IKA

designed for scientists

APPLICATION NOTE

Application Note

/// Viscosity measurement of varnish samples

PRODUCT

ROTAVISC hi-vi I Complete (0025000312)
labworldsoft® 6 Visc (0020101872)
MICROSTAR 15 digital (0025004883)
R 1342 Propeller stirrer (0000741000)

INDUSTRY

Chemical

TASK / OVERVIEW

The task was to find a suitable viscometer to measure varnish samples directly in the varnish vessel. For this purpose, the relative measuring spindles that are included in the scope of delivery of the ROTAVISC hi-vi I were utilized. Five varnish samples were measured with a rotational viscometer to determine a reproducible measuring method.

EXPERIMENTAL SETUP

Viscometer	ROTAVISC hi-vi I
Spindles	SP 8 – 11
Sample vessel	Customer's varnish vessel
Speed	10 – 130 rpm
Sample temperature	23 °C
Measuring time	1 min

The varnish was tempered to 23 °C. Thereafter, it was stirred for one minute with the IKA overhead stirrer MICROSTAR 15 digital and the propeller stirrer R 1342 (diameter 50 mm) at appprox. 900 rpm. After the sample was homogenized, its viscosity was measured with the rotational viscometer ROTAVISC hi-vi I and the spindles 8 – 11 at 10 – 130 rpm. After each minute, the measured value was recorded.

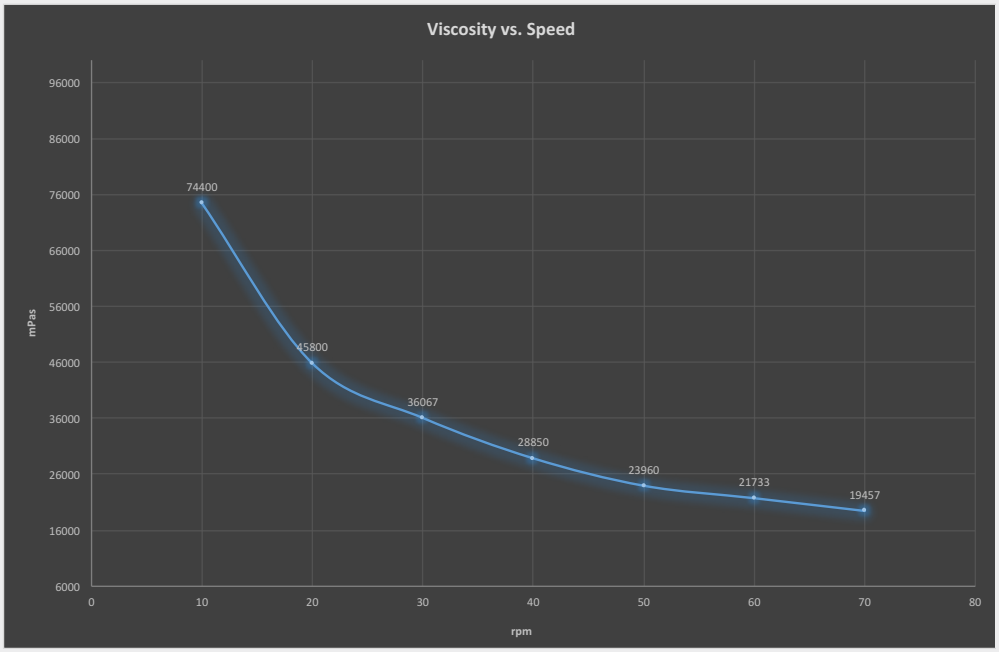
SAMPLE MATERIAL

5 varnishes with different product features

RESULTS UV putty dark oak

Speed	Viscosity	M
10 rpm	74400 mPas	37.2 %
20 rpm	45800 mPas	45.8 %
30 rpm	36067 mPas	54.1 %
40 rpm	28850 mPas	57.7 %
50 rpm	23960 mPas	59.9 %
60 rpm	21733 mPas	65.2 %
70 rpm	19457 mPas	68.1 %

