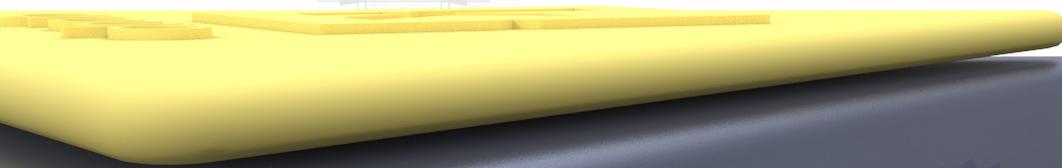
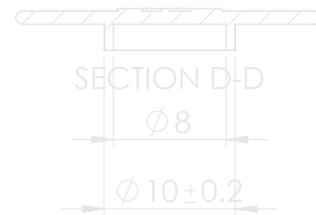
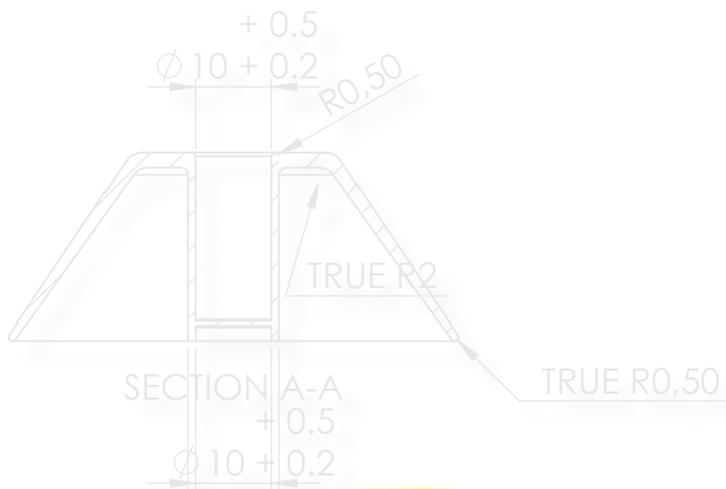


Afstudeerstage Kellpla Group

Data sheets

&

Technische tekeningen



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Industrieel Product Ontwerpen

2221053

20-06-2018

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Examinator

Naam: Remko Killaars

Stageperiode

Start: 05-02-2018 Eind: 06-07-2018

Geheim: Nee

Inhoud

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Bijlage 27 - Datasheet ABS



<http://www.4plas.com>
enquiries@4plas.com

PRODUCT DATA SHEET

4LAC 10H10000

4PLAS LTD

7 Aldin Way
HINCKLEY
Leicestershire
LE10 0GE
UK
Tel: +44 870 446 0424
Fax: +44 870 446 0434

Product Description:

4LAC 10H10000 is a Extrusion Grade Unfilled ABS

Technical Data:

General Properties:

Property	Test Procedure	Units	Value Dry - (Cond.)
Melt Flow Rate (220°C, 10kg)	ISO 1133	g/10 sec	8
Shrinkage	With Flow	%	0.5
Specific Gravity	ISO 1183	g/cm ³	1.05

Mechanical Properties:

Property	Test Procedure	Units	Value Dry - (Cond.)
Izod Impact, Notched, +23°C	ISO 180/1A	kJ/m ²	16
Izod Impact, Notched, -30°C	ISO 180/1A	kJ/m ²	6
Tensile Modulus 5mm/min, +23°C	ISO R 527	MPa	2000
Tensile Strain @ Break, 5mm/min, +23°C	ISO R 527	%	20
Tensile Stress @ Break 5mm/min, +23°C	ISO R 527	MPa	38

Electrical/ Flammability Properties:

Property	Test Procedure	Units	Value Dry - (Cond.)
Flammability Rating 1.6mm	UL 94 (Internal)	--	HB
Glow Wire Test - 2mm plaque	IEC 60695-2-12	°C	650

This information and our technical advice - whether verbal, in writing or by way of trials - are given in good faith but without warranty, and this also applies where proprietary rights of third parties are involved. Our advice does not release you from the obligation to verify the information currently provided - especially that contained in our safety data and technical information sheets - and to test our products as to their suitability for the intended processes and uses. The application, use and processing of our products and the products manufactured by you on the basis of our technical advice are beyond our control and, therefore, entirely your own responsibility. Our products are sold in accordance with the current version of our General Conditions of Sale and Delivery.

Test Values: Unless specified to the contrary, the values given have been established on standardized test specimens at room temperature. The figures should be regarded as guide values only and not as binding minimum values. Kindly note that, under certain conditions, the properties can be affected to a considerable extent by the design of the mould/ die, the processing conditions and the colouring.



Certificate No. GB2001368



ACCUCOMP™ ASA002L

Acrylonitrile Styrene Acrylate
Engineering Plastics

General

Material Status	• Commercial: Active
Availability	• North America
Forms	• Pellets

Physical	Nominal Value (English)	Nominal Value (SI)	Test Method
Density / Specific Gravity	1.06	1.06 g/cm ³	ASTM D792
Melt Mass-Flow Rate (MFR)			ASTM D1238
200°C/5.0 kg	2.5 g/10 min	2.5 g/10 min	
220°C/10.0 kg	25 g/10 min	25 g/10 min	
Molding Shrinkage - Flow	3.0E-3 in/in	0.30 %	ASTM D955
Mechanical	Nominal Value (English)	Nominal Value (SI)	Test Method
Tensile Modulus	276000 psi	1900 MPa	ASTM D638
Tensile Strength			ASTM D638
Yield	6820 psi	47.0 MPa	
Break	4640 psi	32.0 MPa	
Tensile Elongation			ASTM D638
Yield	4.0 %	4.0 %	
Break	35 %	35 %	
Flexural Modulus	312000 psi	2150 MPa	ASTM D790
Flexural Strength	9720 psi	67.0 MPa	ASTM D790
Impact	Nominal Value (English)	Nominal Value (SI)	Test Method
Notched Izod Impact (0.125 in (3.18 mm))	2.3 ft-lb/in	130 J/m	ASTM D256
Hardness	Nominal Value (English)	Nominal Value (SI)	Test Method
Rockwell Hardness (R-Scale)	106	106	ASTM D785
Thermal	Nominal Value (English)	Nominal Value (SI)	Test Method
Deflection Temperature Under Load			ASTM D648
66 psi (0.45 MPa), Unannealed	199 °F	93.0 °C	
264 psi (1.8 MPa), Unannealed	172 °F	78.0 °C	

HiFill® PA4/6 0206

Polyamide 46

Techmer Polymer Modifiers

PROSPECTOR®

www.ulprospector.com

Technical Data

Product Description

HiFill® PA4/6 0206 is a Polyamide 46 (Nylon 46) product. It can be processed by injection molding and is available in North America. Primary characteristic: conductive.

General

Material Status	• Commercial: Active
Literature ¹	• Technical Datasheet
Search for UL Yellow Card	• Techmer Polymer Modifiers
Availability	• North America
Features	• High Specific Gravity • Thermally Conductive
Appearance	• Colors Available
Forms	• Pellets
Processing Method	• Injection Molding

Physical	Nominal Value Unit	Test Method
Density / Specific Gravity	2.05 g/cm ³	ASTM D792
Molding Shrinkage - Flow (3.18 mm)	1.5 %	ASTM D955
Water Absorption (24 hr)	0.10 %	ASTM D570
Mechanical	Nominal Value Unit	Test Method
Tensile Strength (Yield)	100 MPa	ASTM D638
Tensile Elongation (Break)	2.0 %	ASTM D638
Flexural Modulus	10300 MPa	ASTM D790
Flexural Strength	180 MPa	ASTM D790
Impact	Nominal Value Unit	Test Method
Notched Izod Impact (23°C, 3.18 mm)	43 J/m	ASTM D256
Thermal	Nominal Value Unit	Test Method
Deflection Temperature Under Load		ASTM D648
0.45 MPa, Unannealed	291 °C	
1.8 MPa, Unannealed	277 °C	
CLTE - Flow	3.6E-5 cm/cm/°C	ASTM D696
Thermal Conductivity	0.98 W/m/K	ASTM C177

Notes

¹ These links provide you with access to supplier literature. We work hard to keep them up to date; however you may find the most current literature from the supplier.

² Typical properties: these are not to be construed as specifications.



