Titanium in steel,

Product	Al ₂ O ₃	CaO (min)	C ₁₂ A ₇	SiO ₂	Fe ₂ O ₃ +FeO	MgO (min)	TiO ₂	SIZE	Melting Temp.
SLAG EASY- HV	38%	45%	100%	5.50%	3% Max	4% Max	0.50%	10-50 mm	1300°C
SLAG EASY- LC	35%	43%	100%	10%	3% Max	4% Max	0.50%	10-50 mm	1300°C
SLAG EASY- Mg	35%	43%	100%	5.50%	3% Max	8% Max	0.50%	10-50 mm	1300°C

Packaging: 1MT jumbo bag / 25kg HDPE bags in Pallet.



SLAG KILL 50/80

PRODUCT DATA SHEET

DESCRIPTION:

Steel making market in India is highly competitive and being cost effective in manufacturing along with good quality steel is the essence for sustainability and growth. Kunal minerals private limited is happy to introduce SLAG KILL 50/80 a product designed to reduce Manganese consumption by improving Manganese recovery up to 80% or more. Slag Kill 50/80 reduces the final Fe(m) and FeO content in the LRF furnace slag. This is done by killing the slag of excess oxygen and reducing the slag viscosity. Our product also helps reduce non-metallic inclusions to give better surface finish of rolled product. Along with Sulphur removal.

This is a win-win product where cost saving is far more than the cost of addition. Synthetic slag has always been a product to be used by Primary steel makers with basic or neutral lining to reduce Sulphur and inclusion levels. We have added De-Oxidation capability to our product.

Synthetic slag consists of prepared mixture of several individual compounds which is used during secondary steelmaking to assist the steel treatment in the furnace and ladle from the viewpoint of effective refinement. As we are aware of the complexity of number of items needed for effective steel treatment. That's why we offer this pre mix material for simplicity.

ADDITION OF SLAG KILL 50/80:

APPLICATION:(How to use)

- * Once the liquid steel metal is ready for tapping and empty ladle is placed add 2 to 5kg of Slag Kill 50/80 per ton of liquid steel in the empty ladle.
- * Take the ladle to LRF for refining process. During which lime and other flux are added as per old SOP.
- * Depending on the FeO, MnO and other alloying element oxides in slag we can add 2kg to 8kg of Slag Kill 50/80. This will help reduce all metal oxides to metal. Make sure after the 2nd addition there is sufficient turbulence in the ladle for proper slag and metal reaction at the interface.

BENEFITS OF SLAG KILL 50/80:

- * Avoid use of Aluminum Metal.
- * Improves Mn recovery to 80% or more as per c% in steel.
- * Reduces Fe(m) and FeO in final discarded furnace Slag
- * Reduce heat loss in ladle.
- * Faster inclusion removal and clean liquid steel.
- * Helps prevent refractory lining Life as the basicity of slag is improved.
- * Consistent chemistry of the steelmaking slag.
- * Gives better recovery of rolled products and surface finish and
- * Reduce miss rolls.
- * An effective fluid sink that absorbs inclusions from steel.
- * Fast and better recovery of steel as well as alloys.
- * Slag kill 50/80 works as the catalyst to prevent inclusion, Phosphorus and Sulphur reversal from slag to steel.
- * **Cost saving is more than the cost of addition.**

Product	C ₁₂ A ₇	Al ₂ O ₃ (Total)	Al Metal	CaO (min)	SiO ₂	Fe2O3+FeO	MgO	TiO2	SIZE	Melting Temp.	Compression
SLAG KILL 50	50%	55%	6-8%	30%	9%	3% Max	4% Max	0.8% Max	0-40 mm	1380°C	Impurity removal Lower De-oxidation higher
SLAG KIL 80	20%	66%	10-12%	12%	9%	3% Max	4% Max	0.8% Max	0-40 mm	1380°C	Impurity removal higher De-oxidation Lower

Packaging: 1MT jumbo bag / 25kg HDPE bags in Pallet.



SALGMMASTER

Silica rich flux speciealy designed for silica lining.

PRODUCT DATA SHEET

Unleash the Power of Slag Master! Induction furnaces running with acidic lining.

