

6029

WW/B/116

FUEL RESEARCH INSTITUTE OF SOUTH AFRICA.

6029

TECHNICAL MEMORANDUM NO. 55 OF 1965.



A REPORT ON WASHABILITY DETERMINATIONS  
PERFORMED ON A BULK SAMPLE OF ANTHRACITE FROM  
BALGRAY COLLIERY, DUNDEE.

By  
P.J.F. FOURIE.

FUEL RESEARCH INSTITUTE OF SOUTH AFRICA.

TECHNICAL MEMORANDUM NO. 55 OF 1965.

A REPORT ON WASHABILITY DETERMINATIONS  
PERFORMED ON A BULK SAMPLE OF ANTHRACITE FROM  
BALGRAY COLLIERY, DUNDEE.

INTRODUCTION:

During November 1965 the Fuel Research Institute of South Africa was requested by a director of Balgray Collieries (Pty.) Ltd., to take a bulk sample of their run-of-mine anthracite (after passing through the crusher i.e. the feed to the washing plant) at Balgray Colliery, Dundee for washability derterminations.

On the 23rd November, 1965 officers of this Institute took the sample at the colliery by stopping the feed conveyor belt at regular 10 minute intervals from 0715 hours till 1415 hours. Every time a measured 10 feet strip of the 2 feet wide conveyor belt was cleared as an increment, resulting in bulk sample of about 5 tons.

ANALYSIS OF SAMPLE:

On arrival at the Institute the sample was air-dried. The air-dried sample was screened at 60 mm. and the plus 60 mm. anthracite was crushed by hand to minus 60 mm. This crushed coal was mixed in with the original minus 60 mm. size fraction and the sample was then screened at 60 mm., 35 mm., 20 mm., 12 mm., 5 mm. and  $\frac{1}{8}$ ". The results of the screen analysis are given in Table 1.

All plus  $\frac{1}{8}$ " size fractions were then subjected to detailed float and sink analyses in the specific gravity range 1.30 to 1.70 at 0.05 intervals. The ash content of each float and sink fraction was determined.

These/.....

These results are tabulated in Tables 2 and 3. These results were evaluated and washability curves were drawn. The curves are shown in Figures 1 - 5.

An ash determination only was done on the  $\frac{1}{8}$ "x0 material. This figure is reported at the bottom of Table 3.

NOTE:

From the float and sink data it will be noted that there were no floats at S.G. 1.30 and for practical reasons the relative small 1.30 - 1.35 fractions were combined with the 1.35 - 1.40 fraction for the ash determinations.

(SIGNED) P.J.F. FOURIE.  
SENIOR TECHNICAL OFFICER.

PRETORIA.  
20TH DECEMBER, 1965.

/LNS.

TABLE 1.

SCREEN ANALYSIS.

Size	Weight lb.	Fract. %	Cum. %
60 x 35 mm.	2191 $\frac{3}{4}$	22.10	22.10
35 x 20 mm.	1706 $\frac{1}{2}$	17.21	39.31
20 x 12 mm.	1245 $\frac{1}{2}$	12.56	51.87
12 x 5 mm.	1690 $\frac{3}{4}$	17.05	68.92
5 mm. x $\frac{1}{8}$ "	773 $\frac{3}{4}$	7.80	76.72
- $\frac{1}{8}$ "	2182 $\frac{1}{4}$	22.00	98.72
Loss	126 $\frac{3}{4}$	1.28	-
Total	9917 $\frac{1}{4}$	100.00	100.00

The plus 60 mm. coal weighed 413 lb and this coal was hand crushed to minus 60 mm.

Table 2/.....

TABLE 2.  
FLOAT AND SINK ANALYSES.