Where to Buy

Supplier

Techmer Polymer Modifiers

Clinton, TN USA
Telephone: 865-457-6700
Web: <http://www.techmerpm.com/>

Distributor

Amco Polymers

Telephone: 800-262-6685
Web: <http://www.amcopolymers.com/>
Availability: North America

Chase Plastic Services, Inc.

Chase Plastics Services is a North American distributor with representatives throughout the region. Please find your rep here: <http://www.chaseplastics.com/contact/locations>
Telephone: 800-232-4273
Web: <http://www.chaseplastics.com/>
Availability: North America

Nexeo Solutions

Telephone: 800-531-7106
Web: <http://www.nexeosolutions.com/>
Availability: North America

Plastic Service Centers

Telephone: 586-307-3900
Web: <http://www.plasticservice.com/>
Availability: North America

PolySource

Telephone: 866-558-5300
Web: <http://www.polysource.net/>
Availability: North America

Resinal de México

Telephone: +52-55-5254-7600
Web: <http://resinal.mx/>
Availability: Mexico



Plaslube® PA6 GF30 RM BK

Polyamide 6

Techmer Polymer Modifiers

PROSPECTOR®

www.ulprospector.com

Technical Data

Product Description

Plaslube® PA6 GF30 RM BK is a Polyamide 6 (Nylon 6) product filled with glass fiber. It can be processed by injection molding and is available in North America.

General

Material Status	• Commercial: Active
Literature ¹	• Technical Datasheet
Search for UL Yellow Card	• Techmer Polymer Modifiers • Plaslube®
Availability	• North America
Filler / Reinforcement	• Glass Fiber
Appearance	• Colors Available
Forms	• Pellets
Processing Method	• Injection Molding

	Nominal Value Unit	Test Method
Physical		
Density / Specific Gravity	1.34 g/cm ³	ASTM D792
Molding Shrinkage - Flow (3.18 mm)	0.50 %	ASTM D955
Water Absorption (24 hr)	0.70 %	ASTM D570
Mechanical		
Tensile Strength (Break)	176 MPa	ASTM D638
Tensile Elongation (Break)	2.4 %	ASTM D638
Flexural Modulus	1030 MPa	ASTM D790
Flexural Strength	276 MPa	ASTM D790
Impact		
Notched Izod Impact (23°C, 3.18 mm)	120 J/m	ASTM D256
Hardness		
Rockwell Hardness (R-Scale)	118	ASTM D785
Thermal		
Deflection Temperature Under Load 1.8 MPa, Unannealed	210 °C	ASTM D648
CLTE - Flow	1.6E-5 cm/cm/°C	ASTM D696

Notes

¹ These links provide you with access to supplier literature. We work hard to keep them up to date; however you may find the most current literature from the supplier.

² Typical properties: these are not to be construed as specifications.



Plaslube® PA6 GF30 RM BK

Polyamide 6

Techmer Polymer Modifiers

PROSPECTOR®

www.ulprospector.com

Where to Buy

Supplier

Techmer Polymer Modifiers

Clinton, TN USA

Telephone: 865-457-6700

Web: <http://www.techmerpm.com/>

Distributor

Amco Polymers

Telephone: 800-262-6685

Web: <http://www.amcopolymers.com/>

Availability: North America

Chase Plastic Services, Inc.

Chase Plastics Services is a North American distributor with representatives throughout the region. Please find your rep here: <http://www.chaseplastics.com/contact/locations>

Telephone: 800-232-4273

Web: <http://www.chaseplastics.com/>

Availability: North America

Nexeo Solutions

Telephone: 800-531-7106

Web: <http://www.nexeosolutions.com/>

Availability: North America

Plastic Service Centers

Telephone: 586-307-3900

Web: <http://www.plasticservice.com/>

Availability: North America

PolySource

Telephone: 866-558-5300

Web: <http://www.polysource.net/>

Availability: North America

Resinal de México

Telephone: +52-55-5254-7600

Web: <http://resinal.mx/>

Availability: Mexico

10



Lucent PA 6-01

Polyamide 6
A. Schulman Inc.

PROSPECTOR®
www.ulprospector.com

Technical Data

Product Description

Unreinforced Nylon 6, General Purpose Injection Grade

Colors Available
Add "H" for Heat Stabilized
Add "U" for UV Stabilized
Typical Properties, Dry as Molded

General

Material Status	• Commercial: Active
Literature ¹	• Technical Datasheet
Search for UL Yellow Card	• A. Schulman Inc.
Availability	• North America
Features	• General Purpose
Uses	• General Purpose
Appearance	• Colors Available
Processing Method	• Injection Molding

Physical	Nominal Value Unit	Test Method
Density / Specific Gravity	1.13 g/cm ³	ASTM D792
Molding Shrinkage - Flow (3.18 mm)	1.3 %	
Mechanical	Nominal Value Unit	Test Method
Tensile Strength (Yield)	73.1 MPa	ASTM D638
Tensile Elongation (Break)	> 25 %	ASTM D638
Flexural Modulus	2760 MPa	ASTM D790
Flexural Strength	103 MPa	ASTM D790
Impact	Nominal Value Unit	Test Method
Notched Izod Impact (23°C, 3.18 mm)	48 J/m	ASTM D256
Thermal	Nominal Value Unit	Test Method
Deflection Temperature Under Load 1.8 MPa, Unannealed	60.0 °C	ASTM D648
Peak Melting Temperature	216 to 225 °C	ASTM D789

Notes

¹ These links provide you with access to supplier literature. We work hard to keep them up to date; however you may find the most current literature from the supplier.

² Typical properties: these are not to be construed as specifications.



Lucent PA 6-01

Polyamide 6

A. Schulman Inc.

PROSPECTOR®

www.ulprospector.com

Where to Buy

Supplier

A. Schulman Inc.

Akron, OH USA

Telephone: 800-547-3746

Web: <http://www.aschulman.com/>

Distributor

Plastic Service Centers

Telephone: 586-307-3900

Web: <http://www.plasticservice.com/>

Availability: North America

Plastics Plus, Inc.

Telephone: 248-393-0300

Web: <http://www.plasplus.com/>

Availability: North America

Resin Resource, Inc.

Telephone: 877-652-3431

Web: <http://www.resinresourceinc.com/>

Availability: North America

Tex-Co Resin Distribution, Inc.

Telephone: 877-908-3926

Web: <http://www.texcoresin.com/>

Availability: North America



ADSINT® PA12

Polyamide 12

ADVANC3D Materials® GmbH

PROSPECTOR®

www.ulprospector.com

Technical Data

Product Description

AdSint® PA12 is the most common used Polyamide for the SLS process because it offers excellent mechanical properties and chemical resistance. AdSint® PA12 shows a smoother surface compared to other PA12 products and delivers excellent results for a detailed print. The finished parts will keep the polymer natural white-cream colour over time. AdSint® PA12 has been tested on most common SLS printers. Parameters for printing will be provided. It is also available in black. The refresh rate is between 25% - 35%, depending on the application.

General

Material Status	• Commercial: Active
Literature ¹	• Technical Datasheet (English)
Availability	• Europe
Features	• Chemical Resistant • Good Surface Finish
Uses	• Additive Manufacturing (3D Printing)
Appearance	• Black • Natural Color • White
Forms	• Powder
Processing Method	• 3D Printing, Laser Sintering/Melting

Physical	Nominal Value Unit	Test Method
Density (23°C)	0.940 to 1.04 g/cm ³	ISO 61
Apparent (Bulk) Density ³	0.50 to 0.60 g/cm ³	ISO 1068
Water Absorption (Equilibrium, 23°C, 50% RH)	0.50 to 0.70 %	ISO 62
Particle Size Distribution		ISO 13320
Course Particles <28 µm	< 10 %	
Course Particles >51 µm	< 10 %	

Mechanical	Nominal Value Unit	Test Method
Tensile Modulus	1650 to 1850 MPa	ISO 527-2/1B
Tensile Stress	45.0 to 47.0 MPa	ISO 527-2/1B
Tensile Strain (Break)	20 to 24 %	ISO 527-2/1B
Flexural Modulus (23°C)	1510 to 1530 MPa	ISO 178

Impact	Nominal Value Unit	Test Method
Charpy Unnotched Impact Strength (23°C)	79 to 95 kJ/m ²	ISO 179/1eU

Hardness	Nominal Value Unit	Test Method
Shore Hardness (Shore D, 20°C)	73 to 75	ISO 868

Thermal	Nominal Value Unit	Test Method
Heat Deflection Temperature		
0.45 MPa, Unannealed	145 to 155 °C	ISO 75-2/B
1.8 MPa, Unannealed	65.0 to 75.0 °C	ISO 75-2/A
Glass Transition Temperature	38.0 to 42.0 °C	ISO 11357-2
Melting Temperature	180 to 184 °C	ISO 11357-3

Additional Information	Nominal Value Unit	Test Method
Mean Diameter	38.0 µm	ISO 13320

Notes

¹ These links provide you with access to supplier literature. We work hard to keep them up to date; however you may find the most current literature from the supplier.

