

CERTIFIED REFERENCE MATERIALS (CRM)



Sufficiently Homogenized Indian Reference Materials Certified by as per ISO 17034 for the use of validation of methods and calibration



RC-1019

prepared by



**CSIR-NATIONAL METALLURGICAL LABORATORY
JAMSHEDPUR-831007, INDIA**

METALS / ALLOYS

1	CAST IRON (CRM No. 201.8) (Turning form)	
	Carbon (C)	2.97%
	Silicon (Si)	2.64%
	Manganese (Mn)	0.44%
	Phosphorus (P)	0.05%
	Sulfur (S)	0.11%
	Chromium (Cr)	0.03%
	Copper (Cu)	0.034%
	Nickel (Ni)	0.025%
	Price: Rs. 6600.00 (for 100 gm pack)	
2	ALLOY CAST IRON (CRM No. 207.3) (Turning form)	
	Total Carbon (C)	3.13%
	Silicon (Si)	1.22%
	Manganese (Mn)	0.83%
	Phosphorus (P)	0.20%
	Sulfur (S)	0.016%
	Nickel (Ni)	1.90%
	Copper (Cu)	0.034%
	Chromium (Cr)	0.37%
	Price: Rs. 6600.00 (for 100 gm pack)	
3	STEEL 0.10 % C (CRM No. 213) (Turning form)	
	Carbon (C)	0.10%
	Silicon (Si)	0.07%
	Sulfur (S)	0.01%
	Phosphorus (P)	0.02%
	Manganese (Mn)	0.47%
	Chromium (Cr)	0.03%
	Price: Rs. 6600.00 (for 100 gm pack)	
4	STEEL 1 % C STEEL (CRM No. 215) (Turning form)	
	Carbon (C)	1.01%
	Silicon (Si)	0.26%
	Manganese (Mn)	0.43%
	Phosphorus (P)	0.038%
	Sulfur (S)	0.046%
	Chromium (Cr)	1.08%
	Nickel (Ni)	0.043%
	Price: Rs. 6600.00 (for 100 gm pack)	
5	STEEL 0.6 % C STEEL (CRM No. 216) (Turning form)	
	Carbon (C)	0.61%
	Silicon (Si)	0.25%
	Manganese (Mn)	0.72%
	Phosphorus (P)	0.018%
	Sulfur (S)	0.021%
	Chromium (Cr)	0.037%
	Nickel (Ni)	0.0033%
	Price: Rs. 6600.00 (for 100 gm pack)	
6	STAINLESS STEEL (CRM No. 220) (Turning form)	
	Carbon (C)	0.084%
	Silicon (Si)	0.56%
	Manganese (Mn)	1.33%
	Phosphorus (P)	0.03%
	Sulfur (S)	0.013%
	Copper (Cu)	0.12%
	Cobalt (Co)	0.15%
	Nickel (Ni)	8.66%
	Chromium (Cr)	19.20%
	Price: Rs. 6600.00 (for 100 gm pack)	
7	NICKEL STEEL (CRM No. 221) (Turning form)	
	Carbon (C)	0.18%
	Silicon (Si)	0.18%
	Manganese (Mn)	0.39%
	Sulfur (S)	0.014%
	Phosphorus (P)	0.013%
	Nickel (Ni)	3.21%
	Chromium (Cr)	0.68%
	Molybdenum (Mo)	0.23%
	Price: Rs. 6600.00 (for 100 gm pack)	

