

Mr Savage MEMO
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FUEL RESEARCH INSTITUTE OF SOUTH AFRICA.

TECHNICAL MEMORANDUM NO. 46 OF 1965.

A REPORT ON THE RESULTS OBTAINED FROM WASHABILITY
DETERMINATIONS CARRIED OUT ON A BULK SAMPLE FROM
UMGALA COLLIERY.

By:

P.J.F. FOURIE.

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INTRODUCTION.

The Fuel Research Institute of South Africa was requested by the Director, Umgala Colliery (Pty.) Ltd., to take a bulk sample at Umgala Colliery and to carry out washability tests on it. *The coal is metamorphic with about 7% volatile matter.*

ANALYSIS OF SAMPLE.

The coal was blasted on the 6th October, 1965 and was collected the following morning by officers of the Institute. The total weight of the sample was $4\frac{1}{4}$ tons. It was screened at 60 mm.; the plus 60 mm. coal fraction was weighed and then crushed by hand to minus 60 mm. and combined with the natural -60 mm. arisings.

Thereupon the sample was screened at 35 mm., 20 mm., 12 mm., 5 mm. and $\frac{1}{8}$ " (the nearest equivalent screen to 3 mm. at the Institute). The results of the screen analysis are reported in Table 1.

All the plus $\frac{1}{8}$ " size fractions were then subjected to detailed float and sink analyses on a fractional basis at 0.05 intervals in the specific gravity range 1.30 to 1.70. The ash content of each float and sink fraction was determined. All these results are tabulated in Table 2. From these results washability curves were drawn (figures 1 - 5). Only an ash determination was done on the minus $\frac{1}{8}$ " size fraction.

P.J.F. FOURIE
SENIOR TECHNICAL OFFICER.

PRETORIA.

3rd November, 1965.

TABLE 1.
SCREEN ANALYSIS.

SIZE	WEIGHT %	FRACT. %	CUM. %
60 x 35 mm.	4490 $\frac{3}{4}$	52.71	52.71
35 x 20 mm.	1549 $\frac{1}{4}$	18.18	70.89
20 x 12 mm.	831 $\frac{1}{2}$	9.76	80.65
12 x 5 mm.	722 $\frac{1}{4}$	8.48	89.13
5 mm. x $\frac{1}{8}$ "	610 $\frac{1}{2}$	7.17	96.30
Minus $\frac{1}{8}$ "	223 $\frac{3}{4}$	2.63	98.93
Loss	91 $\frac{1}{2}$	1.07	-
TOTAL	8519 $\frac{1}{2}$	100.00	100.00

The air dry weight of sample as received was 8519 $\frac{1}{2}$ lb. and the plus 60 mm. coal weighed 4417 $\frac{3}{4}$ lb.

TABLE 2.
FLOAT AND SINK DATA.

S.G. INTERVAL	60 x 35 mm.			35 x 20 mm.			20 x 12 mm.			
	YIELD		ASH	YIELD		ASH	YIELD		ASH	
	FRACT. %	CUM. %	FRACT. %	FRACT. %	CUM. %	FRACT. %	FRACT. %	CUM. %	FRACT. %	CUM. %
F.1.30	-	-	-	-	-	-	-	-	-	-
1.30 - 1.35	-	-	-	-	-	-	-	-	-	-
1.35 - 1.40	-	-	-	-	-	-	-	-	-	-
1.40 - 1.45	10.35	10.35	6.6	15.84	15.84	6.8	0.07	0.07	5.2	5.20
1.45 - 1.50	45.63	55.98	10.5	46.14	61.98	10.1	19.09	19.16	7.2	7.19
1.50 - 1.55	21.80	77.78	15.5	17.34	79.32	17.9	44.31	63.47	10.9	9.78
1.55 - 1.60	10.23	88.01	20.1	8.47	87.79	22.3	16.02	79.49	17.1	11.25
1.60 - 1.65	4.46	92.47	24.2	3.34	91.13	26.2	8.25	87.74	20.9	12.16
1.65 - 1.70	2.02	94.49	27.1	2.30	93.43	30.3	3.30	91.04	26.1	12.67
S.1.70	5.51	-	64.1	6.57	-	57.9	2.36	93.40	30.0	13.11
Whole Coal	100.00	100.00	-	100.00	100.00	-	100.00	100.00	-	15.83