S.G.	60 mm. x 35 mm.				35 mm. x 20 mm.				20 mm. x 12 mm.			
	Yield		Ash		Yield		Ash		Yield		Ash	
	Fract. %	Cum. %	Fract. %	Cum. %	Fract. %	Cum. %	Fract. %	Cum. %	Fract. %	Cum. %	Fract. %	Cum. %
F 1.30	-	-	-	-	-	-	-	-	-	-	-	-
1.30 - 1.35	0.01	0.01	-	0.21	0.21	0.21	-	0.76	0.76	0.76	-	-
1.35 - 1.40	17.74	17.75	-	26.16	26.37	8.9	8.90	33.26	34.02	8.8	8.80	8.80
1.40 - 1.45	26.67	44.42	12.8	25.21	51.58	12.9	10.86	21.41	55.43	13.1	10.46	10.46
1.45 - 1.50	6.27	50.69	17.1	7.89	59.47	18.3	11.84	7.48	62.91	18.5	11.42	11.42
1.50 - 1.55	3.59	54.28	23.3	4.47	63.94	22.9	12.62	4.64	67.55	23.4	12.24	12.24
1.55 - 1.60	3.97	58.25	27.4	2.33	66.27	28.7	13.18	2.91	70.46	29.2	12.94	12.94
1.60 - 1.65	3.33	61.58	33.2	2.28	68.55	32.9	13.84	2.22	72.68	33.5	13.57	13.57
1.65 - 1.70	4.31	65.89	39.0	4.08	72.63	38.6	15.23	3.47	76.15	38.5	14.70	14.70
S 1.70	34.11	-	53.3	27.38	-	50.8	-	23.84	-	50.7	-	-
Total	100.00	100.00	-	100.01	100.01	-	24.97	99.99	99.99	-	23.28	23.28

TABLE 3.  
FLOAT AND SINK ANALYSES.

S.G.	12 mm. x 5 mm.			5 mm. x $\frac{3}{8}$ "		
	Yield		Ash	Yield		Ash
	Fract. %	Cum. %	Fract. %	Cum. %	Fract. %	Cum. %
F 1.30	-	-	-	-	-	-
1.30 - 1.35	4.98	4.98	-	10.92	-	-
1.35 - 1.40	41.82	46.80	7.9	44.00	7.0	7.00
1.40 - 1.45	15.93	62.73	13.1	14.56	13.1	8.28
1.45 - 1.50	7.26	69.99	18.7	5.95	18.6	9.09
1.50 - 1.55	4.12	74.11	23.8	3.31	24.0	9.72
1.55 - 1.60	2.93	77.04	28.5	2.81	28.4	10.36
1.60 - 1.65	2.06	79.10	33.5	1.84	34.3	10.89
1.65 - 1.70	3.36	82.46	38.6	3.06	39.8	11.91
S 1.70	17.55	-	50.3	13.56	52.8	-
Total	100.01	100.01	-	100.01	-	17.45

Ash content of the  $\frac{1}{8}$ " coal = 15.9%.