METALS / ALLOYS

8	LOW ALLOY STEEL (CRM No. 223.6 A)(Turning form)		11	6% Si-AL ALLOYS (CRM No. 251.1) (Turning form)	
	Carbon (C)	0.21%		Silicon (Si)	6.09%
	Silicon (Si)	0.28%		Iron (Fe)	0.76%
	Manganese (Mn)	0.65%		Magnesium (Mg)	0.63%
	Sulfur (S)	0.036%		Copper (Cu)	0.28%
	Phosphorus (P)	0.038%		Manganese (Mn)	0.22%
	Nickel (Ni)	0.98%		Zinc (Zn)	0.077%
	Chromium (Cr)	0.88%		Lead (Pb)	0.054%
	Molybdenum (Mo)	0.17%		Tin (Sn)	0.019%
	Copper (Cu)	0.14%		Nickel (Ni)	0.02%
	Aluminium (Al)	0.041%		Price: Rs. 6600.00 (for 100 gm pack)	
	Cobalt (Co)	0.015%			
	Price: Rs. 6600.00 (for 100 gm pack)				
9	BRASS 60:40 (CRM No. 241) (Turning form)			(Newly Developed)	
	Copper (Cu)	58.10%		GASEOUS STANDARDS IN STEEL	
	Zinc (Zn)	38.94%			
	Lead (Pb)	2.64%	12	HYDROGEN IN STEEL (CRM No. 502) (Pin Shape)	
	Phosphorus (P)	0.004%		Hydrogen (H)	1.56 PPM
	Tin (Sn)	0.14%		Price: Rs. 12000.0 (for 100 gm pack)	
	Nickel (Ni)	0.044%			
	Iron (Fe)	0.13%	13	HYDROGEN IN STEEL (CRM No. 503) (Pin Shape)	
	Price: Rs. 6600.00 (for 100 gm pack)			Hydrogen (H)	5.41 PPM
10	BRASS 70:30 (CRM No. 242) (Turning form)			Price: Rs. 12000.0 (for 100 gm pack)	
	Copper (Cu)	70.19%			
	Zinc (Zn)	29.49%			
	Lead (Pb)	0.029%			
	Phosphorus (P)	0.005%			
	Tin (Sn)	0.06%			
	Nickel (Ni)	0.041%			
	Iron (Fe)	0.062%			
	Price: Rs 6600.00 (for 100 gm pack)				

FERRO-ALLOYS & ALLIED MATERIAL

14	L.C. Fe-CHROMIUM (CRM No. 229) (Powder form)	
	Carbon (C)	0.14%
	Silicon (Si)	0.76%
	Phosphorus (P)	0.029%
	Sulfur (S)	0.009%
	Chromium (Cr)	58.88%
	Price: Rs. 6600.00 (for 100 gm pack)	
15	H.C. Fe-CHROMIUM (CRM No. 230) (Powder form)	
	Chromium (Cr)	62.91%
	Silicon (Si)	3.53%
	Carbon (C)	7.85%
	Phosphorus (P)	0.035%
	Sulfur (S)	0.036%
	Price: Rs. 6600.00 (for 100 gm pack)	
16	Fe-SILICON (CRM No. 231) (Powder form)	
	Silicon (Si)	72.72%
	Aluminium (Al)	1.51%
	Phosphorus (P)	0.023%
	Sulfur (S)	0.005%
	Carbon (C)	0.20%
	Price: Rs. 6600.00 (for 100 gm pack)	
17	Fe-MOLYBDENUM (CRM No. 232) (Powder form)	
	Molybdenum (Mo)	56.65%
	Silicon (Si)	0.85%
	Phosphorus (P)	0.040%
	Carbon (C)	0.10%
	Sulfur (S)	0.048%
	Price: Rs. 6600.00 (for 100 gm pack)	
18	L.C. Fe-Manganese (CRM No. 233.1) (Powder form)	
	Manganese (Mn)	84.49%
	Silicon (Si)	1.65%
	Phosphorus (P)	0.13%
	Carbon (C)	0.12%
	Sulfur (S)	0.006%
	Price: Rs. 6600.00 (for 100 gm pack)	
19	H.C. Fe-MANGANESE (CRM No.233.2) (Powder form)	
	Manganese (Mn)	75.55%
	Silicon (Si)	0.36%
	Phosphorus (P)	0.20%
	Carbon (C)	6.68%
	Sulfur (S)	0.005%
	Price: Rs. 6600.00 (for 100 gm pack)	
20	Fe-TITANIUM (CRM No. 234) (Powder form)	
	Titanium (Ti)	25.56%
	Silicon (Si)	2.84%
	Phosphorus (P)	0.040%
	Carbon (C)	0.050%
	Sulfur (S)	0.011%
	Aluminium (Al)	5.43%
Price: Rs. 6600.00 (for 100 gm pack)		
21	Fe-VANADIUM (CRM No. 235) (Powder form)	
	Vanadium (V)	51.53%
	Silicon (Si)	1.05%
	Carbon (C)	0.053%
	Phosphorus (P)	0.039%
	Sulfur (S)	0.024%
	Price: Rs. 6600.00 (for 100 gm pack)	
ALLIED MATERIAL		
22	BLAST FURNACE SLAG (CRM No. 435.2) (Powder form)	
	Silica (SiO ₂)	32.22%
	Alumina (Al ₂ O ₃)	20.79%
	Calcium Oxide (CaO)	34.94%
	Magnesium Oxide (MgO)	7.63%
	Total Iron [Fe (T)]	0.43%
	Sulfur (S)	0.98%
	Phosphorus (P)	0.007%
	Titanium Dioxide (TiO ₂)	0.88%
Price: Rs. 6600.00 (for 100 gm pack)		

