



Operational Instructions for ACLA® Lift Buffers

Translation of original German operational instructions

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1. Scope of validity

These operational instructions apply to ACLA® lift buffers of article numbers made of Autan HE:

300xxxAxxx 300xxxBxxx 300xxxLxxx 300xxxMxxx 300xxxFxxx 300xxxGxxx
30052x.xx

and to ACLA® lift buffers of article numbers made of Autan XL:

300xxxPxxx 300xxxQxxx 300xxxRxxx 300xxxSxxx 300707.xx

Only for use in lift constructions (x = letter, digit)

2. Product description, technical data

2.1 Configuration and function

ACLA® lift buffers consist of a high-quality cellular polyurethane foam with excellent elastic deformation and damping properties.

ACLA® lift buffers are used to dampen the impact of lift cabins or counterweights considering certain final limits so that the masses will not crash hard and undamped to the ground in case of a defect. The buffers slow down the free-fall by their deflection, and decrease the retardation and impact forces. This reduces the risks for personal injuries in the cabin or lift damages.

The certifications/conformity and availability of ACLA® lift buffers depend on country specific standards/codes.

2.2 Mounting types

The lift buffers are available in different types of mounting (fig. 1) depending on article no.

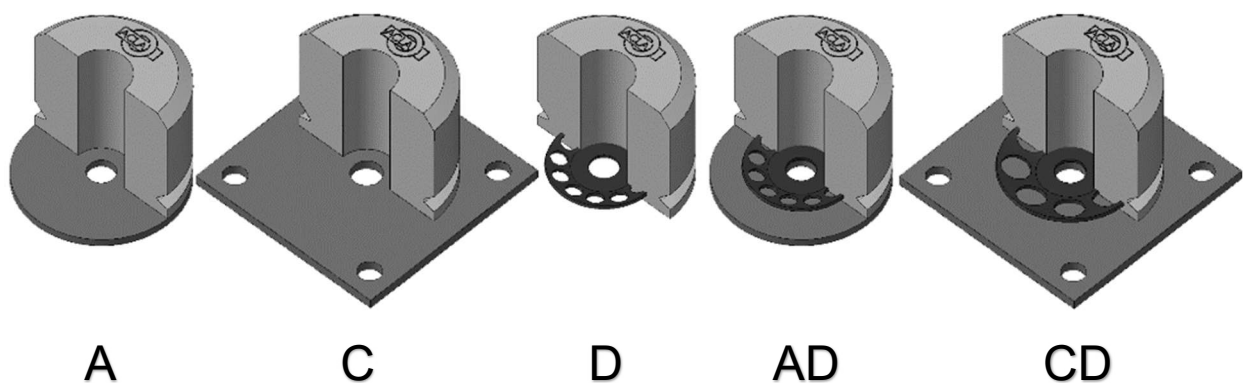


Fig. 1: mounting kinds type A, C, D, AD, CD and fixing elements

The following mounting elements are available but depend on certification/conformity:

- Type A round steel plate
- Type C square steel plate
- Type D foamed-in perforated plate
- Type AD round steel plate plus additionally foamed-in perforated plate
- Type CD square steel plate plus additionally foamed-in perforated plate

ACLA verbal or written recommendations for any application as well as tests are carried out to the best of our knowledge. They are without engagement also as far as patent rights of third parties are concerned, and do not exempt you from checking the products supplied by us to their suitability for the intended procedure and purpose. Application, use and processing of the products are outside our control, and are exclusively the responsibility of the customer. Moreover, our general sales conditions apply. This data sheet replaces all previous sheets. As it is not subject to any updating service, the user has to check for relevance, whenever necessary.

2.3 Ambient and application conditions

- Temperature range of material for transport and warehouse: - 40 °C up to + 80 °C
 - General temperature range buffer function: + 5 °C up to + 40 °C
- The temperature range of the buffer function can be found in the respective certificates.

Note: Some standards/codes require a minimum temperature for elevator areas. If this is above -15°C, this temperature must be set as the lowest buffer function temperature for the lift buffer.

