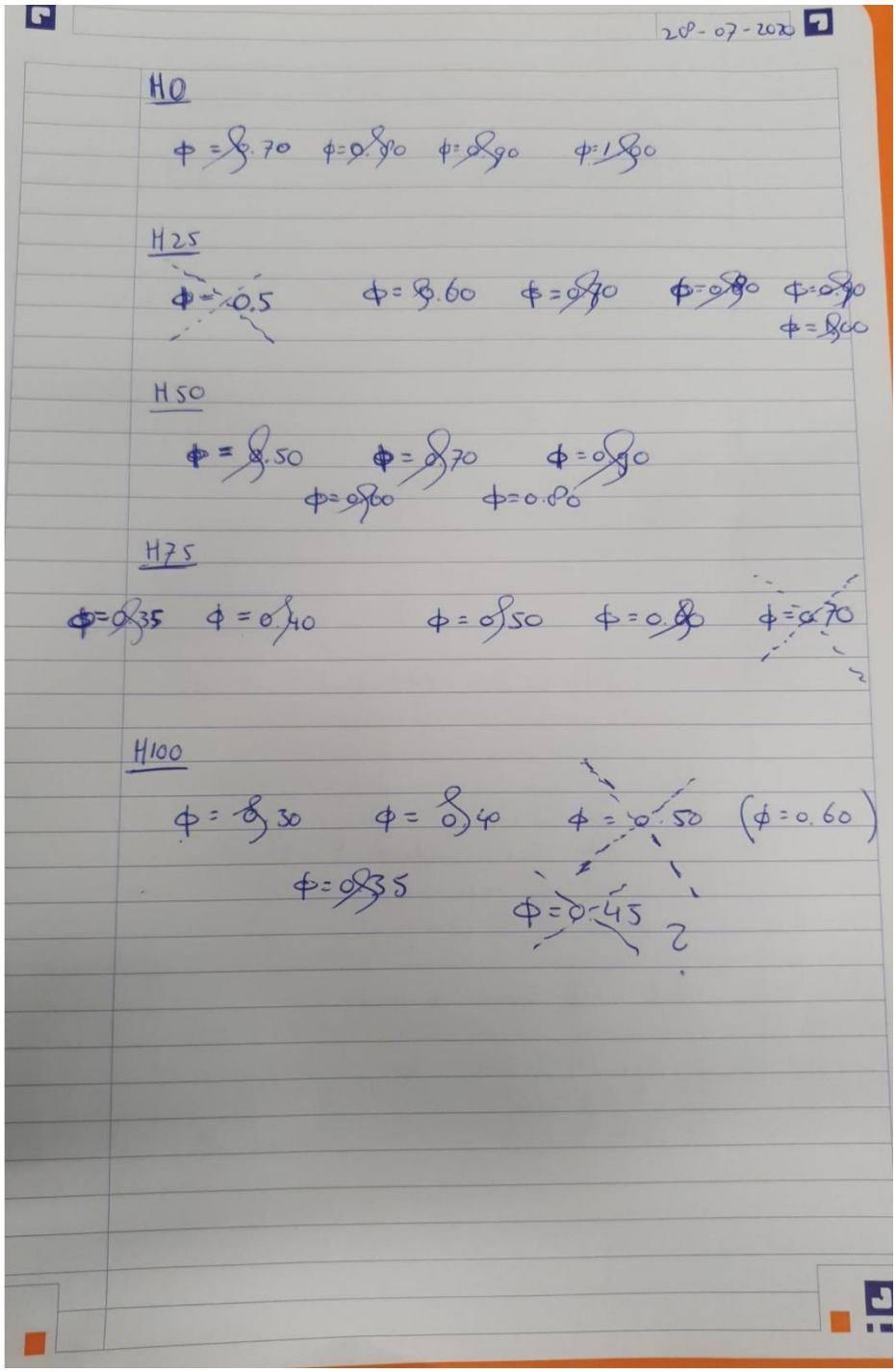
Steel liner set 1: 2020 28 July - 31 July

First complete flashback map scaled FlameSheet combustor with steel liner

IMPORTANT NOTES:

