

Technical Data Sheet

Metal Foundry Refractories

Section 1. Stopper, Nozzle and Well Block

1.1. General Description:

Dirgodaz amol offers some of metal foundry shaped refractories such as: Carbon Containing Refractories: Graphite Stopper Rod, Graphite Stopper Head and Graphite Nozzle. Alumina-Silica Refractories: Nozzle, Well Block and Stopper Head.

These products are manufactured from different raw materials, which are processed with high pressure isostatic pressing or casting and high temperature sintering techniques. This manufacturing process enables to the production of high quality product with homogenous microstructure and exquisite characteristics.

The usage of these products offers many benefits in extending the service life and reliable performances, in which the foundry is able to cast more pieces before replacing with a new one and reducing of production downtime. To obtain optimized control of the metal flow, these products are fabricated in exacting dimensional precision to ensure maximum geometrical compatibility to other components. Preheating is carried out to minimize the thermal shock that occurs at the start of the casting sequence. Various products are available with different chemical composition and geometrical shapes. Also new products can be developed to achieve the specific customer technical specification and design requirements for different types of foundry operations.

1.2. Features:

These products are subject to severe chemical and physical corrosion and thermal shock impacts in working conditions. In this regard our products have many features including of high thermal stability, good thermo-mechanical properties, good thermal shock resistance, poor wettability and high erosion corrosion resistance.

1.3. Different type of Stoppers, Nozzles and Well Block:

1.3.1. Graphite Stopper Rod:

Stopper rod is an important component of flow control system which is used to flow controlling of liquid metal through the nozzle to mold in foundry systems.

Various products are available and their chemical compositions and physical properties are listed in the below table. For these products different carbon content of approximately 20-40 weight percent is widely used.

Application: these products are mostly used for casting process of various metal including of cast iron (grey & ductile) and copper and aluminum alloys. Stopper rods are manufactured as close and open end types, for grey and ductile cast iron foundry respectively.

Graphite Stopper Rod			
SD-Code		SD-GS1	SD-GS2
B.D	(g/cm ³)	2.1-2.3	2-2.2
M.O.R	(kg/cm ²)	100	90
A.P	(%)	12	15
Al ₂ O ₃	(%)	40	20
SiO ₂	(%)	≤ 40	≤ 30
SiC	(%)	-	20
C	(%)	20-30	30-40



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1.3.2. Stopper Head:

Stopper head is used for discharge of liquid metal from ladles bottom in bottom pouring system of steel foundry. This comprised the assembling of steel rod lined with ceramic sleeves and stopper.

Application: these products are mostly used for casting process of steel alloys.

Chemical compositions and physical properties of these products are listed in the below table.

Stopper Head			
SD-Code		SD-SH1	SD-SH2
B.D	(g/cm ³)	2.40	2.40
M.O.R	(kg/cm ²)	120	100
A.P	(%)	15	16
Al ₂ O ₃	(%)	60	60
SiO ₂	(%)	≤ 35	≤ 30
C	(%)	-	5



1.3.3. Nozzle and well block:

Nozzles are used for delivering of liquid metals in optimize and laminar fluid flow. Various type of nozzles are available in different chemical compositions and with a range of inner bore diameters and shapes.

This parameters are designed according to various metals, nozzle output, flow rate and ladle or pouring box. To ensure minimize of thermal expansion incompatibility and sticking potential of stopper and nozzle products, chemical composition of them are well designed.

Chemical compositions and physical properties of these products are listed in the below table.

Application: these products are mostly used for casting process of various metal including of steel alloys, cast iron (grey & ductile) and copper and aluminum alloys.

Nozzle					
SD-Code		SD-GN1	SD-GN2	SD-AN3	SD-WB1
B.D	(g/cm ³)	2.1-2.3	2-2.2	2.4	2.4
M.O.R	(kg/cm ²)	110	100	100	100
A.P	(%)	12	15	16	16
Al ₂ O ₃	(%)	40	20	55	55
SiO ₂	(%)	≤ 40	≤ 30	≤ 40	≤ 40
SiC	(%)	-	20	-	-
C	(%)	20-30	30-40	-	-