- Relative humidity: max. 98 % at ambient temperature, non-condensing
- No exposure to liquids
- Mineral oils and greases only in minor superficial contact
- No exposure to acids, bases and solvents
- No permanent load and no transverse load. In case of elevator maintenance, the buffers must be protected against compression by setting down the weight.
- Short time load on the buffer ≤ 1 min contact is allowed. The maximum force absorption of the buffer must not be exceeded.
- If necessary, install protection against damage from animals (e. g. termites, rats).

2.4 Definitions

Use of definitions in this technical sheet (fig. 2):

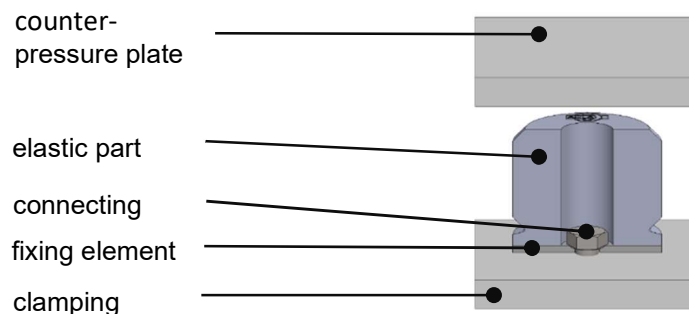


Fig. 2: definitions in these operational instructions

lift buffer, buffer	The complete component consisting of the elastic part and a fixing element. The fixing element and the elastic part are connected firmly to each other.
counter-pressure plate	The surface that is parallel to the clamping plate and with which the buffer is deflected.
elastic part	Elastic deformable part of the buffer.
connecting part	Part for connecting the fixing element with the clamping plate (e. g. bolt).
fixing part	Massive part of the buffer used for connection with clamping plate.
clamping plate	The surface where the buffer is mounted.



3. Safety instructions

3.1 Intended use, dimensioning

3.1.1 In general

The ACLA® lift buffers for elevator construction mentioned under 1 are safety components which must be tested and certified for this use in accordance with national safety standards and regulations!

In elevator construction, these buffers may only be used in accordance with the type examination certificate applicable to the product and in compliance with these operating instructions! In addition, all other ordinances, standards, regulations and other provisions applicable in connection with the use of lift buffers must be observed. The user must inform himself about these and observe them accordingly.

The use of a buffer mentioned in 1 which does not comply with these regulations is the sole responsibility of the user.

3.1.2 Masses, speeds

It is particularly important to keep the mass and speed limits stipulated in the type test certificates. If the relevant speeds of the type examination certificate and the application do not correspond, the next higher value listed in the certificate shall be decisive.

3.1.3 Use of several buffers in parallel

To use several buffers in parallel, the user must ensure that all buffers correspond to one item number and that a common impact mass hits all buffers simultaneously. The buffers must be arranged in such a way that equal loads result for the buffers used, so that the reaction forces are transferred symmetrically to the elevator system (e. g. avoidance of a tilting position). The minimum and maximum masses specified in the type examination certificate are multiplied towards higher values according to the number of buffers, e. g. when two buffers are used, the possible load figures are doubled. The speed according to which the buffers are dimensioned remains unchanged.

3.2 Modification or damage of buffers

3.2.1 Modifications of the buffers are not admissible.

3.2.2 It is neither possible nor allowed to repair a buffer.

3.2.3 Do not weld fixing elements onto the buffer because the temperature will damage the buffer.

3.3 Misapplication

3.3.1 The buffers may only be loaded directly by sufficiently dimensioned counter pressure plates.

3.3.2 The buffers must be loaded over their entire surface and not only partially or with profiles.

3.3.3 The buffers may only be used with the certified minimum and maximum loads, which can be found in the buffer certificate and on its label. S. 3.1.3.

3.3.4 Buffers may not be loaded above 90% of their elastic height (elastic height < total height).

3.3.5 Permanent transverse loads on the buffer must be avoided.

3.3.6 During assembly work, the buffer must not be subjected to permanent loads. Suitable spacers must be used by the assembly team to relieve the load on the buffer.

3.3.7 The buffer may be subjected to a short-term static load up to its maximum certified load for up to 1 minute (1 min). After this time, the buffer requires at least thirty minutes (30 min) to return to its original height. If the buffer does not fully return to its original height after thirty minutes (30 min), it must be replaced.

