

AD1/CS Series
THERMOLAST® K

The AD1/CS Series is your material solution for applications with excellent adhesion to polar thermoplastics such as ABS, PC and PC/ABS as well as excellent compression set. The compounds are available in natural and black colors.

Typical applications

- Fastenings
- Grommets
- Membranes
- Seals

Material advantages

- Easy coloring (compounds in natural colors)
- Excellent compression set
- Insert molding possible
- UL 94 HB listed

Processing Method: Extrusion, Injection Molding

	Color / RAL DESIGN	Hardness DIN ISO 7619-1 ShoreA	Density DIN EN ISO 1183-1 g/cm ³	Tensile Strength ¹ DIN 53504/ISO 37 MPa	Elongation at Break ¹ DIN 53504/ISO 37 %	Tear Resistance ISO 34-1 Methode B (b)(Graves) N/mm	CS 72 h/23 °C DIN ISO 815-1 Method A %	CS 24 h/70 °C DIN ISO 815-1 Method A %	CS 24 h/100 °C DIN ISO 815-1 Method A %	Adhesion to ABS ² VDI 2019 two-component injection molding N/mm	Adhesion to PC ² VDI 2019 two-component injection molding N/mm	Adhesion to PC/ABS VDI 2019 two-component injection molding N/mm
TP5VCN	natural	47	1.100	3.5	500	11.0	13	43	76	3.0 (B)	3.5 (B/D)	3.5 (B/D)
TP5VCZ	black	50	1.100	3.5	500	11.0	14	43	65	3.0 (B)	2.0 (B)	3.5 (B)
TP6VCN	natural	60	1.100	5.5	550	14.0	14	45	60	5.0 (D)	5.5 (D)	6.0 (D)
TP6VCZ	black	60	1.100	5.5	550	15.0	16	45	64	5.0 (D)	5.0 (D)	6.0 (D)
TP7VCN	natural	66	1.100	7.0	550	16.0	17	44	61	6.0 (D)	6.5 (D)	6.5 (D)
TP7VCZ	black	68	1.100	7.5	600	16.0	18	45	71	6.0 (D)	7.0 (D)	7.0 (D)
TP8VCN	natural	75	1.100	10.0	600	24.5	18	47	60	5.5 (A)	9.5 (D)	9.5 (D)
TP8VCZ	black	80	1.100	10.0	600	24.0	23	47	60	6.0 (B)	10.0 (D)	9.5 (D)

¹ Deviating from ISO 37 standard test piece S2 is tested with a traverse speed of 200 mm/min.

² The adhesion quality depends on mold design, product geometry and process parameters.



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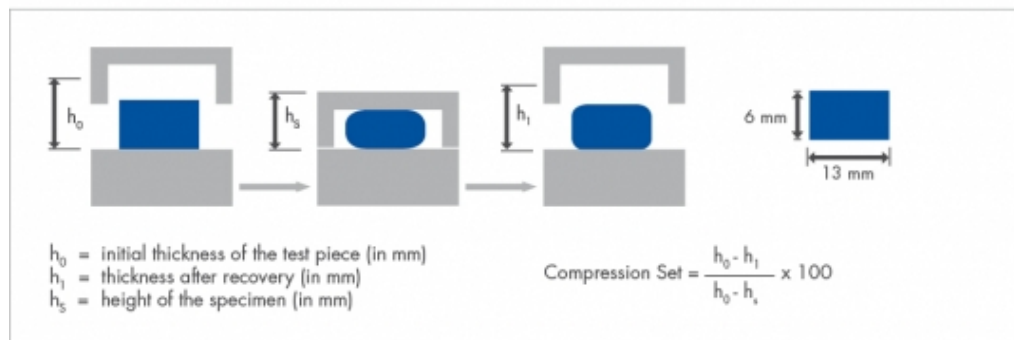
All values published in this data sheet are rounded average values.