- Note that Hm is measured from the inner part of the gasket support ring
- H_gap is assumed to be 0 mm throughout all experiments
- SCHUIFMAAT 1 was used to measure dimensions and distances

28 July 2020



20-07-2020

H0
$\phi = 0.70$ test 1

H_m = 146.7 mm (schuifmaat 1)

H0
$\phi = 0.80$ test 1

H_m = 146.7 mm (" 1)

- flikkeren van vlam → heeft hem warmt
- eerste test : data opslaan mislukt → panel niet aan en uit zetten ivm initialisatie files

H0
$\phi = 0.90$ test 1

H_m = 146.7 mm (" 1)

H0
$\phi = 1.00$

H_m = 146.7 mm (" 1)

H100
$\phi = 0.30$ test 1

H_m = 146.7 mm
- aangeslagen op $\phi = 0.40$
$\%H_2 = 70\%$
$u_1 = 8$ m/s

H100 test 2

$ [ϕ = 0.30]

- FB velocity = laatst set velocity in data file
  Hm = niet gemeten

H100

$ [ϕ = 0.40] test 1

Hm = niet gemeten
- phi: laag → hoog (gewenste phi)

H100

$ [ϕ = 0.50] test 1

Hm = 146.7 mm (gemeten na 2 bovenstaande metingen → zelfde Hm)

- aangestoken op ϕ = 0.40
  H_2% = 50%
  u_1 = 7 m/s
- mengsel bereikt ~~#~~ startend vanuit lage phi
- Niet gelukt ! → vermoeden: te lage snelheid

H100

$ [ϕ = 0.50] test 2

Hm = 147 mm

- Niet gelukt

Notes

- flow is a symmetrisch → premixers !
- vlam in punt C:
  - hoe verifiëren we dat de 100% H_2 vlam in punt C zit?
- ~~dns~~ DNG MFC convergeert traag ~~in~~ bij lage flows