Welcome to a new era of steelmaking efficiency with Slag Master. Our revolutionary product is designed to transform your steel melting process, making it more efficient, cost-effective, and environmentally friendly. Discover how Slag Master can help you overcome challenges, increase productivity, and boost your bottom line.

Product Description:

Slag Master helps in formation of fayalite phase in the induction furnace slag, which has 1100C melting point. For best result of adding Slag Master is at a specific ratio (1 kg per 40 kg of furnace slag or 8 kg per ton of steel). Slag Master serves as a catalyst that encourages the phase transformation of the existing slag. Not only that the unreacted gang (non-metallic impurities) is coagulated on the surface of the slag level. This gang will be the first thing to be skimmed out by bariman. Slag Master also contains Organic Substance which actively take part in accelerating redox reaction of Iron Oxide to Metallic Steel.

Key Features:

Exceptional performance in preventing clinker formation by maintaining Fayalite Phase.

Simplifies slag handling and removal, especially when using mechanical pokers and lifters.

Helps recover Steel from the iron oxide in slag to improve metal recovery.

Instructions for Use:

- Apply 8 to 12 kg per ton of Steel.
- Not required for scrap and Pig Iron melting.
- Apply before the start of slag skimming until the end of DRI melting.
- Need to apply more if any clinker formation is building up.
- Mix Slagmaster with the pallet addition or use belcha for addition in very regular addition. "

Limitation:

- Can only be used in acidic lining.
- Is most effective when DRI used either lumps or pallets.
- Only effective if added at right time and right quantity. (Fayalite Phase is the key to high performance)
- Some times A lot of this reduced iron oxide to steel metal will be still in the slag when skimmed out.
- Bulk additions at irregular periods will not help maintain optimum performance.
- Short training is required for developing the art of maximising recovery. "

Cost-Effectiveness:

With Slag Master, you invest a small amount and gain significantly higher by:

Dedpending upon your operations, cost saving from 100 to 200Rs Per Ton steel.

• Get higher metal recovery by reducing extra iron oxide (present in slag) to steel. This is not the same as recovering metal stuck in slag.

Dedpending upon your Charge Mix cost saving 50 to 120 rs per ton steel

- Use higher percentage of pellets. Which is a cheaper source of Fe for SMS.
- Lowering slag melting temperatures. That means cost saving in electricity/Power.
- Avoiding costly stoppages due to clinker formation also save downtime in process.
- Increasing overall profitability.

Packing:

The material will be packed in 25 kg bags then in 1mt jumbo bags.



SLAG KILL 100

PRODUCT DATA SHEET

DESCRIPTION:

Secondary steel making market in India is highly competitive and being cost effective in manufacturing is the essence for sustainability and growth. Kunal minerals private limited is happy to introduce SLAG KILL 100 a product designed to reduce Manganese consumption by improving Manganese recovery up to 70% or more Slag Kill 100 reduces the final Fe(m) and FeO content in the induction furnace slag. This is done by killing the slag of excess oxygen and reducing the slag viscosity. Our product also helps reduce non-metallic inclusions to give better surface finish of rolled product. This is a win-win product where cost saving is far more than the cost of addition. Synthetic slag has always been a product to be used by Primary steel makers with basic or neutral lining but with little modification Slag Kill 100 is designed keeping in mind acidic lining of secondary steel maker's needs.

Synthetic slag consists of prepared mixture of several individual compounds which is used during secondary steelmaking to assist the steel treatment in the furnace and ladle from the viewpoint of effective refinement. Synthetic slag practice is normally used to obtain clean steels and for the desulphurization and dephosphorization of the liquid steel but that will not be the case in Acidic lining.

ADDITION OF SLAG KILL 100:

- * After full melting of scrap / sponge iron drain some surface slag.
- * Add Slag Kill 100 at the rate of 2+1 kg per Ton of molten Steel.
- * Add 20 to 40% SiMn and then add 1 to 2kg slag kill 100
- * Tap the melt in the ladle.
- * Tap the metal in ladle and add rest of the SiMn. For maximum result we can further add 1 to 2kg per ton slag kill 100.
- * Melt is ready for casting.