² Typical properties: these are not to be construed as specifications.

³ Packed



Where to Buy

Supplier

ADVANC3D Materials® GmbH
Hamburg, Germany
Telephone: +49 (0)40-303-933-11
Web: <http://www.advanc3dmaterials.com/>

Distributor

Please contact the supplier to find a distributor for ADSINT® PA12



4MID® 9A10000

Polyamide 66

4Plas

PROSPECTOR®

www.ulprospector.com

Technical Data

Product Description

4MID 9A10000 is a Extrusion Unfilled PA66

General

Material Status	• Commercial: Active
Literature ¹	• Processing (English) • Technical Datasheet (English)
Search for UL Yellow Card	• 4Plas
Availability	• Europe
Processing Method	• Extrusion • Injection Molding

Physical	Nominal Value Unit	Test Method
Density	1.14 g/cm ³	ISO 1183
Molding Shrinkage		
Across Flow	1.4 %	
Flow	1.4 %	
Water Absorption ³ (Equilibrium, 23°C, 50% RH)	2.7 %	ISO 62
Moisture Content	< 2000 ppm	ISO 960
Mechanical	Nominal Value Unit	Test Method
Tensile Modulus (23°C)	3200 MPa	ISO 527-2/5
Tensile Stress (Break, 23°C)	80.0 MPa	ISO 527-2/5
Impact	Nominal Value Unit	Test Method
Charpy Notched Impact Strength		ISO 179/1eA
-30°C	5.0 kJ/m ²	
23°C	6.0 kJ/m ²	
Charpy Unnotched Impact Strength		ISO 179/1eU
-30°C	No Break	
23°C	No Break	
Notched Izod Impact Strength		ISO 180/1A
-30°C	5.0 kJ/m ²	
23°C	6.0 kJ/m ²	
Thermal	Nominal Value Unit	Test Method
Heat Deflection Temperature		
0.45 MPa, Unannealed	210 °C	ISO 75-2/B
1.8 MPa, Unannealed	80.0 °C	ISO 75-2/A
Melting Temperature ⁴	262 °C	ISO 11357
Electrical	Nominal Value Unit	Test Method
Surface Resistivity	1.0E+13 ohms	IEC 60093
Volume Resistivity	1.0E+15 ohms·cm	IEC 60093
Comparative Tracking Index	600 V	IEC 60112
Flammability	Nominal Value Unit	Test Method
Flame Rating		UL 94
1.6 mm	V-2	
3.2 mm	V-2	



Injection	Nominal Value Unit
Drying Temperature	80 °C
Drying Time	2.0 hr
Suggested Max Moisture	0.20 %
Processing (Melt) Temp	270 to 290 °C
Mold Temperature	50 to 90 °C
Injection Rate	Moderate-Fast
Holding Pressure	50.0 to 100 MPa
Screw Speed	400 rpm

Injection Notes

Feed Throat Temperature: 60 - 80 °C
 Back Pressure: Low

Extrusion	Nominal Value Unit
Drying Temperature	80 °C
Drying Time	2.0 hr
Suggested Max Moisture	0.20 %
Melt Temperature	270 to 290 °C
Die Temperature	50 to 90 °C

Notes

- ¹ These links provide you with access to supplier literature. We work hard to keep them up to date; however you may find the most current literature from the supplier.
- ² Typical properties: these are not to be construed as specifications.
- ³ 24 Hrs
- ⁴ 10 K/min



4MID® 9A10000

Polyamide 66

4Plas

PROSPECTOR®

www.ulprospector.com

Where to Buy

Supplier

4Plas

Hinckley, Leicestershire United Kingdom

Telephone: +44-870-446-0424

Web: <http://www.4plas.com/>

Distributor

Please contact the supplier to find a distributor for 4MID® 9A10000



Badamid® PA610

Polyamide 610

Bada AG

PROSPECTOR®

www.ulprospector.com

Technical Data

Product Description

Badamid® PA610 is a Polyamide 610 (Nylon 610) material. It is available in Europe for injection molding. Primary attribute of Badamid® PA610: Flame Rated.

General

Material Status	• Commercial: Active
Literature ¹	• Technical Datasheet (English)
Search for UL Yellow Card	• Bada AG • Badamid®
Availability	• Europe
Processing Method	• Injection Molding
Resin ID (ISO 1043)	• >PA610<

	Dry	Conditioned	Unit	Test Method
Physical				
Density	1.07	--	g/cm ³	ISO 1183
Water Absorption (Equilibrium, 23°C, 50% RH)	0.40	--	%	ISO 62
Mechanical				
Tensile Modulus (23°C)	2000	1600	MPa	ISO 527-2/1
Tensile Stress (Yield, 23°C)	60.0	50.0	MPa	ISO 527-2/1A/50
Tensile Strain (Yield, 23°C)	100	> 100	%	ISO 527-2/1A/50
Impact				
Charpy Notched Impact Strength (23°C)	16	--	kJ/m ²	ISO 179/1eA
Charpy Unnotched Impact Strength (23°C)	No Break	--		ISO 179/1eU
Thermal				
Heat Deflection Temperature				
0.45 MPa, Unannealed	175	--	°C	ISO 75-2/B
1.8 MPa, Unannealed	70.0	--	°C	ISO 75-2/A
Melting Temperature (DSC) ³	220	--	°C	ISO 3146
Electrical				
Volume Resistivity (1.00 mm)	1.0E+13	--	ohms-cm	IEC 60093
Electric Strength (1.00 mm)	30	--	kV/mm	IEC 60243-1
Comparative Tracking Index	550	--	V	IEC 60112
Flammability				
Flame Rating				UL 94
0.8 mm	HB	--		
1.6 mm	HB	--		
Injection		Dry Unit		
Drying Temperature		80 °C		
Drying Time		2.0 to 4.0 hr		
Processing (Melt) Temp		250 to 290 °C		
Mold Temperature		60 to 90 °C		

Notes

¹ These links provide you with access to supplier literature. We work hard to keep them up to date; however you may find the most current literature from the supplier.

² Typical properties: these are not to be construed as specifications.

³ 10 K/Min



Badamid® PA610

Polyamide 610

Bada AG

PROSPECTOR®

www.ulprospector.com

Where to Buy

Supplier

Bada AG

Bühl, Baden Germany

Telephone: +49-7223-94077-0

Web: <http://www.bada.de/>

Distributor

Please contact the supplier to find a distributor for Badamid® PA610



Bijlage 35 - Datasheet PBT

4DUR® 9K10000

Polybutylene Terephthalate
4Plas

PROSPECTOR®

www.ulprospector.com

Technical Data

Product Description

4DUR 9K10000 is a Extrusion Unfilled PBT

General

Material Status	• Commercial: Active
Literature ¹	• Processing (English) • Technical Datasheet (English)
Search for UL Yellow Card	• 4Plas
Availability	• Europe
Processing Method	• Extrusion • Injection Molding

Physical	Nominal Value Unit	Test Method
Density	1.31 g/cm ³	ISO 1183
Melt Mass-Flow Rate (MFR) (270°C/2.16 kg)	10 g/10 min	ISO 1133
Molding Shrinkage		
Across Flow	1.6 %	
Flow	1.6 %	
Water Absorption ³ (Equilibrium, 23°C, 50% RH)	0.20 %	ISO 62
Mechanical	Nominal Value Unit	Test Method
Tensile Modulus (23°C)	2500 MPa	ISO 527-2/5
Tensile Stress		ISO 527-2/5
Yield, 23°C	55.0 MPa	
Break, 23°C	55.0 MPa	
Tensile Strain (Break, 23°C)	30 %	ISO 527-2/5
Impact	Nominal Value Unit	Test Method
Notched Izod Impact Strength		ISO 180/1A
-30°C	7.0 kJ/m ²	
23°C	8.0 kJ/m ²	
Thermal	Nominal Value Unit	Test Method
Heat Deflection Temperature		ISO 75-2/A
1.8 MPa, Unannealed	60.0 °C	
Melting Temperature ⁴	225 °C	ISO 11357
Electrical	Nominal Value Unit	Test Method
Surface Resistivity	1.0E+14 ohms	IEC 60093
Volume Resistivity	1.0E+16 ohms·cm	IEC 60093
Flammability	Nominal Value Unit	Test Method
Flame Rating (3.2 mm)	HB	UL 94
Injection	Nominal Value Unit	
Drying Temperature	120 °C	
Drying Time	2.0 to 4.0 hr	
Suggested Max Moisture	0.040 %	
Processing (Melt) Temp	240 to 260 °C	
Mold Temperature	60 to 100 °C	
Injection Rate	Moderate-Fast	
Holding Pressure	40.0 to 80.0 MPa	
Screw Speed	300 rpm	