Compression Set

Compression Set (acc. DIN ISO 815)

For the compression set testing the following specimen is used:

The specimen is a cylindrical disk shaped 6 mm thick and 13 mm in diameter.



The specimen is compressed by 25%. The compressed specimen is heated to the test temperature. DIN ISO 815 describes two methods.

Method A: The specimen is allowed to recover immediately after its aging in the oven and then cooled down to room temperature. After 30 minutes the thickness of the specimen is measured and the compression set calculated.

Method B: The specimen is cooled down to room temperature after its aging in the oven and then allowed to recover.

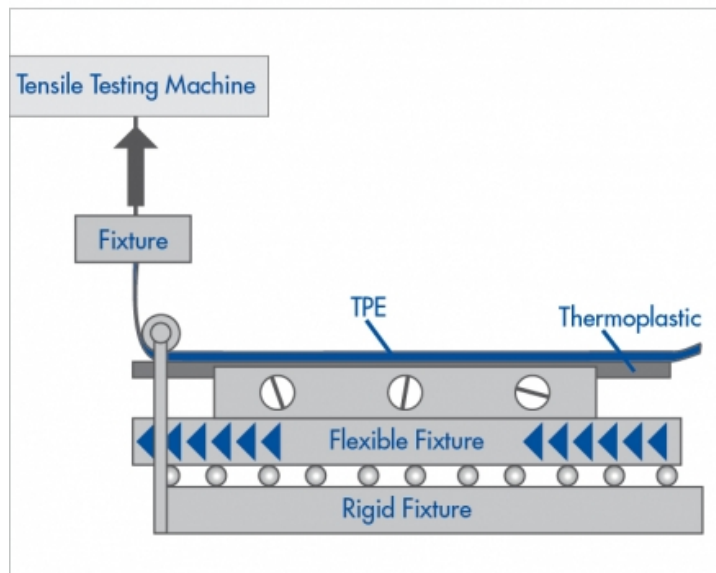
Test results gained from method B are in general higher than from method A.



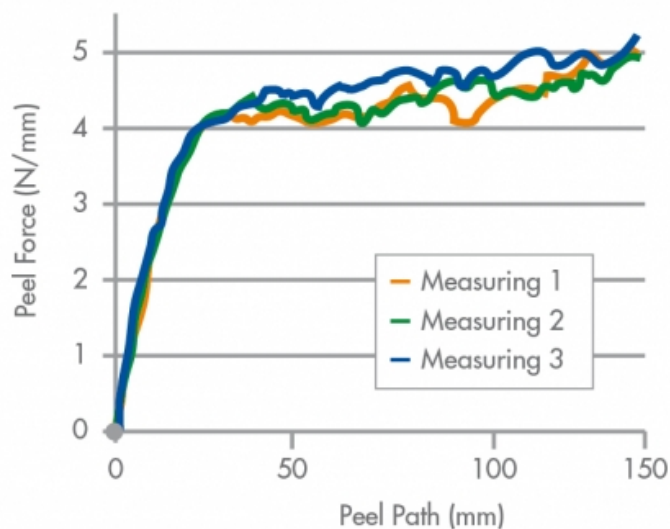
Description peel test

Peel test according to VDI guide line 2019

Test Setup



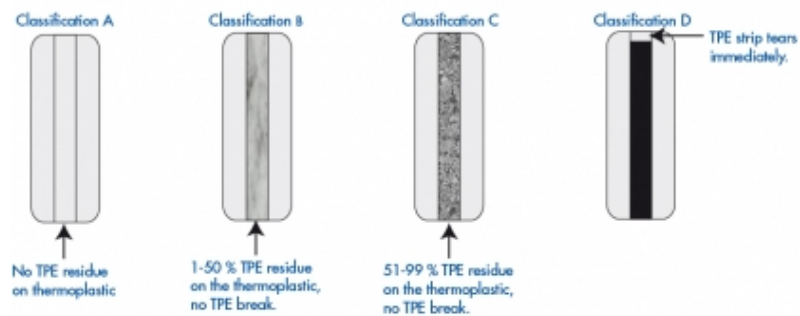
Example diagram for results of a peel test