BENEFITS OF SLAG KILL 100:

- * Avoid use of Aluminum Metal.
- * Improves Mn recovery to 70% or more. As per C% in Steel.
- * Reduces Fe(m) and FeO in final discarded furnace Slag
- * Reduce heat loss in ladle.
- * Does not affect refractory lining Life.
- * Consistent chemistry of the Steel made.
- * Gives better recovery of rolled products and surface finish.
- * Reduce Miss Rolls.
- * An effective fluid sink that absorbs inclusions from steel. Ladle with gas purging is mandatory to get this benefit.
- * Fast and better recovery of steel as well as alloys.
- * Slag kill 100 works as the catalyst to prevent inclusion, Phosphorus and Sulphur reversal from slag to steel.
- * **Cost saving is more than the cost of addition.**

PRODUCT - SLAG KILL 100:

AL METAL	AL ₂ O ₃ (Total)	CaO(max)	SiO ₂ (Max)	Fe2O3 +FeO	MgO (max)	TiO2	SIZE	Melting Temp.
12-16%	70%	5%	8%	3%	2%	0.8%	2-40 mm	1400°C

Packaging: 1MT jumbo bag / 20kg HDPE bags in Pallet



OXY SHEILD PRO

PRODUCT DATA SHEET

PREFUSED ACTIVE TUNDISH FLUX

A Pre-Fused Mag-Al spinel and Calcium Aluminate based tundish powder which is very active for inclusion absorption.

Special Characteristics:

- Quick self-spreading
- Very active for Alumina inclusion absorption due to its Mag-Al Spinel content.
- TiO₂ in traces / NIL – best suited for ball bearing and Low Titania grades.
- Low heat absorption
- Excellent heat insulator to retain the tundish steel temperature.
- The self spreading liquid phase stops re-oxidation and nitrogen influx at tundish.
- Forms minimum crust even for long sequences to help increasing yield and easy de-skulling.

Specification:

Oxy Shield Light	Mgo	CaO	Al ₂ O ₃	SiO ₂	TiO ₂	Size
	4% max	35%min	35% min	15% max	Traces	- 0.5 mm

Oxy Shield Pro	Mgo	CaO	Al ₂ O ₃	SiO ₂	TiO ₂	Size
	4 % max	35%min	33% min	10% max	Traces	-0.5 mm

Addition Norms:

The powder is to be added at the start of casting. In case of sequence casting, appropriate quantity is to be added after required interval. For heat insulation, rice husk or similar insulation material may be used after adding the powder.

Packing: Packed in polyethylene lined HDPE bag of 10 kg each.

Storage: Store in dry and covered place.

Shelf life: 1 year from date of dispatch



FERRO NICKEL (60% to 75%, grade)

PRODUCT DATA SHEET

What is Ferro Nickel (60% to 75%, grade) ?

Ferro Nickel

Ni 55-75%Ni
C 1.50% Max
S 0.05% Max
Co 0.10% Max
P 0.05% Max, Balance Fe

Size:

1-4 Kg per Piece.
4-10 Kgs per Piece
Pkg- In 1 mt Jumbo bags.

Commercial Benefit

Ferro Nickel is consistently offered at a lower price per kilogram compared to Pure Nickel. Additionally, we include 30 to 40% Iron at no extra cost. Beyond these savings, another advantage is the absence of import duties. Unlike Pure Nickel, which requires importation, Ferro Nickel is readily available within India. As manufacturers of Ferro Nickel, we ensure direct supply to our customers.

Ferro Nickel Vs Pure Nickel

During the Application of Ferro Nickel, some dilution may occur, which is offset by the cost advantage of acquiring 25 to 35% iron at no additional charge. Therefore, extra attention is necessary. To accommodate this, we ensure the supply of Ferro Nickel in sizes ranging from 1kg to 4kg.

Long term availability

We ensure you there is no dearth of raw material source. We have been making this for over 2 decades.

How and when to add Ferro Nickel

Ferro Nickel is to be added just like pure Nickel plates. No special care needed.

Any limitation of using Ferro Nickel

There are no limitation to the use of Ferro Nickel.

Precaution of Using Ferro Nickel

The only precaution needed while using Ferro Nickel is to keep a note of the percentage of nickel content in the batch being used and adjust the input weight accordingly.