Injection Notes

Feed Throat Temperature: 50 - 70 °C
Back Pressure: Low



Extrusion	Nominal Value	Unit
Drying Temperature	120	°C
Drying Time	2.0 to 4.0	hr
Suggested Max Moisture	0.040	%
Melt Temperature	240 to 260	°C
Die Temperature	60 to 100	°C

Notes

- ¹ These links provide you with access to supplier literature. We work hard to keep them up to date; however you may find the most current literature from the supplier.
- ² Typical properties: these are not to be construed as specifications.
- ³ 24 Hrs
- ⁴ 10 K/min



4DUR® 9K10000
Polybutylene Terephthalate
4Plas

PROSPECTOR®
www.ulprospector.com

Where to Buy

Supplier

4Plas
Hinckley, Leicestershire United Kingdom
Telephone: +44-870-446-0424
Web: <http://www.4plas.com/>

Distributor

Please contact the supplier to find a distributor for 4DUR® 9K10000



Allen 2000

Polycarbonate + ABS

SEKISUI Polymer Innovations, LLC

PROSPECTOR[®]

www.ulprospector.com

Technical Data

Product Description

2000 is a general purpose PC/ABS with high impact strength and high heat deflection.

Common Applications:

- Vehicle Interior Trim
- Covers and Housings
- Instrument Panels

Features and Benefits:

- Custom color matching
- Good forming properties
- Edge trim easily used into future orders
- High Heat Deflection Temperature
- High Gloss Finish
- Meets many automotive specifications

General

Material Status	• Commercial: Active
Literature ¹	• Technical Datasheet (English)
Search for UL Yellow Card	• SEKISUI Polymer Innovations, LLC
Availability	• North America
Features	<ul style="list-style-type: none"> • General Purpose • High Gloss • High Heat Resistance • High Impact Resistance
Uses	<ul style="list-style-type: none"> • Automotive Instrument Panel • Automotive Interior Trim • General Purpose • Housings
Processing Method	• Sheet Extrusion

Physical	Nominal Value Unit	Test Method
Density / Specific Gravity	1.13 g/cm ³	ASTM D792
Molding Shrinkage - Flow	0.50 to 0.70 %	ASTM D955
Mechanical	Nominal Value Unit	Test Method
Tensile Strength (Yield)	57.0 MPa	ASTM D638
Flexural Modulus	2460 MPa	ASTM D790
Flexural Strength	89.6 MPa	ASTM D790
Impact	Nominal Value Unit	Test Method
Notched Izod Impact		ASTM D256
-29°C	590 J/m	
23°C	690 J/m	
Thermal	Nominal Value Unit	Test Method
Deflection Temperature Under Load		ASTM D648
0.45 MPa, Unannealed	129 °C	
1.8 MPa, Unannealed	108 °C	
Vicat Softening Temperature	141 °C	ASTM D1525
Flammability	Nominal Value Unit	Test Method
Flame Rating (1.5 mm)	HB	UL 94
Optical	Nominal Value Unit	Test Method
Gloss (60°)	80	ASTM D523

Additional Information

Forming Temperature Range: 320-400 °F

Mold Temperature Range: 150-200 °F



Allen 2000

Polycarbonate + ABS

SEKISUI Polymer Innovations, LLC

PROSPECTOR®

www.ulprospector.com

Notes

¹ These links provide you with access to supplier literature. We work hard to keep them up to date; however you may find the most current literature from the supplier.

² Typical properties: these are not to be construed as specifications.



Allen 2000

Polycarbonate + ABS

SEKISUI Polymer Innovations, LLC

PROSPECTOR®

www.ulprospector.com

Where to Buy

Supplier

SEKISUI Polymer Innovations, LLC

Bloomsburg, PA USA

Telephone: 800-325-3133

Web: <http://www.sekisui-spi.com/>

Distributor

Please contact the supplier to find a distributor for Allen 2000



ACCULOY™ PCS003L

Polycarbonate + ASA
A. Schulman Inc.

PROSPECTOR®

www.ulprospector.com

Technical Data

Product Description

ACCULOY™ PCS003L is a Polycarbonate + ASA (PC+ASA) product. It is available in North America.

General

Material Status	• Commercial: Active
Literature ¹	• Technical Datasheet
Search for UL Yellow Card	• A. Schulman Inc.
Availability	• North America
Forms	• Pellets

Physical	Nominal Value Unit	Test Method
Density / Specific Gravity	1.16 g/cm ³	ASTM D792
Melt Mass-Flow Rate (MFR) (250°C/2.16 kg)	6.0 g/10 min	ASTM D1238
Molding Shrinkage - Flow	0.60 %	ASTM D955
Mechanical	Nominal Value Unit	Test Method
Tensile Modulus	2000 MPa	ASTM D638
Tensile Strength		ASTM D638
Yield	62.0 MPa	
Break	52.0 MPa	
Tensile Elongation		ASTM D638
Yield	6.0 %	
Break	100 %	
Flexural Modulus	2500 MPa	ASTM D790
Flexural Strength	94.0 MPa	ASTM D790
Impact	Nominal Value Unit	Test Method
Notched Izod Impact (3.18 mm)	550 J/m	ASTM D256
Hardness	Nominal Value Unit	Test Method
Rockwell Hardness (R-Scale)	120	ASTM D785
Thermal	Nominal Value Unit	Test Method
Deflection Temperature Under Load		ASTM D648
0.45 MPa, Unannealed	127 °C	
1.8 MPa, Unannealed	106 °C	

Notes

¹ These links provide you with access to supplier literature. We work hard to keep them up to date; however you may find the most current literature from the supplier.

² Typical properties: these are not to be construed as specifications.



ACCULOY™ PCS003L

Polycarbonate + ASA

A. Schulman Inc.

PROSPECTOR®

www.ulprospector.com

Where to Buy

Supplier

A. Schulman Inc.

Akron, OH USA

Telephone: 800-547-3746

Web: <http://www.aschulman.com/>

Distributor

Plastic Service Centers

Telephone: 586-307-3900

Web: <http://www.plasticservice.com/>

Availability: North America

Plastics Plus, Inc.

Telephone: 248-393-0300

Web: <http://www.plasplus.com/>

Availability: North America

Resin Resource, Inc.

Telephone: 877-652-3431

Web: <http://www.resinresourceinc.com/>

Availability: North America

Tex-Co Resin Distribution, Inc.

Telephone: 877-908-3926

Web: <http://www.texcoresin.com/>

Availability: North America



ACCUCOMP™ ACE091L

Acetal (POM) Copolymer
A. Schulman Inc.

PROSPECTOR®

www.ulprospector.com

Technical Data

Product Description

ACCUCOMP™ ACE091L is an Acetal (POM) Copolymer product. It is available in North America. Primary characteristic: high viscosity.

General

Material Status	• Commercial: Active
Literature ¹	• Technical Datasheet
Search for UL Yellow Card	• A. Schulman Inc.
Availability	• North America
Features	• High Viscosity
Forms	• Pellets

Physical	Nominal Value Unit	Test Method
Density / Specific Gravity	1.41 g/cm ³	ASTM D792
Melt Mass-Flow Rate (MFR) (190°C/2.16 kg)	2.5 g/10 min	ASTM D1238
Molding Shrinkage - Flow	2.2 %	ASTM D955
Mechanical	Nominal Value Unit	Test Method
Tensile Strength (Yield)	61.0 MPa	ASTM D638
Tensile Elongation (Break)	65 %	ASTM D638
Flexural Modulus	2620 MPa	ASTM D790
Flexural Strength	90.0 MPa	ASTM D790
Impact	Nominal Value Unit	Test Method
Notched Izod Impact	74 J/m	ASTM D256
Hardness	Nominal Value Unit	Test Method
Rockwell Hardness (R-Scale)	78	ASTM D785
Thermal	Nominal Value Unit	Test Method
Deflection Temperature Under Load		ASTM D648
0.45 MPa, Unannealed	158 °C	
1.8 MPa, Unannealed	110 °C	
Melting Temperature	165 °C	

Notes

¹ These links provide you with access to supplier literature. We work hard to keep them up to date; however you may find the most current literature from the supplier.