Classification

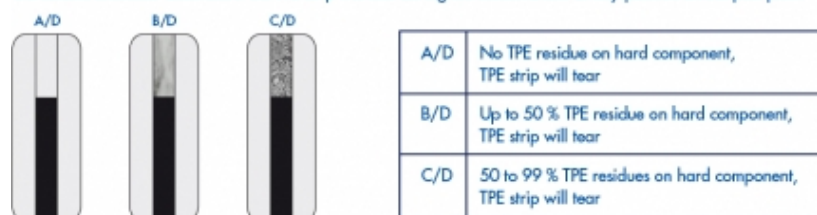
Peel test according to VDI Guideline 2019

For the VDI peel test we add two characters to the peel force value.
The first character describes the TPE residue on the hard component.



A	No TPE residue on hard component
B	Up to 50 % TPE residue on hard component
C	50 to 99 % TPE residue on hard component
D	TPE strip tears immediately

The second character describes if the TPE strip will tear during the measurement at any position on the peel path.



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Processing Guideline Injection Molding

Cylinder temperature	180 - 210 - 240 °C, max. 250 °C (360 - 410 - 460 °F, max. 480 °F)
Hotrunner	Hot runner temperatures: 200 -250 °C (390 - 480 °F). The runner should be empty after a maximum of 2 - 3 shots.
Injection pressure	200 - 1000 bar (2900 - 14504 psi) (depending on the size and weight of the part).
Injection rate	In general, the fill time should not be more than 1–2 seconds.
Hold pressure	We recommend to derive the optimum hold pressure from determining the solidification point, starting with 40 % - 60 % of the required injection pressure.
Back pressure	20 - 100 bar; if color batches are used, higher back pressure is necessary.
Screw retraction	If an open nozzle is used processing with screw retraction is advisable.
Mold temperature	The mold temperature depends on the hard component. A temperature exceeding 80 °C (175 °F) should be avoided. The common temperature is 40 - 60 °C (105 - 140° F).
Predrying	To achieve optimum mechanical values, drying the material for 2 - 4 hours at 60 - 80 °C (140 - 175 °F) is recommended.
Needle valve	With materials < 50 Shore A the use of a needle valve is advisable.
Screw geometry	Standard 3-zone polyolefine screw.
Residence time	The residence time is to be set as short as possible with a maximum of 10 minutes.
Cleaning recommendation	For cleaning and purging of the machine it is appropriate to use polypropylene or polyethylene. Machine must be PVC-free.



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Processing Guideline Extrusion

Cylinder temperature	160 - 180 - 200 °C (320 - 360 - 390 °F). For Coextrusion with engineering thermoplastics temperature profile should be increased up to 30 °C (85 °F); maximum 230 °C (440 °F)
Screw geometry	Standard three-zone screw (e.g. polyolefin screw). The screw must be able to provide sufficient shearing.
L/D ratio	At least 25
Compression ratio	At least 3 : 1
Screens / breaker plate	A breaker plate and a screen pack are generally recommended in the extruder configuration in order to increase pressure.
Die land	<= 3 mm (<= 0,12 in.)
Extruder Head	Ca. 220 °C (430 °F)
Die temperature	Ca. 220 °C (430 °F)
Predrying	Drying of the material for at least four hours at 80°C (175°F) is recommended. The moisture level of material has to be below 0.02 %. To avoid porosity in the profile a pre drying is recommended for wall thickness > 3mm.
Calibration	Generally not necessary; support elements may be required when extruding THERMOLAST® compounds with high hardness or when coextruding with standard thermoplastics.
Cleaning recommendation	For cleaning and purging of the machine it is appropriate to use polypropylene or polyethylene. Machine must be PVC-free.