The static load must not be higher than the max. load in the buffer certification. S. 3.1.3.

3.3.8 It is not permitted to drive buffers against each other. (fig. 3)

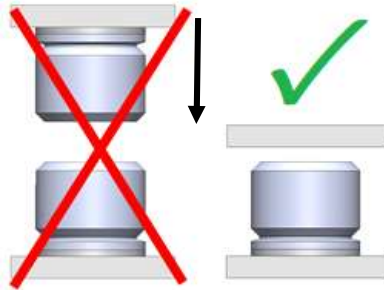


Fig. 3: do not drop buffers against each other

3.4 Case of fire

Harmful fumes and smoke may be produced if an external fire ignites the buffer. Therefore, it is necessary to take protective measures when constructing the lift in order to avoid personal injury.

3.5 Storage

The ambient conditions described in chapter 2.3 apply for the storage of buffers. The optimum storage is carried out at room temperature. We recommend storing the buffers on a flat surface. They can be stacked on each other up to a height of 1,5 m. This will prevent an accidental slipping. It is not allowed to put additional load on the buffers, i.e. by stacking of pallets. Attention must be paid that no edges are pressed against the buffers. In case of need the buffers must be secured by cushioning material. In case of horizontal storage, several layers one on top or additional load is not allowed.

3.6 Disposal

Disposal with due regard of all applicable international, national and local laws, regulations and statutes.

4. Building requirements, fixing

This chapter describes the requirements only that directly affect the buffers.

The user must ensure that further requirements or deviations from these operating instructions for on-site conditions, such as elevator cabins, rail lengths, foundations, shaft dimensions, etc. with regard to structural conditions and the resulting evidence meet the certificated conditions of the buffer.

4.1 The counter pressure plates must be level and parallel to the faces of the buffer (fig. 4).



Fig. 4: counter-pressure plates even and parallel moving

4.2 When the buffer is compressed from the initial diameter d_0 and the elastic height h_0 by a distance e to the remaining height h_1 , it expands to the diameter d_1 convexly. In the case of big deformation, the widened area in diameter d_{G_u} , d_{G_o} or d_{G_1} comes into contact with the counter-pressure plates (fig. 5).

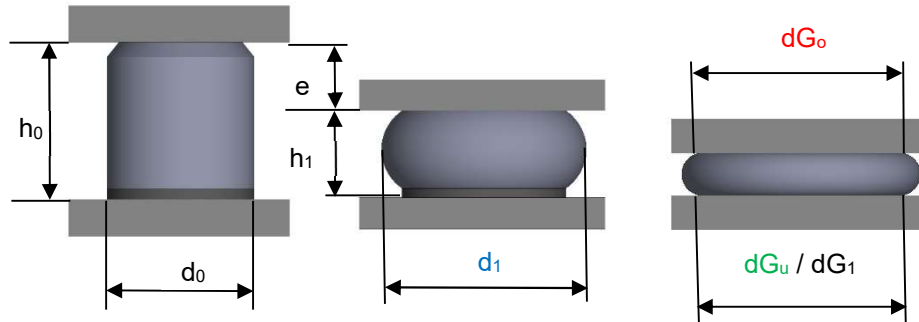


Fig. 5: convex expansion and contact to counter-pressure plates

4.3 Because d_1 , d_{Gu} , d_{Go} and d_{G1} depend on the special buffer and the application, separate buffer-specific data is provided in Appendix I for the dimensioning of the free space. The maximum values can be found there.

4.4 The diameters d_{Gu} , d_{Go} or d_{G1} of the counter-pressure plates must be large enough that the buffer is supported over the entire surface even when the expanded area comes into contact with the plates (fig. 6) (see 4.3).

