Newsprint and newsink economy and quality in the face of rising prices : workshop, Hong Kong 13-14 June 1995: [test printing]

1995

https://hdl.handle.net/10356/93126

Test Printing

Session 10:

Test printing

Laboratory scale
Pilot scale
Full scale
Use of test results
Use of testformes

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LABORATORY SCALE

1. IGT PRINTABILITY TESTER

- suitable for comparisons of different paper/ink combinations
  - rub-off
  - set-off
  - ink requirement
  - ink hue
  - delamination
- does not cover emulsified inks

2. PRÜFBAU TESTPRINTER

- paper width	4cm
- impression	200 - 1600 N
- speed	0.5 - 6 m/s
- temperatute	15 - 40 C
- extra modules:	damping
	drying

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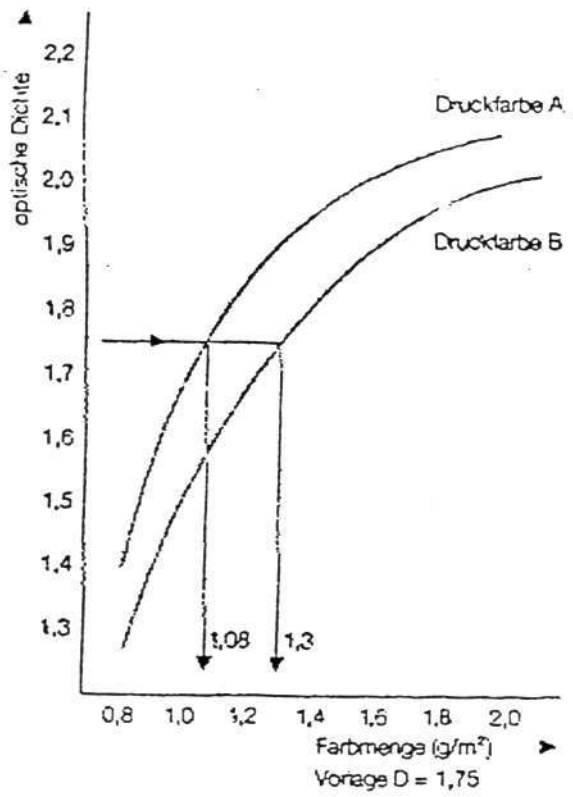
TYPICAL MEASUREMENTS