FERRO NICKEL MOLY

PRODUCT DATA SHEET

What is Ferro Nickel Moly ?

Ferro Nickel Moly

Ni 60-65%Ni
C 0.05% Max
S 0.05% Max
MO: 2-3%
Co 0.45% Max
P 0.05% Max,
Balance Fe

Size

1-4 Kg per Piece.
4-10 Kgs per Piece
Pkg- In 1 mt Jumbo bags.

Commercial Benefit

Our Ferro Nickel Moly product delivers substantial savings by incorporating 2 to 3% Molybdenum and 30 to 40% Fe at no additional cost, while billing is based solely on the Nickel component, priced as pure Nickel. This domestically-produced alternative avoids the import tariffs associated with pure nickel, it also eliminates the necessity for middlemen and their accompanying charges further augmenting its affordability. As the direct manufacturers, we provide a streamlined and economical option for your requirements.

Ferro Nickel Moly Vs Pure Nickel and Ferro Moly

Unlike pure nickel plate and Ferro Moly, Ferro Nickel is a very safe product to store in shop floor. No added care needs to be taken. Ferro Nickel Moly gives greater control of Nickel addition as the material is provided in great variation from 1kg to 4kg.

In Ferro Nickel some dilution can be observed but then that comes with cost benefit plant gets 25 to 35% fe free of cost.

Long term availability

We ensure you there is no dearth of raw material source. We have been making this for over 2 decades.

How and when to add Ferro Nickel Moly

Ferro Nickel Moly is to be added just like pure Nickel plates. No special care needed.

Any limitation of using Ferro Nickel Moly

There are no limitations to the use of Ferro Nickel Moly.

Precaution of Using Ferro Nickel Moly

The only precaution needed while using Ferro Nickel Moly is to keep a note of the amount of Molybdenum needed and that has already been added in the form of Ferro Nickel Moly.



CALCIUM MOLYBDATE (CM) PRODUCT DATA SHEET

What is Calcium Molybdate (CM).

This is a new cost saving alternate to the traditional ferro moly or Moly Oxide. As each material has its strength and weakness so does Calcium Moly.

CALCIUM MOLYBDATE SPECIFICATION

Mo : 40-45 %

CaO : 27-30%

Free Sulphur is trace, around 0.35% as CaSo4.

P : 0.04% Max

SiO2 : 0.5 to 1% Max

V : 0 to 0.4% Max

Fe : 0.5-0.7% Max

Sn, Sb, Mn, Cu, As : Nil

FERRO MOLY VS CALCIUM MOLY

- No dilution effect of Molybdenum. Unlike Ferro Moly which has around 35% iron contain and rest in Molybdenum. Calcium Moly has only Molybdenum and Calcium which goes to slag so gives a better Moly control.
- The Calcium that separate from Calcium Moly and combines with Oxygen is highly reactive to remove sulphur.
- In addition, Calcium Moly takes up less heat from system per kg Molybdenum than its counterpart ferro Moly.
- With ferro Moly there are possibility of mix-up by traders whereas in Calcium Moly it is not possible.
- Calcium Moly has lower chances addition error.

COMMERCIAL BENEFIT

Calcium Molybdate is always priced a bit lower than ferro Moly. But that's not the only cost benefit. Just like Ferro Moly Calcium Moly does give 100% recovery. Takes less heat, does not dilute the steel, helps remove sulphur. Unlike ferro moly being denser than steel calcium moly does not have a tendency to settle to the bottom. Does require less time and less agitation to form a homogeneous mixture

LONG TERM AVAILABILITY

We ensure you there is no dearth of raw material source. We have been making this for over 2 decades.

HOW AND WHEN TO ADD CM

AOD ADDITION FOR STAINLESS :

CALCIUM MOLYBDATE (CM) is the best source of Molybdenum addition in AOD for stainless steel. With cost saving, impurity removal, power saving all happening at once at lower cost per kg moly. This product has a long-lasting benefit in ever rising cost of SMS. CM can be directly be added in AOD and gives near to 100% recovery. At the same time we get very highly reactive Calcium which helps in Decarbonizing directly reducing need of Lime addition.