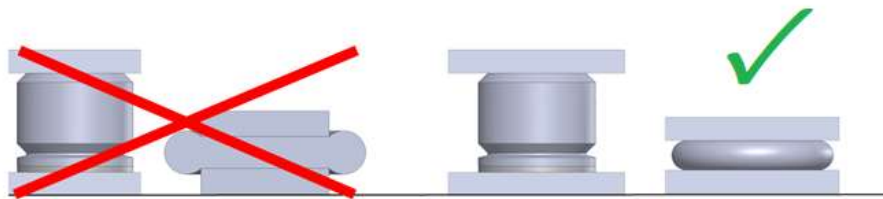


Fig. 6: sufficient dimensioning of counter-pressure plates

4.5 In order for the buffers to be able to expand to the diameter d_1 during compression freely, there must be free space next to them (fig. 7). The minimum required free space can be calculated with 4.3.

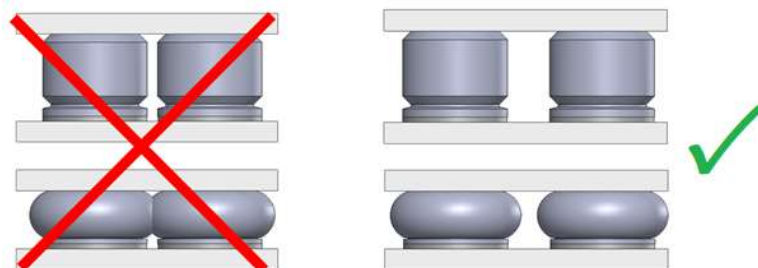


Fig. 7: pay attention to sufficient distance

4.6 The counter-pressure plates and their substructure must be able to absorb the entire force transmitted through the buffer in the event of a collision, as the buffer's fastening elements are not load-bearing elements. They are only used for attachment (fig. 8) (see 3.3.2).

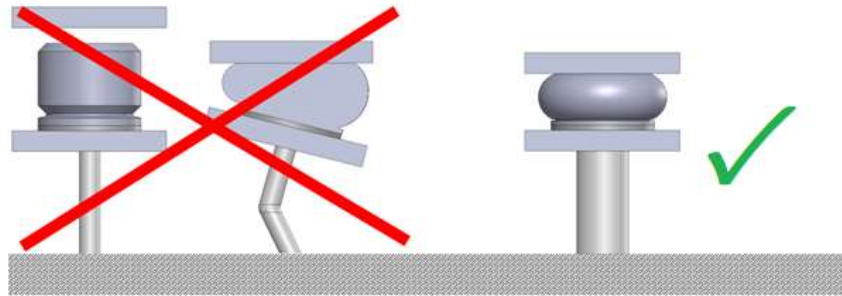


Fig. 8 pay attention to a stable substructure and design the plates according to 4.3

This implies that the type A, D and AD buffers require a mounting surface with at least the diameter of the buffer and for type C and CD a mounting surface with at least the dimensions of the square mounting plate. In the event that an expansion of the buffer must be assumed, use 4.3 to dimension the correct dimensions of the counter-pressure plates.

Remark: The CE test of the buffer requires a full-surface contact of the buffer to be tested, e. g. according to test standards EN 81-20 and EN 81-50, so that the above point is related to the certification and therefore must give attention by the user accordingly.

4.7 Through-holes for screwing are included in all fasteners.

The following should be noted:

4.7.1 The buffer and the fixing element are mounted towards the clamping plate (picture 9).

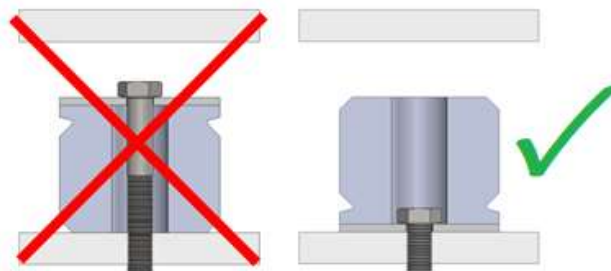


Fig. 9: mount fixing element towards clamping plate

4.7.2 When tightening the screws, washers are recommended under the screw head, except for buffer 307070. If the fatigue strength of the screw connection cannot be ensured otherwise, locking screws must be used, the total height of which (screw head, locking screw, and washer) must not exceed 10% of the elastic buffer height. Fastening methods other than M16 hex head screws are possible. Only M8 hex head screws may be used for buffer 307070.