- as with IGT
- tack
- ink penetration
- picking
- coating behaviour in general



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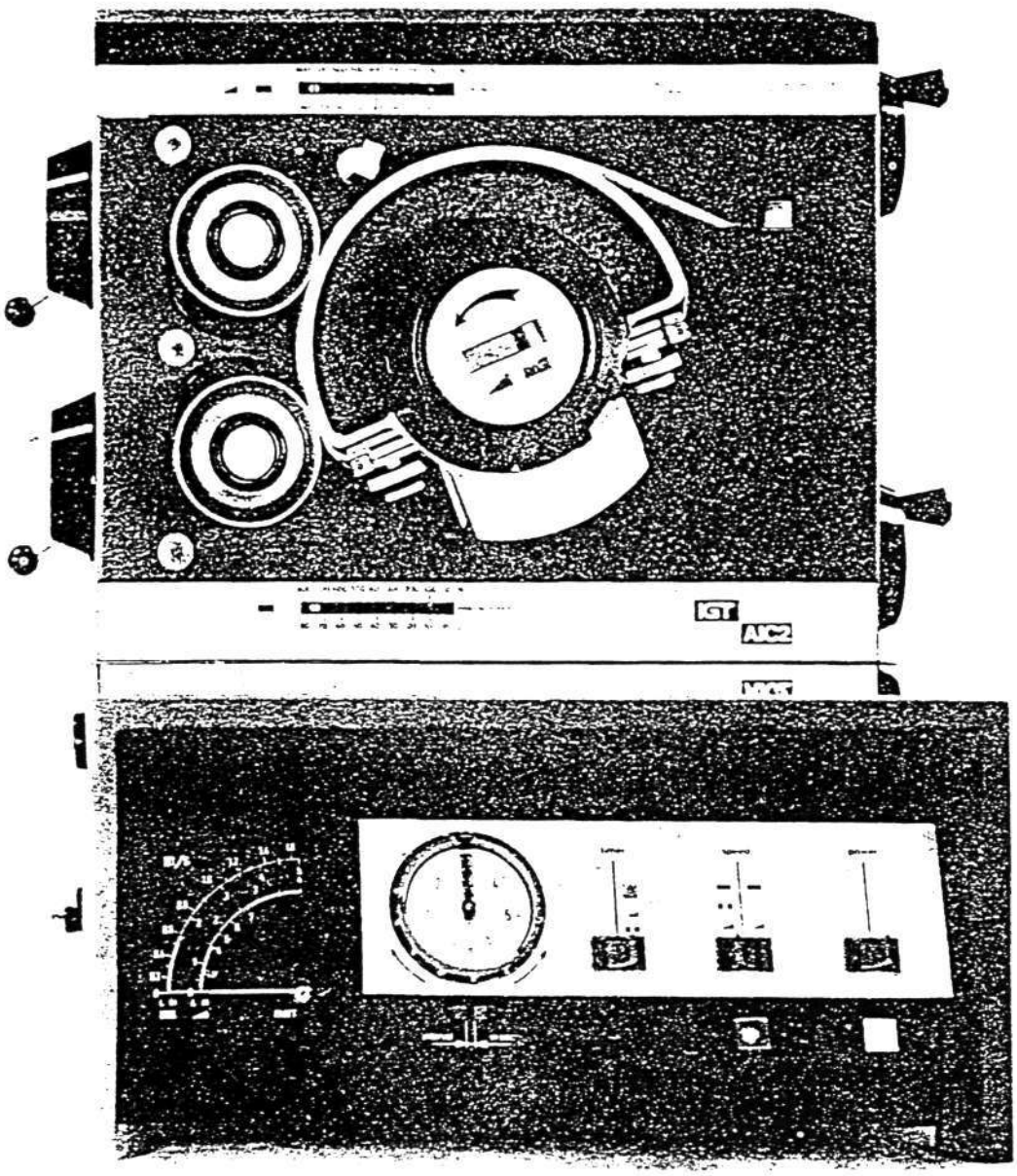
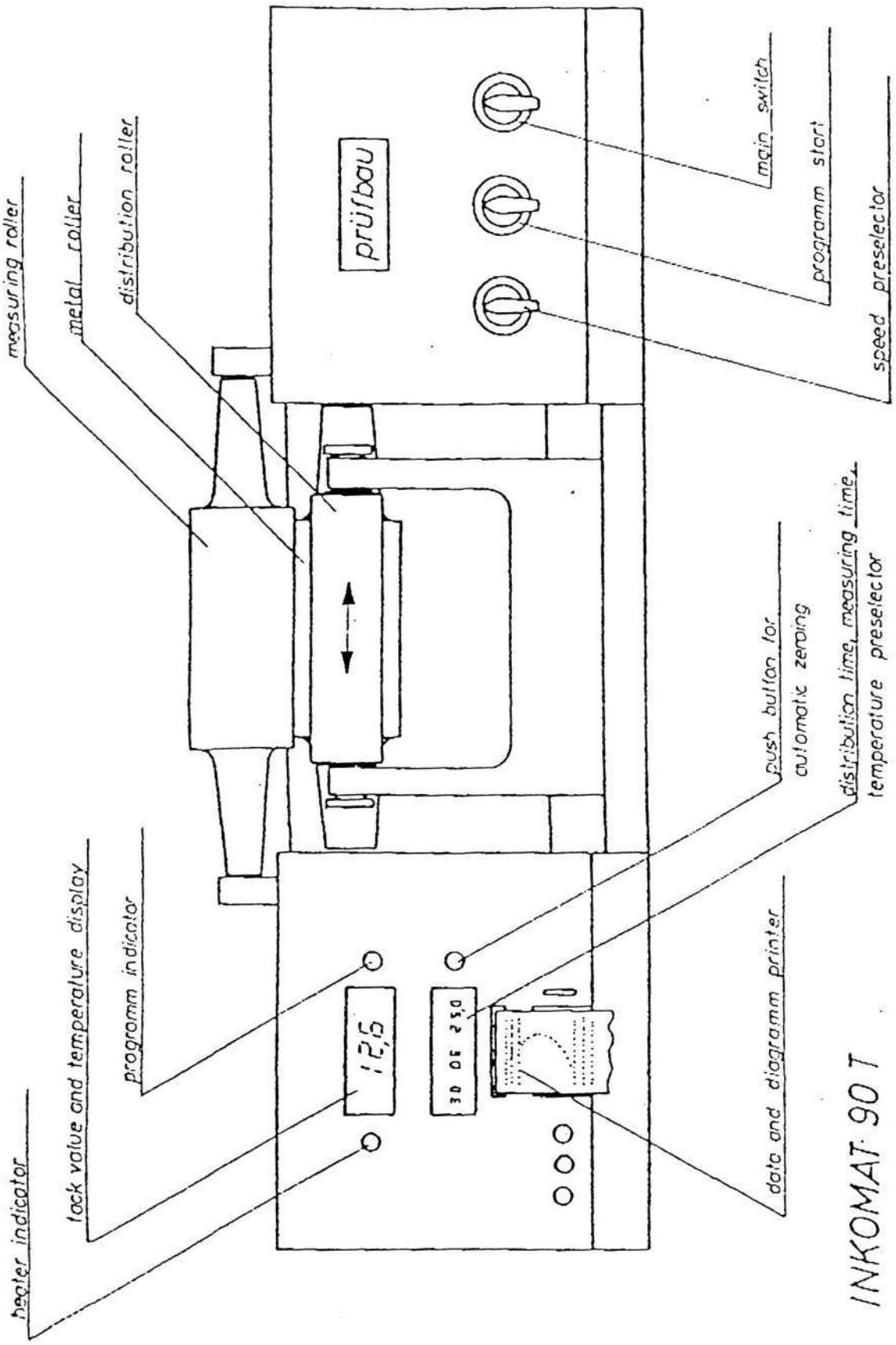