LRF / LADLE ADDITION FOR ALLOY STEEL TO REPLACE FERRO MOLY:

CALCIUM MOLYBDATE (CM) is to be added in ladle during tapping from Induction or Arc furnace to replace Ferro Moly to save cost. Quantity of addition should be targeting 90 - 95% of the target chemistry. The balance trimming addition needs to be done by Ferro Moly only during processing.

PRECAUTION : CM should not be added in LRF during processing after formation of slag as in case of crusty slag, CM pallets may get caught in slag and may not reach steel to give less / erratic recovery of Moly.

However, if the steel is taken to VD after LRF treatment, then trimming addition may be done in VD to get full recovery of Moly.

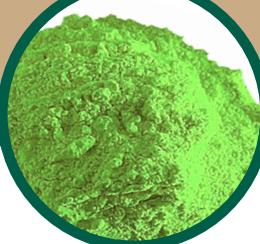
EAF ADDITION TO REPLACE MOLY OXIDE:

CALCIUM MOLYBDATE can also be added in Arc furnace to replace Moly oxide. Recovery of Moly from CM (97-100%) is much better than Moly oxide (92-96%) as Moly doesn't sublime from Calcium Moly (being attached to Calcium) which happens in case of Moly oxide during addition.

ANY PRECAUTION OF USING CM

Only precaution is Calcium Moly should not be added as trimming addition towards the finishing addition. After the formation LRF slag formation. As there can be a possibility of uneven result because of slag coating and coagulation to bigger pieces CM might get trapped in Slag. There is no limit to Calcium Moly addition in EAF, nor is there any loss of moly recovery in EAF. CM does not Sublime like Moly Oxide.

Calcium Moly has another precaution for use in induction furnace that it requires neutral or basic lining



TUNGSTEN OXIDE Nx35

Tungsten oxide is an oxide compound of tungsten and oxygen.

TECHNICAL DATA SHEET		
1	CHEMICAL FORMULA:	WO ₃
2	Assay	96%
3	APPEARANCE:	Green
4	CAS No.:	39318-18-8
5	Bulk Density	7.6 g/cm ³
6	Particle Size Mesh	50 Mesh Passing 0.02% max
7	Tungsten	75%
8	Moly	3% Max
9	Safety and storage conditions	Store under clean, dry conditions

NICKLE OXIDE (NiO)BB-32

Nickel oxide (NiO) is a versatile compound that finds various applications in the industry.

Properties of Nickle Oxide (NiO)		
1	CHEMICAL FORMULA:	NiO
2	Assay	97%
3	APPEARANCE	Black Powder
4	CAS No.	1313-99-1
5	Bulk Density	6.67 g/cm ³
6	Form	Powder Form
7	Nickel	75%
8	Cobalt	0.3% Max
9	Safety and storage conditions	Store under clean, dry conditions
10	Water Soluble	Nil
11	High-temperature stability	
12	Excellent corrosion resistance	

VANADIUM PENTOXIDE Wn38

Vanadium pentoxide (V₂O₅) is a compound composed of vanadium and oxygen atoms.

Properties of Vanadium Pentoxide (V ₂ O ₅):CHEMICAL PROPERTIES V205		
1	Chemical Formula	V ₂ O ₅
2	Assay	98%
3	Appearance:	Brown
4	CAS No.:	1314-62-1
5	Bulk Density	3.33 g/cm ³
6	Particle Size Mesh	Powder
7	Vanadium	55%
8	Moly	0.3% Max
9	Safety and storage conditions	Store under clean, dry conditions
10	Water Soluble	Nil

Cobalt Oxide (CoO.Co₂O₃)

Cobalt Oxide (CoO.Co₂O₃) is a black powder compound with various applications across different industries.

PROPERTIES OF COBALT OXIDE (CoO.Co ₂ O ₃)		
1	CHEMICAL FORMULA	CoO.Co ₂ O ₃
2	Assay	97%
3	APPEARANCE:	Black Powder
4	CAS No.	1307-96-6
5	Bulk Density	6.11 g/ml
6	Particle Size Mesh	200 mesh Passing 0.02% max
7	Cobalt	70%
8	Iron	0.3% Max
9	Safety and storage conditions	Store under clean, dry conditions
10	Water Soluble	Nil



KUNAL MINERALS PVT. LTD.



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