

IP

Whiskybottelmachine: mechanisch

Ramses De Vuyst

3EMEM3

2020-2021

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1 Opdrachtsomschrijving

1.1 Situering

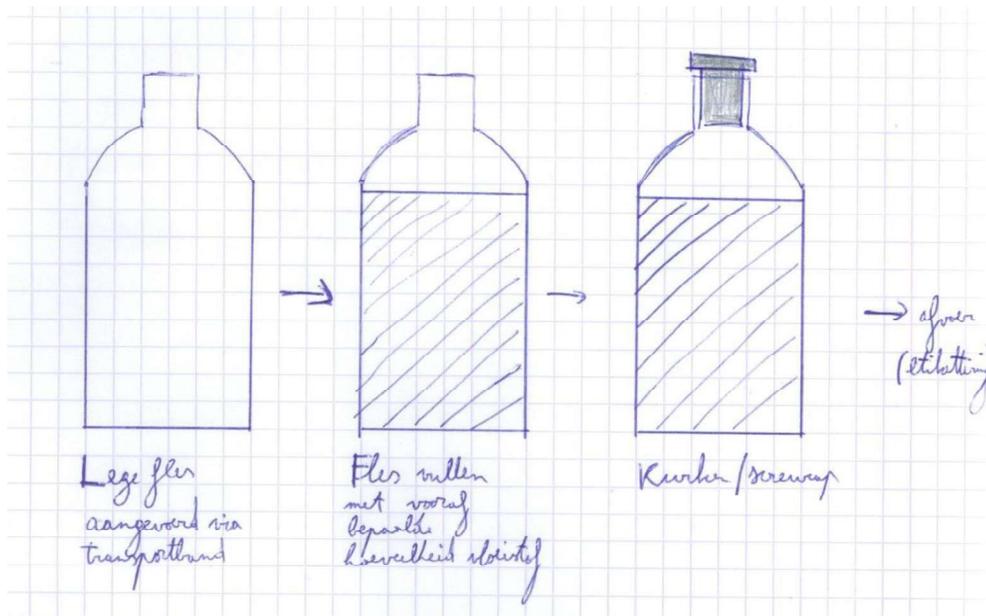
Firma: Château Pabus, Chemin de Menusey, 33670 Sadirac, Frankrijk

Kerntaak: Alcoholische dranken produceren

1.2 Beginsituatie

De producent wil graag uitbreiden en een whiskystokerij starten. Hij wil graag een productielijn die modulair opgebouwd is, zodat er makkelijk overgeschakeld kan worden naar andere flesontwerpen. De producent wil de mogelijkheid hebben om de productie om te schakelen tussen gewone flessen en uniekere ontwerpen, waaronder 'sample bottles'. Dit zijn kleine flessen die bijvoorbeeld als cadeau bij proeverijen gegeven worden. De bottelmachines die momenteel op de markt verkrijgbaar zijn, worden specifiek ontworpen voor slechts 1 flesstype, en zijn op enkele uitzonderingen na in het geheel niet modulair.

De machine moet 2 handelingen uitvoeren, namelijk het vullen en het kurken van de flessen.



1.3 Producten

Whiskyflessen:

- Geen gestandaardiseerde formaten
- Screwcap of kurk (moet kunnen omschakelen)
- Aan- en afvoer via transportband
- Perslucht en 3x400VAC ter beschikking

Om het project binnen de tijdspanne van 1 semester haalbaar te maken, werd er besloten enkel met kurken te werken.

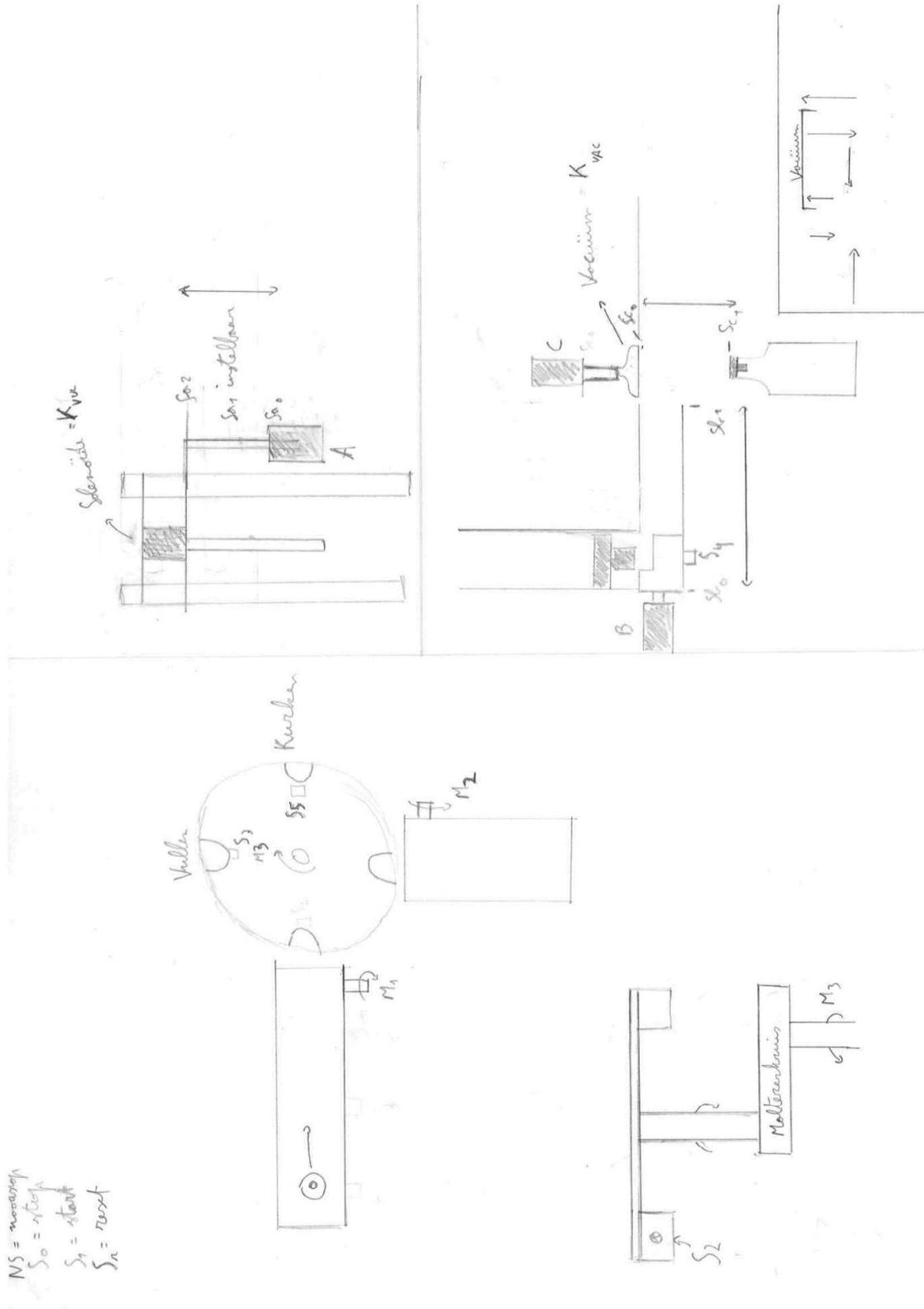
1.4 Probleem

De beschikbare bottelmachines zijn moeilijk/niet afstelbaar op verschillende flesformaten.

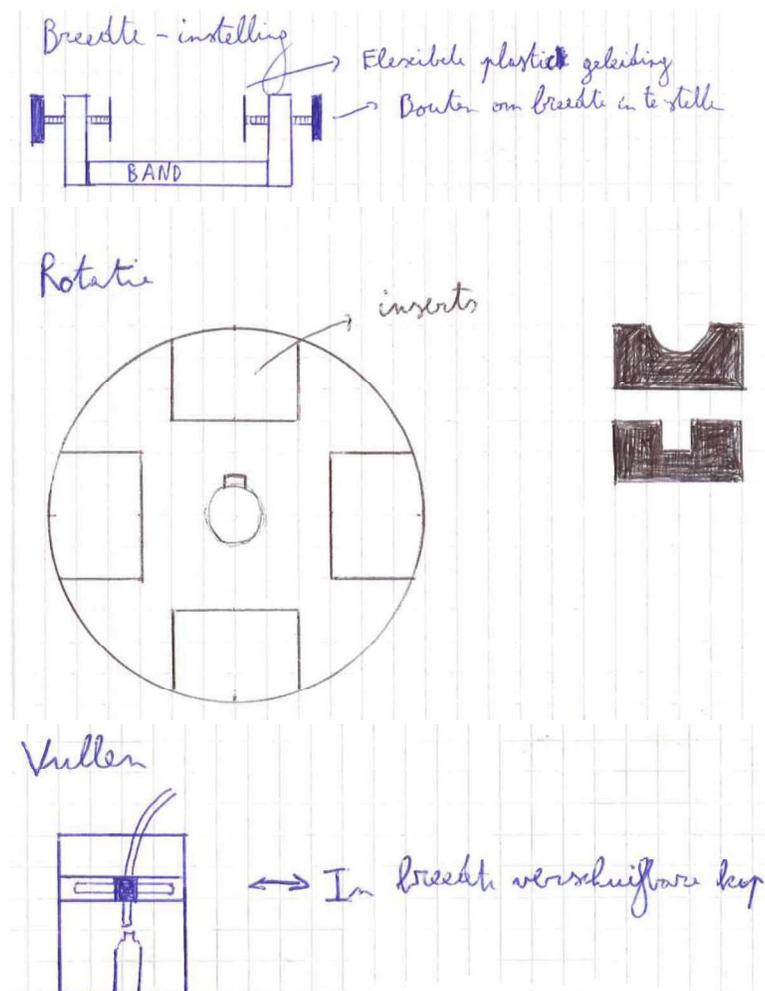
1.5 Gewenste eindsituatie

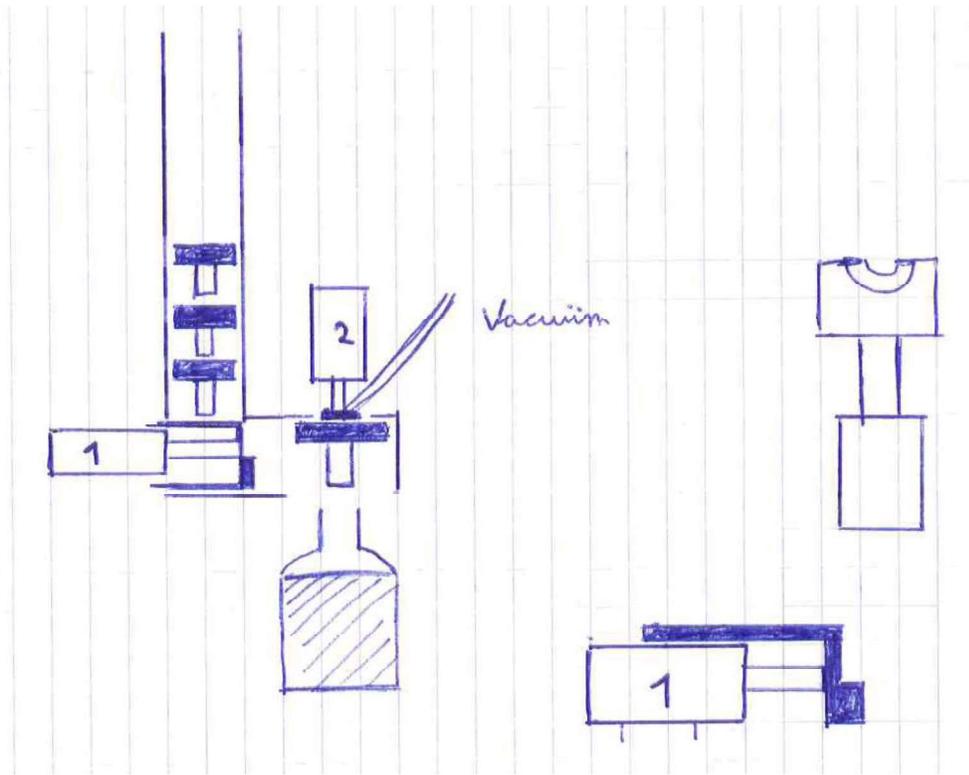
- Een bottelmachine die binnen het uur omgeschakeld kan worden tussen verschillende flesgroottes.
- Gewenste productiecapaciteit van 200.000 flessen per jaar
- Machine moet, zolang er aanvoer van flessen is, compleet autonoom en zonder tussenkomst van een operator werken

2 Gekozen concept



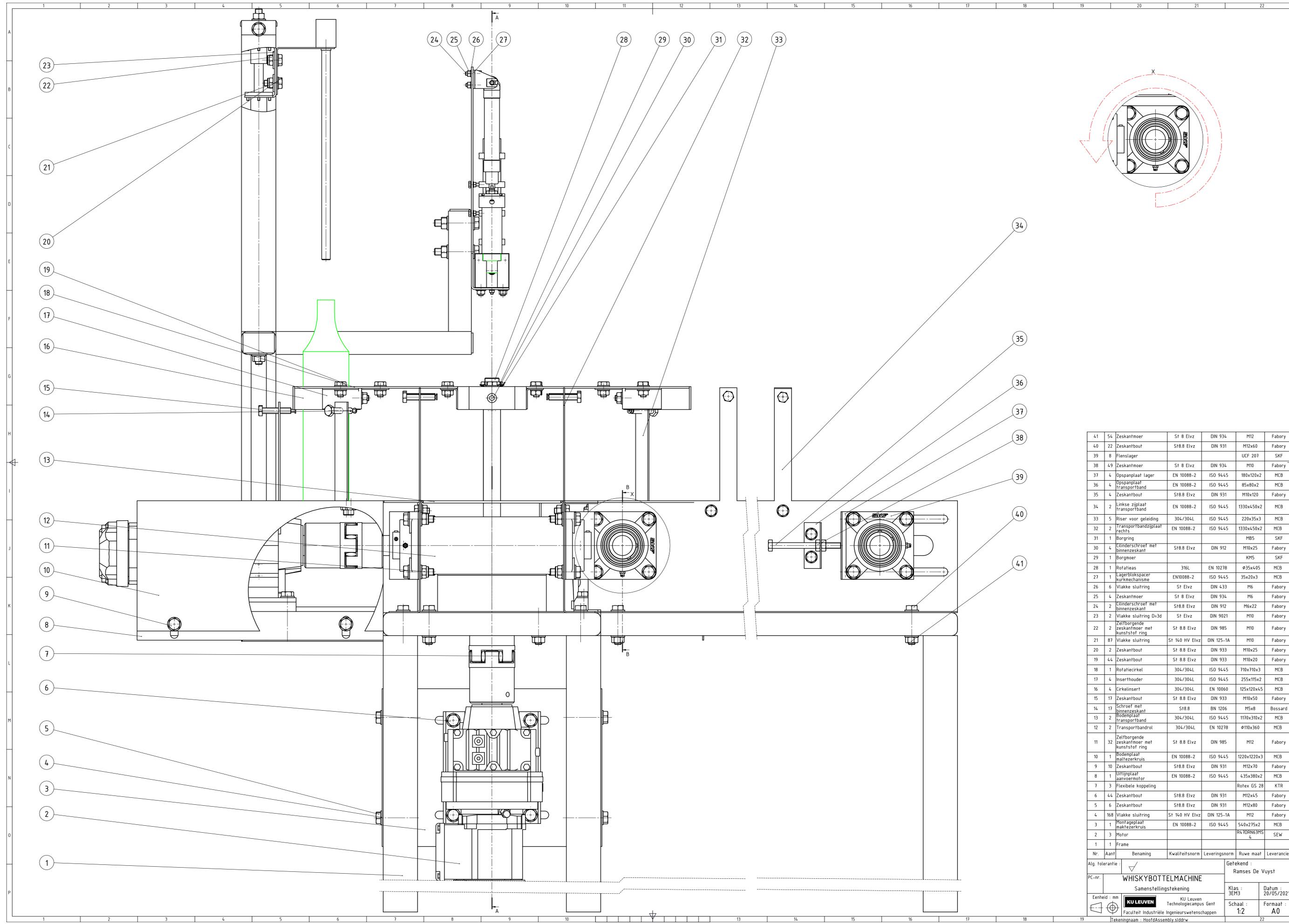
In het gekozen concept komen de lege flessen toe via een aanvoertransportband. De flessen komen op deze manier in de rotatiecirkel terecht. De rotatiecirkel heeft verwisselbare inserts om het flestype aan te passen. Ze is aangedreven via een maltezerkruis, dat ervoor zorgt dat bij elke rotatie van de motor de cirkel een kwartslag roteert. Na de eerste rotatie komt de fles onder de vullans terecht. Deze vullans is verwisselbaar met verschillende lengtes, en kan van horizontaal bijgesteld worden. De vullans wordt bewogen door een pneumatische cilinder, en de beweging wordt via 2 assen geleid. Na het vullen draait de rotatiecirkel weer een kwartslag verder, en komt de fles bij de vulstap terecht. Hierbij worden de kurken via een magazijn in een uitgefreesd blokje gevoed. Dit blokje verplaatst de kurk tot ze onder de bevestigingscilinder terecht komt, waarna ze op de fles gezet wordt.