Ash content of minus 1/8" coal = 20.2%

= M 1.3 V 7.0 Fc 85.1

TABLE 2 (Continued)

S.G. INTERVAL	12 x 5 mm.			5 mm. x 1/8"		
	YIELD		ASH	YIELD		ASH
	FRACT. %	CUM. %	FRACT. %	CUM. %	FRACT. %	CUM. %
F.1.30	-	-	-	-	-	-
1.30 - 1.35	-	-	-	-	-	-
1.35 - 1.40	0.06	0.06	5.1	5.10	0.19	4.50
1.40 - 1.45	25.41	25.47	7.2	7.20	31.98	6.39
1.45 - 1.50	40.07	65.54	10.8	9.40	33.39	8.69
1.50 - 1.55	13.19	78.74	17.4	10.74	11.95	9.75
1.55 - 1.60	7.33	86.07	22.7	11.76	6.33	10.69
1.60 - 1.65	3.42	89.49	27.8	12.37	3.16	11.40
1.65 - 1.70	2.20	91.69	32.4	12.85	2.11	11.73
S.1.70	8.31	-	53.4	-	10.89	-
Whole Coal	100.00	100.00	-	16.22	100.00	16.14

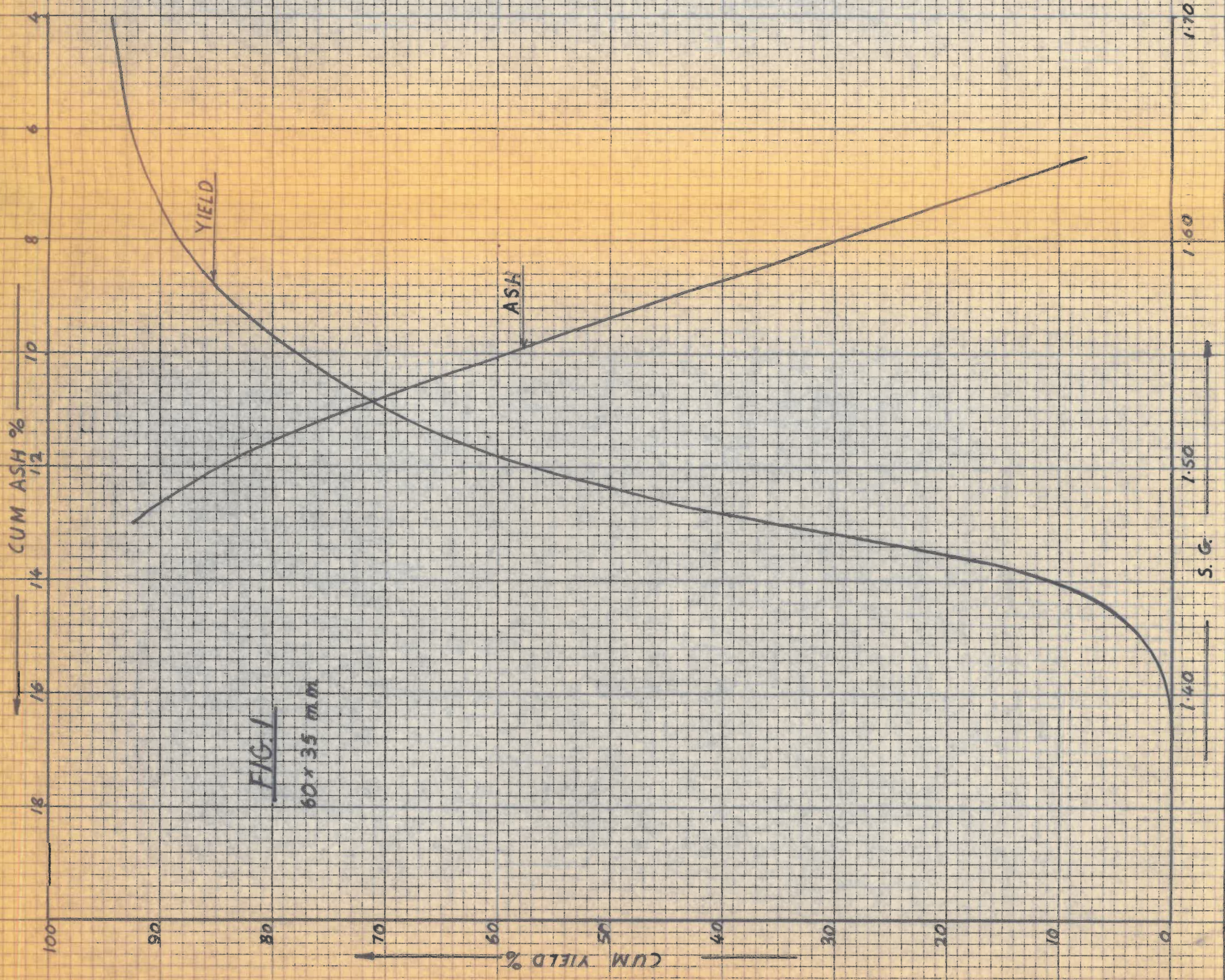


FIG 1

60 x 35 mm

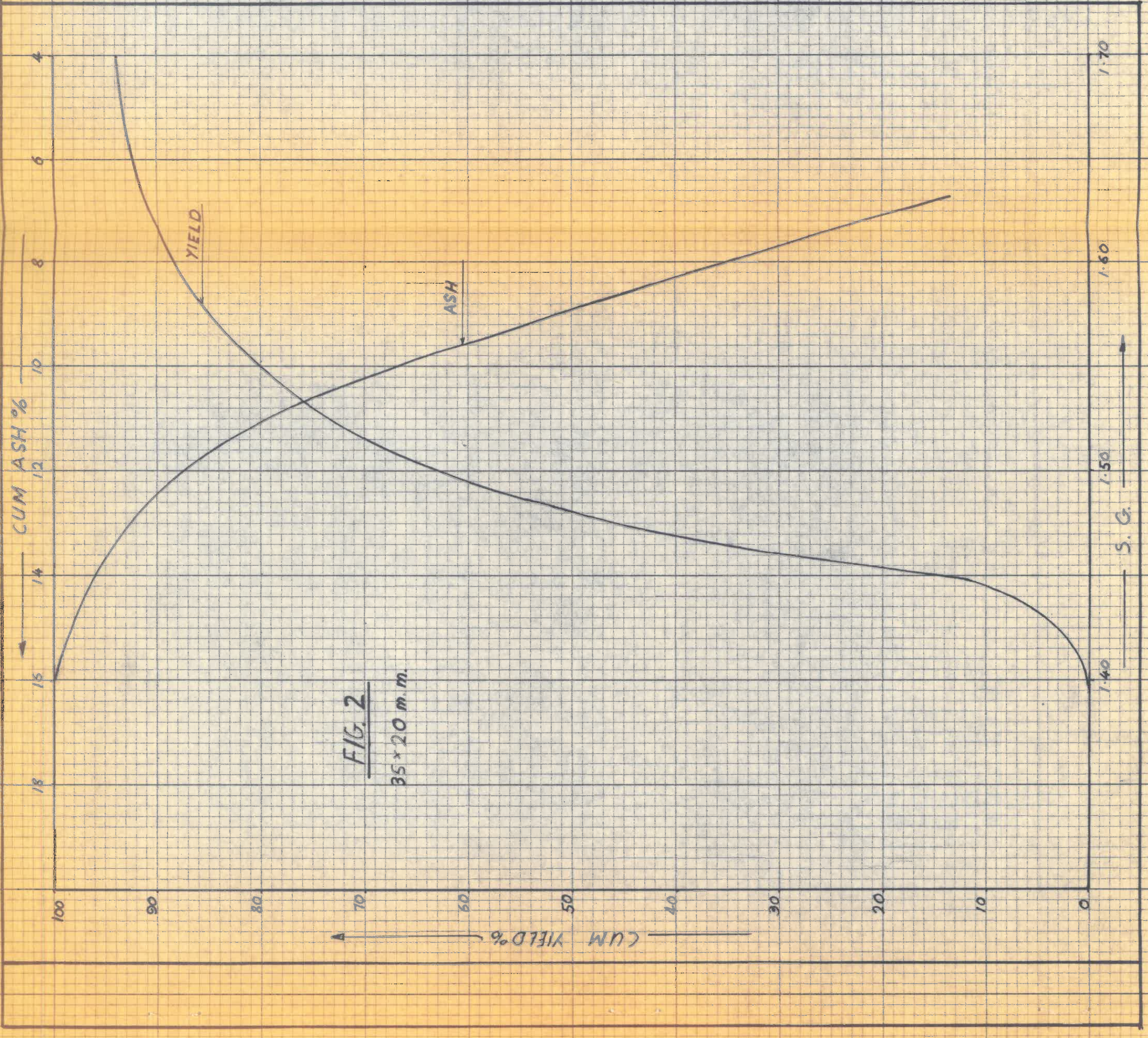
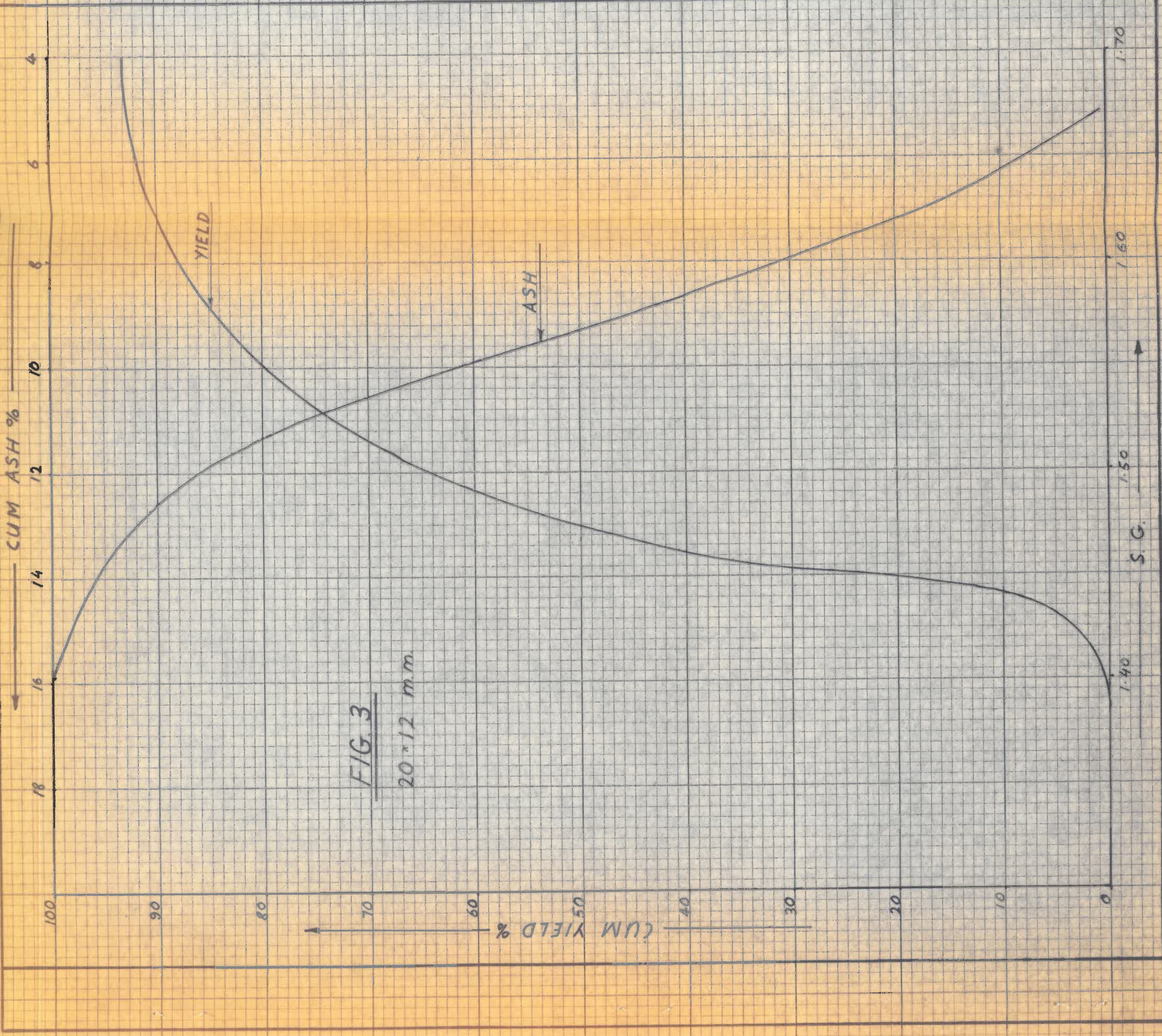


FIG. 2
35 x 20 m. m.