² Typical properties: these are not to be construed as specifications.



ACCUCOMP™ ACE091L

Acetal (POM) Copolymer

A. Schulman Inc.

PROSPECTOR®

www.ulprospector.com

Where to Buy

Supplier

A. Schulman Inc.

Akron, OH USA

Telephone: 800-547-3746

Web: <http://www.aschulman.com/>

Distributor

Plastic Service Centers

Telephone: 586-307-3900

Web: <http://www.plasticservice.com/>

Availability: North America

Plastics Plus, Inc.

Telephone: 248-393-0300

Web: <http://www.plasplus.com/>

Availability: North America

Resin Resource, Inc.

Telephone: 877-652-3431

Web: <http://www.resinresourceinc.com/>

Availability: North America

Tex-Co Resin Distribution, Inc.

Telephone: 877-908-3926

Web: <http://www.texcoresin.com/>

Availability: North America





P.O. Box 1128 • Marietta OH 45750
Phone: 740-374-3742 • Phone: 800-937-3746 • Fax: 740-374-6059

Typical Properties

ARC10H

Description: Acetal Homopolymer, High Viscosity

<u>Property</u>	<u>English Value</u>	<u>Test Reference</u>
Melt Point	347°F 175°C	ASTM D-789
Density	1.42 1.42 gm/cm ³	ASTM D-792
Tensile Strength	10,500 lbs/in ² 73 MPa	ASTM D-638
Elongation	50%	ASTM D-638
Flexural Modulus	405,00 lbs/in ² 2,793 MPA	ASTM D-790
Flexural Strength	12,000 lbs/in ² 83 MPa	ASTM D-790
Notched Izod	2.1 ft-lb/in.	ASTM D-256
Shrinkage	2.4%	ASTM D-955
Deflection Temp. @ 264 psi	277°F 136°C	ASTM D-648

Properties indicated above are for natural color resins, dry as molded. Addition of colorants or additives may alter or degrade these properties.

The test results are believed to be based on reliable procedures. Due to variable conditions or methods of processing, NO GUARANTEES OR WARRANTIES ARE EXPRESSED OR IMPLIED, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY FOR PARTICULAR PURPOSE. The above information is not to be construed as a license or a recommendation to infringe on any patents.

4PROP® 25C10000

Polypropylene Copolymer

4Plas

PROSPECTOR®

www.ulprospector.com

Technical Data

Product Description

4PROP 25C10000 is a MFI 10 to 14 Unfilled Copolymer Polypropylene

General

Material Status	<ul style="list-style-type: none"> Commercial: Active
Literature ¹	<ul style="list-style-type: none"> Processing - 4Plas 4PROP (English) Processing (English) Technical Datasheet (English)
Search for UL Yellow Card	<ul style="list-style-type: none"> 4Plas
Availability	<ul style="list-style-type: none"> Europe
Features	<ul style="list-style-type: none"> Copolymer
Processing Method	<ul style="list-style-type: none"> Injection Molding

Physical	Nominal Value Unit	Test Method
Density	0.905 g/cm ³	ISO 1183
Melt Mass-Flow Rate (MFR) (230°C/2.16 kg)	12 g/10 min	ISO 1133
Molding Shrinkage		
Across Flow	1.3 %	
Flow	1.3 %	

Mechanical	Nominal Value Unit	Test Method
Tensile Modulus (23°C)	1300 MPa	ISO 527-2/5
Tensile Stress (Break, 23°C)	28.0 MPa	ISO 527-2/5
Tensile Strain		ISO 527-2/5
Yield, 23°C	6.5 %	
Break, 23°C	50 %	

Impact	Nominal Value Unit	Test Method
Charpy Notched Impact Strength		ISO 179/1eA
-20°C	2.5 kJ/m ²	
0°C	3.0 kJ/m ²	
23°C	5.0 kJ/m ²	
Notched Izod Impact Strength		ISO 180/1A
-30°C	2.0 kJ/m ²	
23°C	6.0 kJ/m ²	

Thermal	Nominal Value Unit	Test Method
Heat Deflection Temperature		
0.45 MPa, Unannealed	88.0 °C	ISO 75-2/B
1.8 MPa, Unannealed	51.0 °C	ISO 75-2/A
Vicat Softening Temperature		
--	151 °C	ISO 306/A
--	67.0 °C	ISO 306/B
Melting Temperature ³	165 °C	ISO 11357

Flammability	Nominal Value Unit	Test Method
Flame Rating (1.6 mm)	HB	UL 94
Glow Wire Ignition Temperature (2.0 mm)	650 °C	IEC 60695-2-13

Injection	Nominal Value Unit
Processing (Melt) Temp	200 to 240 °C
Mold Temperature	20 to 50 °C
Injection Rate	Moderate-Fast
Holding Pressure	40.0 to 80.0 MPa
Screw Speed	400 rpm



4PROP® 25C10000
Polypropylene Copolymer
4Plas

PROSPECTOR®
www.ulprospector.com

Injection Notes

Feed Throat Temperature: 20 - 60 °C
Back Pressure: Low

Notes

¹ These links provide you with access to supplier literature. We work hard to keep them up to date; however you may find the most current literature from the supplier.

² Typical properties: these are not to be construed as specifications.

³ 10 K/min



4PROP® 25C10000
Polypropylene Copolymer
4Plas

Where to Buy

Supplier

4Plas

Hinckley, Leicestershire United Kingdom

Telephone: +44-870-446-0424

Web: <http://www.4plas.com/>

Distributor

Please contact the supplier to find a distributor for 4PROP® 25C10000



RTP 1387 C NATURAL

Polyphenylene Sulfide
RTP Company

PROSPECTOR®

www.ulprospector.com

Technical Data

Product Description

Warning: The status of this material is 'Commercial: Limited Issue'

The data for this material has not been recently verified.
Please contact RTP Company for current information prior to specifying this grade.

-Preliminary Product Data per RTP Co.-

General

Material Status	• Limited Issue		
Search for UL Yellow Card	• RTP Company • RTP		
Availability	• Africa & Middle East • Asia Pacific	• Europe • Latin America	• North America
Filler / Reinforcement	• Carbon Fiber, 40% Filler by Weight		
RoHS Compliance	• Contact Manufacturer		
Appearance	• Black	• Natural Color	
Forms	• Pellets		
Processing Method	• Injection Molding		

Physical	Nominal Value Unit	Test Method
Density / Specific Gravity	1.47 g/cm ³	ASTM D792
Molding Shrinkage - Flow (3.18 mm)	0.010 %	ASTM D955

Mechanical	Nominal Value Unit	Test Method
Tensile Modulus	31000 MPa	ASTM D638
Tensile Strength	207 MPa	ASTM D638
Tensile Elongation (Break)	1.0 %	ASTM D638
Flexural Modulus	27600 MPa	ASTM D790
Flexural Strength	290 MPa	ASTM D790

Impact	Nominal Value Unit	Test Method
Notched Izod Impact (3.18 mm)	53 J/m	ASTM D256
Unnotched Izod Impact (3.18 mm)	430 J/m	ASTM D4812

Thermal	Nominal Value Unit	Test Method
Deflection Temperature Under Load 1.8 MPa, Unannealed	260 °C	ASTM D648

Electrical	Nominal Value Unit	Test Method
Volume Resistivity	10 ohms·cm	ASTM D257

Flammability	Nominal Value Unit	Test Method
Flame Rating	V-0	UL 94

Injection	Nominal Value Unit
Drying Temperature	149 °C
Drying Time	6.0 hr
Suggested Max Moisture	0.040 %
Suggested Max Regrind	20 %
Rear Temperature	302 to 343 °C
Middle Temperature	302 to 343 °C
Front Temperature	302 to 343 °C
Mold Temperature	135 to 177 °C
Injection Pressure	103 to 138 MPa
Clamp Tonnage	6.9 to 11 kN/cm ²

Notes

¹ Typical properties: these are not to be construed as specifications.