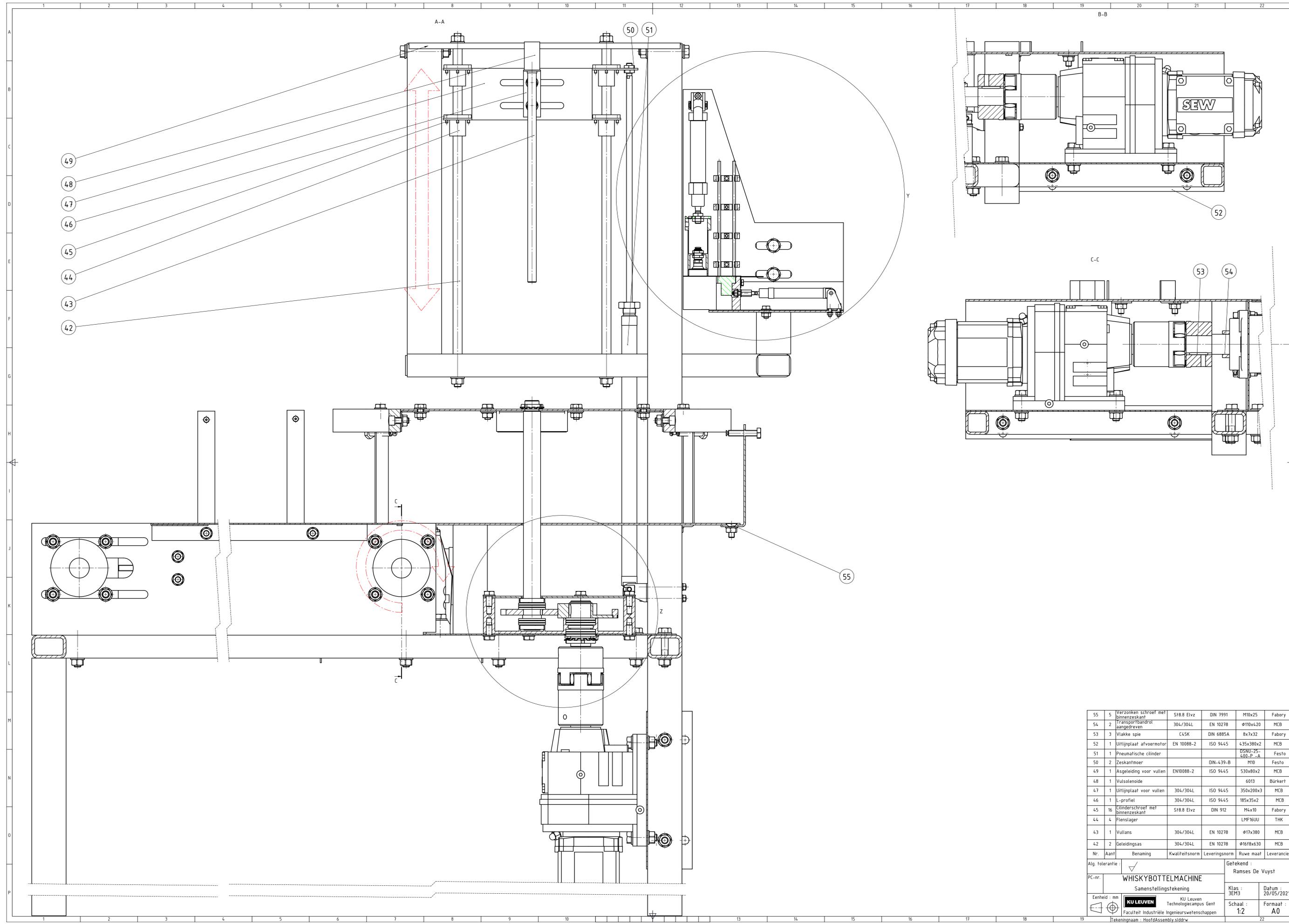
3 Tekeningen

3.1 Samenstellingstekening + stuktekeningen



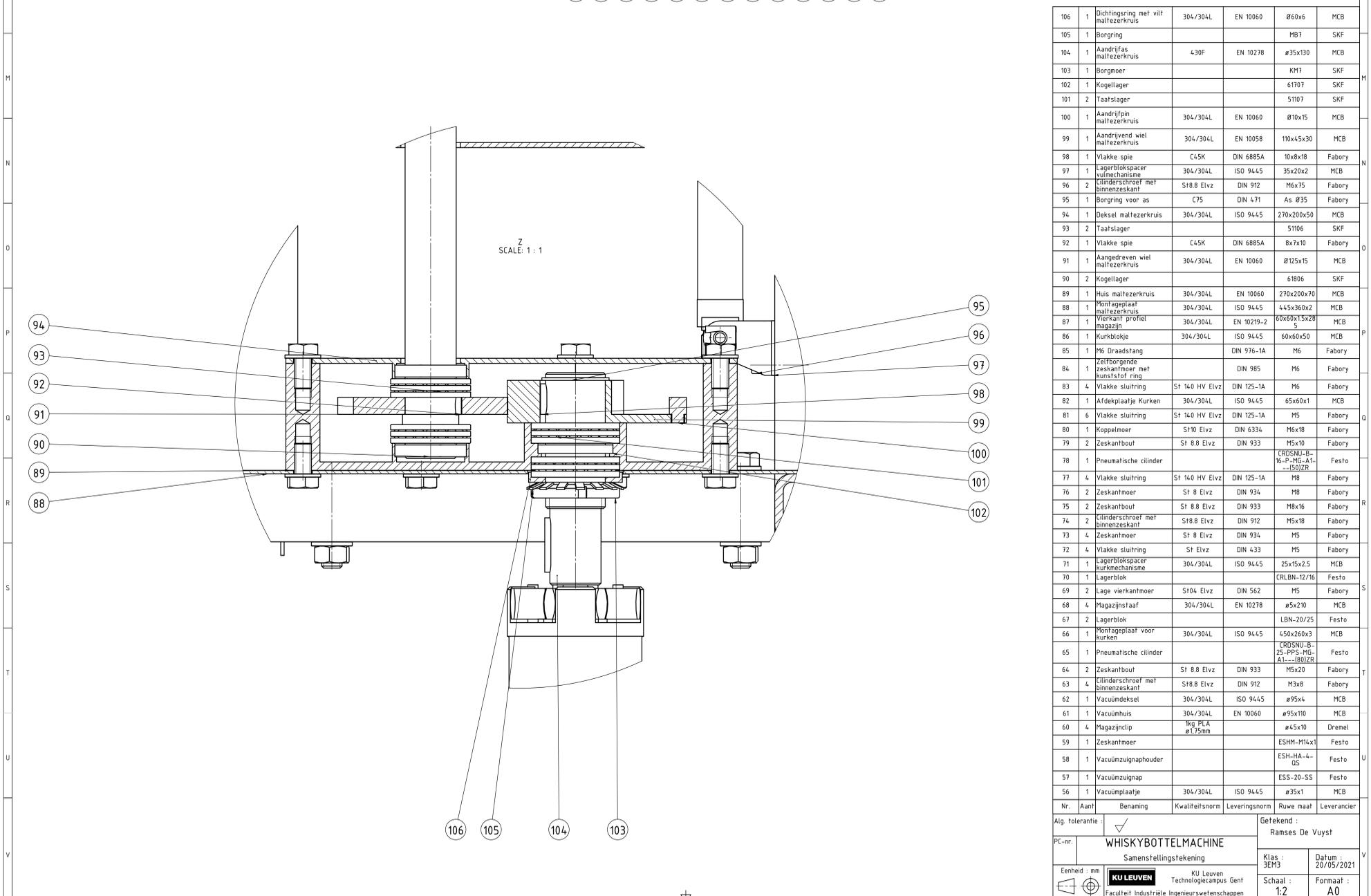
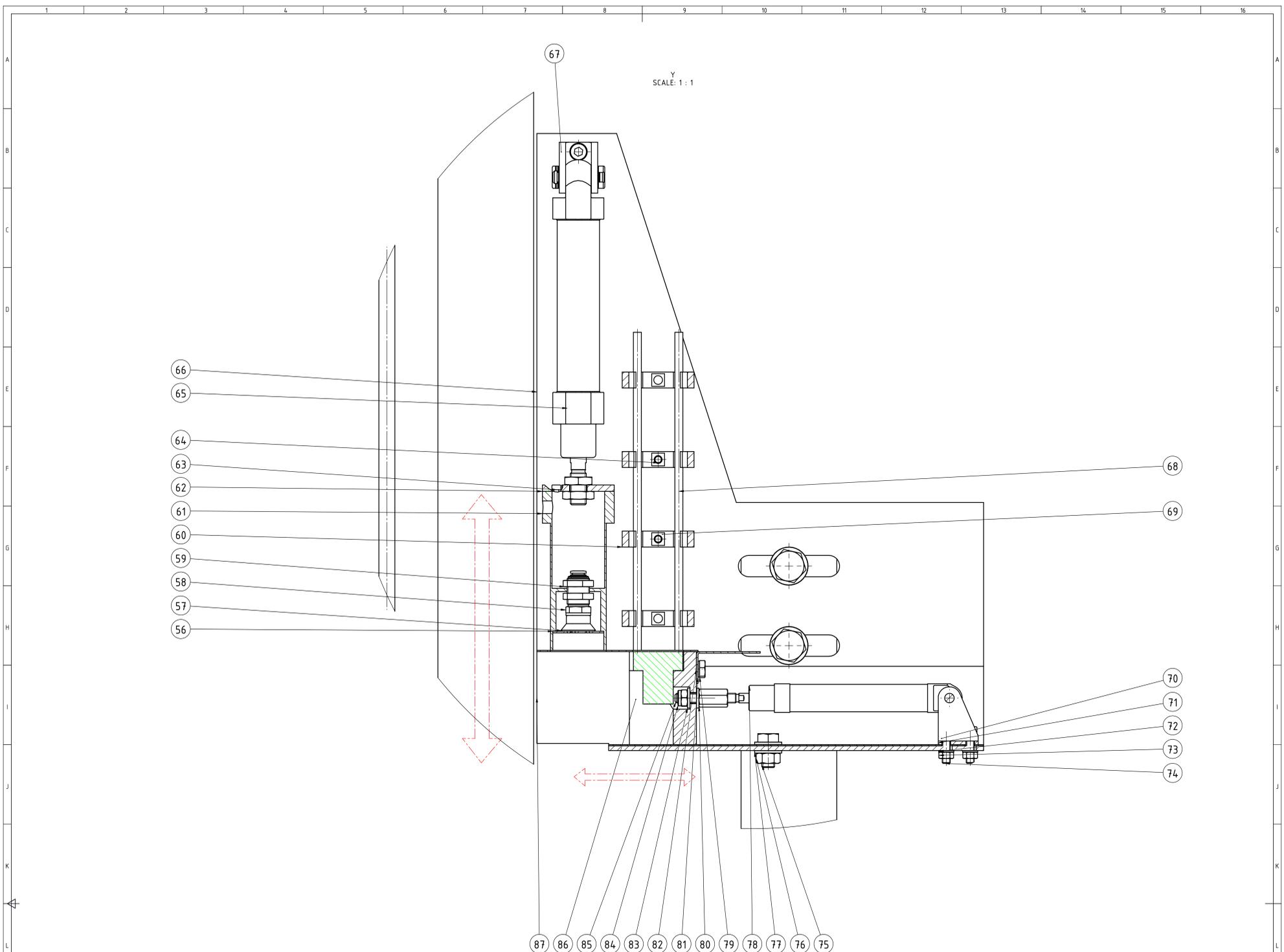
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41	54	Zeskantmoer	St 8 Elvz	DIN 934	M12	Fabory
40	22	Zeskantbout	St 8 Elvz	DIN 931	M12x60	Fabory
39	8	Flenslager		UCF 207		SKF
38	4,9	Zeskantmoer	St 8 Elvz	DIN 934	M10	Fabory
37	4	Opspanplaat lager	EN 10088-2	ISO 9445	180x120x2	MCB
36	4	Opspanplaat transportband	EN 10088-2	ISO 9445	95x80x2	MCB
35	4	Zeskantbout	St 8 Elvz	DIN 931	M10x120	Fabory
34	2	Linkse zijplaat transportband	EN 10088-2	ISO 9445	1330x450x2	MCB
33	5	Riser voor geleiding	304/304L	ISO 9445	220x35x3	MCB
32	2	Transportbandzijplaat rechts	EN 10088-2	ISO 9445	1330x450x2	MCB
31	1	Borgring			MBS	SKF
30	4	Cilinderschroef met binnenzeskant	St 8 Elvz	DIN 912	M10x25	Fabory
29	1	Borgmoer			KMS	SKF
28	1	Rotafless	316L	EN 10278	Ø35x405	MCB
27	1	Lagerblokspacer kurkmechansme	EN10088-2	ISO 9445	35x20x3	MCB
26	6	Vlakke sluitring	St Elvz	DIN 433	M6	Fabory
25	4	Zeskantmoer	St 8 Elvz	DIN 934	M6	Fabory
24	2	Cilinderschroef met binnenzeskant	St 8 Elvz	DIN 912	M6x22	Fabory
23	2	Vlakke sluitring D=3d	St Elvz	DIN 9021	M10	Fabory
22	2	Zelfborgende zeskantmoer met kunststof ring	St 8,8 Elvz	DIN 985	M10	Fabory
21	87	Vlakke sluitring	St 10,0 HV Elvz	DIN 125-1A	M10	Fabory
20	2	Zeskantbout	St 8,8 Elvz	DIN 933	M10x25	Fabory
19	4,4	Zeskantbout	St 8,8 Elvz	DIN 933	M10x20	Fabory
18	1	Rotaflicirikel	304/304L	ISO 9445	710x710x3	MCB
17	4	Inserhouder	304/304L	ISO 9445	255x115x2	MCB
16	4	Cirkelinsert	304/304L	EN 10060	125x120x4,5	MCB
15	17	Zeskantbout	St 8,8 Elvz	DIN 933	M10x50	Fabory
14	17	Schroef met binnenzeskant	St 8,8	BN 1206	M5x8	Bossard
13	2	Montageplaat transportband	304/304L	ISO 9445	1170x310x2	MCB
12	2	Transportbandrol	304/304L	EN 10278	Ø110x360	MCB
11	32	Zelfborgende zeskantmoer met kunststof ring	St 8,8 Elvz	DIN 985	M12	Fabory
10	1	Bodemplaat malfezerkruis	EN 10088-2	ISO 9445	1220x1220x3	MCB
9	10	Zeskantbout	St 8,8 Elvz	DIN 931	M12x70	Fabory
8	1	Drijfplaat aanvoermotor	EN 10088-2	ISO 9445	435x380x2	MCB
7	3	Flexibele koppeling			Rofex GS 28	KTR
6	4,4	Zeskantbout	St 8,8 Elvz	DIN 931	M12x45	Fabory
5	6	Zeskantbout	St 8,8 Elvz	DIN 931	M12x80	Fabory
4	168	Vlakke sluitring	St 10,0 HV Elvz	DIN 125-1A	M12	Fabory
3	1	Montageplaat malfezerkruis	EN 10088-2	ISO 9445	540x275x2	MCB
2	3	Motor			R47DRN63MS	SEW
1	1	Frame				

Nr. Aant. Benaming Kwaliteitsnorm Leveringsnorm Ruwe maat Leverancier
 Alg. tolerantie: Gefekend: Ramses De Vuyst
 PC-nr.: WHISKYBOTTELMACHINE
 Samenstellings-tekening
 Eenheid: mm **KU LEUVEN** KU Leuven Technologiestrategie
 Faculteit Industriële Ingenieurswetenschappen
 Tekeningnaam: HoofdAssemblage/Asmblg.w



55	5	Verzonken schroef met binnenzaskant	S18.8 Elvz	DIN 7991	M10x25	Fabory
54	2	Transportbandrol aangedreven	304/304L	EN 10278	Ø110x420	MCB
53	3	Vlakke spie	C45K	DIN 6885A	8x7x32	Fabory
52	1	Uitlijnplaat afvoermotor	EN 10088-2	ISO 9445	435x380x2	MCB
51	1	Pneumatische cilinder			USNU-25-400-P-A	Festo
50	2	Zeskantmoer		DIN-439-B	M10	Festo
49	1	Asgeleiding voor vullen	EN10088-2	ISO 9445	530x80x2	MCB
48	1	Vulsolenoid			6013	Bürkert
47	1	Uitlijnplaat voor vullen	304/304L	ISO 9445	350x200x3	MCB
46	1	L-profiel	304/304L	ISO 9445	185x35x2	MCB
45	16	Cilinderschroef met binnenzaskant	S18.8 Elvz	DIN 912	M6x10	Fabory
44	4	Flenslager			LMP16UU	THK
43	1	Vullans	304/304L	EN 10278	Ø17x380	MCB
42	2	Geleidingsas	304/304L	EN 10278	Ø16f8x630	MCB

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KU Leuven Faculteit Industriële Ingenieurswetenschappen Technologiecampus Gent						Schaal: 1:2
Tekeningnaam: HoofdAssemblage.sldwtw						Formaat: A0



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106	1	Dichtingsring met vilt maltezerkruis	304/304L	EN 10060	Ø60x6	MCB
105	1	Borgring			M87	SKF
104	1	Aandrijfas maltezerkruis	430F	EN 10278	#35x130	MCB
103	1	Borgmoer			KM7	SKF
102	1	Kogellager			61707	SKF
101	2	Taatslager			51107	SKF
100	1	Aandrijfpin maltezerkruis	304/304L	EN 10060	Ø10x15	MCB
99	1	Aandrijvend wiel maltezerkruis	304/304L	EN 10058	110x45x30	MCB
98	1	Vlakke spie	C45K	DIN 6885A	10x8x18	Fabory
97	1	Lagerblokspacer vulmechanisme	304/304L	ISO 9445	35x20x2	MCB
96	2	Cilinderschroef met binnenzeskant	S18.8 Elvz	DIN 912	M6x75	Fabory
95	1	Borgring voor as	C75	DIN 471	As Ø35	Fabory
94	1	Deksel maltezerkruis	304/304L	ISO 9445	270x200x50	MCB
93	2	Taatslager			51106	SKF
92	1	Vlakke spie	C45K	DIN 6885A	8x7x10	Fabory
91	1	Aangedreven wiel maltezerkruis	304/304L	EN 10060	Ø125x15	MCB
90	2	Kogellager			61806	SKF
89	1	Huis maltezerkruis	304/304L	EN 10060	270x200x70	MCB
88	1	Montageplaat maltezerkruis	304/304L	ISO 9445	445x360x2	MCB
87	1	Vierkant profiel magazijn	304/304L	EN 10219-2	60x60x15x28	MCB
86	1	Kurklokje	304/304L	ISO 9445	60x60x50	MCB
85	1	M6 Draadstang		DIN 976-1A	M6	Fabory
84	1	Zelfborgende zeskantmoer met kunststof ring		DIN 985	M6	Fabory
83	4	Vlakke sluitring	S1 14.0 HV Elvz	DIN 125-1A	M6	Fabory
82	1	Afdeksplaatje Kurken	304/304L	ISO 9445	65x60x1	MCB
81	6	Vlakke sluitring	S1 14.0 HV Elvz	DIN 125-1A	M5	Fabory
80	1	Koppelmoer	S110 Elvz	DIN 6334	M6x18	Fabory
79	2	Zeskantbout	S1 8.8 Elvz	DIN 933	M5x10	Fabory
78	1	Pneumatische cilinder		CRDSNU-B-16-P-M6-A1-ISO2/3R		Festo
77	4	Vlakke sluitring	S1 14.0 HV Elvz	DIN 125-1A	M8	Fabory
76	2	Zeskantmoer	S1 8 Elvz	DIN 934	M8	Fabory
75	2	Zeskantbout	S1 8.8 Elvz	DIN 933	M8x16	Fabory
74	2	Cilinderschroef met binnenzeskant	S18.8 Elvz	DIN 912	M5x18	Fabory
73	4	Zeskantmoer	S1 8 Elvz	DIN 934	M5	Fabory
72	4	Vlakke sluitring	S1 Elvz	DIN 433	M5	Fabory
71	1	Lagerblokspacer kurkmechanisme	304/304L	ISO 9445	25x15x2.5	MCB
70	1	Lagerblok			CR1BN-12/16	Festo
69	2	Lage vierkantmoer	S104 Elvz	DIN 562	M5	Fabory
68	4	Magazijnstaaf	304/304L	EN 10278	#5x210	MCB
67	2	Lagerblok			LBN-20/25	Festo
66	1	Montageplaat voor kurken	304/304L	ISO 9445	450x260x3	MCB
65	1	Pneumatische cilinder			CRDSNU-B-25-PPS-M6-A1-ISO2/3R	Festo
64	2	Zeskantbout	S1 8.8 Elvz	DIN 933	M5x20	Fabory
63	4	Cilinderschroef met binnenzeskant	S18.8 Elvz	DIN 912	M3x8	Fabory
62	1	Vacuümdeksel	304/304L	ISO 9445	#95x4	MCB
61	1	Vacuümhuis	304/304L	EN 10060	#95x110	MCB
60	4	Magazijnclip	1kg PLA #1,75mm		#45x10	Dremel
59	1	Zeskantmoer			ESHM-M14x1	Festo
58	1	Vacuümzuignap			ESH-HA-4-OS	Festo
57	1	Vacuümzuignap			ESS-20-SS	Festo
56	1	Vacuümplaatje	304/304L	ISO 9445	#35x1	MCB

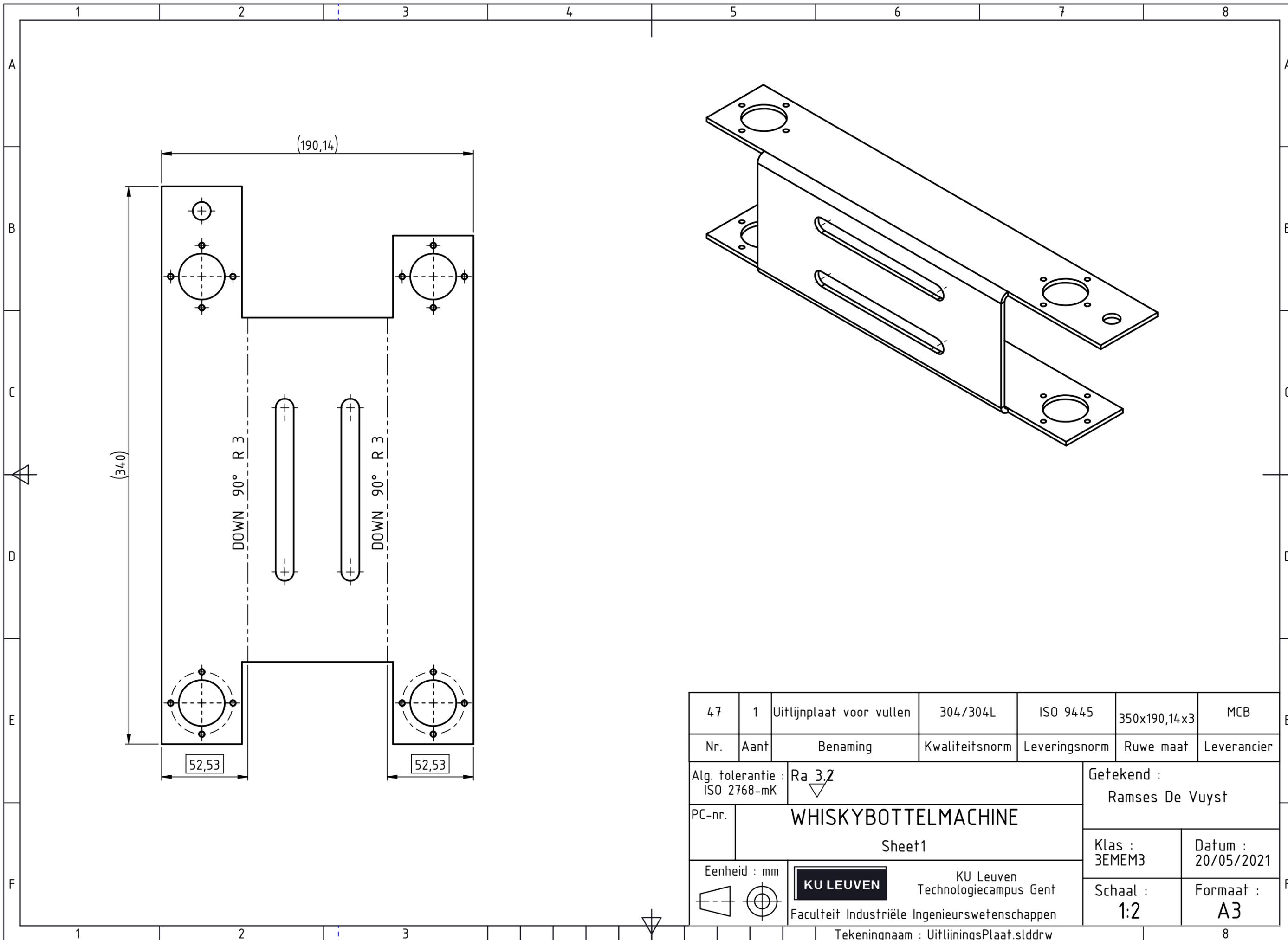
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PC-nr. : **WHISKYBOTTELMACHINE** Samenstellingstekening

Enheid : mm **KU LEUVEN** KU Leuven Technologicampus Gent
 Faculteit Industriële Ingenieurswetenschappen

