Test Methods, Structures and Contents

Comparison of current AFERA TM structure to various other methods:

- ASTM 1002 Standard Test Method for Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading (Metal-to-Metal)
- FINAT FTM 18 Dynamic Shear
- DIN EN 1465 Adhesives - Determination of tensile lap-shear strength of bonded assemblies
- VDA270 Draft Determination of the odour characteristics of trim materials in motor vehicles

Questions to be answered (for structure)

- In how far are we fixed to the current structure of AFERA TM structure?
- Chapter 6 “Solvents” necessary? Proposal to shorten the contents and include them into “Test specimen”
- Chapter 7 “Sampling” necessary?
- Others?

	Afera dyn shear Draft 3		ASTM 1002	FINAT FTM18	DIN EN 1465:2009 (translated)	VDA270 Draft
			Introduction		Introduction	
1	Scope		Scope	Scope	Scope and Application	Scope and Application
				Definition		
2	Reference Documents		Referenced Document		Referenced Documents	
3	Summary of Test Method			Principle	Summary	
			Terminology			Terminology
4	Significance and Use		Significance and Use			Designation
5	Apparatus		Apparatus	Test Equipment	Test Equipment	Test Equipment
6	Solvents					
7	Sampling					
8	Conditioning			Test Conditions		Test Environment
9	Test Specimen		Test Specimen	Sample Preparation		
			Prep. of Test Joints			Sample Preparation
			Preparation of Test Specimen		Test Specimen	Test Specimen
					Conditioning and Test Environment	
10	Procedure		Procedure	Procedure	Procedure	Test Procedure
11	Calculation		Calculations		Results	
12	Report		Report	Results	Report	Evaluation and Report
			Precision and Bias	Repeatability		
				Remarks		
				Notes	Literature	Appendix

- In how far are we fixed to the current structure of AFERA TM structure?

- Chapter 6 “Solvents” necessary? Proposal to shorten the contents and include them into “Test specimen”
- Chapter 7 “Sampling” necessary?
- Proposal to start with an “introduction”

Test Method AFERA Dynamic shear, proposal for <u>structure</u> and contents

Title:

	Afera dyn shear	
	Introduction	
1	Scope	
2	Reference Documents	
3	Summary of Test Method	
4	Significance and Use	
5	Apparatus	
6	Solvents	Omit
7	Sampling	Omit?
8	Conditioning	
9	Test Specimen	
10	Procedure	
11	Calculation	
12	Report	

Test Method AFERA Dynamic shear

Title: **Dynamic shear strength of double sided PSA tapes**

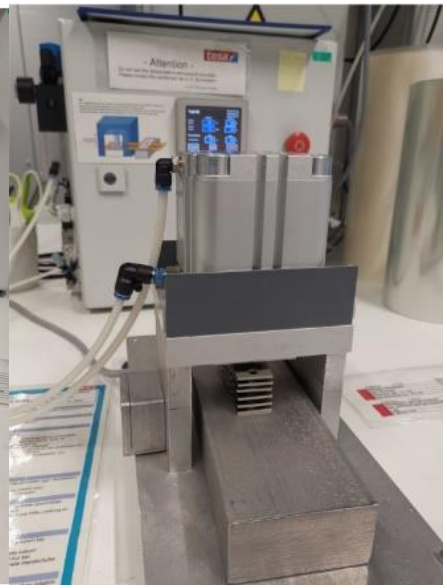
	Afera dyn shear	
	Introduction	The method complements the well-established static shear test methods for PSA tapes and as such enables additional insights into the nature of joints bonded with PSA tapes. The term “dynamic” emphasizes the fact that the mechanical load is constantly increasing over the time of measurement, in contrast to the static methods with constant mechanical load. The method addresses the need to provide data for double-sided tapes that are widely in use for mounting applications, in particular bonding of rigid substrates. The method takes into account the specific characteristics of PSA tapes, e. g. their viscoelasticity, their thickness, which are not in the focus of methods for determination of lap shear strength of structural adhesives. The method is not considered to replace the internal methods of Afera member companies. It offers a standard reference and can be a starting point for more specialized methods for certain products or applications. Where appropriate, the rationale for the selected standard parameter is given to make adaptations easier. It is understood, however, that values obtained from measurements with different parameters are not comparable. The method does not address all possible health and safety concerns associated with its use. The user is responsible for implementing appropriate health and safety measures prior to use as well as to comply with regulatory standards for the materials employed.
	Scope	Determination of the tensile shear strength of single-lap-joints at a constant speed of separation, bonded with double sided or transfer PSA tapes Additional considerations: ASTM 1002: SI units as standard. Mentioning health safety measures.
2	Reference Documents	ASTM 1002, DIN EN 1465, others?