28-07-2020

H50

$\phi = 0.50$ test 1

H_m = 147 mm

H50

$\phi = 0.70$ test 1

H_m = 146.7 mm

H50

$\phi = 0.90$ test 1

H_m = 146.7 mm

29-07-2020

H75

$\phi = 0.40$ test 1

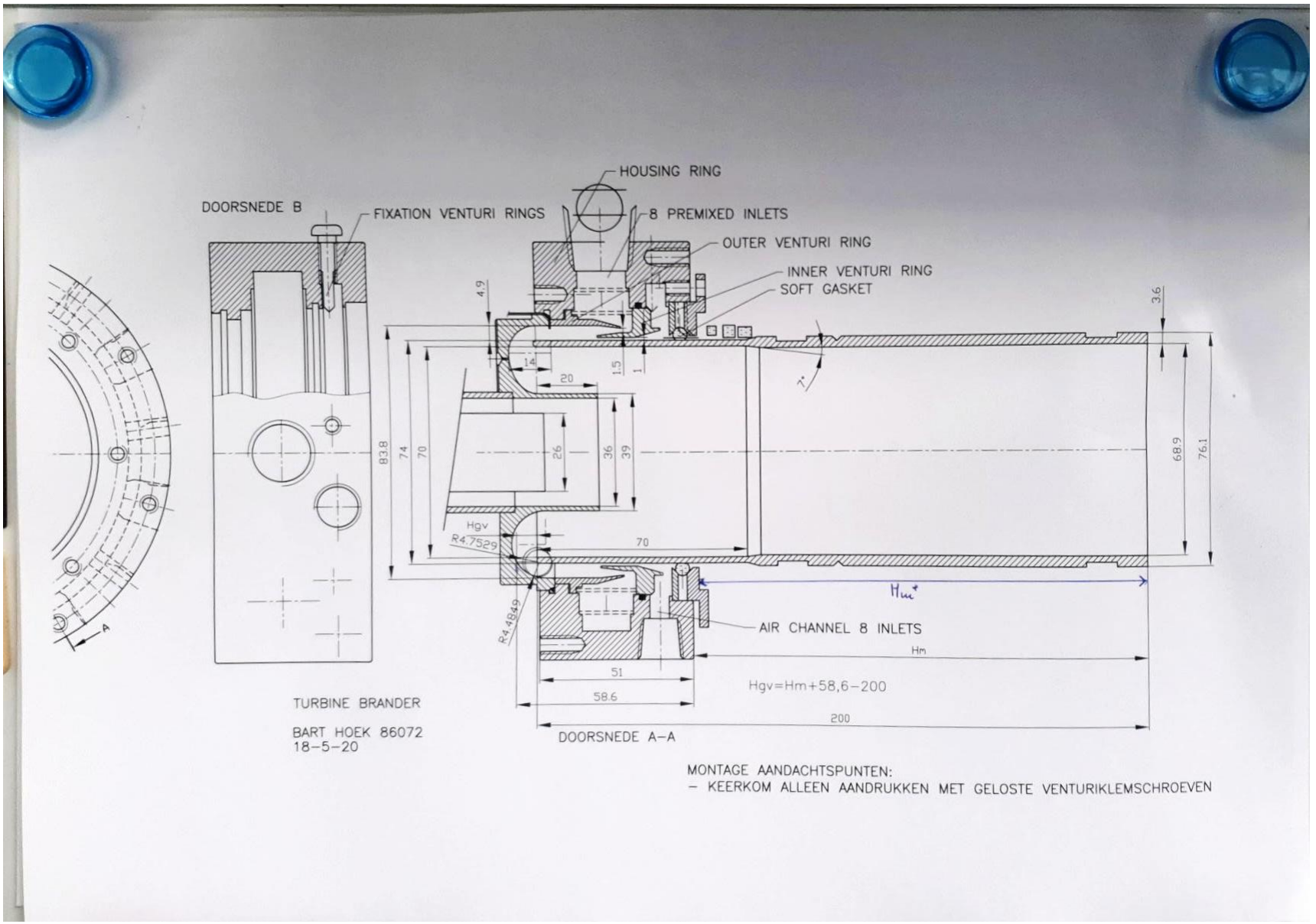
H_m = 146.8 mm

H75

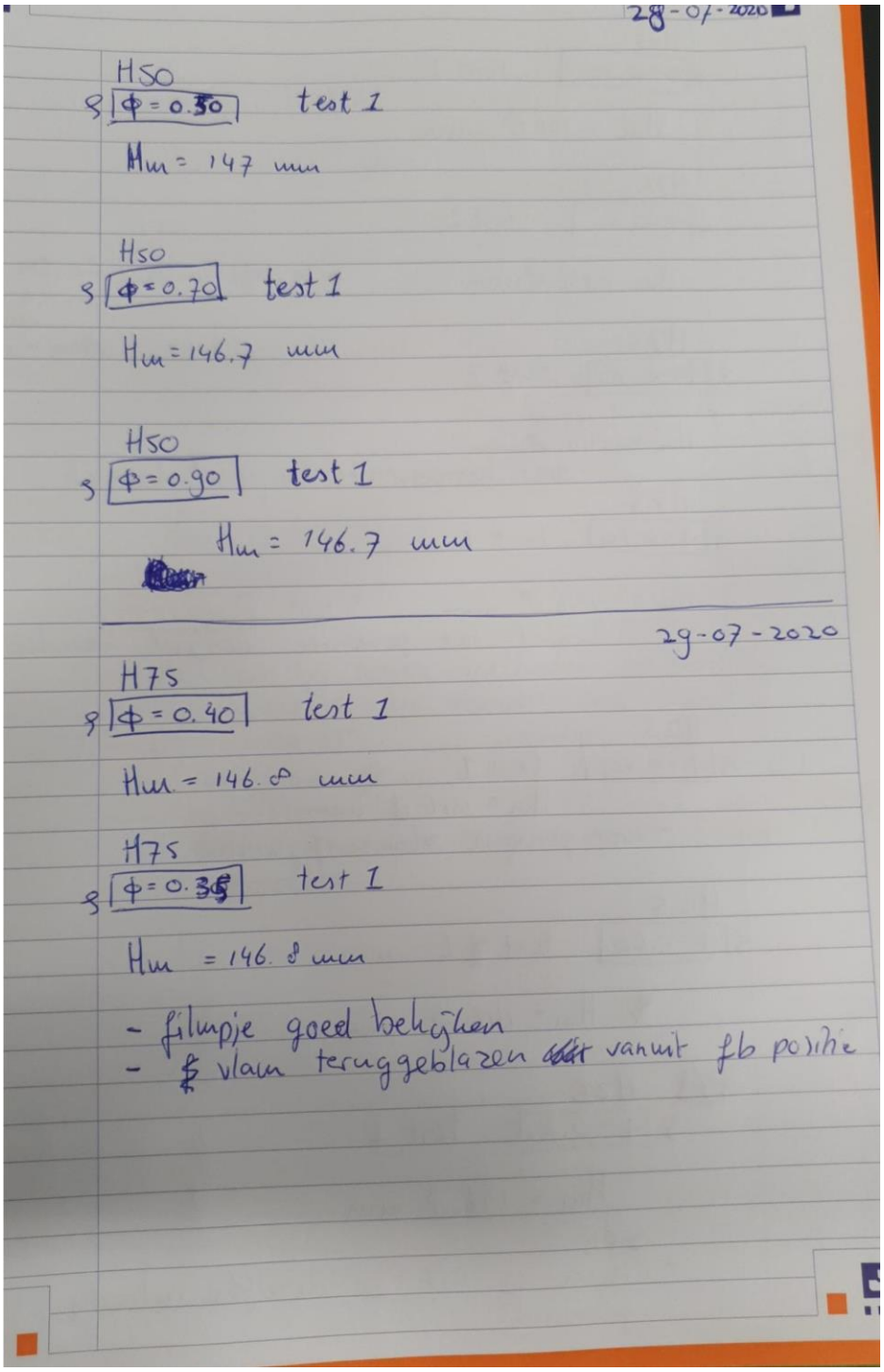
$\phi = 0.35$ test 1

H_m = 146.8 mm

- filmpje goed bekijken
- ~~ff~~ vlam teruggeblazen ~~dat~~ vanuit fb positie


DOORSNEDE B
FIXATION VENTURI RINGS
HOUSING RING
8 PREMIXED INLETS
OUTER VENTURI RING
INNER VENTURI RING
SOFT GASKET
4.9
3.6
14
20
1.5
1
83.8
74
70
26
36
39
68.9
76.1
Hgv
R4.7529
70
Hm*
R4.4849
AIR CHANNEL 8 INLETS
Hm
51
58.6
Hgv=Hm+58,6−200
200
4
TURBINE BRANDER
BART HOEK 86072
18-5-20
DOORSNEDE A-A
MONTAGE AANDACHTSPUNTEN:
– KEERKOM ALLEEN AANDRUKKEN MET GELOSTE VENTURIKLEMSCHROEVEN

29 July 2020



28-07-2020

H50
ϕ = 0.30 test 1

H_m = 147 mm

H50
ϕ = 0.70 test 1

H_m = 146.7 mm

H50
ϕ = 0.90 test 1

H_m = 146.7 mm

29-07-2020

H75