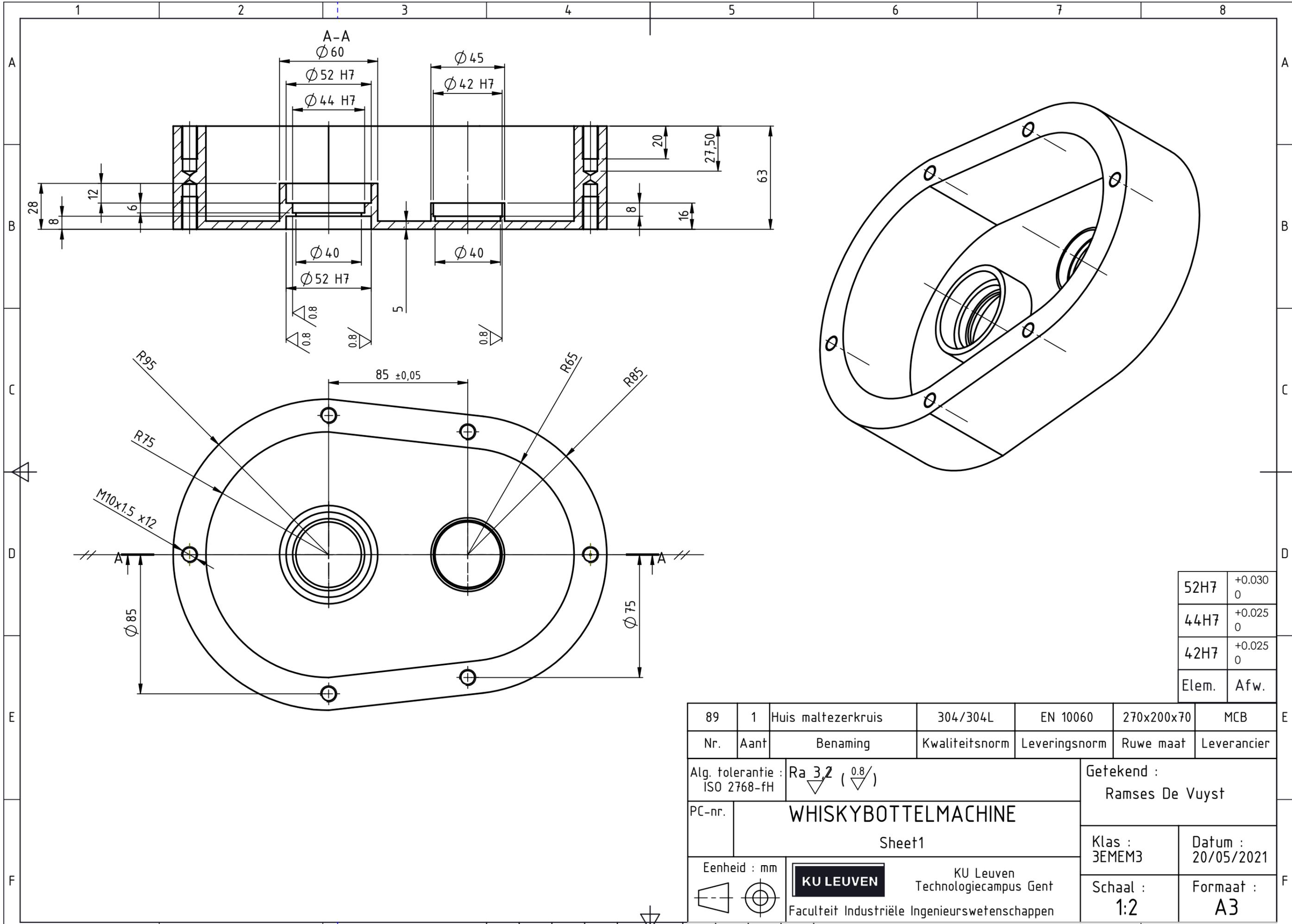
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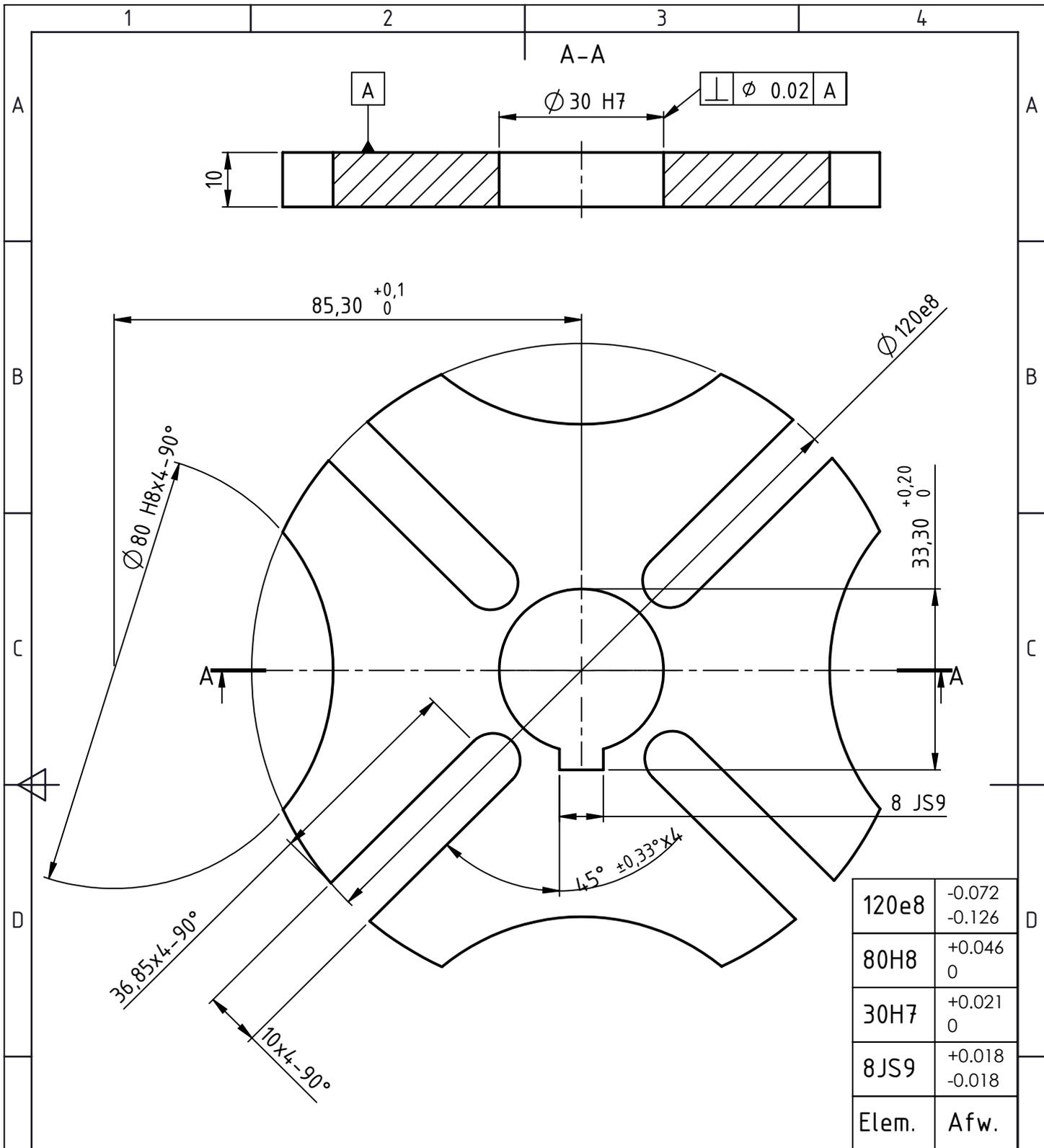
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Alg. tolerantie : Ra 3.2 ISO 2768-mK				Getekend : Ramses De Vuyst		
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Faculteit Industriële Ingenieurswetenschappen				Schaal : 1:2		Formaat : A3

Tekeningnaam : UitlijningsPlaat.slddrw



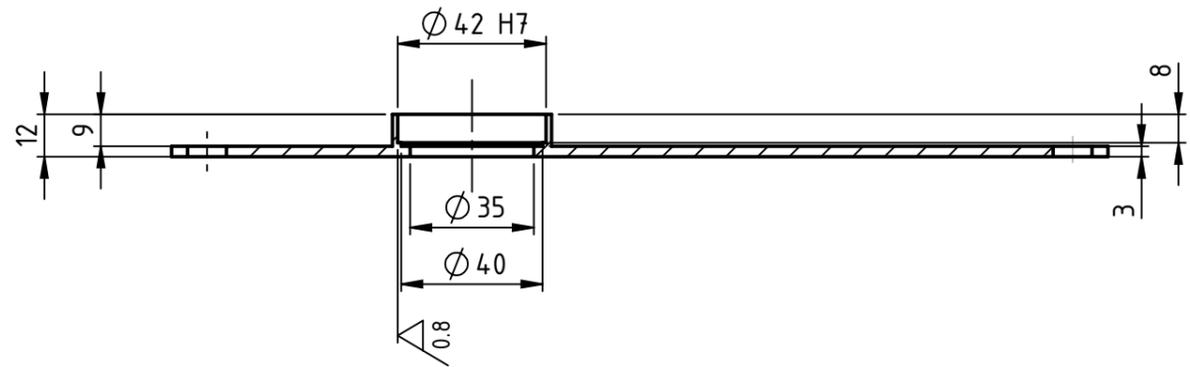
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42H7	+0.025 0
Elem.	Afw.

89	1	Huis maltezerkruis	304/304L	EN 10060	270x200x70	MCB	
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Eenheid : mm				KU Leuven Technologicampus Gent		Schaal : 1:2	Formaat : A3
Faculteit Industriële Ingenieurswetenschappen						Tekeningnaam : MK_Huis.slddrw	8

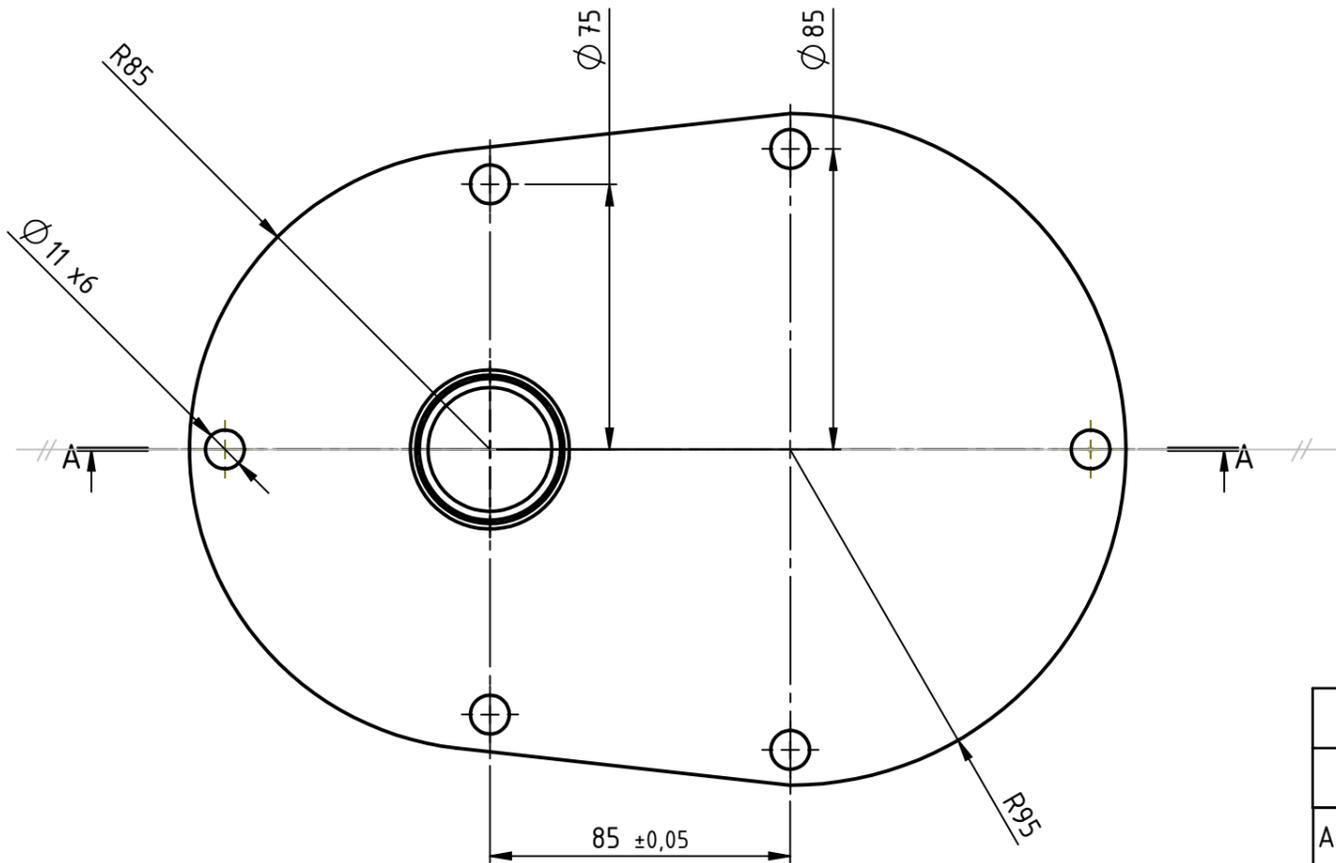
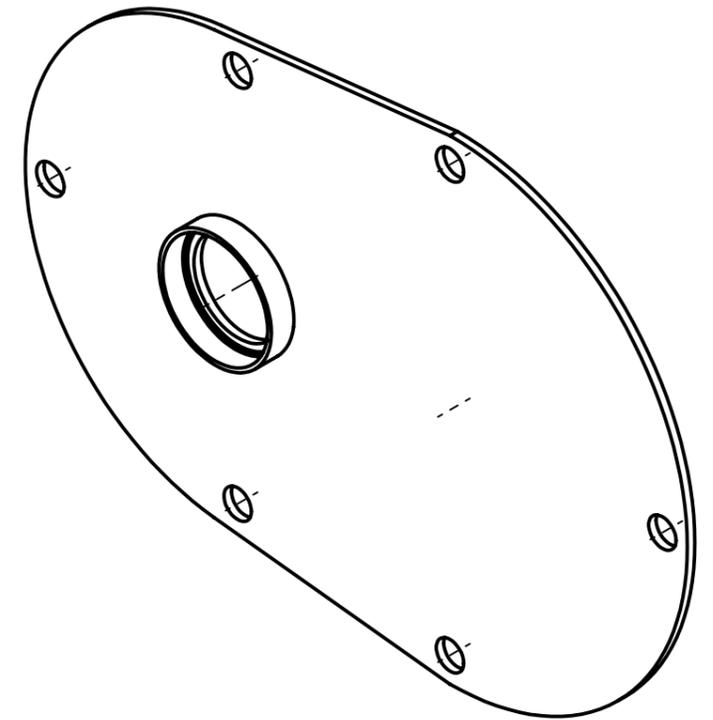


120e8	-0.072 -0.126
80H8	+0.046 0
30H7	+0.021 0
8JS9	+0.018 -0.018
Elem.	Afw.

91	1	Aangedreven wiel maltezerkruis	304/304L	EN 10060	Ø125x15	MCB
Nr.	Aant	Benaming	Kwaliteitsnorm	Leveringsnorm	Ruwe maat	Leverancier
Alg. tolerantie : Ra 3.2 ISO 2768-fH			Getekend : Ramses De Vuyst			
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Eenheid : mm	 KU Leuven Technologiestudie Gent Faculteit Industriële Ingenieurswetenschappen			Schaal : 1:1	Formaat : A4	



A-A



42H7	+0.025 0
Elem.	Afw.

94	1	Deksel maltezerkruis	304/304L	ISO 9445	270x200x50	MCB
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Alg. tolerantie : Ra 3,2 (0.8/)			ISO 2768-fH			Getekend : Ramses De Vuyst
PC-nr.		WHISKYBOTTELMACHINE				Klas : 3EMEM3
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				KU Leuven Technologicampus Gent		Schaal : 1:2
Faculteit Industriële Ingenieurswetenschappen					Formaat : A3	

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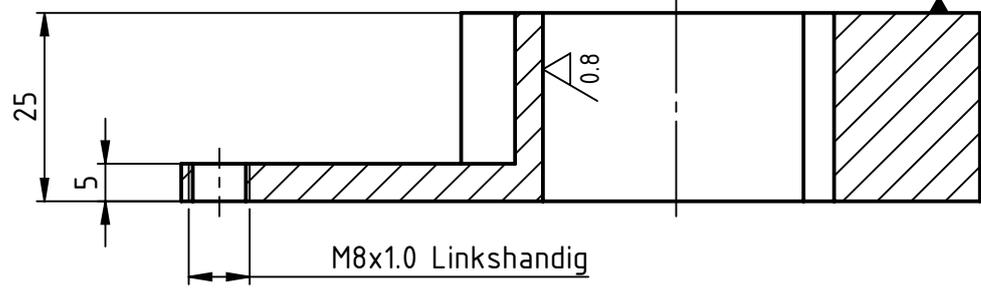
1 2 3 4

A

A

A-A

A



B

B

102 ±0,05

80,90 ^{+0,15}/_{-0,05}

38,30 ^{+0,20}/₀

Ø 35 H7

⊥ Ø 0.02 A

Ø 80 f7

R5

A

A

10 JS9

C

C

D

D

120H8	+0.054 0
35H7	+0.025 0
10JS9	+0.018 -0.018
Elem.	Afw.

Ø 120 H8

E

E

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Alg. tolerantie : Ra 3.2 (0.8/)
ISO 2768-fH

Getekend :
Ramses De Vuyst

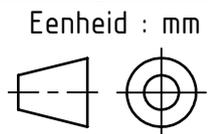
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Sheet1