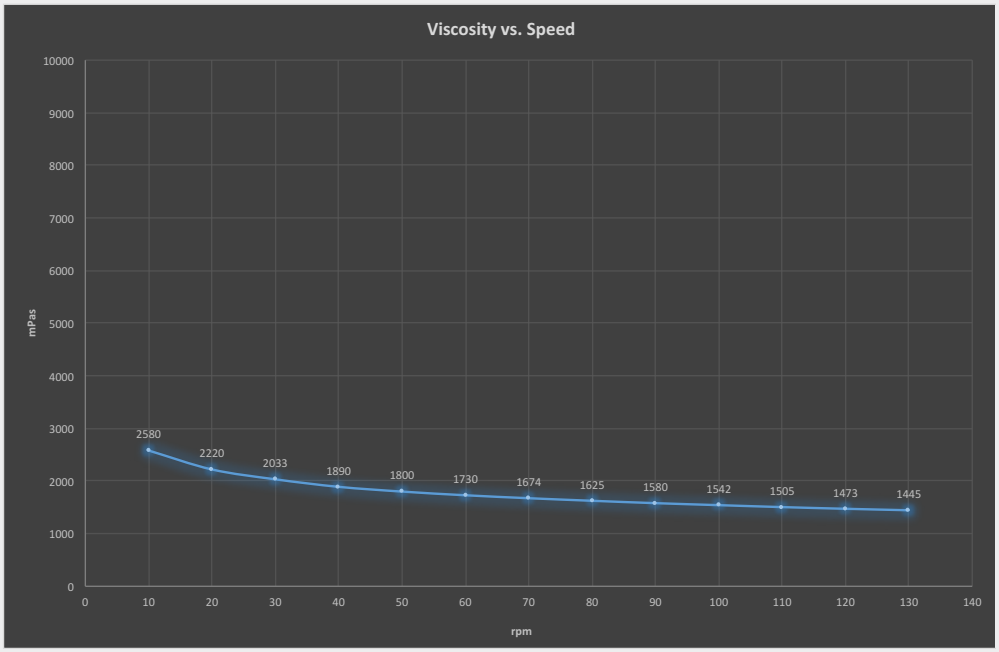
UV putty dark oak



RESULTS hydro textured paint Pure White

Speed	Viscosity	M
10 rpm	2580 mPas	12.8 %
20 rpm	2220 mPas	22.2 %
30 rpm	2033 mPas	30.5 %
40 rpm	1890 mPas	37.8 %
50 rpm	1800 mPas	45 %
60 rpm	1730 mPas	51.9 %
70 rpm	1674 mPas	58.6 %
80 rpm	1625 mPas	65 %
90 rpm	1580 mPas	71.1 %
100 rpm	1542 mPas	77.1 %
110 rpm	1505 mPas	82.8 %
120 rpm	1473 mPas	88.4 %
130 rpm	1445 mPas	93.9 %

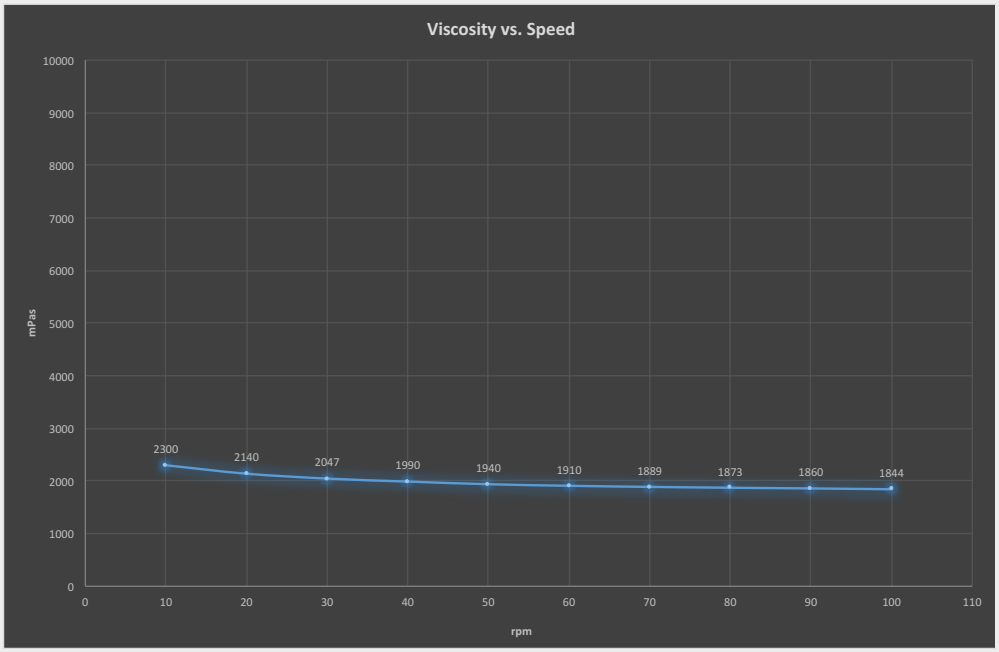
Hydro textured paint Pure White



RESULT hydro base coat blue-grey RAL 7031

Speed	Viscosity	M
10 rpm	2300 mPas	11.5 %
20 rpm	2140 mPas	21.4 %
30 rpm	2047 mPas	30.7 %
40 rpm	1990 mPas	39.8 %
50 rpm	1940 mPas	48.5 %
60 rpm	1910 mPas	57.3 %
70 rpm	1889 mPas	66.1 %
80 rpm	1873 mPas	74.9 %
90 rpm	1860 mPas	83.7 %
100 rpm	1844 mPas	92.2 %