ORES / COAL

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28 MANGANESE ORE (CRM No.166.4 A) (Powder form)																																																																																																																																													
Total Manganese [Mn (T)]	38.77%																																																																																																																																												
Total Iron [Fe (T)]	19.32%																																																																																																																																												
Silica (SiO ₂)	2.88%																																																																																																																																												
Alumina (Al ₂ O ₃)	3.54%																																																																																																																																												
Phosphorus (P)	0.12%																																																																																																																																												
Sulfur (S)	0.008%																																																																																																																																												
Price: Rs. 6600.00 (for 100 gm pack)																																																																																																																																													
29 LIME STONE (CRM No.172) (Powder form)																																																																																																																																													
Calcium Oxide (CaO)	52.78%																																																																																																																																												
Magnesium Oxide (MgO)	1.58%																																																																																																																																												
Silica (SiO ₂)	1.92%																																																																																																																																												
Ferric Oxide (Fe ₂ O ₃)	0.27%																																																																																																																																												
Alumina (Al ₂ O ₃)	0.27%																																																																																																																																												
Loss on Ignition (LOI)	42.57%																																																																																																																																												
Sulfur (S)	0.009%																																																																																																																																												
Price: Rs. 6600.00 (for 100gm pack)																																																																																																																																													
30 COAL (CRM No. 150 A) (Powder form)																																																																																																																																													
Proximate Composition																																																																																																																																													
Gross Calorific Value (GCV)	4979kcal/kg																																																																																																																																												
Volatile Matter (VM)	21.93%																																																																																																																																												
Ash	35.83%																																																																																																																																												
Price: Rs. 12500.00 (for 50gm pack)																																																																																																																																													
31 COAL (CRM No. 151 A) (Powder form)																																																																																																																																													
Ultimate Composition																																																																																																																																													
Carbon (C)	52.44%																																																																																																																																												
Hydrogen (H)	3.25%																																																																																																																																												
Nitrogen (N)	1.13%																																																																																																																																												
Total Sulfur (S)	0.64%																																																																																																																																												
Price: Rs. 12500.00 (for 50gm pack)																																																																																																																																													