Klas :
3EMEM3

Datum :
20/05/2021

F

F

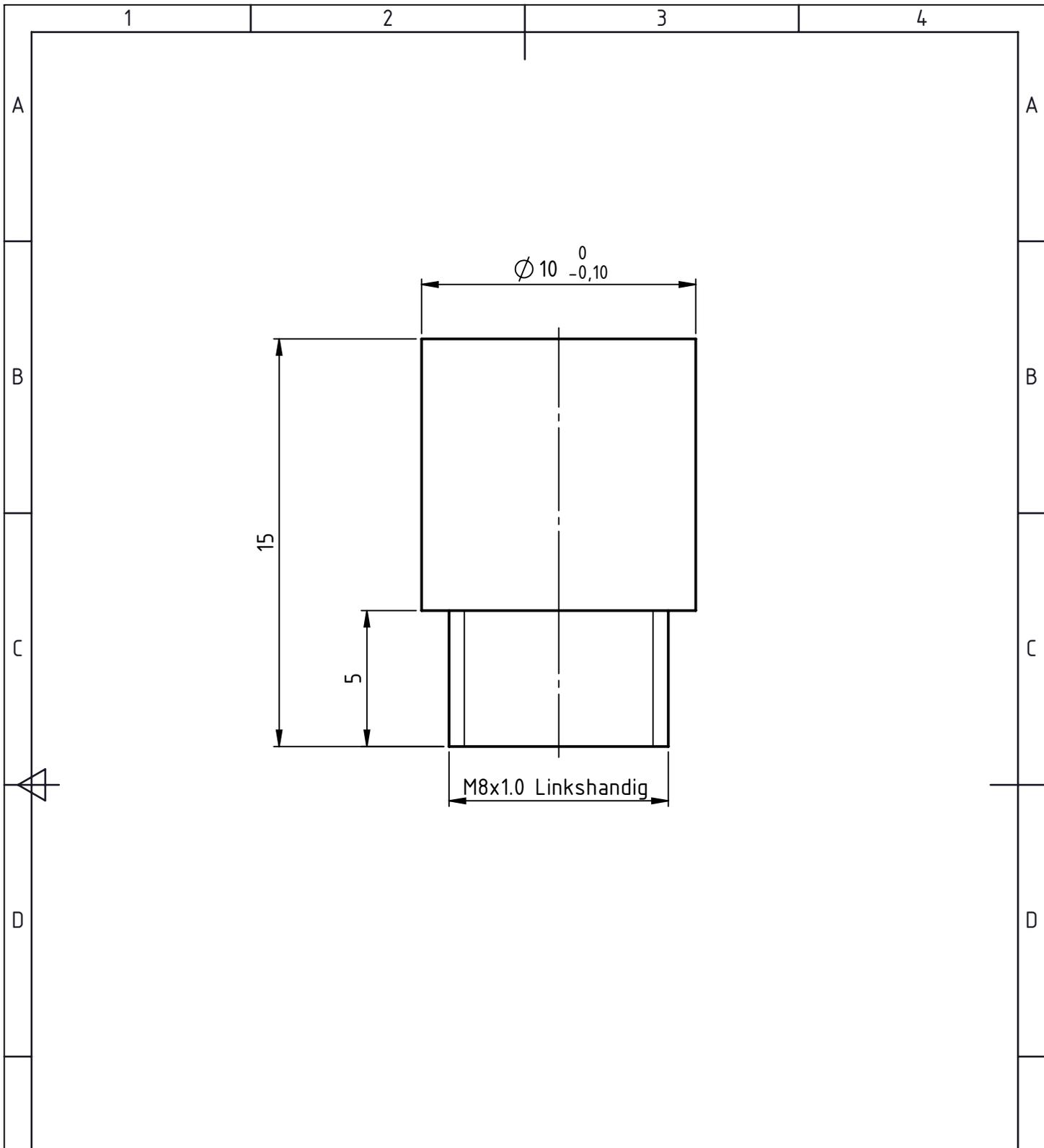


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Schaal :
1:1

Formaat :
A4



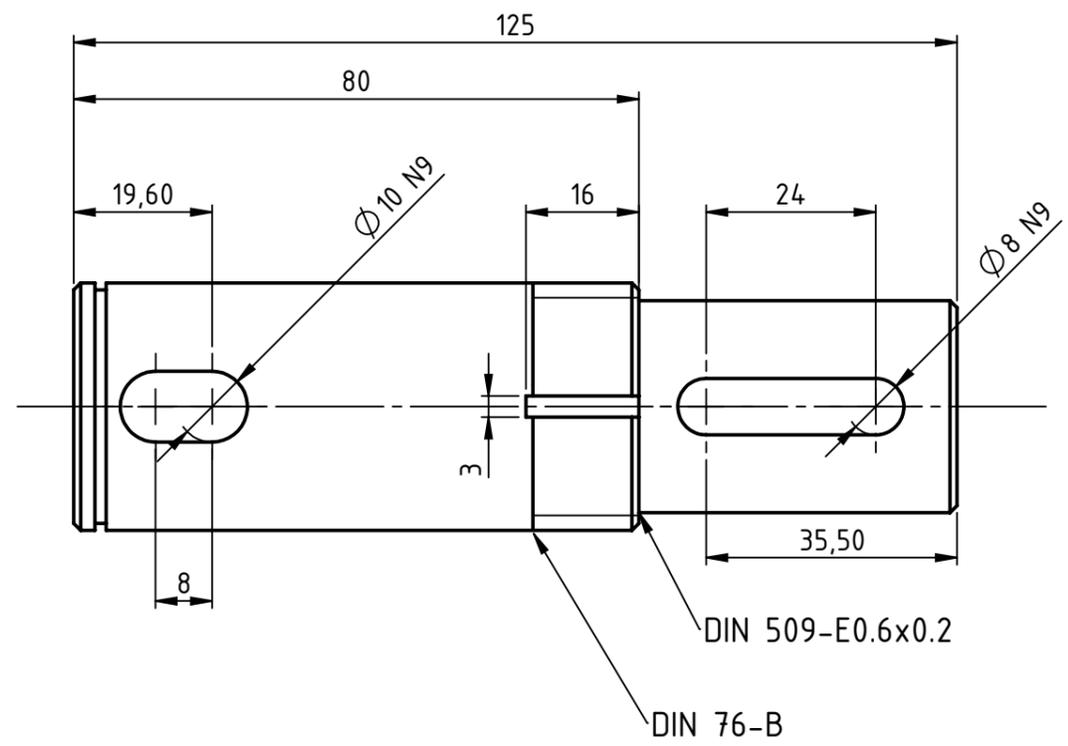
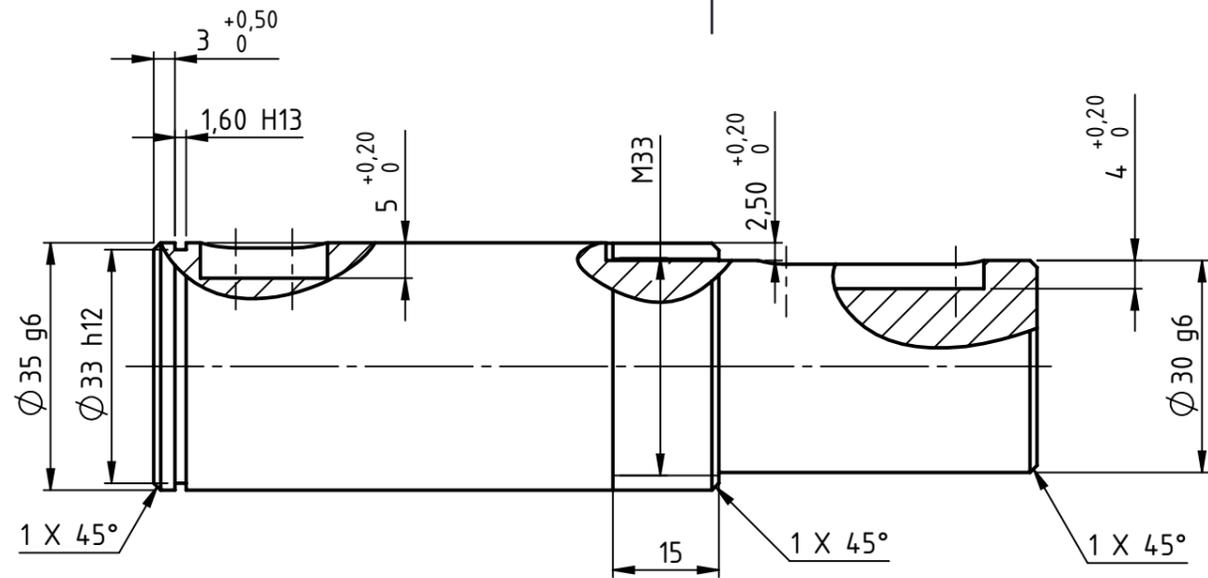
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Nr.	Aant	Benaming	Kwaliteitsnorm	Leveringsnorm	Ruwe maat	Leverancier
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Alg. tolerantie : ISO 2768-mK	Ra 1.6	Getekend : Ramses De Vuyst
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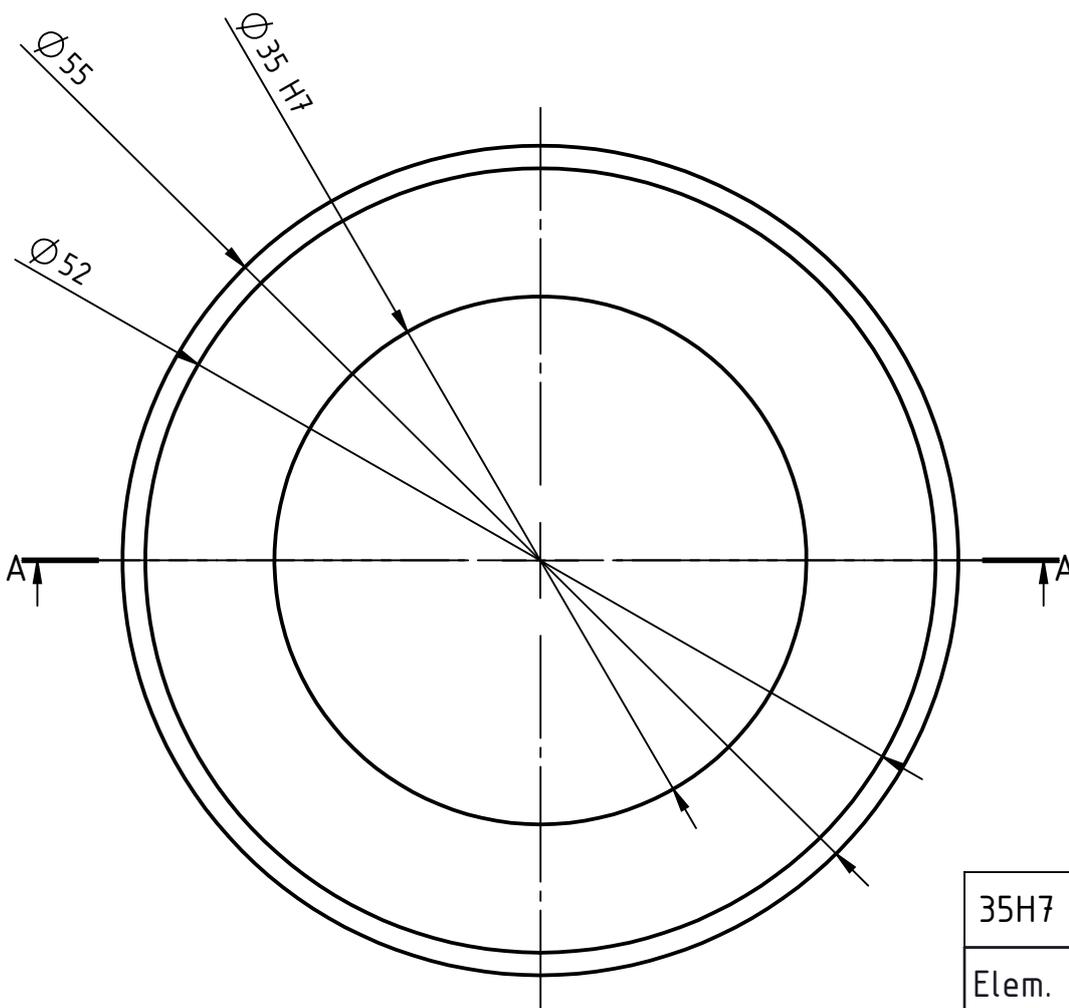
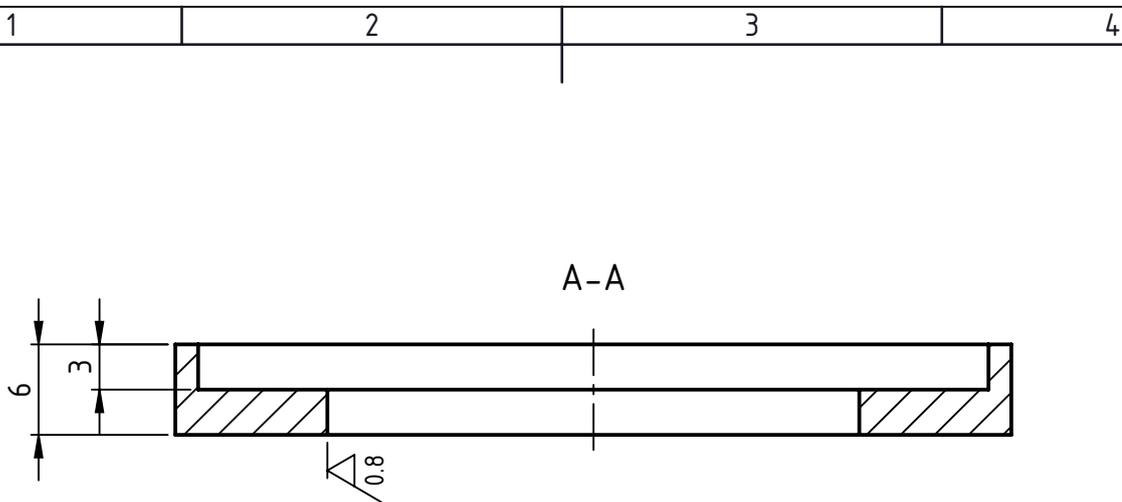
PC-nr.	WHISKYBOTTELMACHINE Sheet1	Klas : 3EMEM3	Datum : 20/05/2021
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Eenheid : mm		KU LEUVEN KU Leuven Technologiecampus Gent Faculteit Industriële Ingenieurswetenschappen	Schaal : 5:1	Formaat : A4
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35g6	-0.009 -0.025
33h12	0 -0.250
30g6	-0.007 -0.020
10N9	0 -0.036
8N9	0 -0.036
1,6H13	+0.140 0
Elem.	Afw.

104	1	Aandrijfas maltezerkruis	430F	EN 10278	ø35x130	MCB
Nr.	Aant	Benaming	Kwaliteitsnorm	Leveringsnorm	Ruwe maat	Leverancier
Alg. tolerantie : Ra 1.6 ISO 2768-mK				Getekend : Ramses De Vuyst		
PC-nr.		WHISKYBOTTELMACHINE				Klas : 3EMEM3
Eenheid : mm		Sheet1				Datum : 20/05/2021
						Schaal : 1:1
		KU Leuven Technologiestad Gent Faculteit Industriële Ingenieurswetenschappen				Formaat : A3



35H7	+0.025 0
Elem.	Afw.

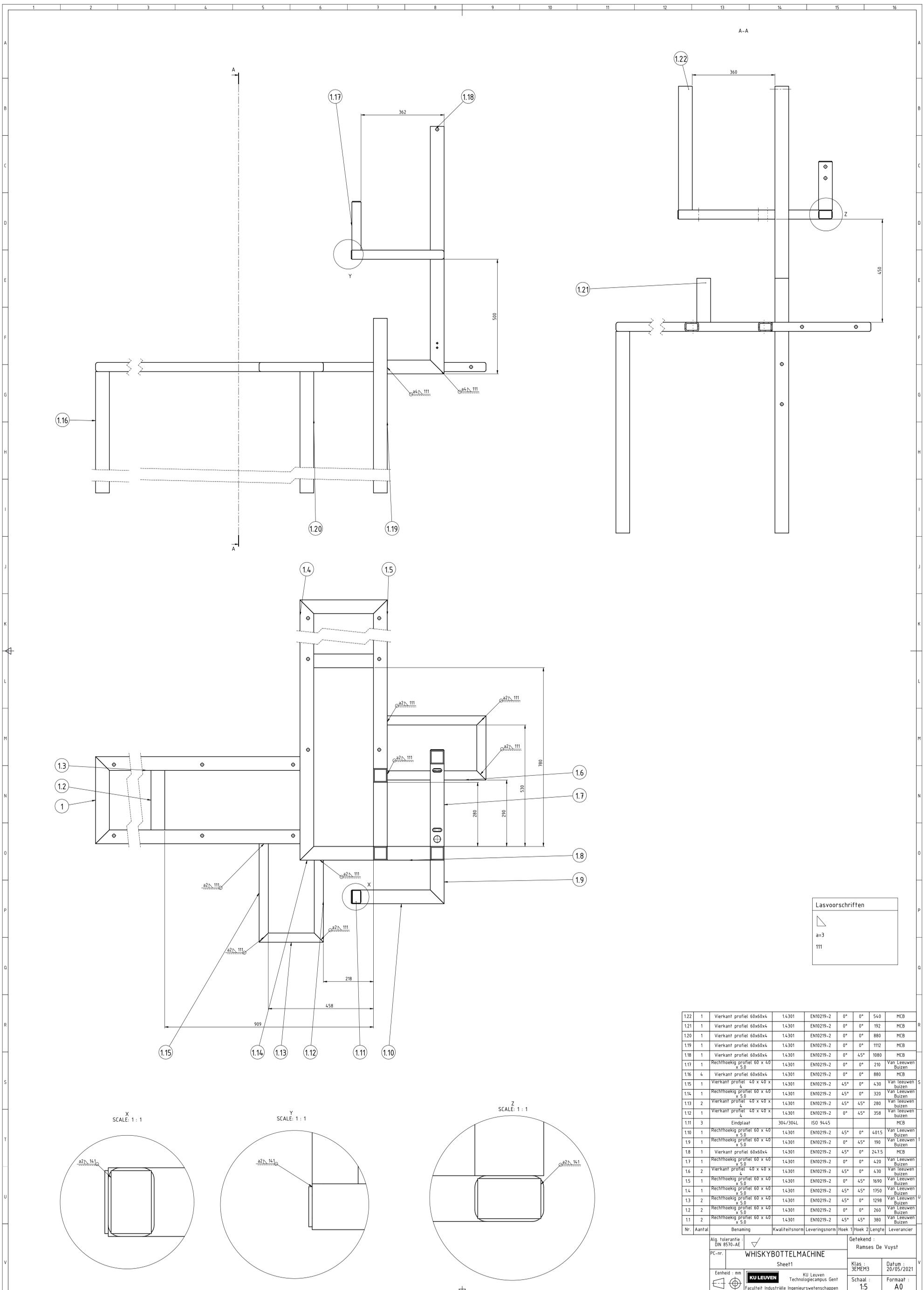
106	1	Dichtingsring met vilt maltezerkruis	304/304L	EN 10060	Ø60x6	MCB
Nr.	Aant	Benaming	Kwaliteitsnorm	Leveringsnorm	Ruwe maat	Leverancier

Alg. tolerantie : Ra 3.2 (0.8/) ISO 2768-mK

Getekend : Ramses De Vuyst

PC-nr.	WHISKYBOTTELMACHINE		Klas : 3EMEM3	Datum : 20/05/2021
Eenheid : mm		KU Leuven Technologiecampus Gent	Schaal : 2:1	Formaat : A4
	Faculteit Industriële Ingenieurswetenschappen			

3.2 Lasdossier



Lasvoorschriften	
	a=3
	111

Nr.	Aantal	Benaming	Kwaliteitsnorm	Leveringsnorm	Hoek 1	Hoek 2	Lengte	Leverancier
1.22	1	Vierkant profiel 60x60x4	1.4.301	EN10219-2	0°	0°	540	MCB
1.21	1	Vierkant profiel 60x60x4	1.4.301	EN10219-2	0°	0°	192	MCB
1.20	1	Vierkant profiel 60x60x4	1.4.301	EN10219-2	0°	0°	880	MCB
1.19	1	Vierkant profiel 60x60x4	1.4.301	EN10219-2	0°	0°	1112	MCB
1.18	1	Vierkant profiel 60x60x4	1.4.301	EN10219-2	0°	45°	1080	MCB
1.17	1	Rechthoekig profiel 60 x 40 x 5,0	1.4.301	EN10219-2	0°	0°	210	Van Leeuwen Buizen
1.16	4	Vierkant profiel 60x60x4	1.4.301	EN10219-2	0°	0°	880	MCB
1.15	1	Vierkant profiel 40 x 40 x 5,0	1.4.301	EN10219-2	45°	0°	430	Van Leeuwen Buizen
1.14	1	Rechthoekig profiel 60 x 40 x 5,0	1.4.301	EN10219-2	45°	0°	320	Van Leeuwen Buizen
1.13	2	Vierkant profiel 40 x 40 x 5,0	1.4.301	EN10219-2	45°	45°	280	Van Leeuwen Buizen
1.12	1	Vierkant profiel 40 x 40 x 5,0	1.4.301	EN10219-2	0°	45°	358	Van Leeuwen Buizen
1.11	3	Eindplaat	304/304L	ISO 9445				MCB
1.10	1	Rechthoekig profiel 60 x 40 x 5,0	1.4.301	EN10219-2	45°	0°	4015	Van Leeuwen Buizen
19	1	Rechthoekig profiel 60 x 40 x 5,0	1.4.301	EN10219-2	0°	45°	190	Van Leeuwen Buizen
18	1	Vierkant profiel 60x60x4	1.4.301	EN10219-2	45°	0°	247,5	MCB
17	1	Rechthoekig profiel 60 x 40 x 5,0	1.4.301	EN10219-2	0°	0°	420	Van Leeuwen Buizen
16	2	Vierkant profiel 40 x 40 x 5,0	1.4.301	EN10219-2	45°	0°	430	Van Leeuwen Buizen
15	1	Rechthoekig profiel 60 x 40 x 5,0	1.4.301	EN10219-2	0°	45°	1690	Van Leeuwen Buizen
14	1	Rechthoekig profiel 60 x 40 x 5,0	1.4.301	EN10219-2	45°	45°	1750	Van Leeuwen Buizen
13	2	Rechthoekig profiel 60 x 40 x 5,0	1.4.301	EN10219-2	45°	0°	1298	Van Leeuwen Buizen
12	2	Rechthoekig profiel 60 x 40 x 5,0	1.4.301	EN10219-2	0°	0°	260	Van Leeuwen Buizen
11	2	Rechthoekig profiel 60 x 40 x 5,0	1.4.301	EN10219-2	45°	45°	380	Van Leeuwen Buizen

Alg. tolerantie : DIN 8570-AE

PC-nr. : **WHISKYBOTTELMACHINE**

Sheet1

Enheid : mm

KU LEUVEN KU Leuven Technologiecampus Gent
Faculteit Industriële Ingenieurswetenschappen

Tekeningnaam : Lassenstelling20.stidrw

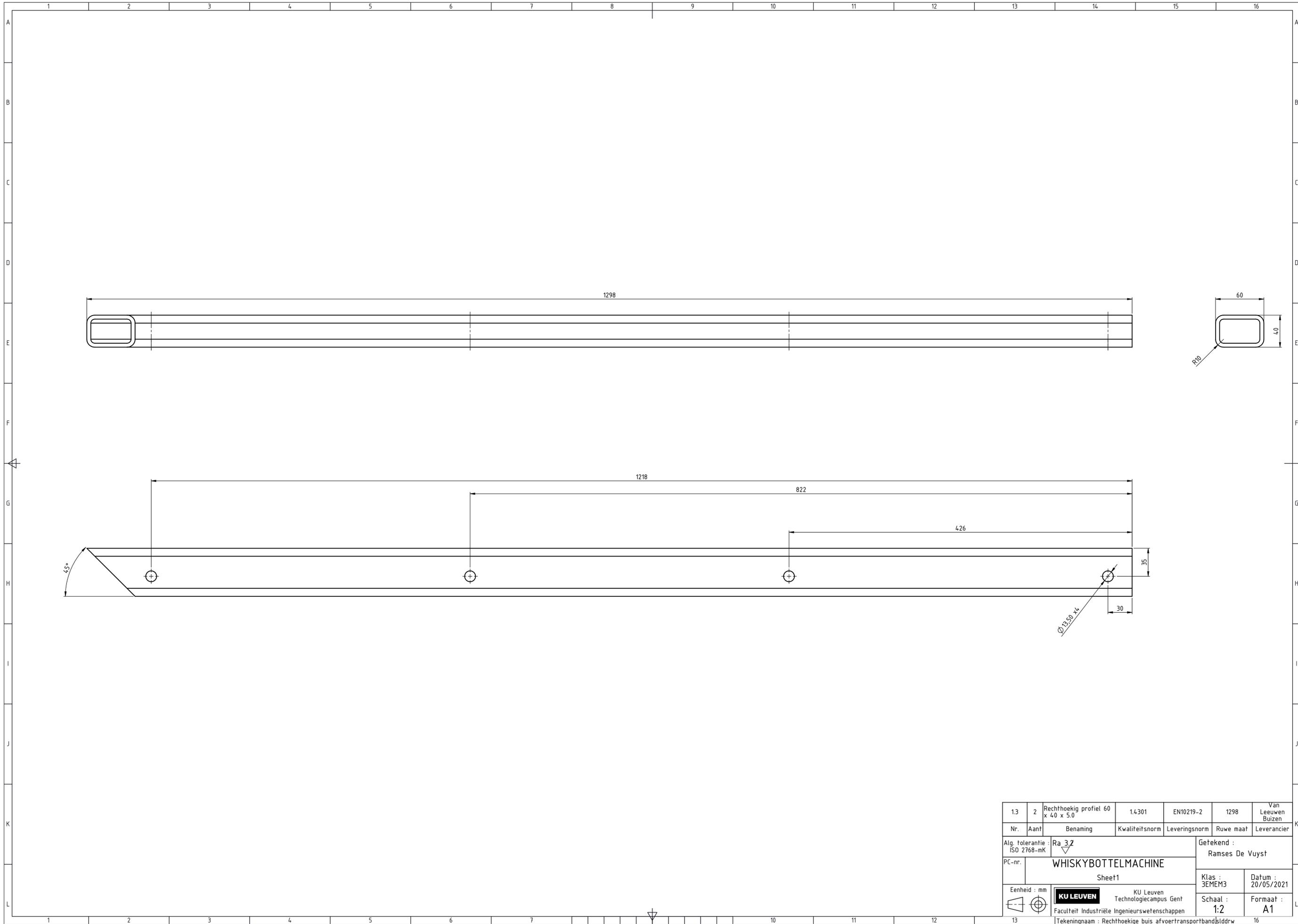
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Klas : **3EMEM3**