4.7.3 There is no general advice for fixing because the kind of fixing depends on the several mounting conditions and possibilities. It is up to the user's responsibility to ensure a permanent and safe fixing and to prevent that the fixing elements will affect the buffer function and the buffer itself.

4.8 With all fastenings, it must be ensured that the connecting elements do not collide with the counter-pressure plate when the buffer deflects (Fig. 10). For preventing it, the counter-pressure plate should have suitable recesses.

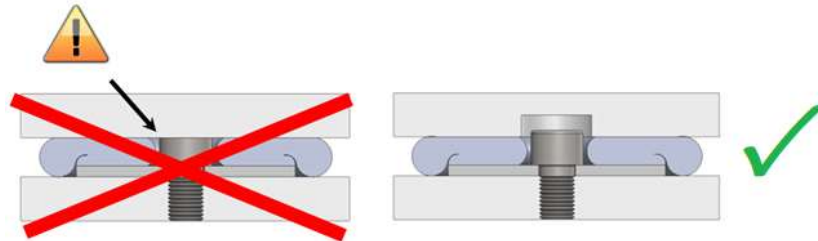


Fig. 10: avoid collision with connecting elements!

5 Installation

5.1 Personnel

The buffer may only be installed by personnel who are trained and qualified according to national training guidelines and who are familiar with these operating instructions.

5.2 Tests

The buffer must be checked prior to installation:

5.2.1 Test for buffer use

To prevent misuse, it is necessary to check. If the buffer is suitable for the application by comparing the buffer marking with the type examination certificate and any other important documents. In the event of any discrepancies, the buffer must not be used (fig. 11).

The following 3 data of the buffer marking are decisive for the assignment of the buffer to the type examination certificate. The arrangement of the elements on the buffer may vary (fig. 12).

1. name and address of the manufacturer: ACLA, DE 51065 KOELN
2. the eight-digit type designation 300xxxxx (x = letter, digit)
3. the conformity mark(s) acc. to the scope(s) of the type-examination certificate(s) or guidelines, i.e.
 - CE XXXX, XXXX represents the number of the certified body as to quality assurance
 - EAC
 - others

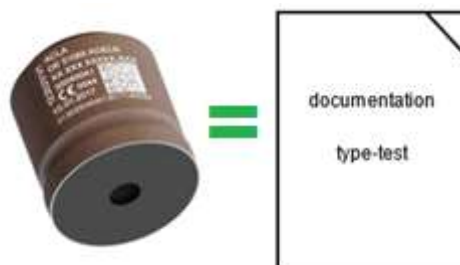


Fig. 11: identity check: compare buffer description and documents!