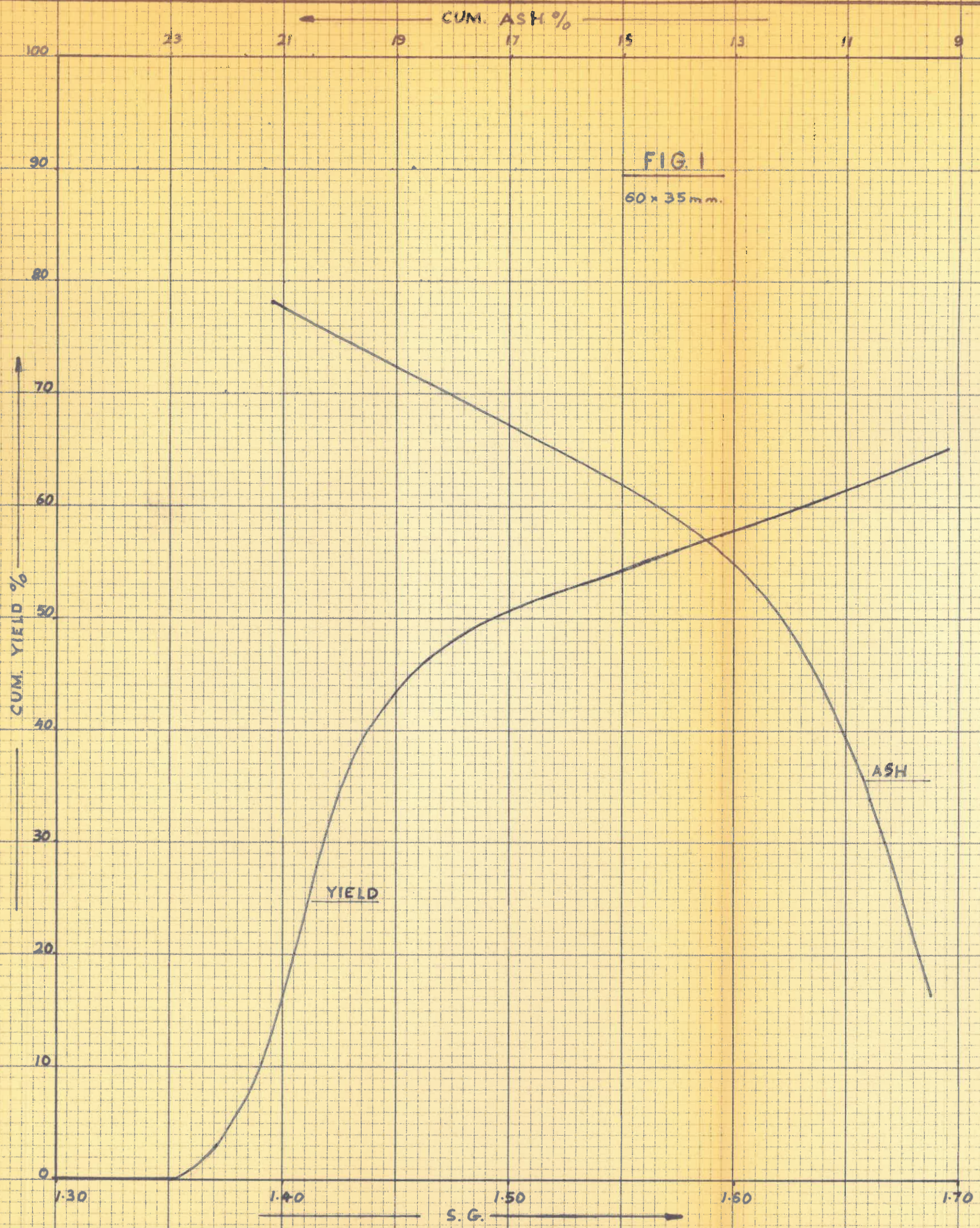
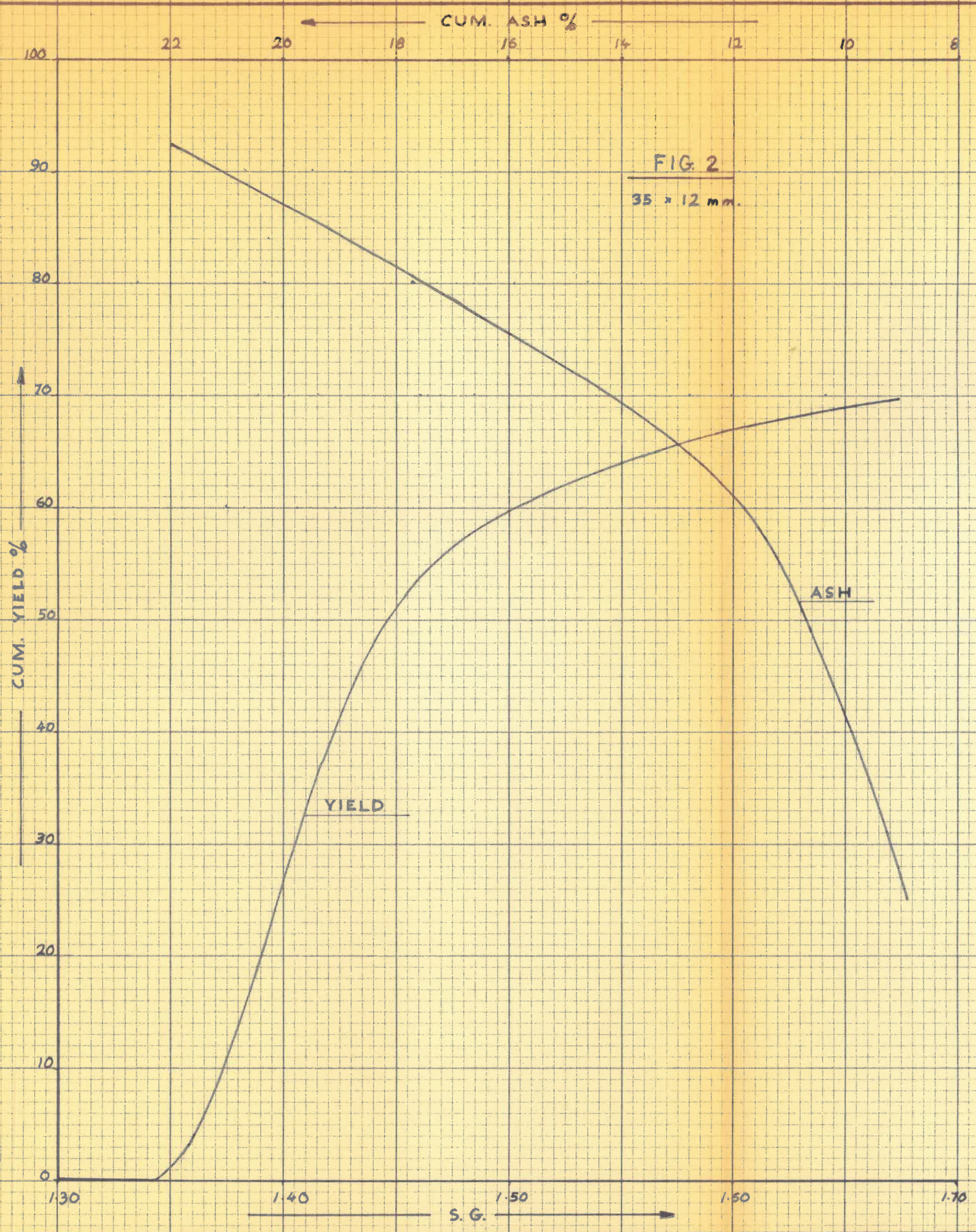