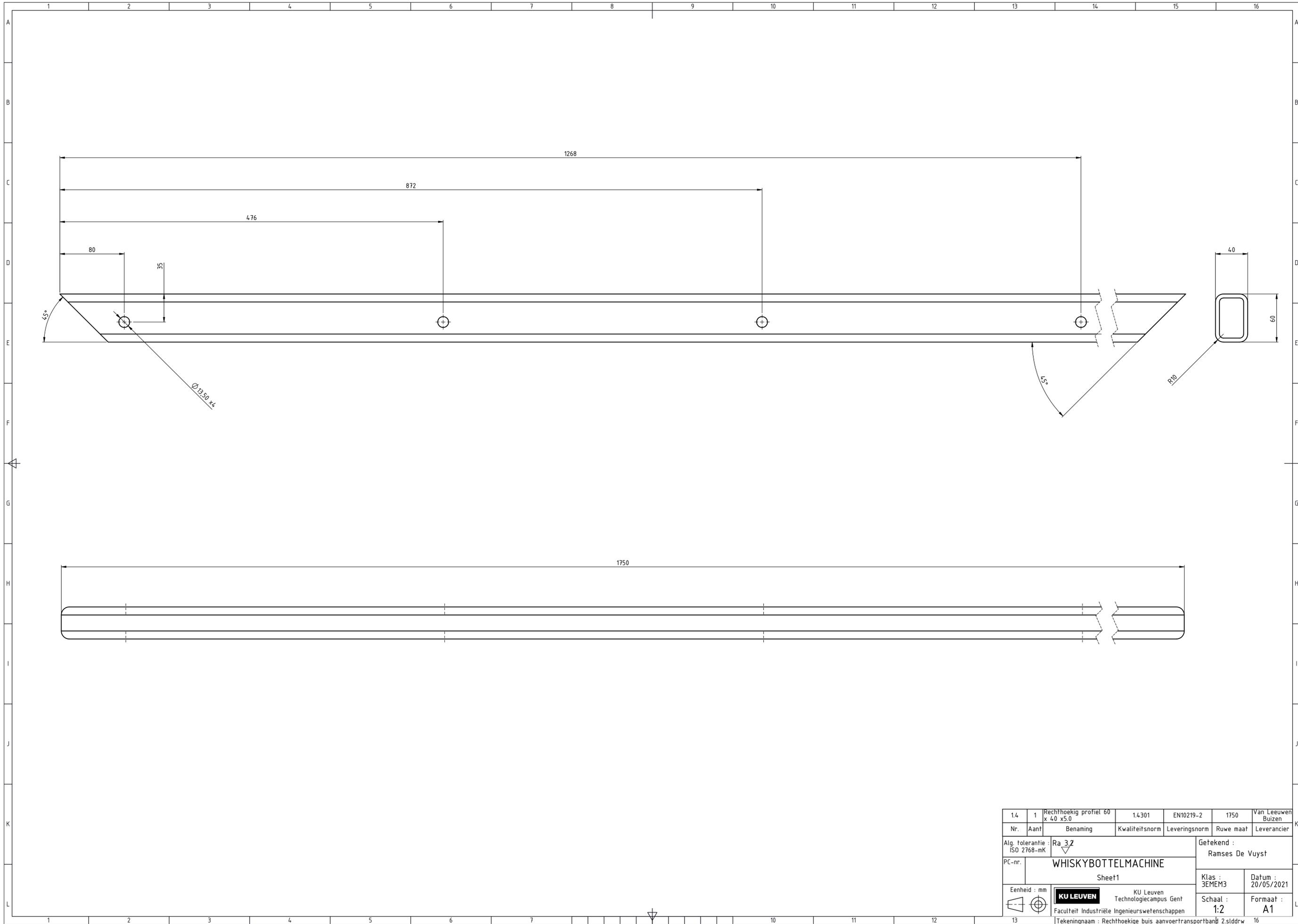
Schaal : **1,5**

Datum : **20/05/2021**

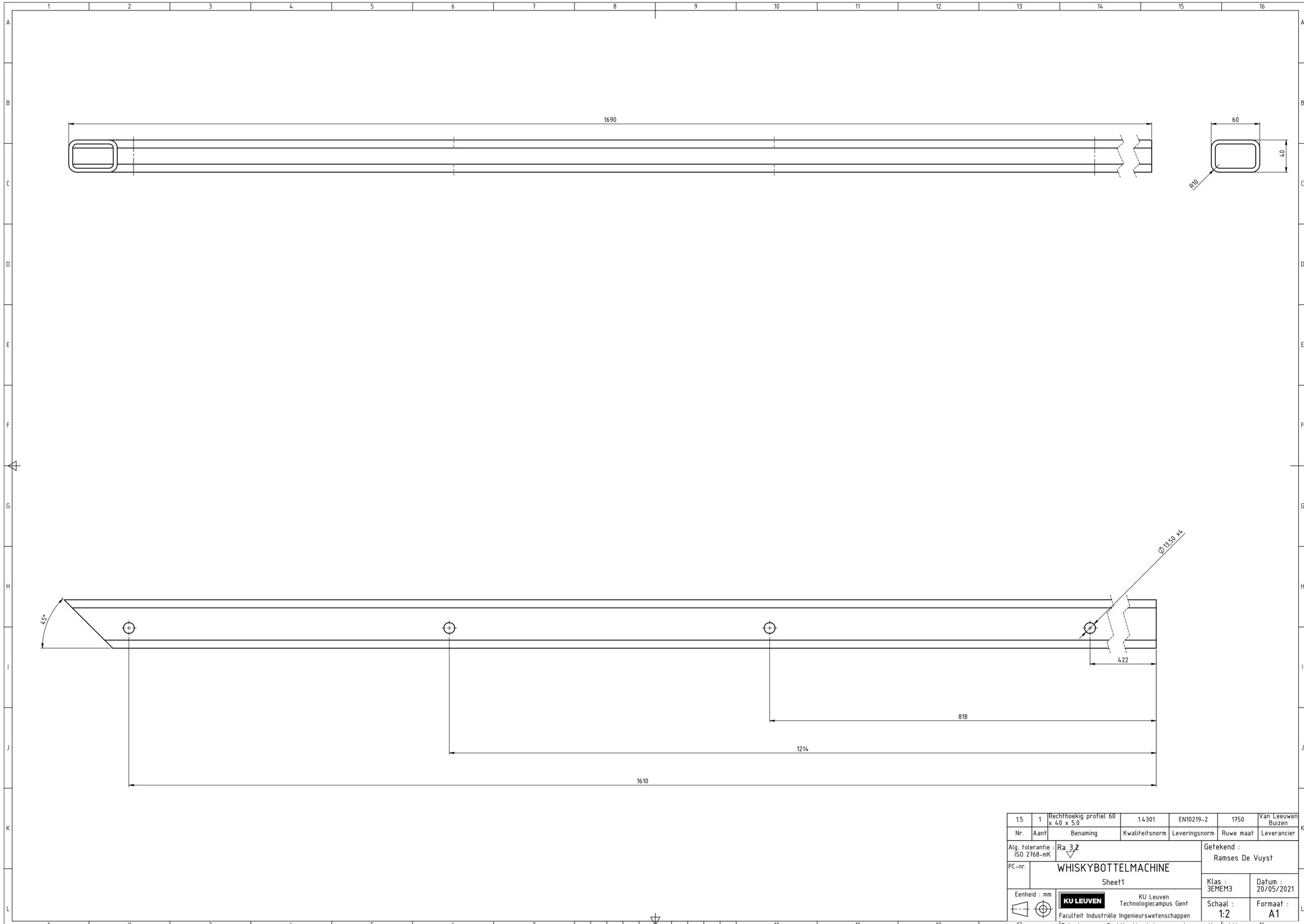
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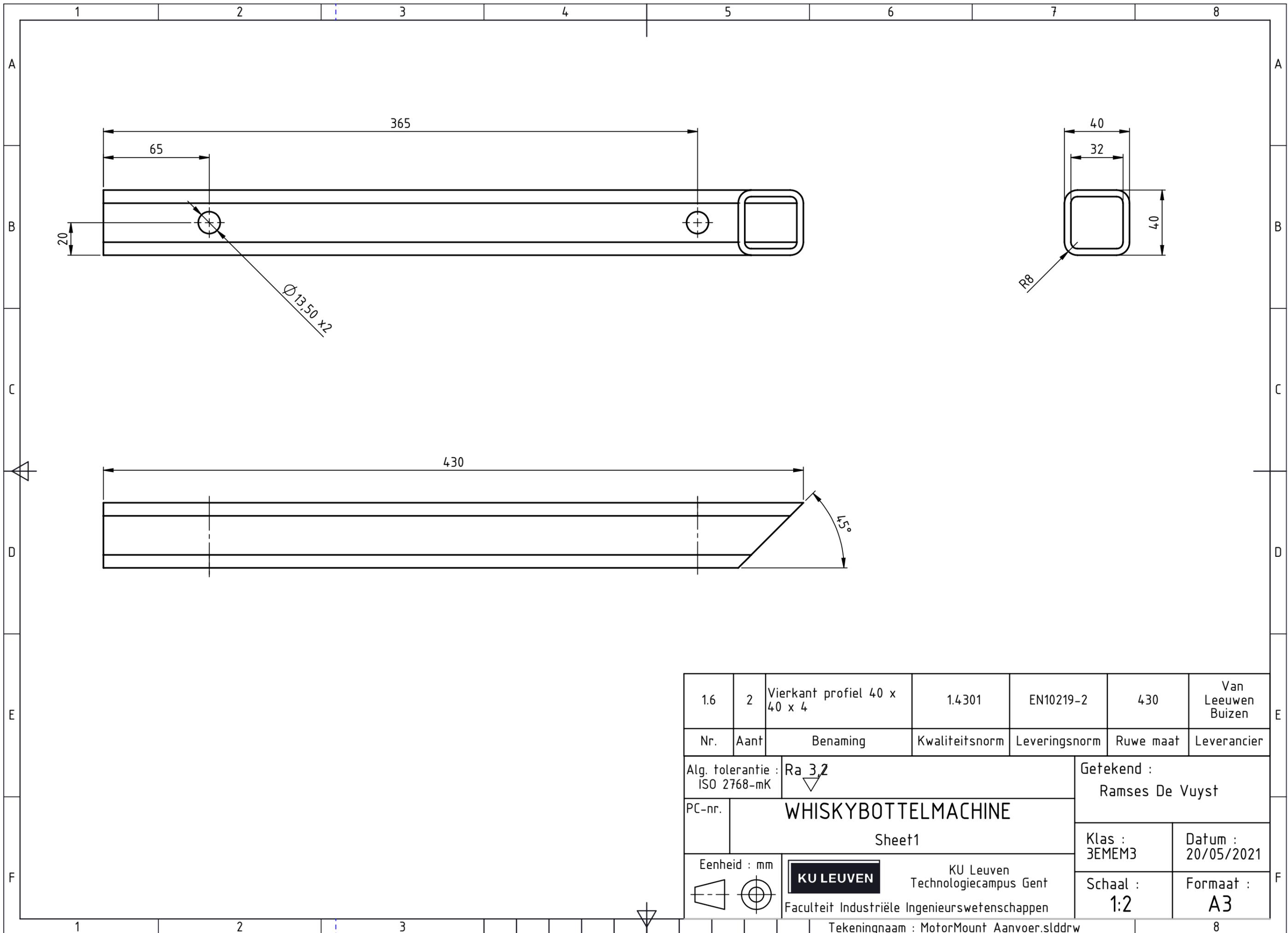
1.3	2	Rechthoekig profiel 60 x 40 x 5.0	1.4301	EN10219-2	1298	Van Leeuwen Buizen
Nr.	Aant	Benaming	Kwaliteitsnorm	Leveringsnorm	Ruwe maat	Leverancier
Alg. tolerantie : ISO 2768-mK	Ra 3.2		Getekend : Ramses De Vuyst			
PC-nr.	WHISKYBOTTELMACHINE				Klas : 3EMEM3	Datum : 20/05/2021
Eenheid : mm	Sheet1		Schaal : 1:2		Formaat : A1	
		KU Leuven Technolgiecampus Gent Faculteit Industriële Ingenieurswetenschappen		Tekeningsnaam : Rechthoekige buis afvoertransportband		



1.4	1	Rechthoekig profiel 60 x 40 x 5.0	1.4301	EN10219-2	1750	Van Leeuwen Buizen
Nr.	Aant	Benaming	Kwaliteitsnorm	Leveringsnorm	Ruwe maat	Leverancier
Alg. tolerantie : ISO 2768-mK		Ra 3.2	Getekend : Ramses De Vuyst			
PC-nr.	WHISKYBOTTELMACHINE					Klas : 3EMEM3
Sheet1		Datum : 20/05/2021			Formaat : A1	
Eenheid : mm	KU Leuven Technolgiecampus Gent Faculteit Industriële Ingenieurswetenschappen		Schaal : 1:2	Tekeningnaam : Rechthoekige buis aanvoertransportband 2.sldrw		

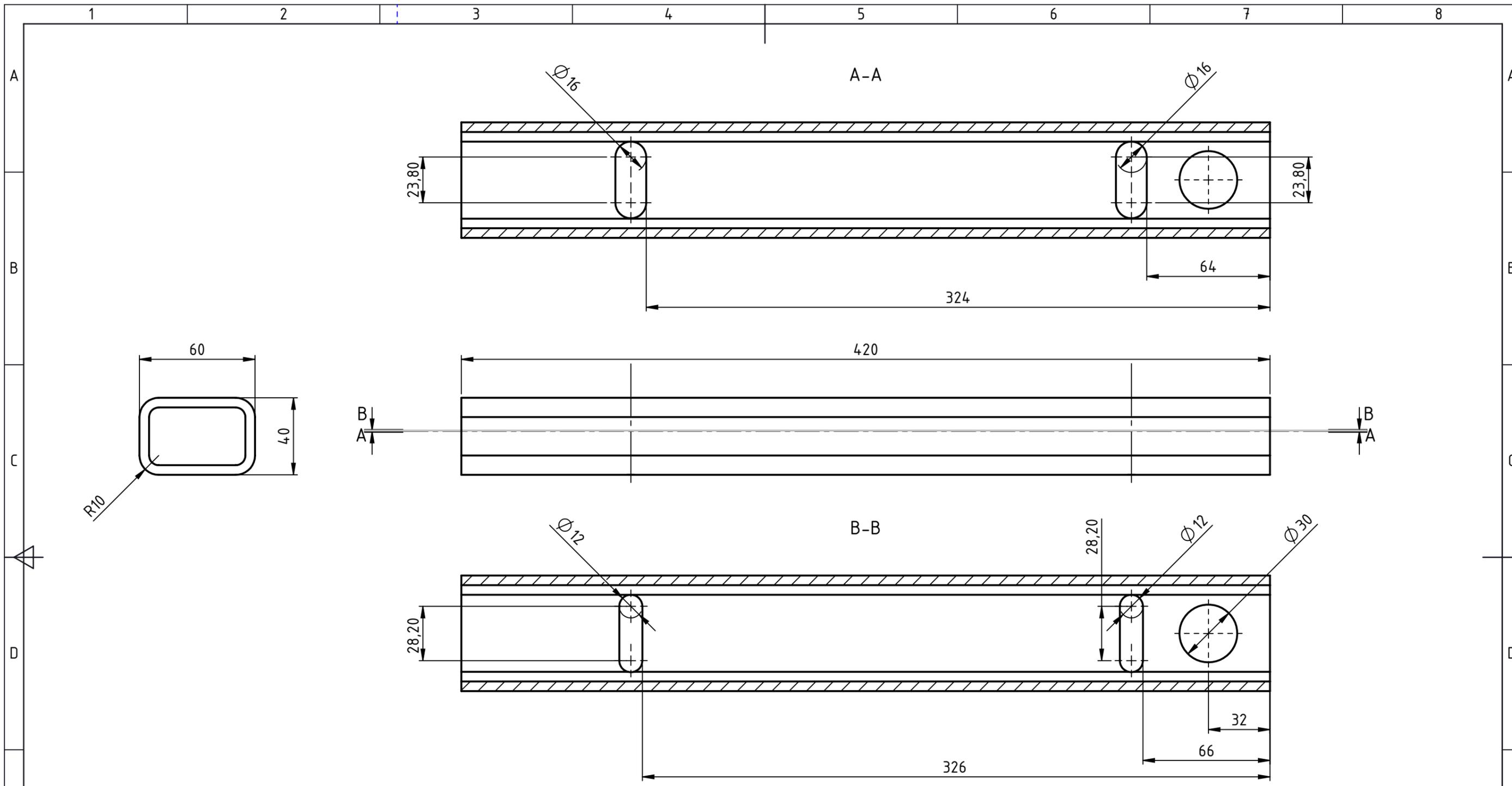


1.5	1	Rechthoekig profiel 60 x 40 x 5.0	1.4301	EN10219-2	1750	Van Leeuwen Buizen
Nr.	Aant	Benaming	Kwaliteitsnorm	Leveringsnorm	Ruwe maat	Leverancier
Alg. tolerantie : ISO 2768-mK		Ra 3.2	Getekend : Ramses De Vuyst			
PC-nr.	WHISKYBOTTELMACHINE					Klas : 3EMEM3
Sheet1		Datum : 20/05/2021			Formaat : A1	
Eenheid : mm	KU Leuven Technolgiecampus Gent Faculteit Industriële Ingenieurswetenschappen		Schaal : 1:2	Tekeningnaam : Rechthoekige buis aanvoertransportband.slddrw		

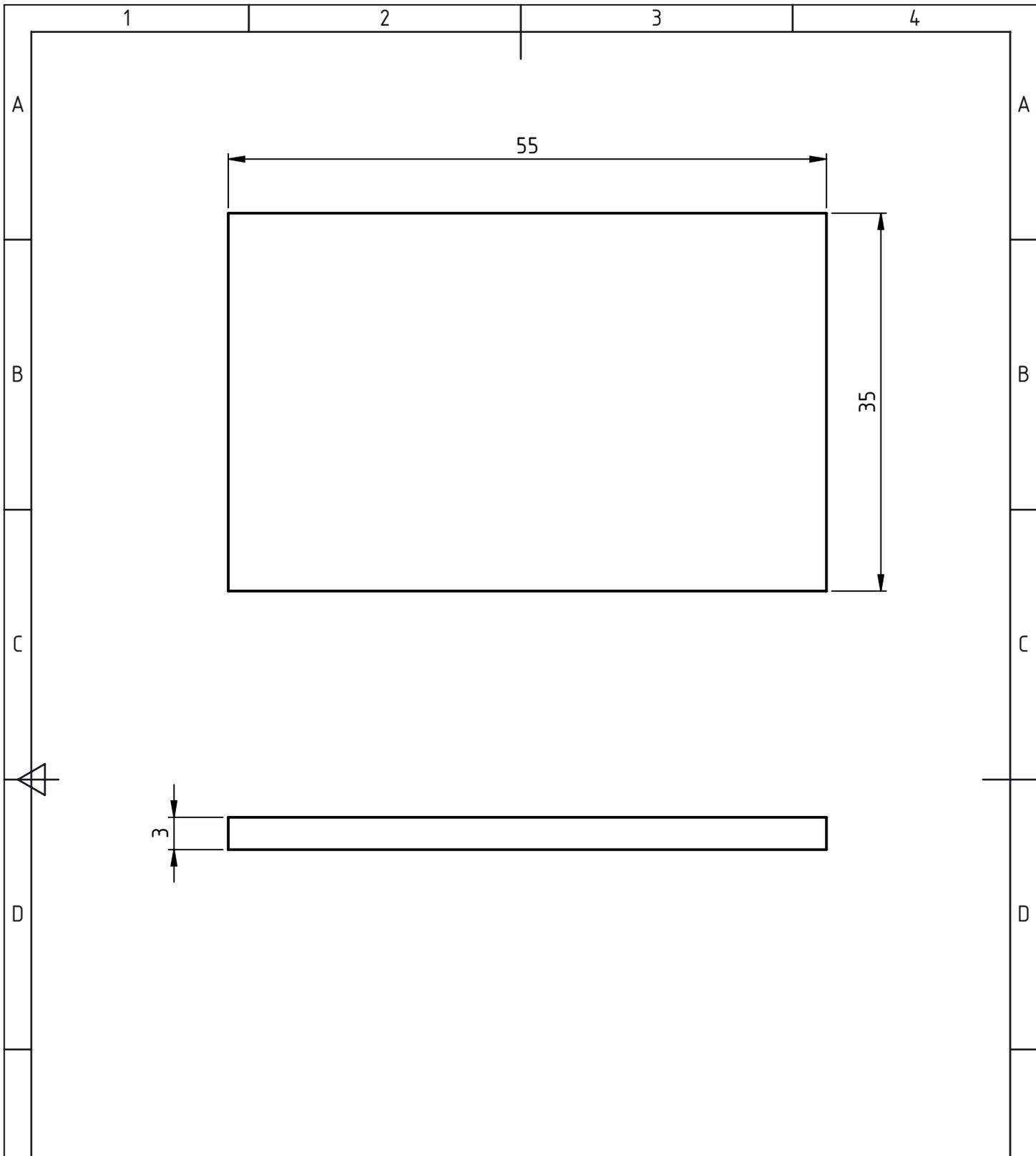


1.6	2	Vierkant profiel 40 x 40 x 4	1.4301	EN10219-2	430	Van Leeuwen Buizen
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Alg. tolerantie : Ra 3,2 ISO 2768-mK				Getekend : Ramses De Vuyst		
PC-nr.	WHISKYBOTTELMACHINE					
Sheet1			Klas : 3EMEM3		Datum : 20/05/2021	
Eenheid : mm					KU Leuven Technologiecampus Gent	
Faculteit Industriële Ingenieurswetenschappen					Schaal : 1:2	Formaat : A3

Tekeningnaam : MotorMount Aanvoer.slddrw



1.7	1	Rechthoekig profiel 60 x 40 x 5.0	1.4301	EN10219-2	420	Van Leeuwen Buizen
Nr.	Aant	Benaming	Kwaliteitsnorm	Leveringsnorm	Ruwe maat	Leverancier
Alg. tolerantie : Ra 3.2			Getekend : Ramses De Vuyst			
ISO 2768-mK						
PC-nr.	WHISKYBOTTELMACHINE				Klas : 3EMEM3	Datum : 20/05/2021
Sheet1						
Eenheid : mm				KU Leuven Technologicampus Gent		Schaal : 1:2
		Faculteit Industriële Ingenieurswetenschappen				Formaat : A3
Tekeningnaam : Vullen Onder.slddrw						8



E	1.11	1	Eindplaat	304/304L	ISO 9445	60x40x3	MCB	E
	Nr.	Aant	Benaming	Kwaliteitsnorm	Leveringsnorm	Ruwe maat	Leverancier	