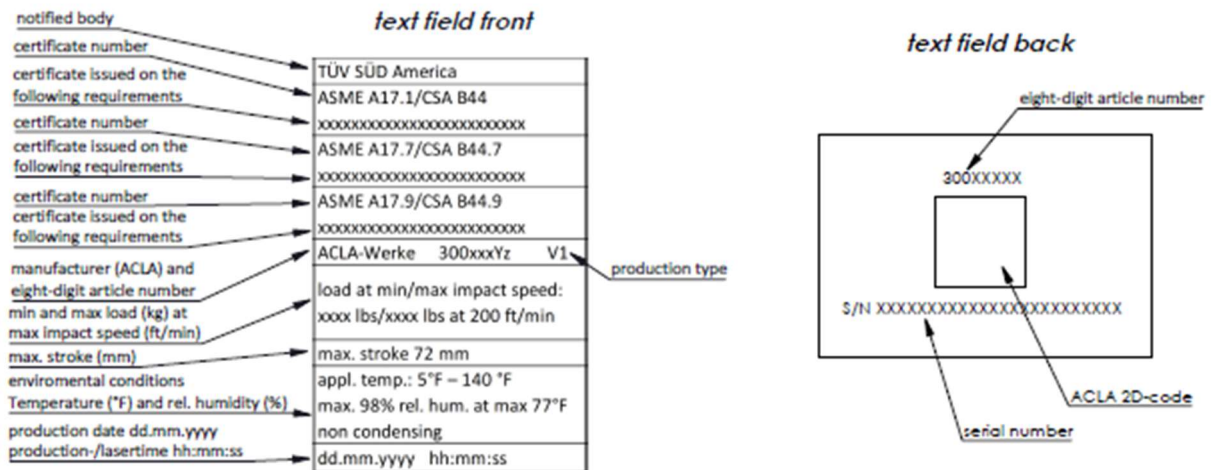


Fig. 12: Example of ASME label

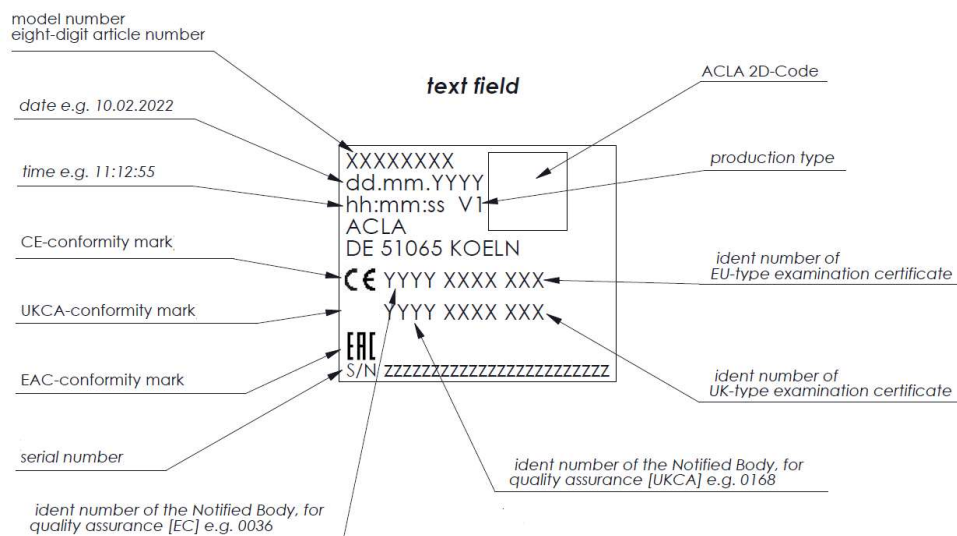


Fig. 13: Example of identification mark of the buffer for EU

The labels (Fig. 12 and 13) always contain the model number, serial number, certificate identification number, and the number or designation of the certifying body.

The individual buffer can be uniquely identified by the information on the buffer label in one of two ways:

- By the 24-digit serial number
- By the date and time, if no 24-digit serial number is provided.

Information may vary depending on the buffer certification.

5.2.2 Buffer inspection

The buffer needs to be checked according to the criteria of chapter "6.3 Inspection" before it is mounted. In case of any damage, it must not be used.

5.3 Assembly

The buffer needs to be mounted in accordance with the instructions of the lift constructor. Particular attention must be paid to the use of prescribed connecting elements, screw locks and torques.

6 Operation

6.1 Personnel

The buffer may only be installed by personnel who are trained and qualified according to national training guidelines and who are familiar with these operating instructions.

The buffer may only be installed by personnel who are trained and qualified according to national training guidelines and who are familiar with these operating instructions.

6.2 Inspection intervals

6.2.1 Normal operation

Considering the above ambient and operation conditions (see chapter 2.3) the buffer needs to be inspected at every lift maintenance but not later than 2 years after production. The production date indicated on the side of the buffer in the format DD.MM.YYYY. The service life may be shortened by different operating conditions like high humidity at simultaneously increased temperature – in this case shorter inspection intervals will be necessary. Any subsequent inspections depend on the current state and the operating conditions, for instance once per year. As the specific conditions are unknown it is up to the user to take reasonable care.

6.2.2 Tests after special incidents

In case of any special influences on the buffer, i.e., emergent operation or submerged in water, it needs to be inspected immediately regardless of any inspection interval and replaced, if necessary.

6.3 Inspection

6.3.1 After a dry cleaning, the buffer is checked for alterations like geometrical changes, brittleness, cracks, decollations or absorbed liquids (fig. 14).