ϕ = 0.40 test 1

H_m = 146.8 mm

H75
ϕ = 0.35 test 1

H_m = 146.8 mm

- filmpje goed bekijken
- $ vlam teruggeblazen ~~dat~~ vanuit fb positie

H75
$\phi = 0.50$ test 1

$H_m = 146.\delta$ mm

H75
$\phi = 0,60$ test 1

$H_m = 146.\delta$ mm

- te hoge snelheid → fb → oorzaak: acoustisch? vlam vibreert/ resoneert

H75
$\phi = 0.70$ test 1

$H_m = 146.\delta$ mm
- niet het gewenste mengsel bereikt

H75
$\phi = 0.70$ test 2

$H_m = 146.\delta$ mm
- niet het gewenste mengsel bereikt

H25
$\phi = 0.50$ test 1
$H_m = 146.\delta$ mm
- niet gewenste vlamconfiguratie

H25
$\phi = 0.60$ test 1

$H_m = 146.\delta$ mm

H25
$\phi = 0.70$ test 1

$H_m = 146.\delta$ mm

2FB:
- Check of het op dezelfde velocity gebeurd

H25

$ | Φ=0.80 | test 1

H_m = 146.8 mm

H25

$ | Φ=0.90 | test 1

- begin filmpje: vlam resoneert bij hoge snelheid → ~~hoog~~ hoog piepend (orgel) geluid (goed te zien bij wing 8)
- vanaf u_m = 3.25 m/s ~~vlam~~ → hoog geluid weg