FIG. 1  
60 x 35 mm.





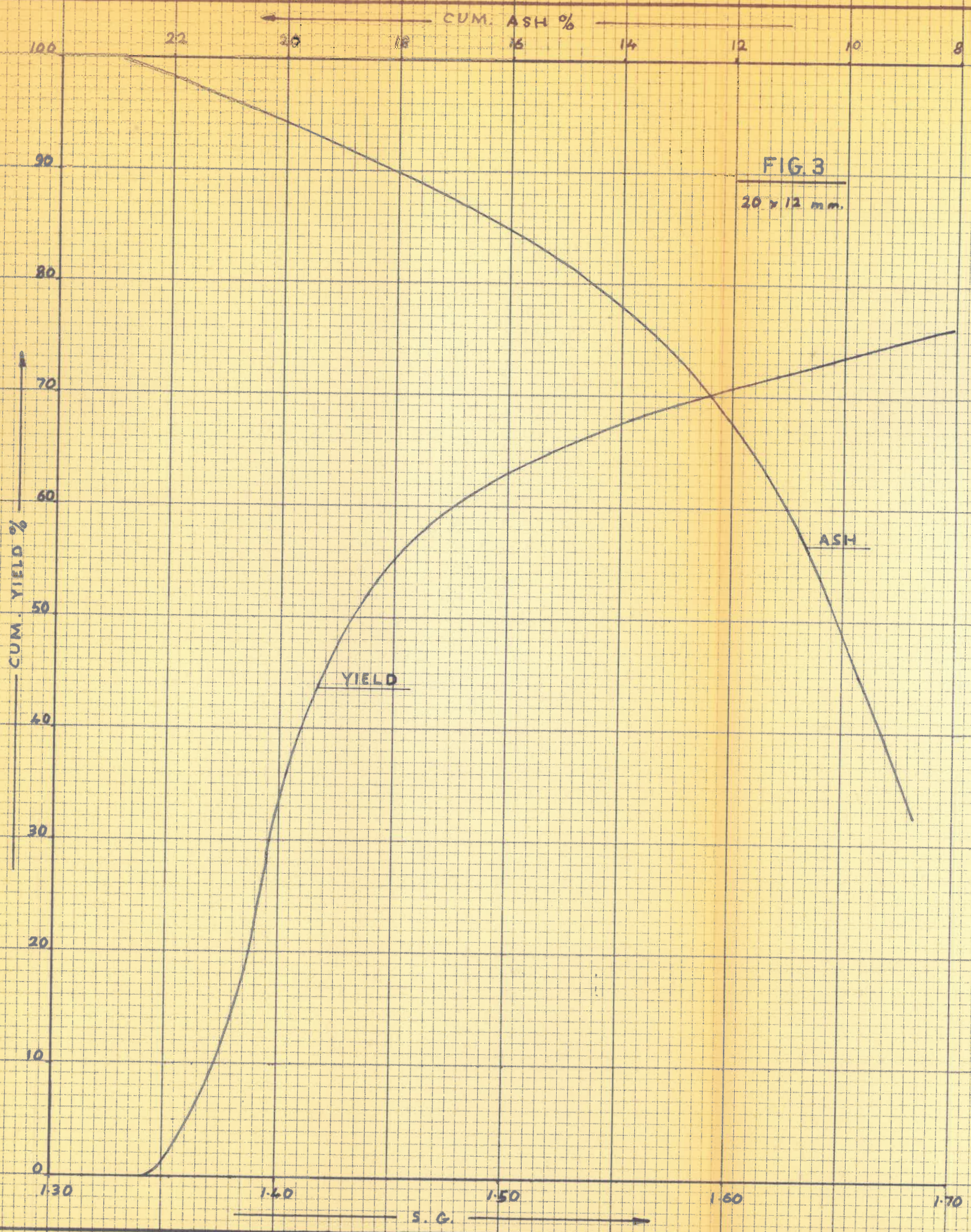


FIG. 3

20 x 12 mm.

YIELD