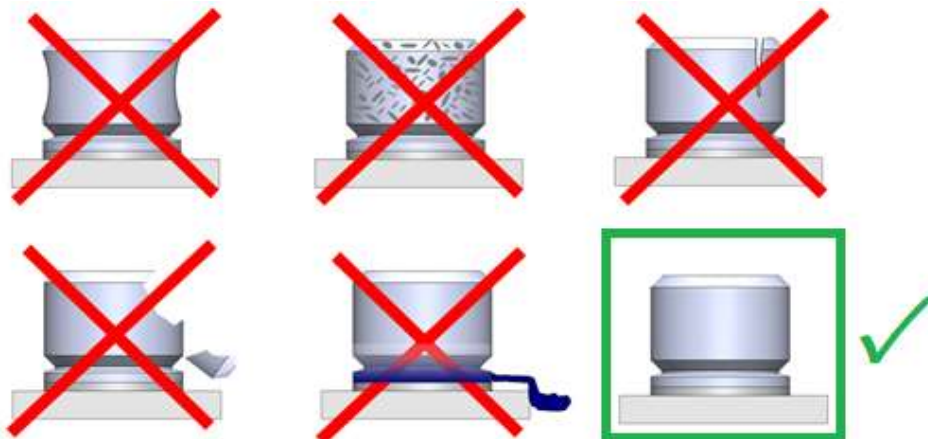


Bild 14: inspection for alterations

6.3.2 The buffer and the stability of fixing elements is checked by pressing a hand moderately against the buffer and visual control. The buffer fastening to the clamping plate (i. e. screw joint) needs to be checked as well and corrected in case of need (fig. 15). In case of any damages or modifications the buffer must be replaced.

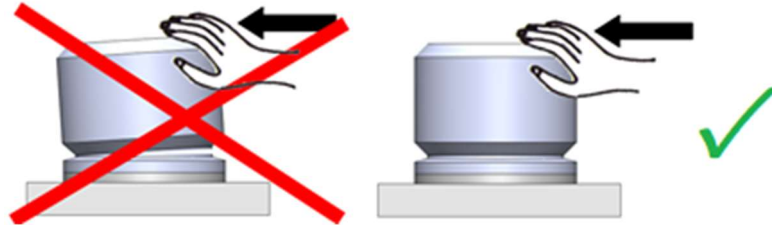


Fig. 15: check fastening

In any case of questions, please, contact your local ACLA Team.

Appendix I

Expansion and support surface when expanding under load of the ACLA® lift buffers

1. General

If an impact with mass m occurs on the buffer, the buffer is compressed from its initial elastic height h_0 and diameter d_0 by a deflection e to the remaining height h_1 and the buffer expands convexly to diameter d_1 . In the case of severe deformation, the deformed buffer with the diameters dG_0 , dG_u or dG_1 rests on the counter-pressure plates (Figure A I.1).

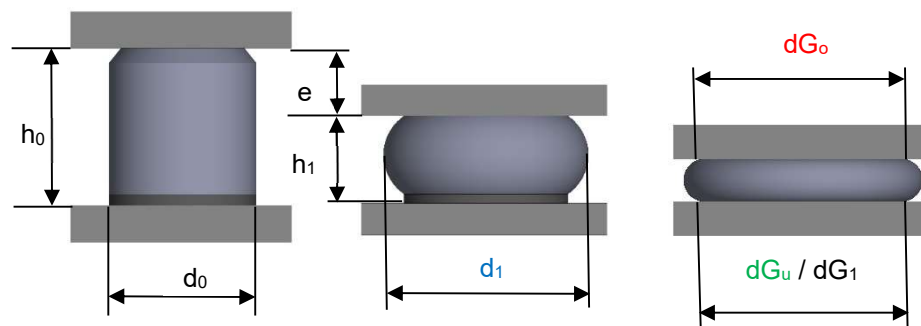
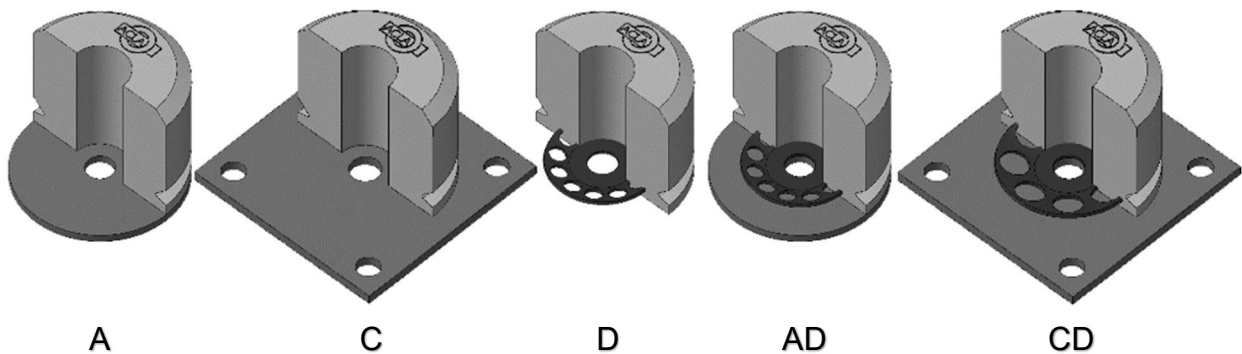