Fig. 12.24. The print unit of an AIC2 IGT printability tester.



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PILOT SCALE

In pilot scale testing, following types of equipment (presses) are used:

- experimental presses
- small full scale presses
- units of full scale presses
- sheet-fed presses

Pilot scale presses (usually) include a damping unit. Thus printing with **emulsified inks**.

Should be capable of operating under reproducible printing conditions.

Equipped with extra control devices:

- print density
- ink film thickness
- water film thickness

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In order to obtain representative results, each test should be carried out **in optimal conditions** adjusted to the paper/ink combination in question. Otherwise, single printing conditions are tested and the results are not valid.

Optimisation is carried out by:

- doing the NCI-test
- optimising the nip condition (true rolling)
- optimising the water feed (visually - no tinting, no water marks)

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FULL SCALE

Full scale tests are regarded as being the only reliable end use test in product development end work.

A few preconditions have to be kept in mind:

- printed samples must be representative
- the press has to be warmed up
- stable conditions have to be achieved (ink, water)

Printing under constant density is **not** recommended as this gives results from one specific condition only. A **simplified NCI-method** is recommended.

Example: IFRA Colour Testforme.

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CORRELATION BETWEEN LABORATORY TESTS AND PRINTED RESULTS

IFRA Special Report 1.7 "Correlations between ink measuring methods and printing results"

Results from the project:
Printability issues can to a certain degree be predicted:

Rub-off:	Correlation is significant
Set-off:	To some degree predictable
Print-through:	To some degree predicatble
Water take-up:	To some extent predictable
Ink mileage:	Predictable
Colour hue:	Predictable

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Runnability issues cannot be predicted:

Rheological properties (viscosity, tack, thixotropy): suitable for trouble shooting for a given type of press/ materials condition. Not as a general quantitative recommendation.

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CONCLUSIONS

Laboratory scale tests can be used to a limited extent only.

They are well suited for monitoring the consistency of an ink or paper - not for finding the optimal solution for your press.

Pilot scale tests can for certain parameters be used for optimising and comparing the products. However, results must always be verified by full scale tests.

Use full scale tests as often as you can. Keep printing conditions constant and change only one parameter at a time.

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