ASH

S.G.

CUM. ASH %

CUM. YIELD %

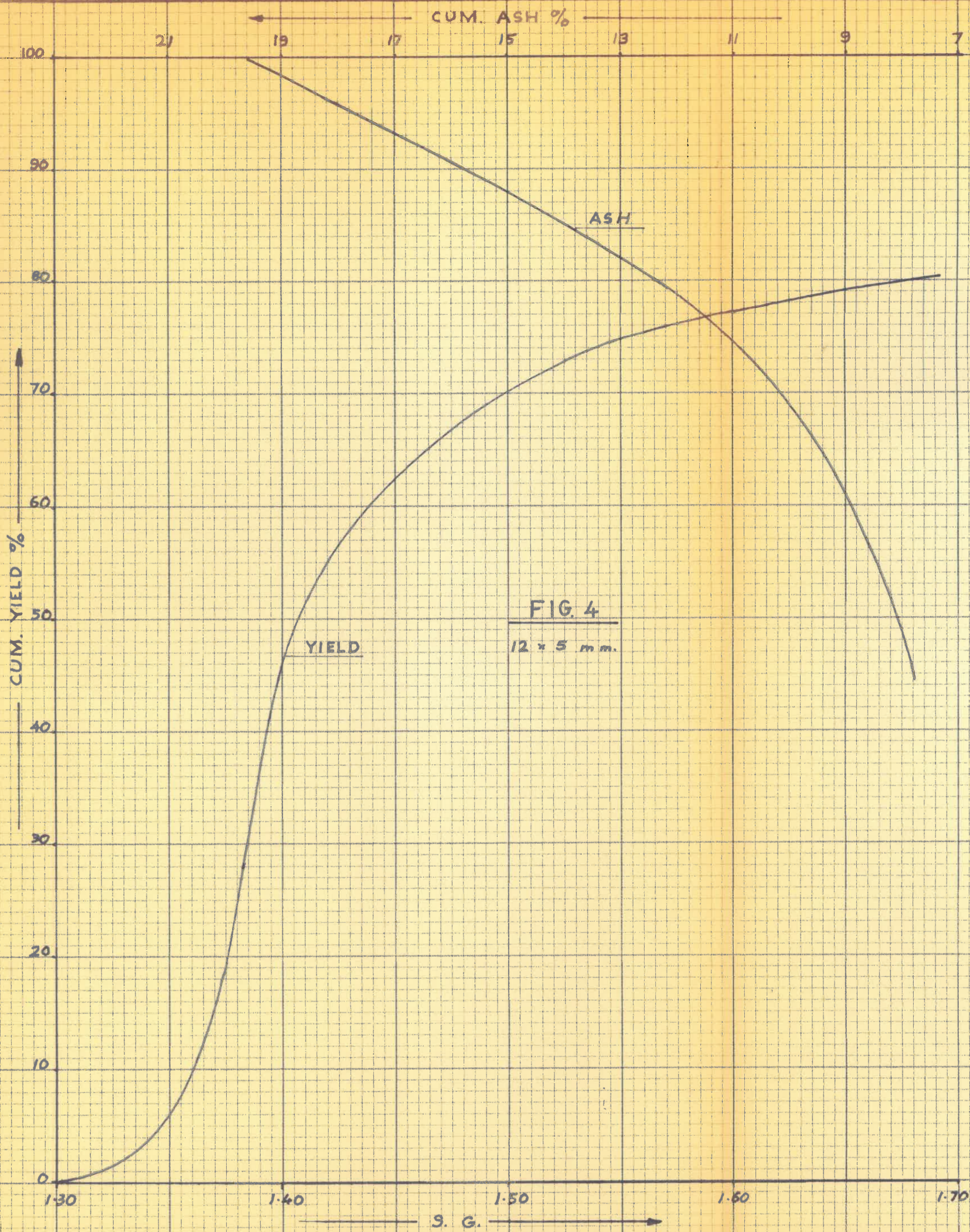


FIG. 4

12 x 5 mm.