1 of 2



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Form No. TDS-28610-en
Document Created: Friday, June 8, 2018
Added to Prospector: November 2000
Last Updated: 12/12/2013

RTP 1387 C NATURAL

Polyphenylene Sulfide

RTP Company

PROSPECTOR®

www.ulprospector.com

Where to Buy

Supplier

RTP Company

Winona, MN USA

Telephone: 800-433-4787

Web: <http://www.rtpcompany.com/>

Distributor

Please contact the supplier to find a distributor for RTP 1387 C NATURAL



ACCUCOMP™ SAN900L

Styrene Acrylonitrile
A. Schulman Inc.

PROSPECTOR®

www.ulprospector.com

Technical Data

Product Description

ACCUCOMP™ SAN900L is a Styrene Acrylonitrile (SAN) product. It is available in North America.

General

Material Status	• Commercial: Active
Literature ¹	• Technical Datasheet
Search for UL Yellow Card	• A. Schulman Inc.
Availability	• North America
Forms	• Pellets

Physical	Nominal Value Unit	Test Method
Density / Specific Gravity	1.07 g/cm ³	ASTM D792
Melt Mass-Flow Rate (MFR) (220°C/10.0 kg)	6.0 g/10 min	ASTM D1238
Molding Shrinkage - Flow	0.20 %	ASTM D955
Mechanical	Nominal Value Unit	Test Method
Tensile Modulus	2900 MPa	ASTM D638
Tensile Strength		ASTM D638
Yield	68.0 MPa	
Break	68.0 MPa	
Tensile Elongation		ASTM D638
Yield	3.0 %	
Break	4.0 %	
Flexural Modulus	4100 MPa	ASTM D790
Flexural Strength	107 MPa	ASTM D790
Impact	Nominal Value Unit	Test Method
Notched Izod Impact (3.18 mm)	10 J/m	ASTM D256
Hardness	Nominal Value Unit	Test Method
Rockwell Hardness (R-Scale)	124	ASTM D785
Thermal	Nominal Value Unit	Test Method
Deflection Temperature Under Load		ASTM D648
0.45 MPa, Unannealed	91.0 °C	
1.8 MPa, Unannealed	79.0 °C	

Notes

¹ These links provide you with access to supplier literature. We work hard to keep them up to date; however you may find the most current literature from the supplier.

² Typical properties: these are not to be construed as specifications.



ACCUCOMP™ SAN900L

Styrene Acrylonitrile

A. Schulman Inc.

PROSPECTOR®

www.ulprospector.com

Where to Buy

Supplier

A. Schulman Inc.

Akron, OH USA

Telephone: 800-547-3746

Web: <http://www.aschulman.com/>

Distributor

Plastic Service Centers

Telephone: 586-307-3900

Web: <http://www.plasticservice.com/>

Availability: North America

Plastics Plus, Inc.

Telephone: 248-393-0300

Web: <http://www.plasplus.com/>

Availability: North America

Resin Resource, Inc.

Telephone: 877-652-3431

Web: <http://www.resinresourceinc.com/>

Availability: North America

Tex-Co Resin Distribution, Inc.