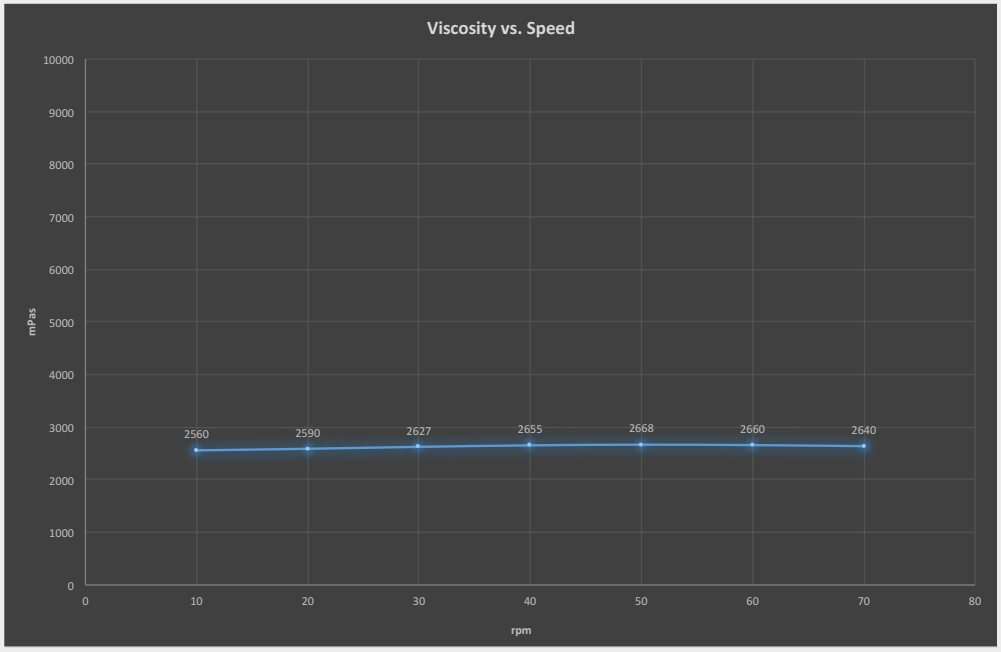
Hydro base coat blue-grey RAL 7031



RESULT hydro varnish colorless

Speed	Viscosity	M
10 rpm	2560 mPas	12.8 %
20 rpm	2590 mPas	25.9 %
30 rpm	2627 mPas	39.4 %
40 rpm	2655 mPas	53.1 %
50 rpm	2668 mPas	66.7 %
60 rpm	2660 mPas	79.8 %
70 rpm	2640 mPas	92.4 %

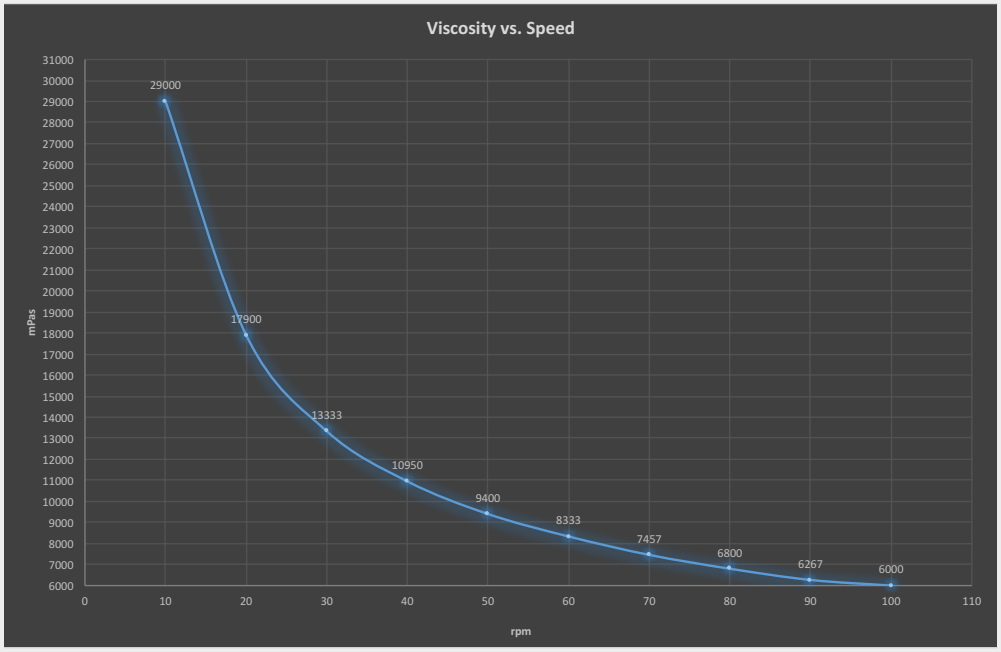
Hydro varnish colorless



RESULT hydro top coat iron gray RAL 7011

Speed	Viscosity	M
10 rpm	29000 mPas	14.5 %
20 rpm	17900 mPas	17.9 %
30 rpm	13333 mPas	20 %
40 rpm	10950 mPas	21.9 %
50 rpm	9400 mPas	23.5 %
60 rpm	8333 mPas	25 %
70 rpm	7457 mPas	26 %
80 rpm	6800 mPas	27.2 %
90 rpm	6267 mPas	28.2 %
100 rpm	6000 mPas	30 %

Hydro top coat iron gray RAL 7011



Different varnish formulations reveal different viscosity trends - while some varnishes are shear-stable, other varnish compositions can be highly shear-thinning. In summary, the viscosity of all varnishes can be determined realiably and with ease.