SPECTROGRAPHIC STANDARDS

32	PLAIN CARBON STEEL [CRM No. 305 (PC-1)] (Disc Form)	
	Carbon (C)	0.034%
	Silicon (Si)	0.031%
	Manganese (Mn)	0.27%
	Phosphorus (P)	0.011%
	Sulfur (S)	0.007%
	Chromium (Cr)	0.025%
	Price: Rs. 7200.00 (for each piece)	
33	PLAIN CARBON STEEL [CRM No. 307 (PC-5)] (Disc Form)	
	Carbon (C)	1.03%
	Silicon (Si)	0.22%
	Manganese (Mn)	0.52%
	Phosphorus (P)	0.072%
	Sulfur (S)	0.073%
	Chromium (Cr)	1.19%
	Price: Rs. 7200.00 (for each piece)	
34	PLAIN CARBON STEEL (CRM No. 308) (Disc Form)	
	Carbon (C)	0.11%
	Silicon (Si)	0.066%
	Manganese (Mn)	0.47%
	Phosphorus (P)	0.013%
	Sulfur (S)	0.008%
	Chromium (Cr)	0.032%
	Nickel (Ni)	0.008%
	Price: Rs. 7200.00 (for each piece)	
35	PLAIN CARBON STEEL (CRM No. 309) (Disc Form)	
	Carbon (C)	0.57%
	Silicon (Si)	0.20%
	Manganese (Mn)	0.80%
	Phosphorus (P)	0.037%
	Sulfur (S)	0.046%
	Chromium (Cr)	0.081%
	Nickel (Ni)	0.034%
	Price: Rs. 7200.00 (for each piece)	
36	STAINLESS STEEL (CRM No. 301) (Disc Form)	
	Carbon (C)	0.072%
	Silicon (Si)	0.39%
	Manganese (Mn)	1.42%
	Phosphorus (P)	0.036%
	Sulfur (S)	0.021%
	Chromium (Cr)	18.00%
	Nickel (Ni)	7.86%
	Molybdenum (Mo)	0.37%
	Vanadium (V)	0.072%
	Cobalt (Co)	0.17%
	Copper (Cu)	0.42%
	Price: Rs. 7200.00 (for each piece)	
37	STAINLESS STEEL (CRM No. 302) (Disc Form)	
	Carbon (C)	0.072%
	Silicon (Si)	0.48%
	Manganese (Mn)	1.05%
	Phosphorus (P)	0.030%
	Sulfur (S)	0.017%
	Chromium (Cr)	16.91%
	Nickel (Ni)	10.12%
	Molybdenum (Mo)	2.04%
	Vanadium (V)	0.061%
	Cobalt (Co)	0.19%
	Copper (Cu)	0.40%
	Price: Rs. 7200.00 (for each piece)	
38	STAINLESS STEEL (CRM No. 303) (Disc Form)	
	Carbon (C)	0.16%
	Silicon (Si)	0.40%
	Manganese (Mn)	7.15%
	Phosphorus (P)	0.035%
	Sulfur (S)	0.051%
	Chromium (Cr)	12.69%
	Nickel (Ni)	1.59%
	Molybdenum (Mo)	0.18%
	Vanadium (V)	0.067%
	Cobalt (Co)	0.060%
	Copper (Cu)	0.69%
	Price: Rs. 7200.00 (for each piece)	

BULK ORDER PROMOTIONAL OFFER FOR CRM SERVICE

1. On bulk purchase of 15 bottles (100g each) 3 bottles any of 100g may be given free.
2. On bulk purchase of 30 bottles (100g each) 8 bottles any of 100g may be given free.
3. On bulk purchase of 150 bottles (100g each) 35 bottles any of 100g may be given free.

Note: *Bulk Order Promotional Offer is not applicable for Coal Standard, Gaseous Standard and Spectrographic Standards.*

ORDERING INFORMATION

Additional *@18 % GST is applicable on the listed price. The CRMs will be sent through SPEED POST PARCEL/COURIER on receipt of full payment in advance. All payments are to be made in favour of "**DIRECTOR, NATIONAL METALLURGICAL LABORATORY, JAMSHEDPUR**" by e-payment (NEFT/RTGS) or Demand Draft payable at State Bank of India, Jamshedpur. No cash will be accepted. The bank details are given below.

Bank Details:

Banker's detail: STATE BANK OF INDIA, NML BRANCH, JAMSHEDPUR- 831007, JHARKHAND, INDIA

Electronic A/c No.: **30271713826**

RTGS No.: SBIN 0003329

MICR No.: 831002013

PAN No.: AAA TC 2716R

*GST No.: 20AAATC2716R2ZS

HSN/SAC Code: 998346

Accreditation Information:

CRM Unit, AAC Division, CSIR-National Metallurgical Laboratory has been accredited by **NABL as per ISO 17034:2016 for the production of Certified Reference Material** for above materials having **Certificate No.: RC-1019 on 13.01.2022 valid up to 12.01.2024.**

Contact Details:

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