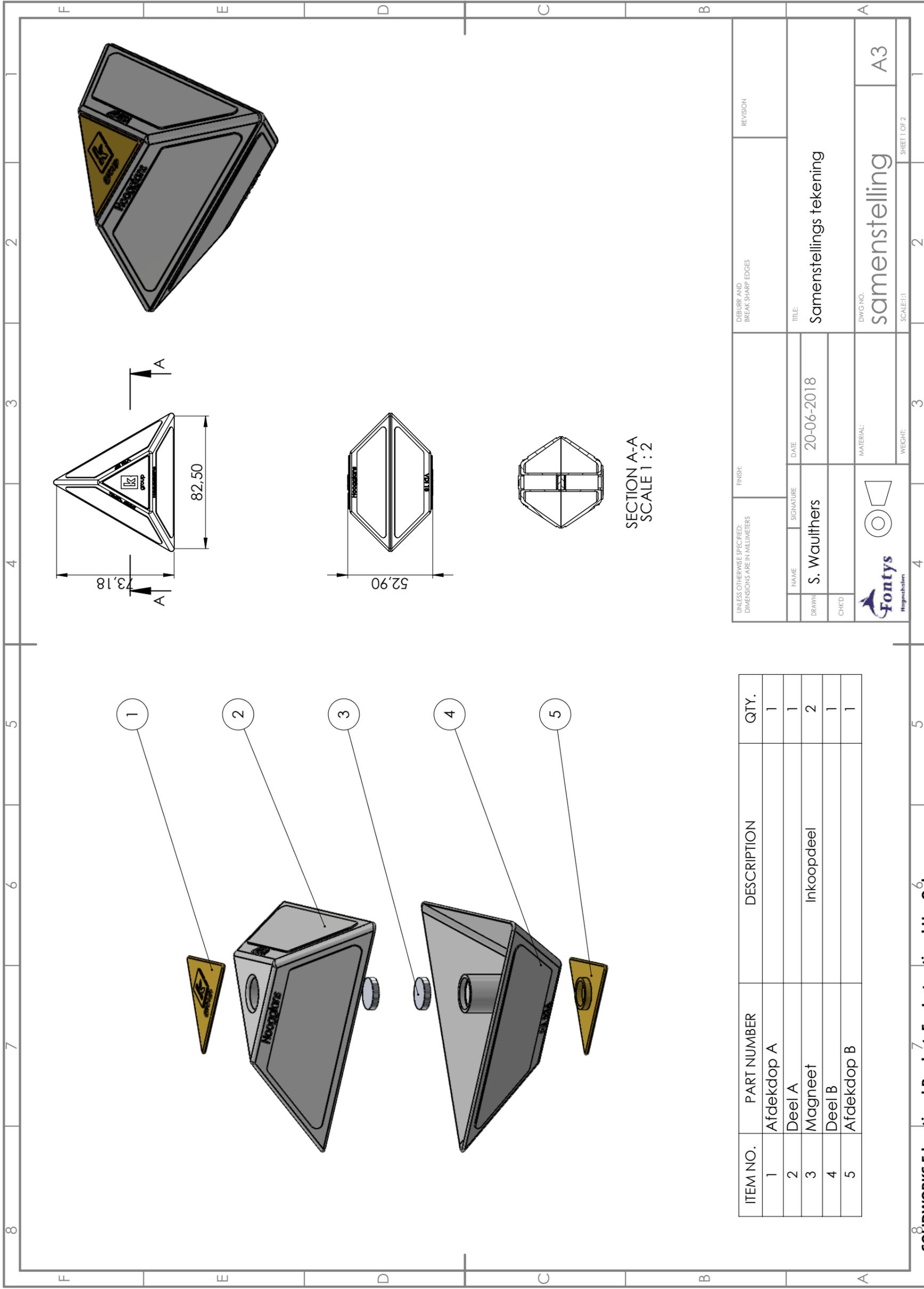
Telephone: 877-908-3926

Web: <http://www.texcoresin.com/>

Availability: North America



Bijlage 43 - Samenstellingstekening



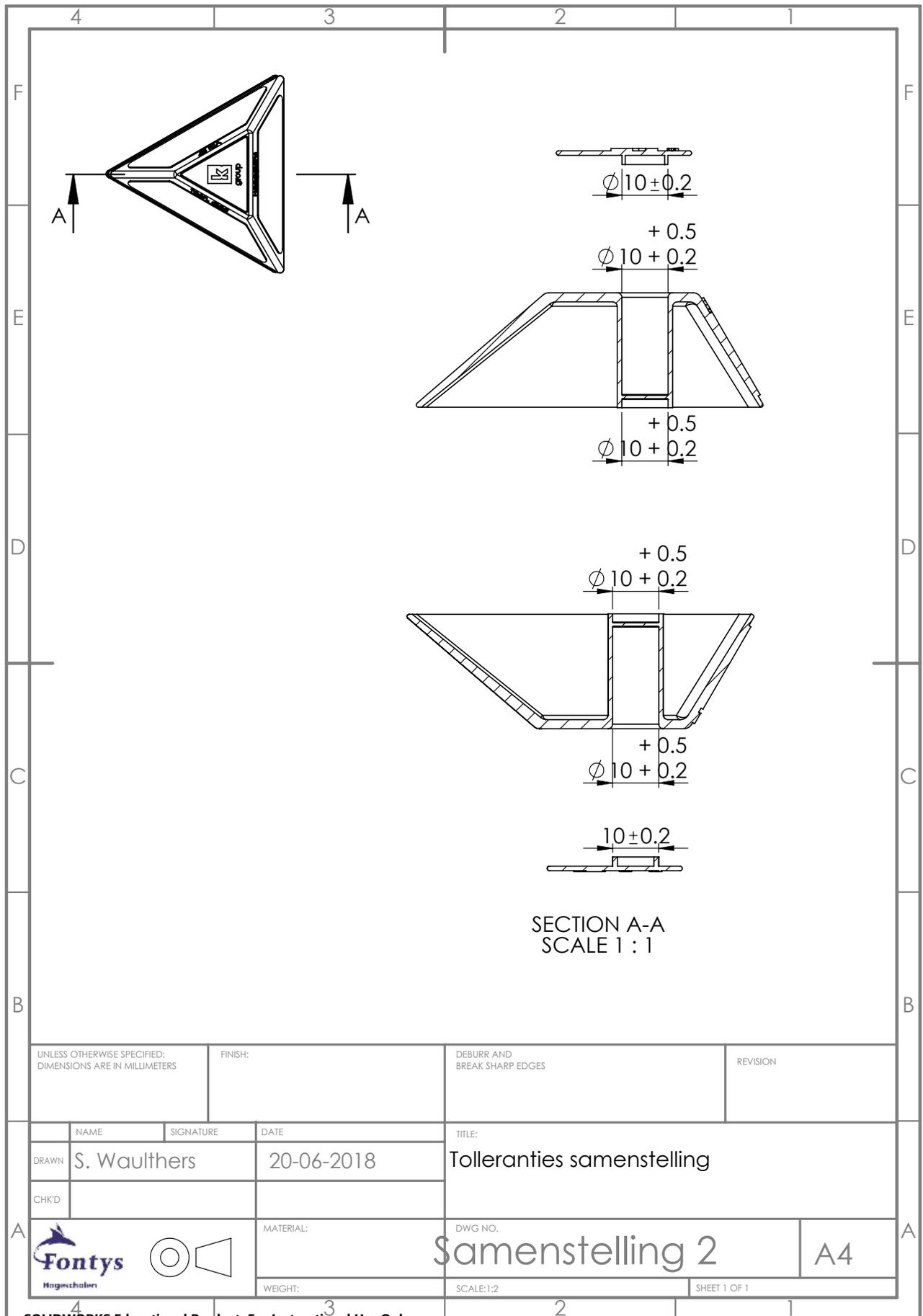
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1	Afdekdop A		1
2	Deel A		1
3	Magneet	Inkoopdeel	2
4	Deel B		1
5	Afdekdop B		1

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN MILLIMETERS		FINISH:		DEBURR AND BREAK SHARP EDGES		REVISION		
NAME	SIGNATURE	DATE	TITLE:					
S. Waulthers		20-06-2018	Samenstellings tekening					
DRAWN	CHK'D		MATERIAL:		DWG NO.			
			Fontys Hogescholen		samenstelling			
			WEIGHT:		SCALE: 1:1			
			4		3		2	
			5		6		7	
			8		A		A3	
			SHEET 1 OF 2					

Bijlage 43 **Samenstellingstekening**



Bijlage 44 - Toleranties samenstelling



UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS

FINISH:

DEBURR AND
BREAK SHARP EDGES

REVISION

NAME	SIGNATURE	DATE
DRAWN S. Waulthers		20-06-2018
CHK'D		

TITLE:
Tolleranties samenstelling



MATERIAL:

WEIGHT:

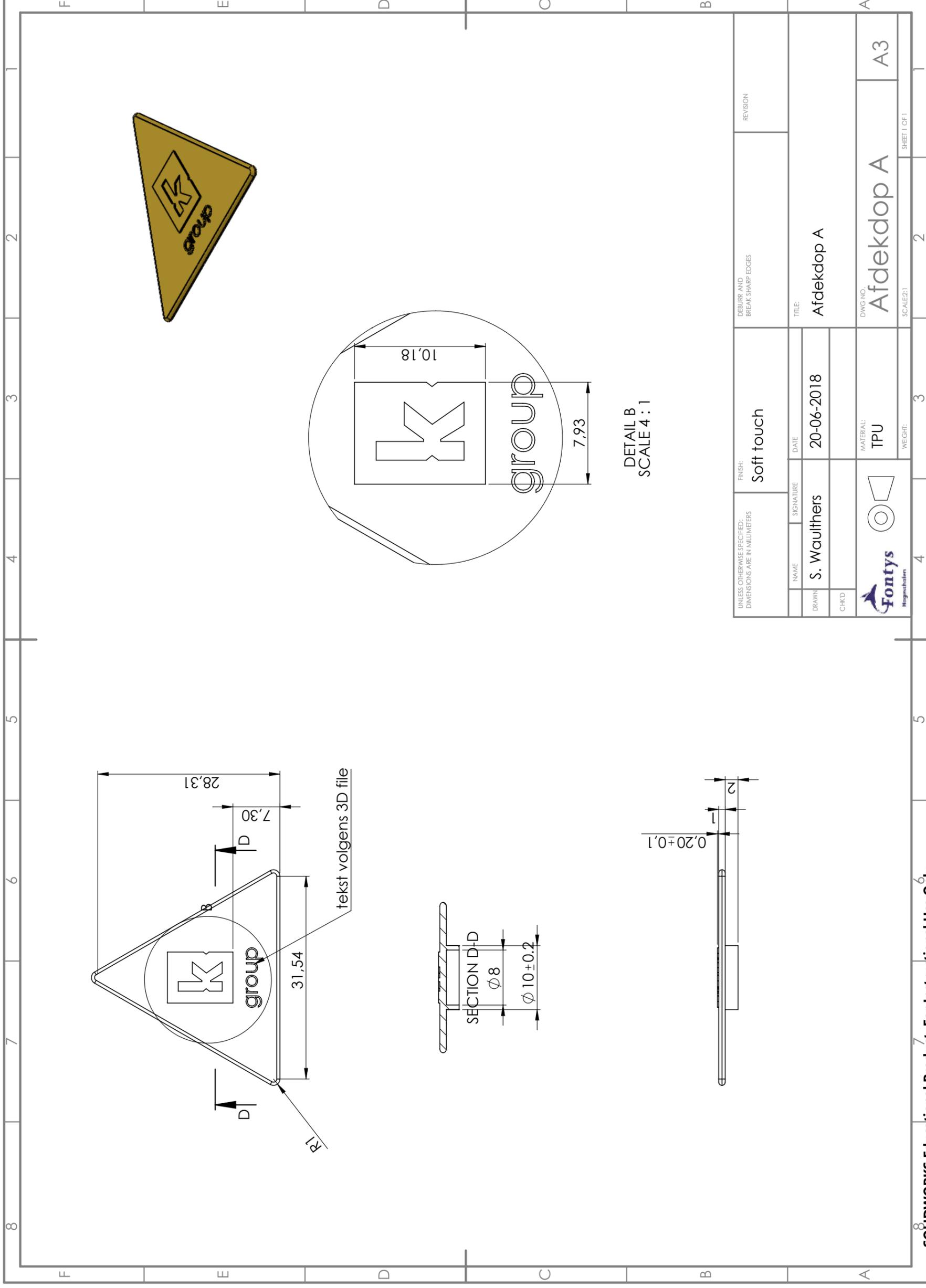
DWG NO.
Samenstelling 2

A4

SCALE:1:2 SHEET 1 OF 1



Bijlage 45 - Afdekdop A



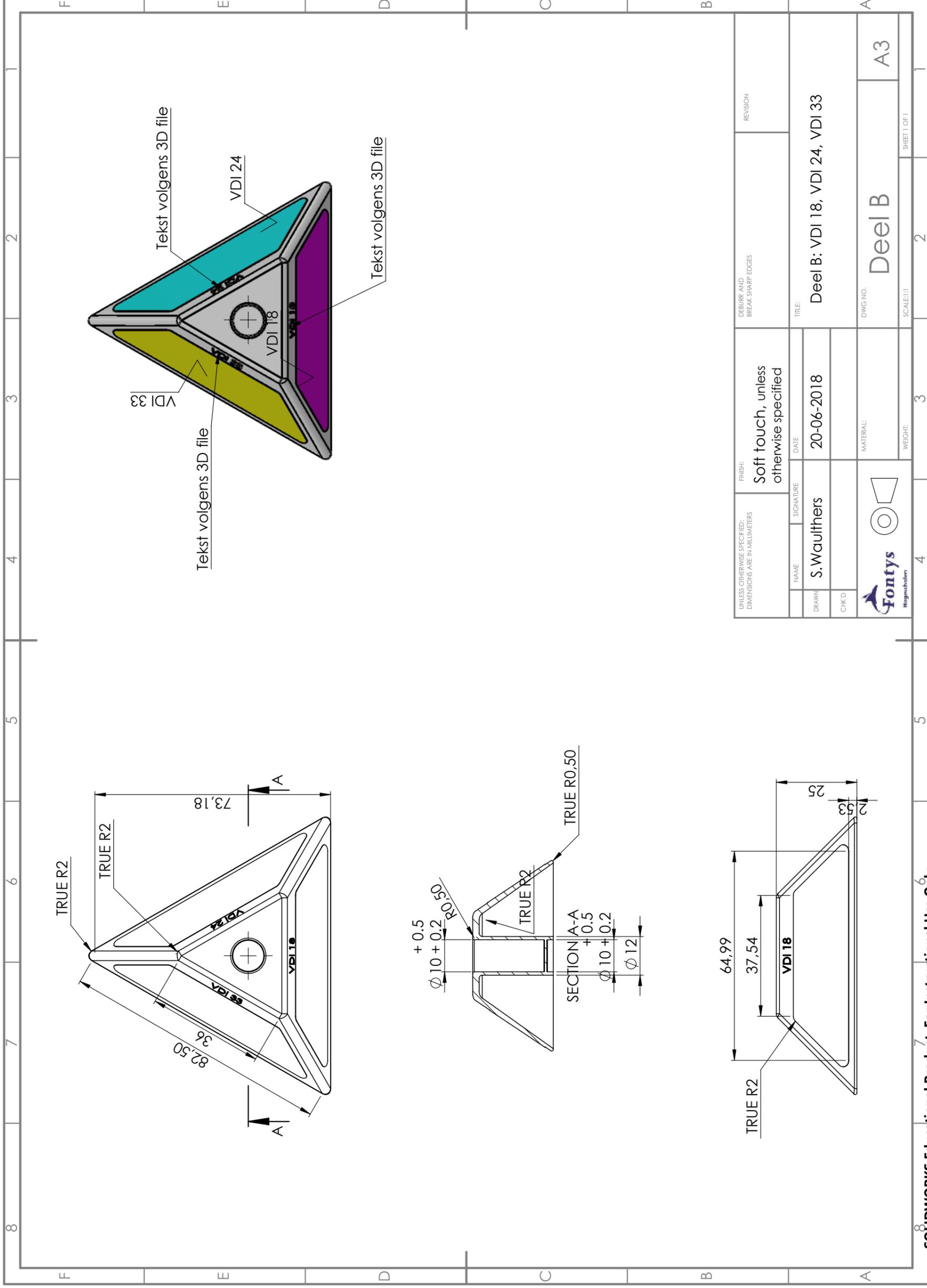
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS		FINISH: Soft touch		DEBURR AND BREAK SHARP EDGES		REVISION	
NAME	SIGNATURE	DATE	TITLE: Afdekdop A				
DRAWN	S. Waulthers	20-06-2018	DWG NO: Afdekdop A				
CHKD			MATERIAL: TPU				
Fontys Hogescholen		WEIGHT:		SCALE: 2:1		SHEET 1 OF 1	
		3		2		A3	

Bijlage 45 Afdekdop A



Bijlage 46
Deel A



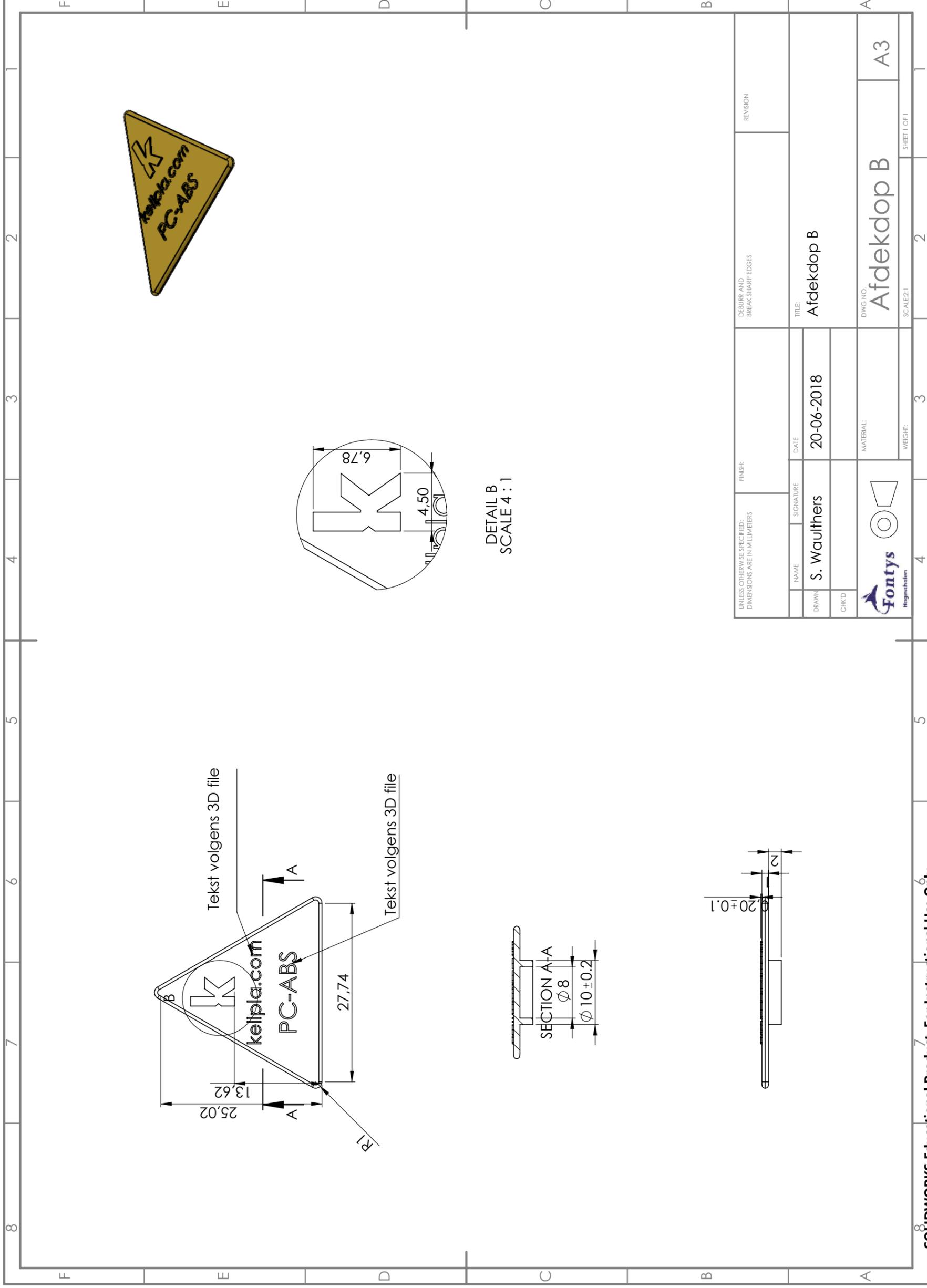


UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS		FINISH: Soft touch, unless otherwise specified		DEBURR AND BREAK SHARP EDGES		REVISION	
NAME	SIGNATURE	DATE	TITLE:				
S. Waulthers		20-06-2018	Deel B: VDI 18, VDI 24, VDI 33				
DRAWN	DWG NO. Deel B						
CHK'D	SCALE: 1:1						
Fontys Hogescholen		MATERIAL:		DWG NO. Deel B		SHEET 1 OF 1	
		WEIGHT:		A3		2	
						3	
						4	
						5	
						6	
						7	
						8	

Bijlage 47
Deel B



Bijlage 48 - Afdekdop B



UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS		FINISH:		DEBURR AND BREAK SHARP EDGES		REVISION	
NAME	SIGNATURE	DATE	TITLE:				
S. Waulthers		20-06-2018	Afdekdop B				
DRAWN	CHK'D	MATERIAL:	DWG NO:				
			Afdekdop B				
Fontys Hogescholen		WEIGHT:	SCALE: 2:1				
			3		2		1
			3		2		SHEET 1 OF 1

Bijlage 48
Afdekdop B