Alg. tolerantie : Ra 3.2
ISO 2768-mK

Getekend :
Ramses De Vuyst

PC-nr. **WHISKYBOTTELMACHINE**

Sheet1

Klas : 3EMEM3 Datum : 20/05/2021

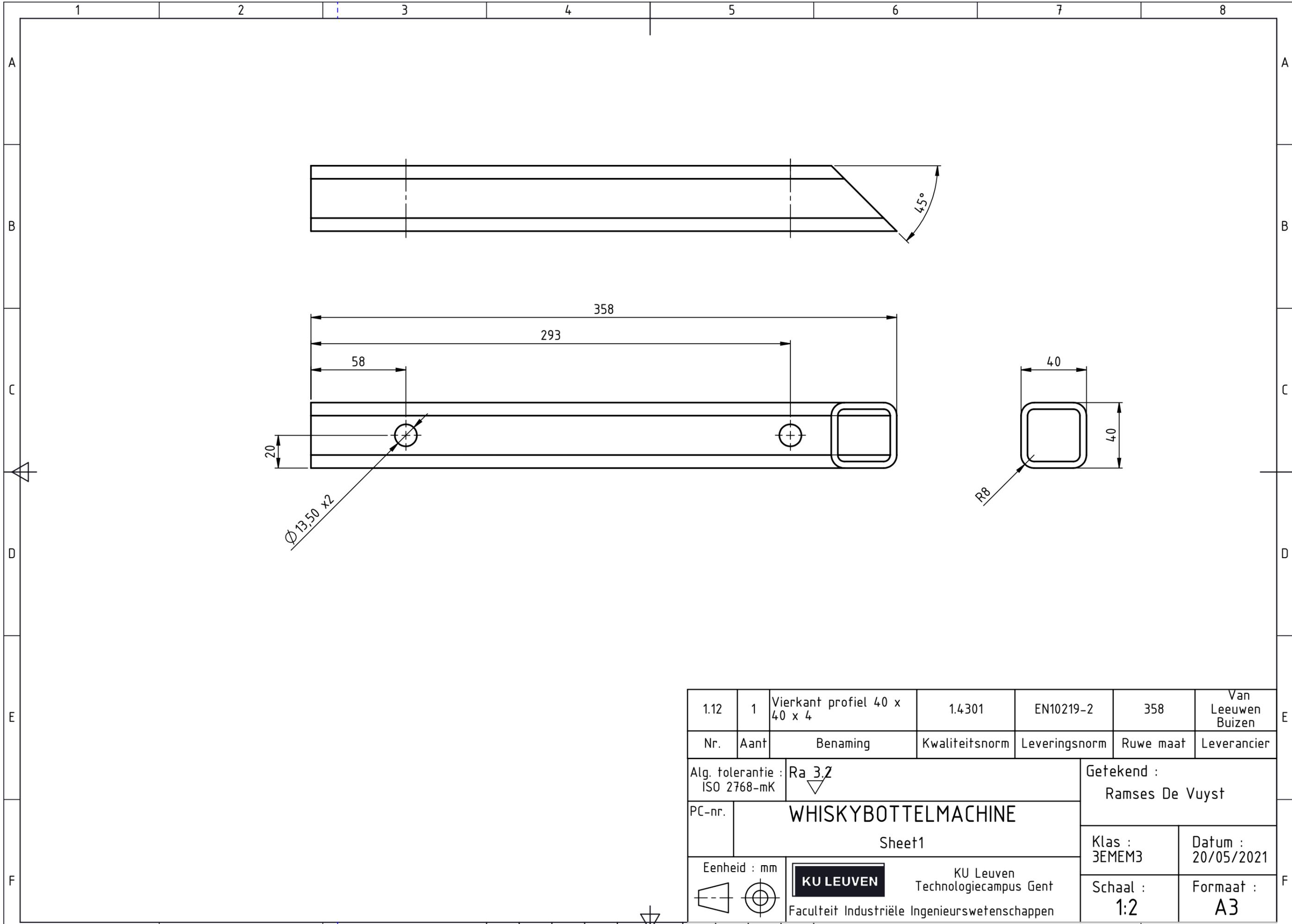
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KU LEUVEN KU Leuven
Technologiecampus Gent

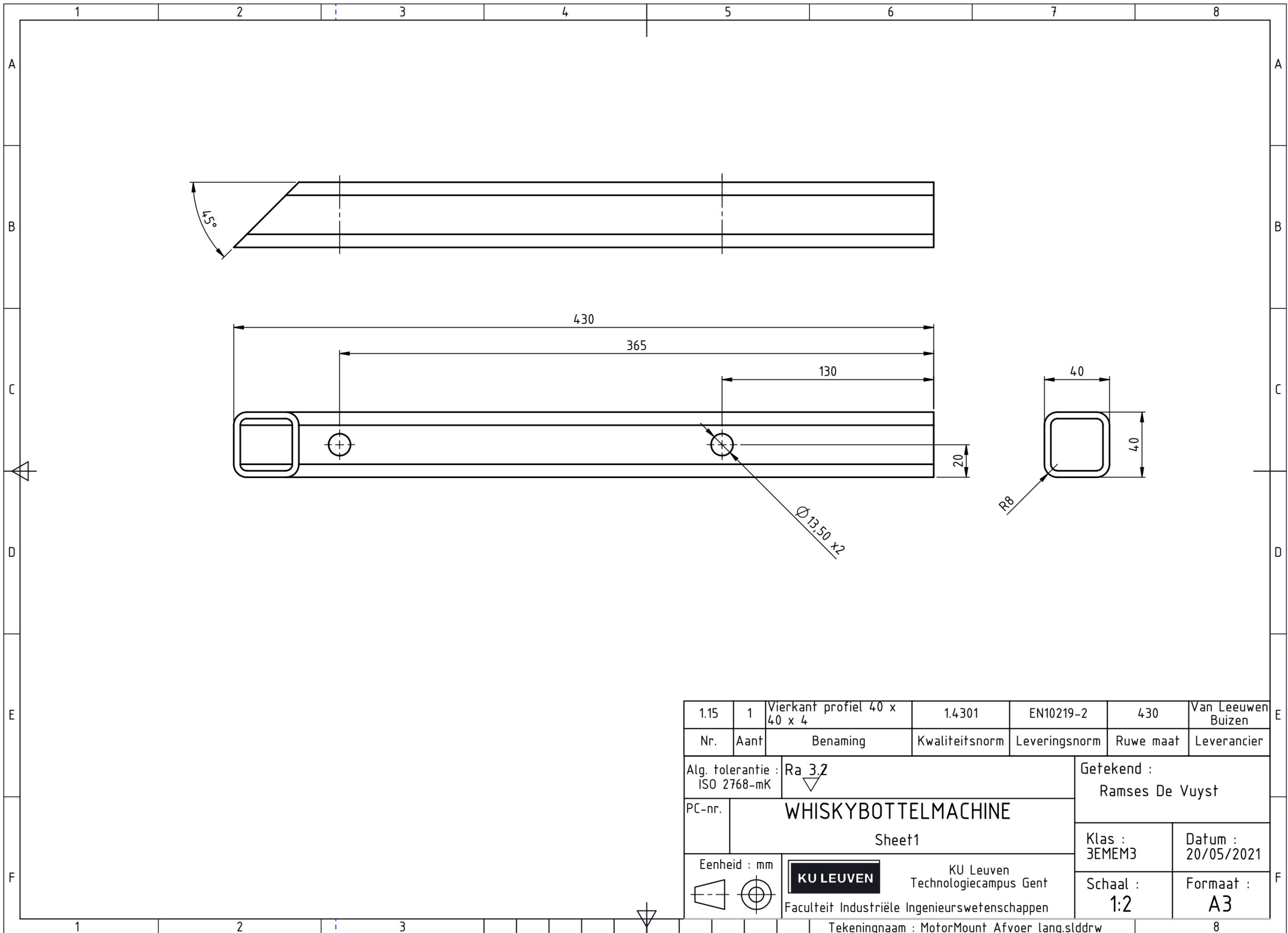
Faculteit Industriële Ingenieurswetenschappen

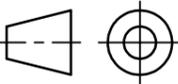
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Tekeningnaam: Eindplaat

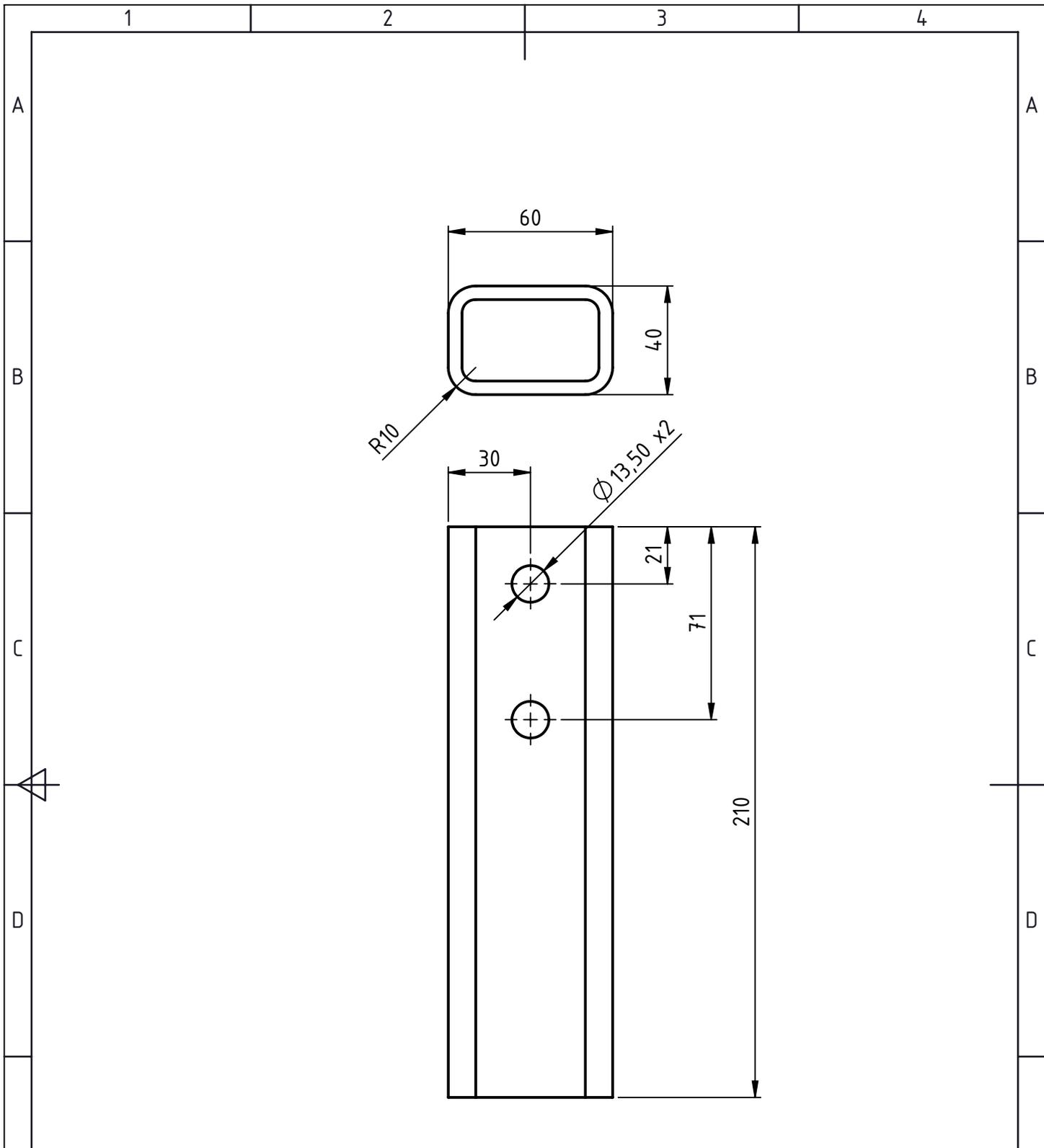


1.12	1	Vierkant profiel 40 x 40 x 4	1.4301	EN10219-2	358	Van Leeuwen Buizen
Nr.	Aant	Benaming	Kwaliteitsnorm	Leveringsnorm	Ruwe maat	Leverancier
Alg. tolerantie : Ra 3.2 ISO 2768-mK			Getekend : Ramses De Vuyst			
PC-nr.	WHISKYBOTTELMACHINE				Klas : 3EMEM3	Datum : 20/05/2021
Eenheid : mm				KU Leuven Technologicampus Gent		Schaal : 1:2
		Faculteit Industriële Ingenieurswetenschappen				Formaat : A3
Tekeningnaam : MotorMount Afvoer kort.slddrw						8



1.15	1	Vierkant profiel 40 x 40 x 4	1.4301	EN10219-2	430	Van Leeuwen Buizen
Nr.	Aant	Benaming	Kwaliteitsnorm	Leveringsnorm	Ruwe maat	Leverancier
Alg. tolerantie : Ra 3.2 ISO 2768-mK				Getekend : Ramses De Vuyst		
PC-nr.	WHISKYBOTTELMACHINE Sheet1					
Eenheid : mm		 KU Leuven Technologiestad Gent		Klas : 3EMEM3	Datum : 20/05/2021	
		Faculteit Industriële Ingenieurswetenschappen		Schaal : 1:2	Formaat : A3	

Tekeningnaam : MotorMount Afvoer lang.slddrw



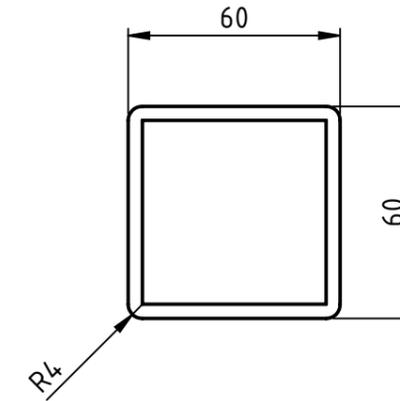
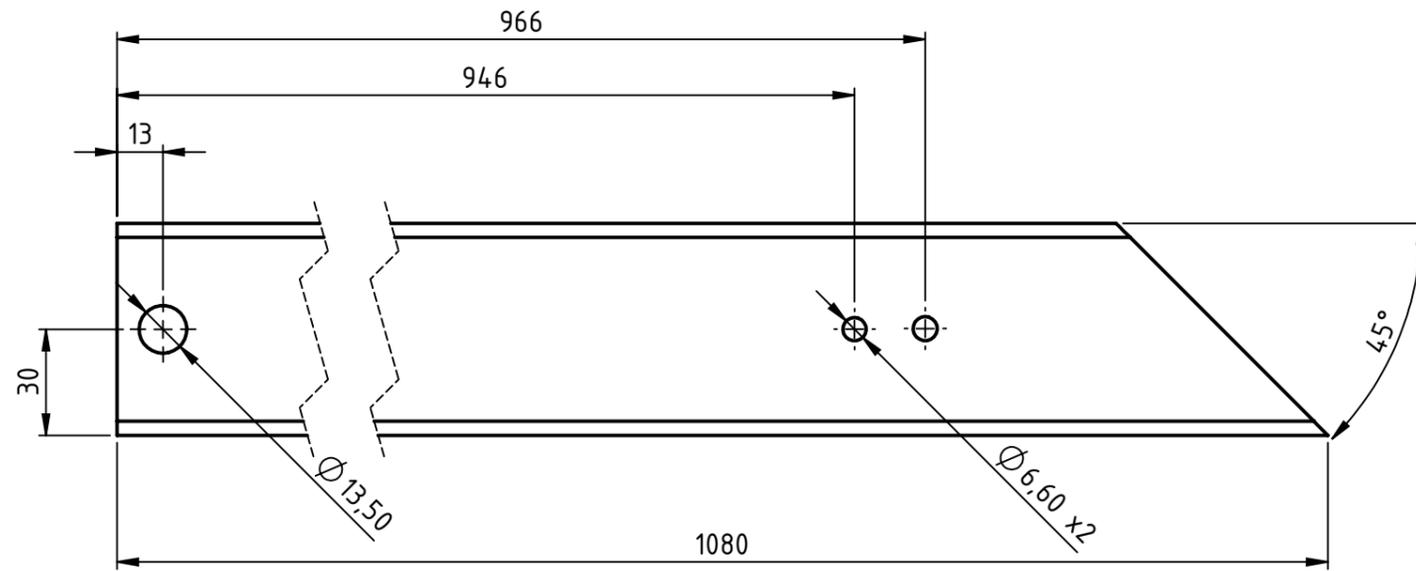
1.17	1	Rechthoekig profiel 60 x 40 x 5.0	1.4301	EN10219-2	210	Van Leeuwen Buizen
Nr.	Aant	Benaming	Kwaliteitsnorm	Leveringsnorm	Ruwe maat	Leverancier

Alg. tolerantie : Ra 3.2 Getekend : Ramses De Vuyst

PC-nr. **WHISKYBOTTELMACHINE** Klas : 3EMEM3 Datum : 20/05/2021

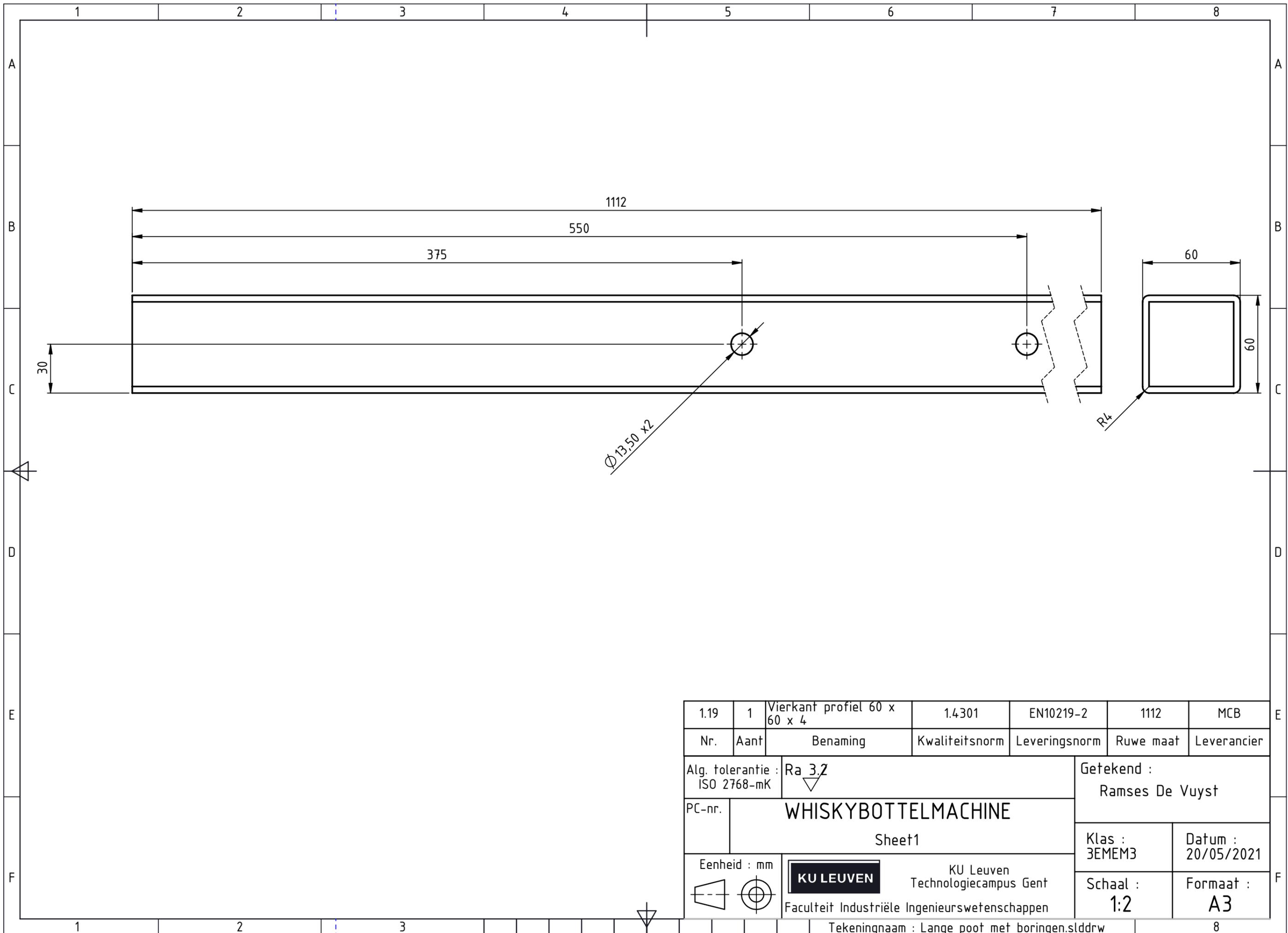
Sheet1

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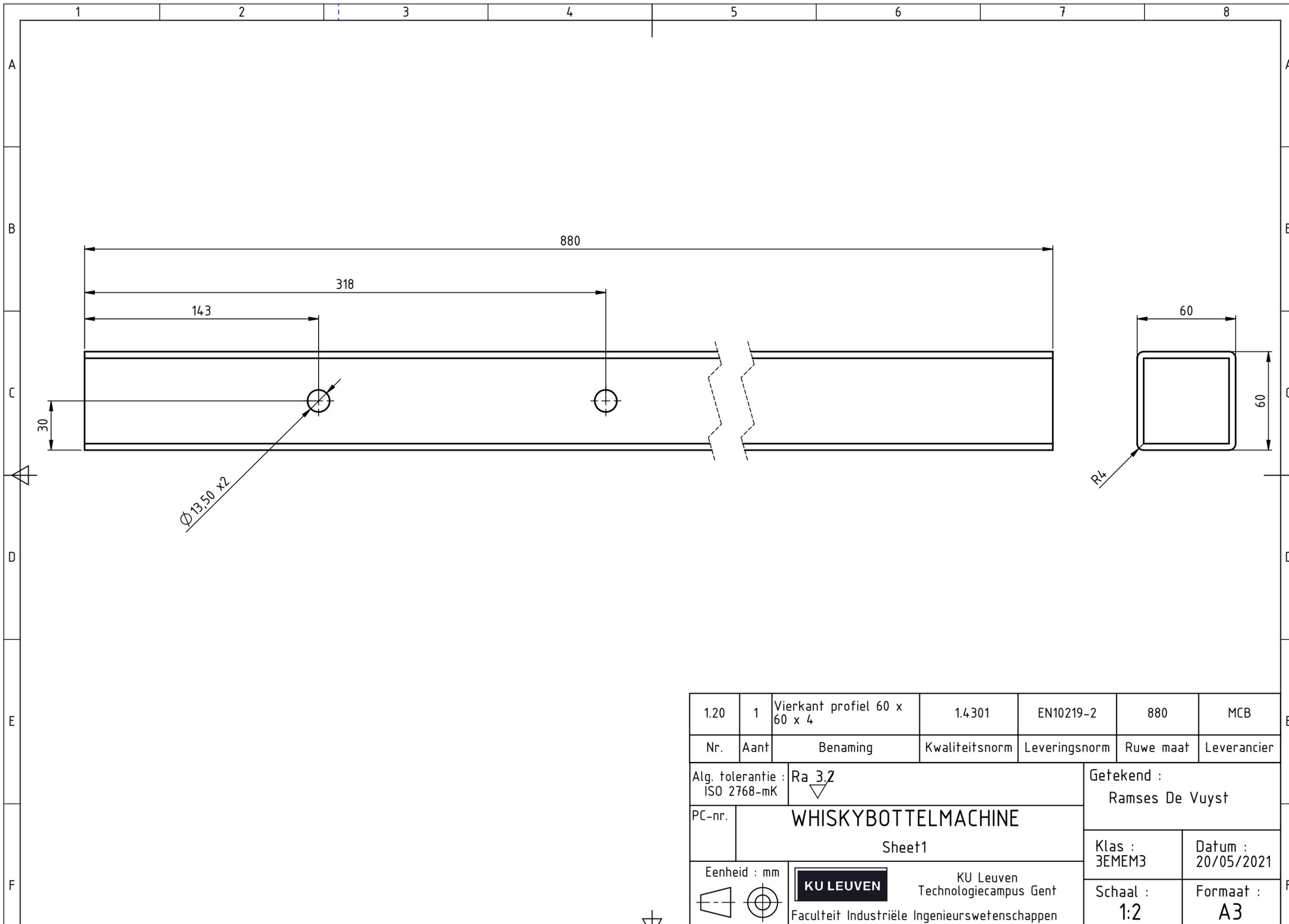
1.18	1	Vierkant profiel 60 x 60 x 4	1.4301	EN10219-2	1080	MCB
Nr.	Aant	Benaming	Kwaliteitsnorm	Leveringsnorm	Ruwe maat	Leverancier
Alg. tolerantie : Ra 3.2 ISO 2768-mK			Getekend : Ramses De Vuyst			
PC-nr.	WHISKYBOTTELMACHINE Sheet1				Klas : 3EMEM3	Datum : 20/05/2021
Eenheid : mm			KU Leuven Technolgiecampus Gent Faculteit Industriële Ingenieurswetenschappen		Schaal : 1:2	Formaat : A3