H_m = 146.8 mm

H25

$ | Φ=1.00 | test 1

- vlam zit bij hogere snelheden op punt C bij mixer 5 en resoneert rond punt C bij mixer 8
  - vlam lijkt ~~op~~ op juiste plek (punt C) te zitten bij u_m = 2.75 m/s, dan verdwijnt het resonantie / hoog frequente geluid. axissymmetrisch

~~verdwijnen~~

H_m = 146.8 mm

H50

$\phi = 0.60$ test 1

$H_m = 146.8$ mm

H50

$\phi = 0.80$ test 1

$H_m = 146.8$ mm

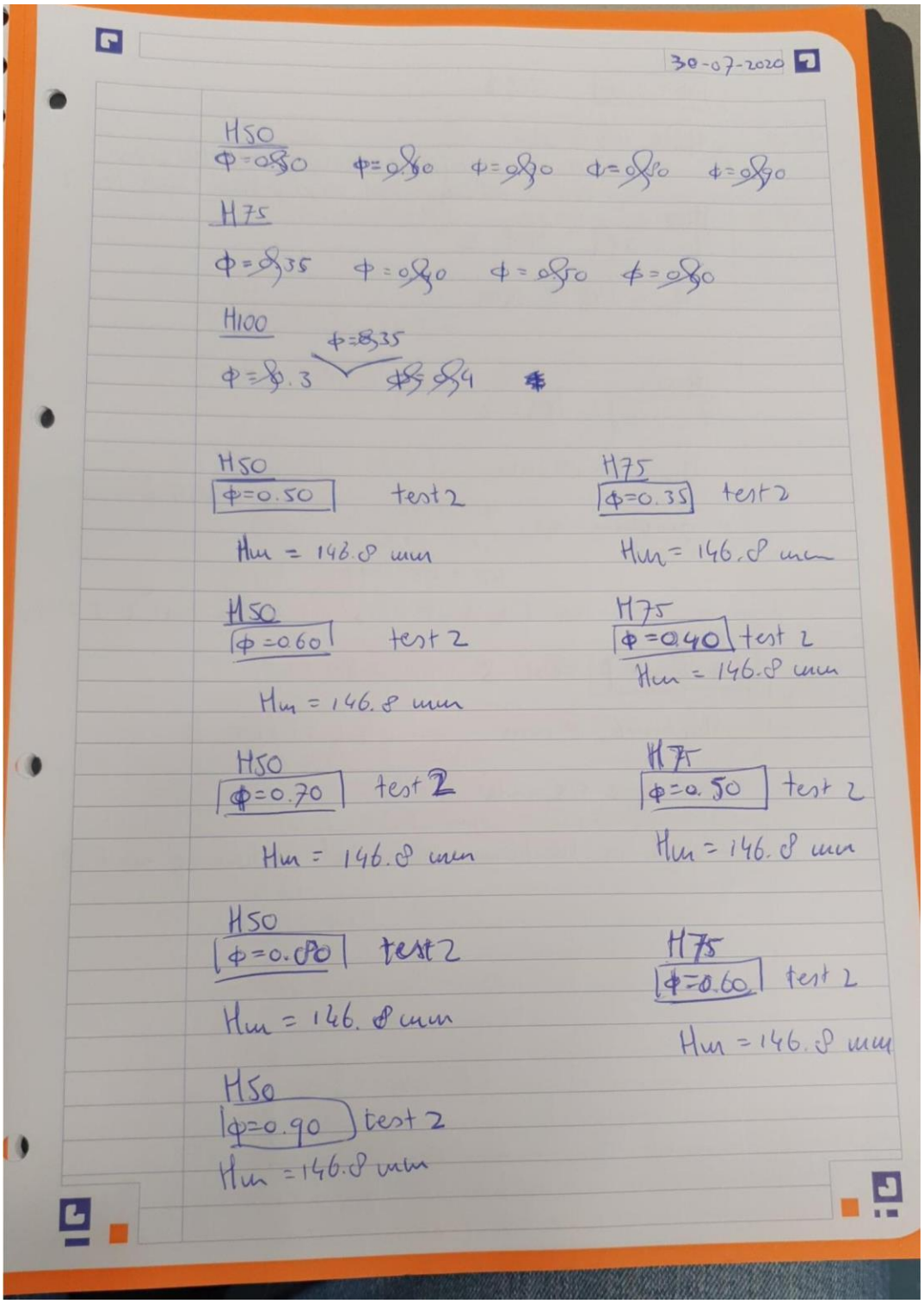
H100

$\phi = 0.35$ test 1

$H_m = 146.8$ mm

- aangestroken op $\phi = 0.35$
  $H_2\% = 80\%$
  $u_1 = 6$ m/s

30 July 2020


30-07-2020
H50
H75
H100
H50
Φ=0.50
test 2
Hm = 148.8 mm
H75
Φ=0.35
test 2
Hm = 146.8 mm
H50
Φ=0.60
test 2
Hm = 146.8 mm
H75
Φ=0.40
test 2
Hm = 146.8 mm
H50
Φ=0.70
test 2
Hm = 146.8 mm
H75
Φ=0.50
test 2
Hm = 146.8 mm
H50
Φ=0.80
test 2
Hm = 146.8 mm
H75
Φ=0.60
test 2
Hm = 146.8 mm
H50
Φ=0.90
test 2
Hm = 146.8 mm

H100

$\Phi = 0.30$ test 3

