AFRICAN PEGMATITE

MILLERS AND PROCESSORS OF BASE MINERALS

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DATA SHEET

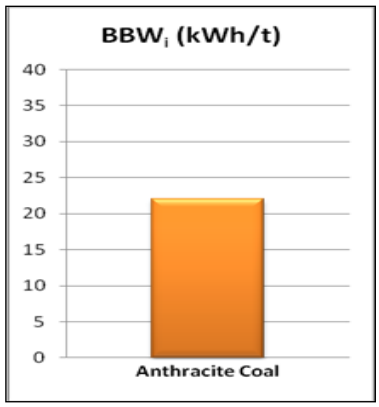
Anthracite Water Filter Media
Grade: (+1.2mm; -2.4mm)
Use: Water Filtration
(Refer to Page 2 for backwash data)

Chemical Analysis (%):

Typical:	Carbon (Combustible)	77.5 – 79.1
	Sulphur	1.5 – Max

Physical Properties:

AGr2	+2.4mm max 5% -1.2mm max 5%
Moisture	0.50% max
Ash	11.0 - 14.0%
Calorific Value MJ/kg	29.0 – 31.0
Volatile matter	6.0 – 10.0
Dry Bulk Density kg/m3	800
Specific Gravity	1.6 - 1.60g/cm^3
Solubility 40% HCl	0.00%
Solubility 2% NaOH	0.0% @ 20°C
Uniformity Coefficiency	1.6
Mean Effective Size	12% max D10
Bondwork Index	20-22 BBW (kWh/mt)
Hardgrove Index(ASTM D 409)	47.0



Application:

Water Filter applications for the removal of suspended solids and solvent extraction of non-ferrous metals. The Bond Work Index is measured in Kwt/hr per metric ton to indicate the materials resistance to being ground. Higher values will typically indicate the materials grinding resistance to a product size of 80% passing 100 microns. The test is undertaken using steel balls in a lab mill, size 305mmx305mm. As an indication TALC(very soft) has1-5 Kw/mt and Natal Hard Anthracite 20-22 Kw/mt. African Pegmatite's Anthracite can, therefore, be regarded as very hard and durable as well as being chemically resistant.

Packaging:

Packed in 40kg polypropylene bags, stretch wrapped on pallets or 1 ton bulk bags.

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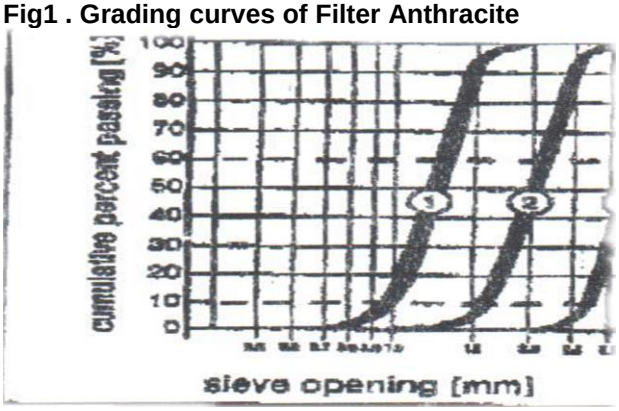
Fig1 . Grading curves of Filter Anthracite



Combinations of media and grain sizes
for dual-media filters are recommended on the grounds of investigations by several research institutes and experience gained from existing units.

Filter Material	Grain Grade Combinations
Filter Anthracite	1.2 - 2.4 mm
Filter Sand	0.71 – 1.25 mm
Support Layers* consist on filter sand/gravel.	2.0 – 3.15mm (3.15 – 5.6 mm) 5.6 – 8.0 mm

*****If necessary or required depending on the construction of the filter floor and width of the filter nozzles.

Depth of filter sand layer at least 300mm
Depth of the individual supportive layers about 150mm

A relationship between washwater velocity and grain size has been described by Kawamura (Journal AWWA 67(1975) p.653) with which it is possible to determine the water backwash rate for maximum scouring in anthracite filters:

V=28

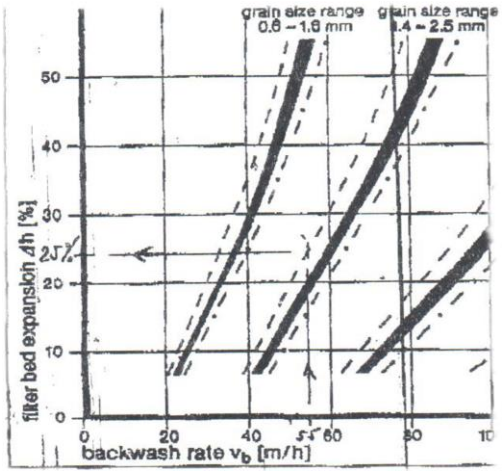
Optimal shearing is obtained when a 90% expansion of the filter bed is achieved during backwashing. Already 25% expansion of the filter bed allows 93% of the possible shear force to be effective. (H.-G. Moll Proc 4th world flitration congress (1986) p.87).

The backwash velocity required to effect a 25% filter bed expansion at 20°C with Filter Anthracite of known grain size can be calculated with the good approximation formula:

V =25 . d +36

By rule of thumb a doubling of the fluidization velocity is sufficient to give a 25% filter bed expansion.

In the following table the order of magnitude of the different backwash velocities at 20°C are shown by a calculation of the grain diameter(d_w) and backwash rates with definite values for the effective size(d_{10}) and the uniformity coefficient



The backwash velocity at other temperatures can be approximately calculated when only the temperature dependant viscosity of the water is taken into account:

V

Practical values for the backwash rate:-

Type	Grain Size	Backwash Rate
2	1.4 - 2.5 mm	55 – 60 m/h

The backwash rate must always be high enough to remove all the accumulated matter from the filter medium, in which case the density and size of these substances are of prime importance.

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