Tekeningnaam : Lange poot vulgeleiding.slddrw



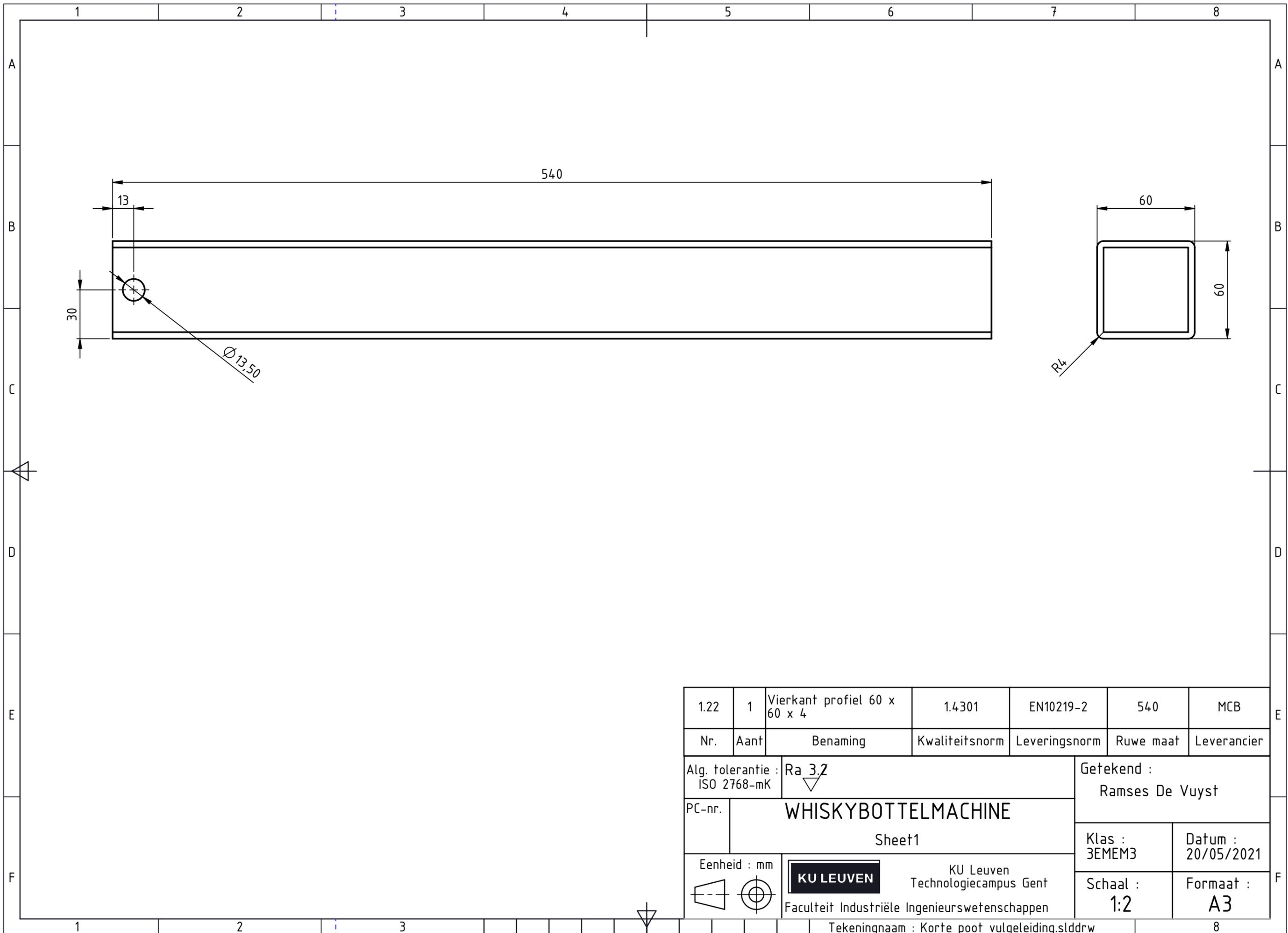
1.19	1	Vierkant profiel 60 x 60 x 4	1.4301	EN10219-2	1112	MCB
Nr.	Aant	Benaming	Kwaliteitsnorm	Leveringsnorm	Ruwe maat	Leverancier
Alg. tolerantie : Ra 3.2 ISO 2768-mK			Getekend : Ramses De Vuyst			
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Eenheid : mm				KU Leuven Technologicampus Gent		Schaal : 1:2
		Faculteit Industriële Ingenieurswetenschappen				Formaat : A3

Tekeningnaam : Lange poot met boringen.slddrw



$\varnothing 13,50 \times 2$

1.20	1	Vierkant profiel 60 x 60 x 4	1.4301	EN10219-2	880	MCB
Nr.	Aant	Benaming	Kwaliteitsnorm	Leveringsnorm	Ruwe maat	Leverancier
Alg. tolerantie : Ra 3.2 ISO 2768-mK			Getekend : Ramses De Vuyst			
PC-nr.	WHISKYBOTTELMACHINE				Klas : 3EMEM3	Datum : 20/05/2021
Eenheid : mm				KU Leuven Technologicampus Gent		Schaal : 1:2
		Faculteit Industriële Ingenieurswetenschappen				Formaat : A3
Tekeningnaam : Poot met boringen.slddrw						8



1.22	1	Vierkant profiel 60 x 60 x 4	1.4301	EN10219-2	540	MCB	
Nr.	Aant	Benaming	Kwaliteitsnorm	Leveringsnorm	Ruwe maat	Leverancier	
Alg. tolerantie : Ra 3.2 ISO 2768-mK				Getekend : Ramses De Vuyst			
PC-nr.	WHISKYBOTTELMACHINE					Klas : 3EMEM3	Datum : 20/05/2021
Eenheid : mm		 KU Leuven Technologiestrategie Faculteit Industriële Ingenieurswetenschappen		Schaal : 1:2	Formaat : A3		

4 Documentatie

Catalog designation

R47DRN63MS4

Helical gear units R + AC motors DRN.. (IE3)

2

Product data

Rated motor speed	[1/min] : 1380
Output speed	[1/min] : 32
Overall gear ratio	: 42.87
Output torque	[Nm] : 35
Service factor SEW-FB	: 8.40
Mounting position	: M1
Base / top coat	: 7031 Blue gray (51370310)
Position of connector/terminal box	[°] : 0
Cable entry/connector position	: X
Output shaft	[mm] : 30x60
Permitted output overhung load with n=1400	[N] : 5920
Lubricant quantity 1st gear unit	[Liter] : 0.7
Motor power	[kW] : 0.12
Duration factor	: S1-100%
Efficiency class	: IE3
Efficiency (50/75/100% Pn)	[%] : 58.25 / 63.9 / 64.8
CE mark	: Yes
Motor voltage	[V] : 230/400
Wiring diagram	: R13
Frequency	[Hz] : 50
Rated current	[A] : 0.7 / 0.41
Cos Phi	: 0.64
Thermal class	: 155(F)
Motor protection type	: IP55
Design requirement	: Europe (CE)
Motor mass moment of inertia	[10 ⁻⁴ kgm ²] : 3.00
Weight	[kg] : 19.00

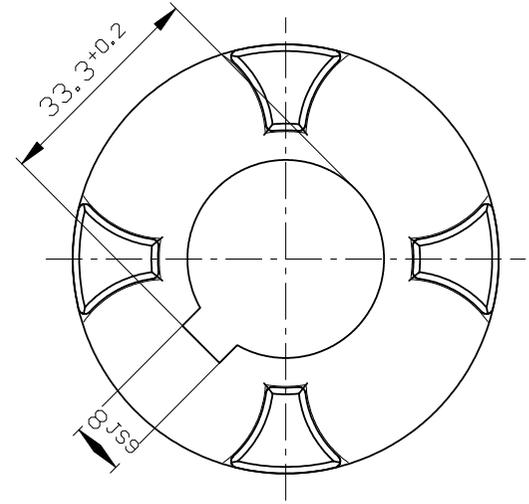
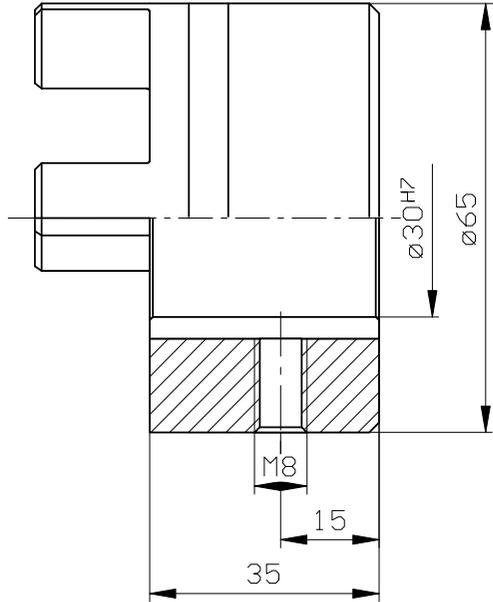
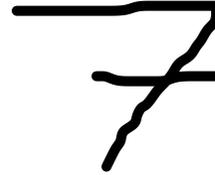


Additional feature

Output shaft: 30x60 mm

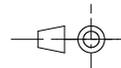
Thermal class 155(F)

Degree of protection IP 55



We reserve the right to make dimensional and design changes.

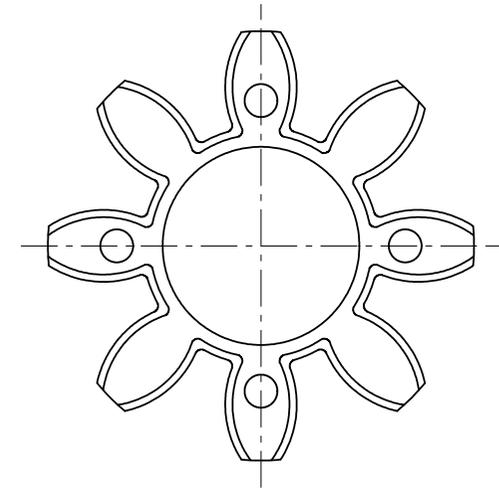
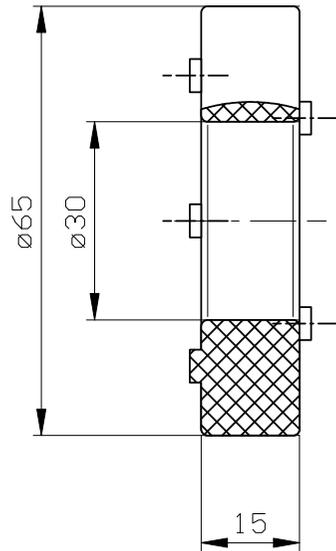
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		Allgemeintoleranz nach DIN ISO 2768-mH General tolerances acc. to DIN ISO 2768-mH			Masstab Scale	1: 0.81	Format DIN Size	A3
		ROTEX® 28 Hub			 KTR Systems GmbH D-48407 Rheine			
	gezeichnet drawn	Werkstoff Material		Teilnummer Part Number	Kz	Lfd.-Nr. Current number	Index Change	
Datum date	17.05.2021	DIN						
Name name		Gewicht Weight						



Order details

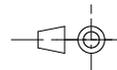
1	1	ROTEX 28 ST	Hub 1.0 Ø30H7 key DIN 6885/1-JS9 >	020285103000
Pos.	No		Description	Part Number

Zg.-Nr.: 377809/



We reserve the right to make dimensional and design changes.

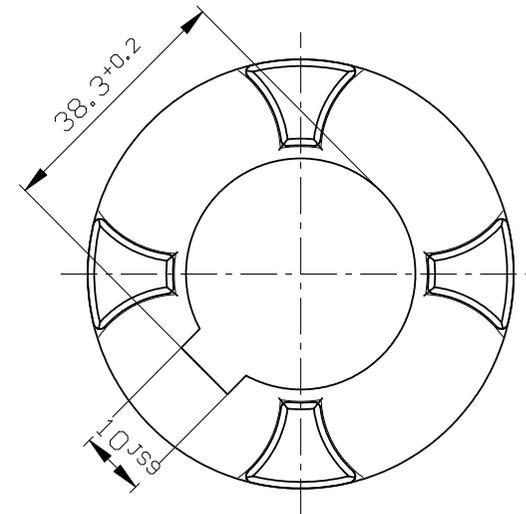
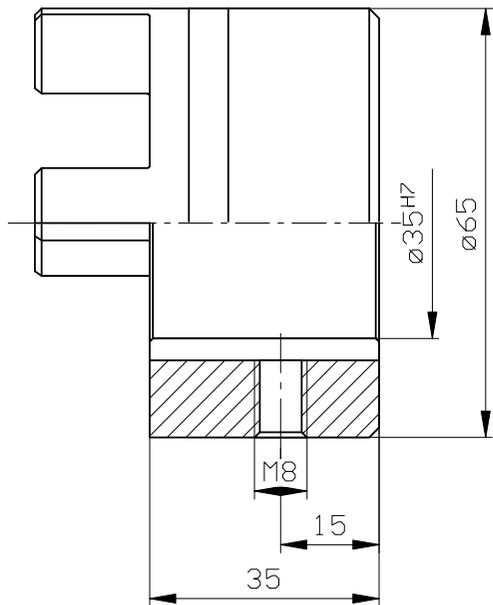
		Oberflächengüte nach DIN ISO 1302 Reihe 2 Surface quality acc. to DIN ISO 1302 line 2			Schutzvermerk nach DIN 34 beachten Note protection mark acc. to DIN 34			
		Allgemeintoleranz nach DIN ISO 2768-mH General tolerances acc. to DIN ISO 2768-mH			Masstab Scale	1: 0.81	Format DIN Size	A3
		ROTEX® 28 Spider			 KTR Systems GmbH D-48407 Rheine			
		gezeichnet drawn	Werkstoff Material	Teilnummer Part Number	Kz	Lfd.-Nr. Current number	Index Change	
		Datum date	17.05.2021	DIN				
		Name	Gewicht Weight					



Order details

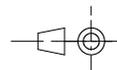
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Pos.	No		Description	Part Number

Zg.-Nr.: 519258/



We reserve the right to make dimensional and design changes.

		Oberflächengüte nach DIN ISO 1302 Reihe 2 Surface quality acc. to DIN ISO 1302 line 2		Schutzvermerk nach DIN 34 beachten Note protection mark acc. to DIN 34			
		Allgemeintoleranz nach DIN ISO 2768-mH General tolerances acc. to DIN ISO 2768-mH		Masstab Scale	1: 0.81	Format DIN Size	A3
		ROTEX® 28 Hub		 KTR Systems GmbH D-48407 Rheine			
		gezeichnet drawn	Werkstoff Material	Teilnummer Part Number	Kz	Lfd.-Nr. Current number	Index Change
		Datum date	17.05.2021	DIN			
		Name		Gewicht Weight			



Order details

1	1	ROTEX 28 ST	Hub 1.0 Ø35H7 key DIN 6885/1-JS9 >	020285103500
Pos.	No		Description	Part Number

Zg.-Nr.: 3778101

29

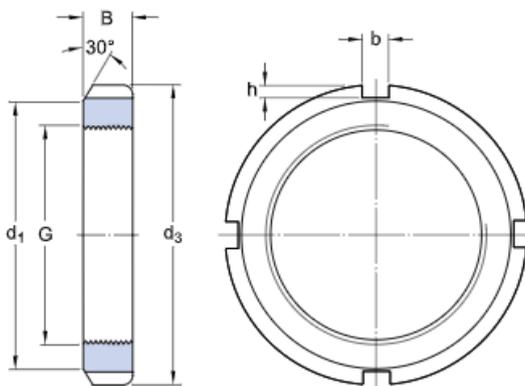
KM 5

Popular item

Lock nuts requiring a keyway (metric)



Technical specification



DIMENSIONS

G	M 25x1.5
d ₃	38 mm
B	7 mm
d ₁	32 mm
b	5 mm
h	2 mm

CALCULATION DATA

Axial static load carrying capacity	31.5 kN
-------------------------------------	---------

MASS

Mass lock nut	0.028 kg
---------------	----------

MOUNTING INFORMATION

Associated spanner	HN 5-6
--------------------	--------

ASSOCIATED PRODUCTS

Lock washer / Locking clip

MB 5

More information

Product details	Tools
Designs and variants	Engineering Tools
Product data	
Installation and removal	
Designation system	

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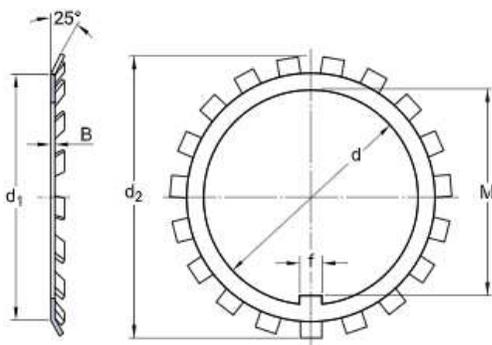
MB 5

Popular item

MB(L) lock washers



Technical specification



DIMENSIONS

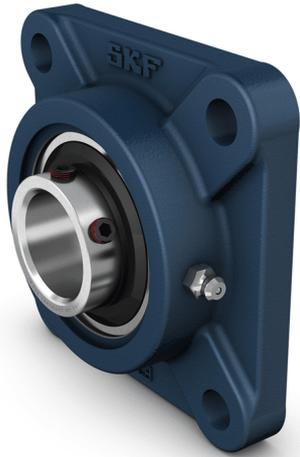
d	25 mm
d ₁	32 mm
d ₂	42 mm
B	1.25 mm
f	5 mm
M	23 mm

MASS

Mass lock washer

0.006 kg

39



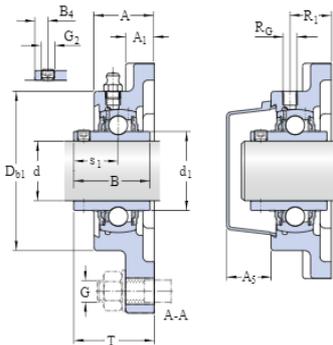
UCF 207 Square flanged ball bearing units

Square flanged ball bearing units

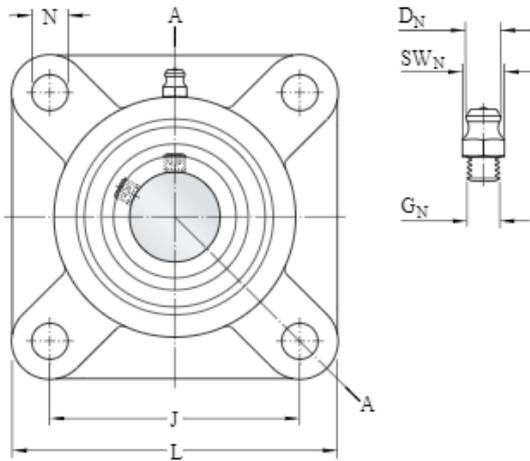
Technical specification

Compliance with standard	JIS
Purpose specific	For material handling applications
Housing material	Cast iron
Sealing solution	Standard seals with additional flingers

DIMENSIONS



d	35 mm
d ₁	≈ 46.8 mm
A	32 mm
A ₁	15 mm
A ₅	24.5 mm
B	42.9 mm
B ₄	6.5 mm
D _{b1}	90 mm
J	92 mm
L	118 mm
N	14 mm
s ₁	25.4 mm
T	44.4 mm



GREASE FITTING

D_N	6.6 mm
SW_N	7.94 mm
G_N	1/4-28 UNF

THREADED HOLE

R_G	1/4-28 UNF
R_1	22.5 mm

CALCULATION DATA

Basic dynamic load rating	C	25.5 kN
Basic static load rating	C_0	15.3 kN
Fatigue load limit	P_u	0.655 kN
Limiting speed		4 300 r/min
with shaft tolerance h6		

MASS

Mass bearing unit	1.35 kg
-------------------	---------

MOUNTING INFORMATION

Set screw	G_2	M8x1
Hexagonal key size for set screw		4.06 mm
Recommended tightening torque for set screw		6.5 N·m
Recommended diameter for attachment bolts, mm	G	12 mm
Recommended diameter for attachment bolts, inch	G	0.5 in

INCLUDED PRODUCTS

Housing	F 207/Y
---------	---------

Bearing

UC 207

ASSOCIATED PRODUCTS

End cover

ECY 207

More information

Product details	Engineering information	Tools
Flanged units to ISO standards	Principles of ball bearing units selection and application - Download catalogue (4.9 MB)	Bearing Select
Flanged units to North American standards	Principles of selecting mounted bearing solutions	Engineering Calculator
Flanged units to Japanese Industrial Standards (JIS)	Bearing failure and how to prevent it	Rolling bearings mounting and dismounting instructions
Flanged units, not standardized (SKF Food Line)		
Permissible misalignment		
Locating/non-locating support flanged		
Loads		
Temperature limits		
Permissible speed		
Lubrication		
Mounting and dismounting		
Ordering information		
Designation system		