3	Summary of Test Method	The test method describes the determination the shear strength of single-lap-joints at a constant speed of separation (+ other specified conditions). The shear strength of the single-lap-joints is determined by subjecting the joints of rigid-to-rigid substrates (?) to a shear force that acts in parallel to the plane of the bond and in parallel to the main axis of the test specimen and that increases as a constant speed of separation is applied. The result is determined as the maximum force and/or the maximum shear stress recorded, as well as the failure mode.
4	Significance and Use	ASTM 1002: predominantly for comparative statements; highlights the limits of the use of the values (e.g. delta alpha issue not addressed in the method, limit of statements obtained from small scale samples). DIN EN 1465: Similar but much shorter (under “scope”). Significance and use can be filled in later
5	Apparatus	 459d7d80-f747-48c1-9bfe-30d48b62c4f6.m Need help for proper definition/description alignment of specimen in the clamps: Employment of hooks as standard option? See picture below Others can be filled in later
6	Solvents	Omit
7	Sampling	Omit?
8	Conditioning	Test specimen: conditioning at 23 °C, 50% r.h. for 24 h before bonding, measurement after 48h dwell time (?), dwell and measurement at same conditions
9	Test Specimen	Close to square geometry, standard size 25 mm width x 30 mm length or 25 mm x 25 mm? Different sizes possible but need to be documented. Substrates?? “Standard” steel for static shear? Others? Surface prep of substrates (same as static shear?); Bonding pressure? 10, 20, 100 N/cm²? Time (significant?)? see picture below Bonding process into “Test specimen”?
10	Procedure	Test speed: standard speed 5 mm/min? Different speeds possible but need to be documented. Speed has significant influence on result. (5 mm/min: 100 µm thick tape with max strain appr. 500 µm => 6 s per measurement, 1000 µm foam tape with max strain appr. 5 mm => 1 min per measurement). Number of specimen: min 3, min 5?
11	Calculation	Result in MPa (= N/mm²) and/or in N/cm²? Typical values will be between 0.1 and 0.5 MPa = 10 – 50 N/cm² Note: Evaluation of other data possible, e.g. strain, modulus
12	Report	Max values and failure mode

Example shear test result (tesa)

dyn. Shear	50 mm/min	100 N/cm² (p)	25 mm x 25 mm		SUS plate to SUS plate	24 h dwell			
		N/cm²			**Mean**	**Std. dev**	**Failure mode**		
Tape 1	Tester 1	153	137	146	145	7,77	CF	CF	CF
	Tester 2	129	129	133	130	2,20	CF	CF	CF
	Tester 3	143	143	150	145	4,34	CF	CF	CF
	Tester 4	130	123	131	128	4,48	CF	CF	CF
Tape 2	Tester 1	83	86	99	89	8,44	40%AF	40%CF	CF
	Tester 2	92	91	92	91	0,40	CF	CF	CF
	Tester 3	86	85	84	85	1,12	80%CF	80%CF	80%CF
	Tester 4	95	87	90	90	4,04	CF	CF	CF


- Attention -


- Attention -