S. G.
1.40 1.50 1.60 1.70



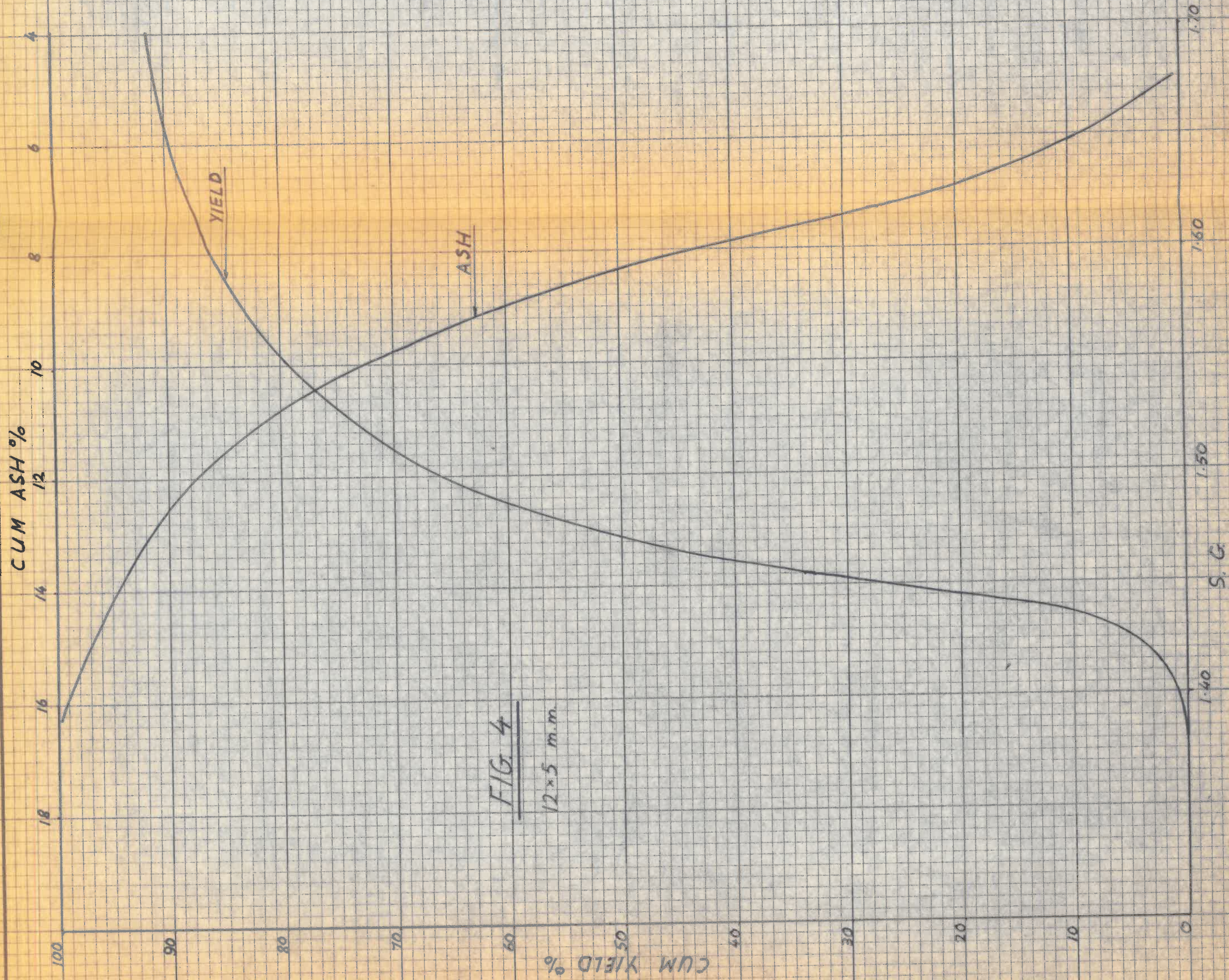