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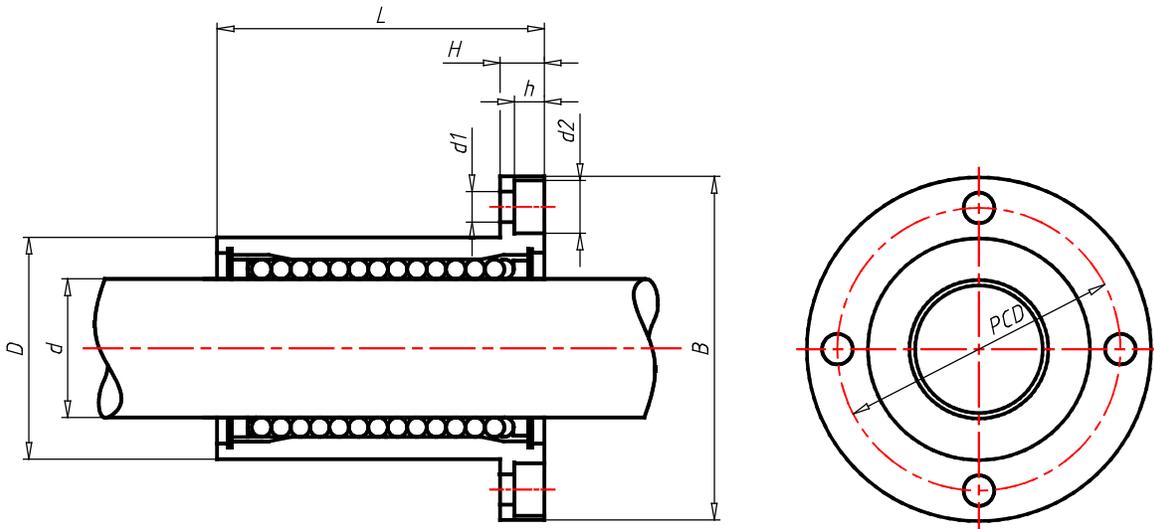
LMF16UU

Standard Flanged Units

HepcoMotion®

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Technical drawings



3D PDF DATASHEET



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LMF16UU

Standard Flanged Units

HepcoMotion®

Technical Data

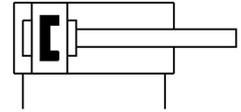
CNSORDERNO (Order number)	LMF16UU
PREVIEW (Preview)	lmf.jpg
DESC (Description)	Circular type
D (Dimensions / mm)	28
L (Dimensions / mm)	37
B (Dimensions / mm)	48
H (Dimensions / mm)	6
PCD (Dimensions / mm)	38
DDH (d1 x d2 x h / mm)	4.5 x 8 x 4.4
NBR (No. of Ball circuit)	5
BLD (Basic Load Ratings - dyn. C / N)	770
BLS (Basic Load Ratings - stat. Co / N)	1170
WBD (Working Bore Diameter / mm)	16
CNSMASSEXACT (Dimension / g)	134
INFO (PDF Info)	PDF Info

ISO cylinder DSNU-25-400-P-A

Part number: 35191

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FESTO



Data sheet

Feature	Value
Maritime classification	See certificate
Stroke	400 mm
Piston diameter	25 mm
Piston rod thread	M10x1.25
Type code	DSNU
Cushioning	Elastic cushioning rings/pads at both ends
Mounting position	Any
Conforms to standard	CETOP RP 52 P ISO 6432
Piston rod end	External thread
Design	Piston Piston rod Cylinder barrel
Position sensing	For proximity sensor
Symbol	00991217
Variants	Piston rod at one end
Operating pressure	1 bar ... 10 bar
Operating pressure	0.1 MPa ... 1 MPa
Mode of operation	Double-acting
Operating medium	Compressed air as per ISO 8573-1:2010 [7:4:4]
Information on operating and pilot media	Operation with oil lubrication possible (required for further use)
Corrosion resistance class (CRC)	2 - Moderate corrosion stress
Ambient temperature	-20 °C ... 80 °C
Impact energy in the end positions	0.3 J
Theoretical force at 6 bar, retracting	247.4 N
Theoretical force at 6 bar, advancing	294.5 N
Moving mass at 0 mm stroke	71 g
Additional weight per 10 mm stroke	11 g
Basic weight with 0 mm stroke	238 g
Additional moving mass per 10 mm stroke	6 g
Type of mounting	With accessories
Pneumatic connection	G1/8
Note on materials	RoHS-compliant
Cover material	Wrought aluminum alloy Plain anodized
Seals material	NBR TPE-U(PU)

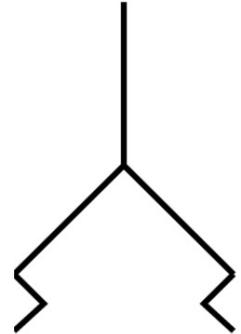
Feature	Value
Piston rod material	High-alloy stainless steel
Material of cylinder barrel	High-alloy stainless steel

Vacuum suction cup ESS-20-SS

Part number: 189296

57

FESTO



Data sheet

Feature	Value
Min. workpiece radius	60 mm
Nominal width	3 mm
Suction cup diameter	20 mm
Suction cup volume	0.318 cm ³
Type code	ESS
Connection position	Top
Mounting position	Any
Symbol	00991485
Classification of suction cup holder	Size 4
Suction cup shape	Round, flat
Operating pressure	0 bar ... 0.95 bar
Nominal operating pressure	-0.7 bar
Operating medium	Atmospheric air based on ISO 8573-1:2010 [7::-:]
Corrosion resistance class (CRC)	1 - Low corrosion stress
For use in the food industry	See supplementary material information
Ambient temperature	-30 °C ... 180 °C
Holding force at nominal operating pressure	16.3 N
Lateral force at nominal operating pressure	10.5 N
Product weight	6.4 g
Type of mounting	Via vacuum connection
Vacuum connection	M6
Color	Transparent
Shore hardness	50 +/- 5
Material of screwed trunnion	Brass, nickel-plated Steel, galvanized and chrome-plated
Note on materials	Free of copper and PTFE Contains paint-wetting impairment substances RoHS-compliant
Suction cup material	VMQ (silicone)

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FESTO

Vacuum suction cup holder ESH-HA-4-QS

Part number: 189199



Data sheet

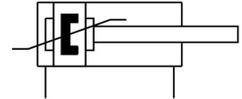
Feature	Value
Volume	0.719 cm ³
Type code	ESH
Mounting position	Vertical
Design	Vacuum connection at top
Classification of suction cup holder	Size 4
Operating medium	Atmospheric air based on ISO 8573-1:2010 [7::-]
Corrosion resistance class (CRC)	1 - Low corrosion stress
Ambient temperature	0 °C ... 60 °C
Product weight	30 g
Type of mounting	With lock nut
Suction cup mounting	M6
Vacuum connection	QS-6
Note on materials	RoHS-compliant
Seals material	NBR
Retaining bracket material	Aluminum Brass, nickel-plated POM High-alloy steel Tempered steel

ISO cylinder CRDSNU-B-25-80-PPS-A-MG-A1

Part number: 2159640

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FESTO



Data sheet

Feature	Value
Stroke	80 mm
Piston diameter	25 mm
Type code	CRDSNU-B
Based on norm	ISO 6432
Cushioning	Self-adjusting pneumatic end-position cushioning
Mounting position	Any
Design	Piston Piston rod Cylinder barrel
Position sensing	For proximity sensor
Symbol	00992970
Operating pressure	1 bar ... 10 bar
Mode of operation	Double-acting
Operating medium	Compressed air as per ISO 8573-1:2010 [7:4:4]
Information on operating and pilot media	Operation with oil lubrication possible (required for further use)
Corrosion resistance class (CRC)	4 - Particularly high corrosion stress
For use in the food industry	See supplementary material information
Ambient temperature	0 °C ... 80 °C
Theoretical force at 6 bar, retracting	247 N
Theoretical force at 6 bar, advancing	295 N
Moving mass at 0 mm stroke	73 g
Additional weight per 10 mm stroke	11 g
Basic weight with 0 mm stroke	410 g
Additional moving mass per 10 mm stroke	6.2 g
Type of mounting	With accessories
Pneumatic connection	G1/8
Note on materials	RoHS-compliant
Cover material	High-alloy stainless steel
Piston rod material	High-alloy stainless steel
Material of cylinder barrel	High-alloy stainless steel

Clevis foot
LBN-20/25
Part number: 6059



FESTO



Data sheet

Feature	Value
Size	20/25
Type code	LBN
Mounting position	Any
Corrosion resistance class (CRC)	1 - Low corrosion stress
Ambient temperature	-40 °C ... 150 °C
Product weight	84 g
Note on materials	Free of copper and PTFE RoHS-compliant
Mounting material	Steel Galvanized
Bolt material	Steel Galvanized
Fuse material	Spring steel, galvanized

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FESTO

Clevis foot CRLBN-12/16

Part number: 161862



Data sheet

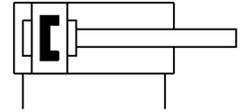
Feature	Value
Size	12/16
Type code	CRLBN
Mounting position	Any
Corrosion resistance class (CRC)	4 - Particularly high corrosion stress
Ambient temperature	-40 °C ... 150 °C
Product weight	39 g
Note on materials	Free of copper and PTFE RoHS-compliant
Mounting material	High-alloy stainless steel
Bolt material	High-alloy stainless steel
Fuse material	High-alloy stainless steel

ISO cylinder CRDSNU-B-16-50-P-A-MG-A1

Part number: 8073762

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FESTO



Data sheet

Feature	Value
Stroke	50 mm
Piston diameter	16 mm
Type code	CRDSNU-B
Based on norm	ISO 6432
Cushioning	Elastic cushioning rings/pads at both ends
Mounting position	Any
Design	Piston Piston rod Cylinder barrel
Position sensing	For proximity sensor
Symbol	00991217
Operating pressure	1 bar ... 10 bar
Mode of operation	Double-acting
Operating medium	Compressed air as per ISO 8573-1:2010 [7:4:4]
Information on operating and pilot media	Operation with oil lubrication possible (required for further use)
Corrosion resistance class (CRC)	4 - Particularly high corrosion stress
For use in the food industry	See supplementary material information
Ambient temperature	0 °C ... 80 °C
Theoretical force at 6 bar, retracting	104 N
Theoretical force at 6 bar, advancing	121 N
Moving mass at 0 mm stroke	21 g
Additional weight per 10 mm stroke	4.8 g
Basic weight with 0 mm stroke	130 g
Additional moving mass per 10 mm stroke	2.2 g
Type of mounting	With accessories
Pneumatic connection	M5
Note on materials	RoHS-compliant
Cover material	High-alloy stainless steel
Piston rod material	High-alloy stainless steel
Material of cylinder barrel	High-alloy stainless steel



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W 61806 Deep groove ball bearings

Deep groove ball bearings

Bearing data

[Tolerances](#),

Normal (metric), P6, P5, Normal (inch),

[Radial internal clearance](#),

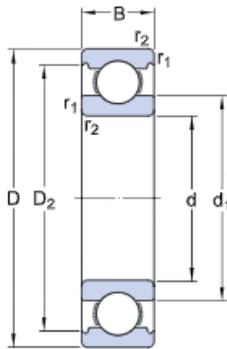
Matched bearing pairs, Stainless steel
 $d < 10$ mm, Other bearings

Bearing interfaces

[Seat tolerances for standard conditions](#),

[Tolerances and resultant fits](#)

Technical specification

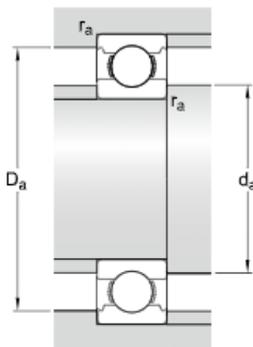


DIMENSIONS

d	30 mm
D	42 mm
B	7 mm
d_1	≈ 33.11 mm
D_2	≈ 39.2 mm
$r_{1,2}$	min. 0.3 mm

ABUTMENT DIMENSIONS

d_a	min. 32 mm
D_a	max. 40 mm
r_a	max. 0.3 mm



CALCULATION DATA

Fatigue load limit	P_u	0.125
Reference speed		34 000 r/min
Limiting speed		20 000 r/min
Calculation factor	k_r	0.02
Calculation factor	f_0	14.1

MASS

Mass bearing	0.022 kg
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More information

Product details	Engineering information	Tools
Single row deep groove ball bearings	Principles of rolling bearing selection	Bearing Select
Stainless steel deep groove ball bearings	General bearing knowledge	SimPro Quick
Single row deep groove ball bearings with filling slots	Bearing selection process	Engineering Calculator
Double row deep groove ball bearings	Bearing interfaces	LubeSelect for SKF greases
Bearing data	Seat tolerances for standard conditions	Heater selection tool
Loads	Selecting internal clearance	Rolling bearings mounting and dismounting instructions
Temperature limits	Lubrication	
Permissible speed	Sealing, mounting and dismounting	
Designation system	Bearing failure and how to prevent it	

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51106

Popular item

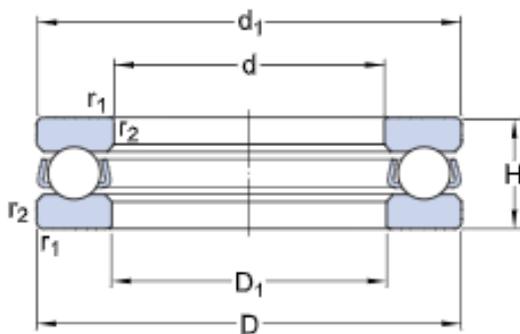
Thrust ball bearings, single direction



Bearing data
[Tolerances,](#)
 table 1

Bearing interfaces
[Seat tolerances for standard](#)
[conditions,](#)
[Tolerances and resultant fit](#)

Technical specification

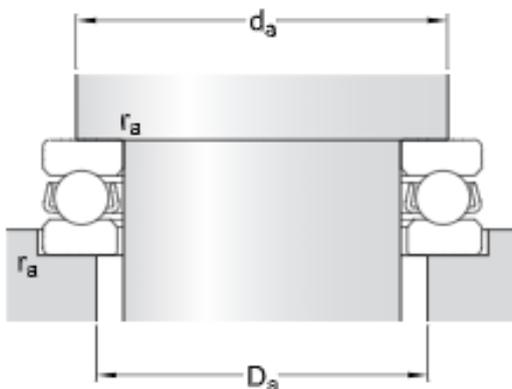


DIMENSIONS

d	30 mm
D	47 mm
H	11 mm
d_1	≈ 47 mm
D_1	≈ 32 mm
$r_{1,2}$	min. 0.6 mm

ABUTMENT DIMENSIONS

d_a	min. 40 mm
D_a	max. 37 mm
r_a	max. 0.6 mm



CALCULATION DATA

Basic dynamic load rating	C	19 kN
Basic static load rating	C_0	43 kN
Fatigue load limit	P_u	1.6 kN
Reference speed		6 000 r/min
Limiting speed		8 500 r/min
Minimum load factor	A	0.01

MASS

Mass bearing (including seat washer where applicable)	0.063 kg
---	----------

More information

<p>Product details</p> <ul style="list-style-type: none"> Designs and variants Bearing data Loads Temperature limits Permissible speed Mounting Designation system 	<p>Engineering information</p> <ul style="list-style-type: none"> Principles of rolling bearing selection General bearing knowledge Bearing selection process Bearing interfaces Seat tolerances for standard conditions Lubrication External sealing, mounting and dismounting Bearing failure and how to prevent it 	<p>Tools</p> <ul style="list-style-type: none"> Bearing Select Engineering Calculator SimPro Quick LubeSelect for SKF greases Heater selection tool
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51107 Thrust ball bearings, single direction

Popular item

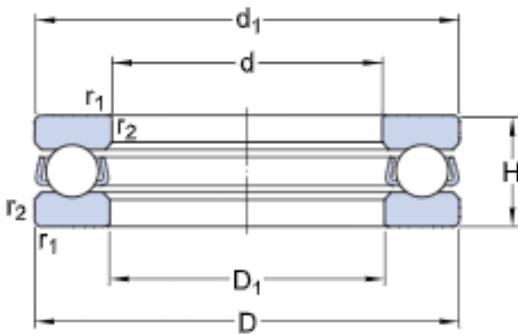
Thrust ball bearings, single direction



Bearing data
[Tolerances,](#)
[table 1](#)

Bearing interfaces
[Seat tolerances for standard conditions,](#)
[Tolerances and resultant fit](#)

Technical specification

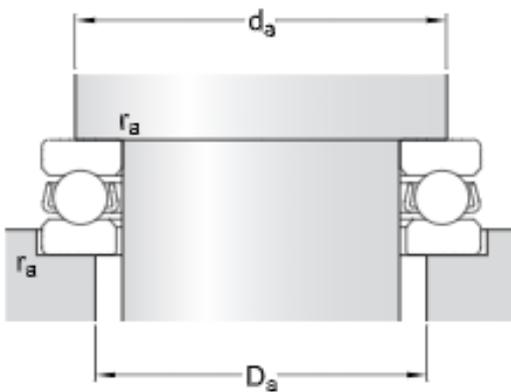


DIMENSIONS

d	35 mm
D	52 mm
H	12 mm
d ₁	≈ 52 mm
D ₁	≈ 37 mm
r _{1,2}	min. 0.6 mm

ABUTMENT DIMENSIONS

d _a	min. 45 mm
D _a	max. 42 mm
r _a	max. 0.6 mm



CALCULATION DATA

Basic dynamic load rating	C	19.9 kN
Basic static load rating	C_0	51 kN
Fatigue load limit	P_u	1.86 kN
Reference speed		5 600 r/min
Limiting speed		7 500 r/min
Minimum load factor	A	0.013

MASS

Mass bearing (including seat washer where applicable)	0.08 kg
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More information

Product details	Engineering information	Tools
Designs and variants	Principles of rolling bearing selection	Bearing Select
Bearing data	General bearing knowledge	Engineering Calculator
Loads	Bearing selection process	SimPro Quick
Temperature limits	Bearing interfaces	LubeSelect for SKF greases
Permissible speed	Seat tolerances for standard conditions	Heater selection tool
Mounting	Lubrication	
Designation system	External sealing, mounting and dismounting	
	Bearing failure and how to prevent it	

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W 61707 Deep groove ball bearings

Deep groove ball bearings

Bearing data

[Tolerances](#),

Normal (metric), P6, P5, Normal (inch),

[Radial internal clearance](#),

Matched bearing pairs, Stainless steel

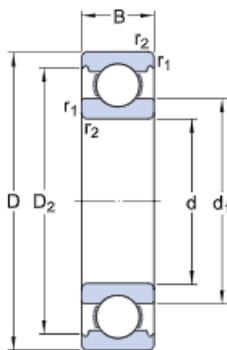
$d < 10$ mm, Other bearings

Bearing interfaces

[Seat tolerances for standard conditions](#),

[Tolerances and resultant fits](#)

Technical specification

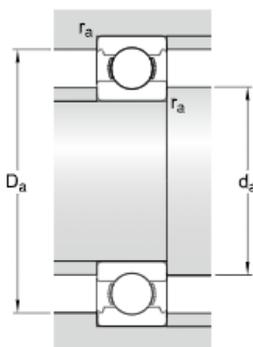


DIMENSIONS

d	35 mm
D	44 mm
B	5 mm
d_1	≈ 38 mm
D_2	≈ 42.2 mm
$r_{1,2}$	min. 0.3 mm

ABUTMENT DIMENSIONS

d_a	min. 37 mm
D_a	max. 42.5 mm
r_a	max. 0.3 mm



CALCULATION DATA

Basic dynamic load rating	C	1.06 kN
Basic static load rating	C_0	0.915 kN
Fatigue load limit	P_u	0.039 kN
Reference speed		30 000 r/min
Limiting speed		19 000 r/min
Calculation factor	k_r	0.015
Calculation factor	f_0	8.9

MASS

Mass bearing		0.014 kg
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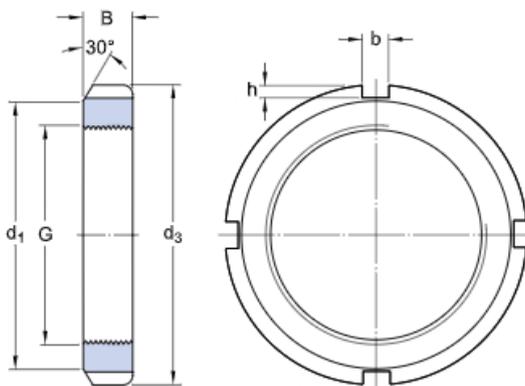


KM 7 Lock nuts requiring a keyway (metric)

Popular item

Lock nuts requiring a keyway (metric)

Technical specification



DIMENSIONS

G	M 35x1.5
d ₃	52 mm
B	8 mm
d ₁	44 mm
b	5 mm
h	2 mm

CALCULATION DATA

Axial static load carrying capacity	50 kN
-------------------------------------	-------

MASS

Mass lock nut	0.059 kg
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MOUNTING INFORMATION

Associated spanner	HN 7
--------------------	------

ASSOCIATED PRODUCTS

Locking device

MB 7

More information

Product details

[Designs and variants](#)

[Product data](#)

[Installation and removal](#)

[Designation system](#)

Tools

[Engineering Tools](#)

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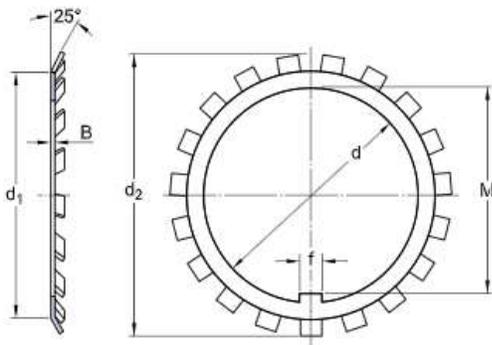
MB 7 MB(L) lock washers

Popular item

MB(L) lock washers



Technical specification



DIMENSIONS

d	35 mm
d ₁	44 mm
d ₂	57 mm
B	1.25 mm
f	6 mm
M	32.5 mm

MASS

Mass lock washer	0.011 kg
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