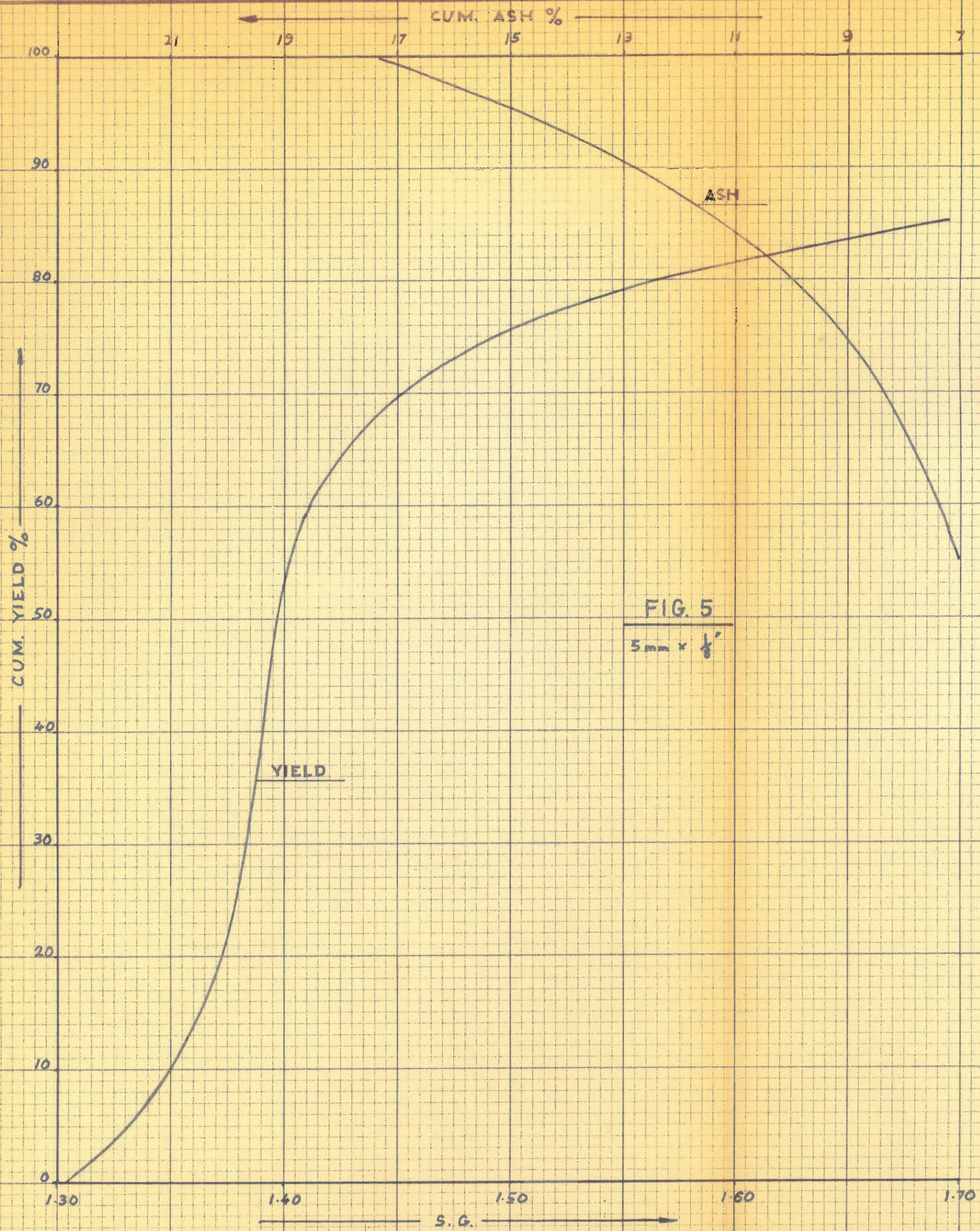


FIG. 5

5mm x 1/8"