$H_m = 146.\delta$ mm

- FB op significant andere velocity dan test 1 ~~xxxxx~~, wel verklaarbaar met test 2

H100

$\Phi = 0.35$ test 2

$H_m = 146.\delta$ mm

H100

$\Phi = 0.40$ test 2

$H_m = 146.\delta$ mm

$T_{lab} = 20.4\ ^\circ C$

aangestoken op $\Phi = 0.40$
$H_{lucht} = 90\%$
$u_1 = 5.5$ m/s

- FB: test 1 $\approx$ 5.95 m/s, ~~xxxxx~~ test 2 $\approx$ 5.1 m/s

H100

$\Phi = 0.40$ test 3

$H_m = 146.\delta$ mm $\quad T_{lab} = 21.5\ ^\circ C$

test 2 $\approx$ 5.5 m/s

- vlam in heersen → warmt heersen op → FB

H0

$\phi = 0.50$ $\phi = 0.70$ $\phi = 0.80$ $\phi = 0.90$ $\phi = 0.90$

H25

$\phi = 0.50$ $\phi = 0.60$ $\phi = 0.70$ $\phi = 0.80$ $\phi = 0.90$

H25

$\phi = 0.50$ test 2

$H_m = 146.8$ mm

H25

$\phi = 0.60$ test 2

$H_m = 146.8$ mm

H25

$\phi = 0.70$ test 2

$H_m = 146.5$ mm (146.8 mm)

↳ meet locchie

H25

$\phi = 0.80$ test 2

$H_m = 146.5$ mm (146.8 mm)