FIG 4
12x5 m.m

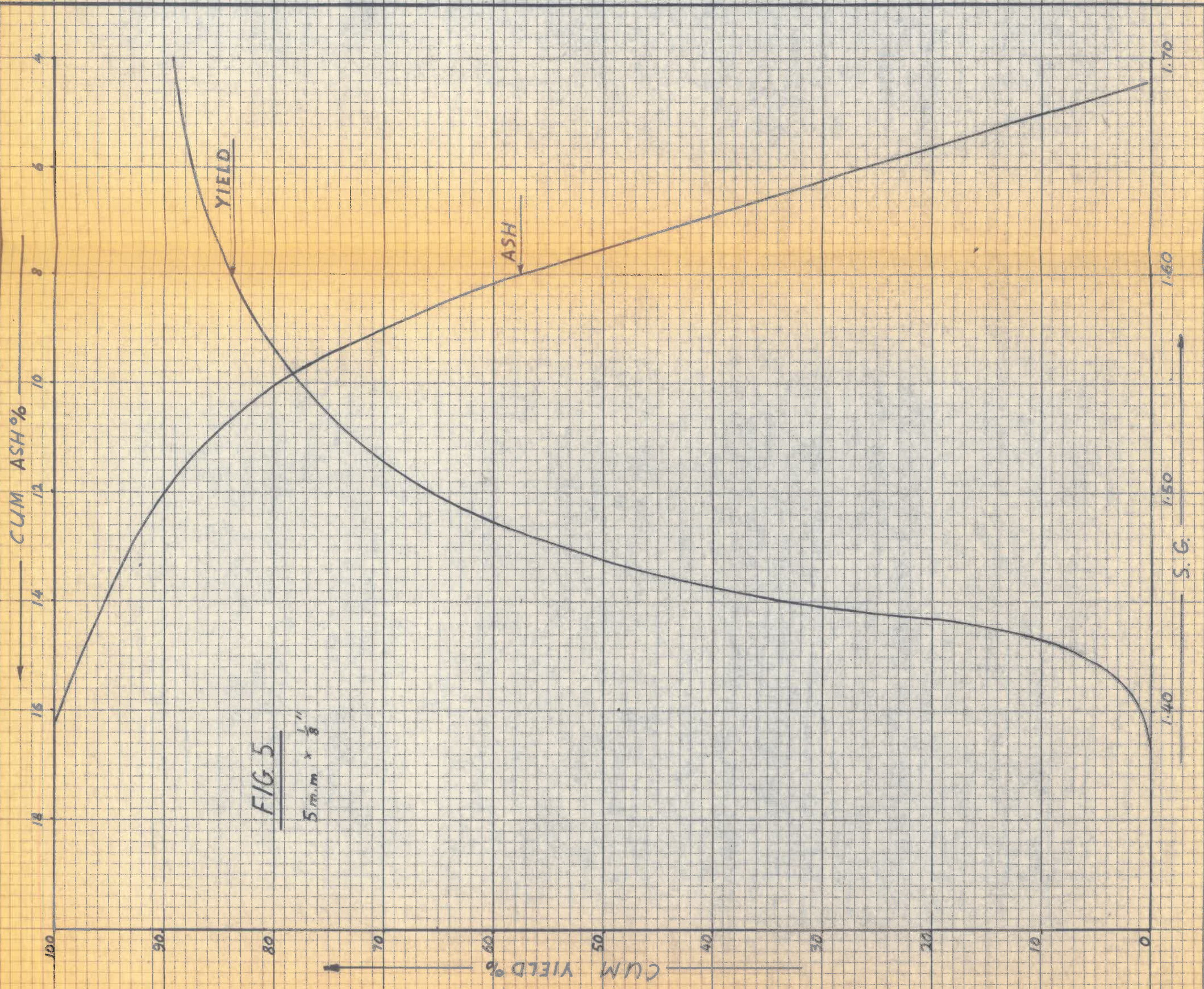


FIG 5

5mm x 1/8"