H25

$\phi = 0.90$ test 2

$H_m = 146.8$ mm

H0

$\phi = 0.60$ test 1

$H_m = 146.8$ mm

HO

$\phi = 0.70$ test 2

$H_m = 146.6$ mm

HO

$\phi = 0.80$ test 2

$H_m = 146.8$ mm

HO

$\phi = 0.90$ test 2

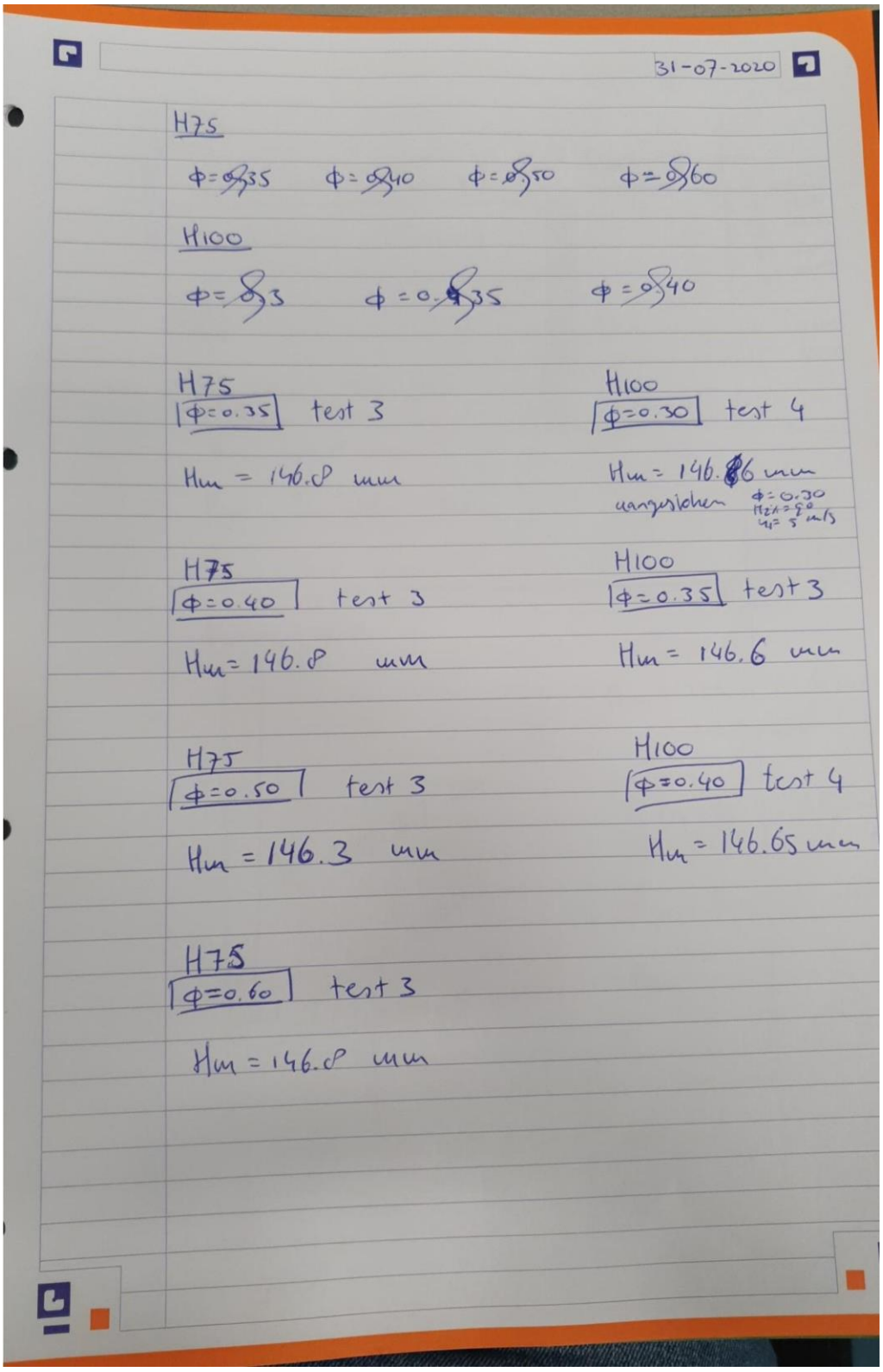
$H_m = 146.8$ mm

HO

$\phi = 1.00$ test 2

$H_m = 146.8$ mm

31 July 2020


31-07-2020
H75
ϕ=0.35 ϕ=0.40 ϕ=0.50 ϕ=0.60
H100
ϕ=0.3 ϕ=0.35 ϕ=0.40
H75
ϕ=0.35 test 3
Hm = 146.8 mm
H100
ϕ=0.30 test 4
Hm = 146.86 mm
aangepaste ϕ=0.30 Hzh=50 vi=5 m/s
H75
ϕ=0.40 test 3
Hm=146.8 mm
H100
ϕ=0.35 test 3
Hm = 146.6 mm
H75
ϕ=0.50 test 3
Hm = 146.3 mm
H100
ϕ=0.40 test 4
Hm = 146.65 mm
H75
ϕ=0.60 test 3
Hm = 146.8 mm