Fig. A I.1

The tables attached on the following pages give the diameters d_1 in the middle of the buffer, dG_0 on the top (impact side) and dG_u or dG_1 on the clamping side. Because the characteristics of the buffer deformation depend somewhat on the type of assembly and the PU. Therefore, the tables differ for the two used materials.



Possible mounting types:

7 th digit of the article number mounting type	mounting type	Monting element
300xxx1xxx	Type A	round steel plate
300xxx3xxx	Type C	square steel plate
300xxx4xxx; 300707.xx	Type D	foamed perforated sheet metal
300xxx5xxx	Type AD	round steel plate plus additional foamed perforated plate
300xxx6xxx	Type CD	square steel plate plus additional foamed perforated plate

**2. Values for ACLA® buffer made of Autan XL**

300400R/300400U					
Mounting type A, C, D, AD, CD		Mounting type A, C, D, AD, CD		Mounting type A, C, AD, CD	Mounting type D
Deflection e [mm]	Impact mass [kg]	d ₁ [mm]	dG _o [mm]	dG _u [mm]	dG _u [mm]
24	350	91	82	80	80
28	415	92	82	80	80
32	505	94	83	80	80
36	590	96	85	80	80
40	690	99	87	80	80
44	795	102	88	80	80
48	905	105	91	80	80
52	1050	109	96	80	88
56	1230	113	100	80	97
60	1700	119	107	93	107

300400S/300400T					
Mounting type A, C, D, AD, CD		Mounting type A, C, D, AD, CD		Mounting type A, C, AD, CD	Mounting type D
Deflection e [mm]	Impact mass [kg]	d ₁ [mm]	dG _o [mm]	dG _u [mm]	dG _u [mm]
22	180	87	80	80	80
24	200	88	82	80	80
28	245	89	82	80	80
32	295	91	83	80	80
36	350	93	84	80	80
40	415	95	86	80	80
44	480	97	88	80	80
48	550	99	89	80	80
52	630	102	93	80	86
56	745	106	95	80	92
61	900	113	103	84	101



300401P/300401V					
Mounting type A, C, D, AD, CD		Mounting type A, C, D, AD, CD		Mounting type A, C, AD, CD	Mounting type D
Deflection e [mm]	Impact mass [kg]	d ₁ [mm]	dG _o [mm]	dG _u [mm]	dG _u [mm]
15	700	109	100	100	100
20	976	113	100	100	100
24	1236	115	104	100	100
28	1496	118	105	100	100
32	1757	121	107	100	100
36	2043	124	109	100	102
40	2303	127	112	100	104
44	2576	130	115	100	109
48	2862	134	119	100	113
50	3000	137	122	106	117

300401Q/300401W					
Mounting type A, C, D, AD, CD		Mounting type A, C, D, AD, CD		Mounting type A, C, D, AD, CD	Mounting type D
Deflection e [mm]	Impact mass [kg]	d ₁ [mm]	dG _o [mm]	dG _u [mm]	dG _u [mm]
18	330	109	100	100	100
20	365	110	100	100	100
24	440	112	103	100	100
28	530	114	104	100	100
32	625	116	106	100	100
36	745	118	107	100	100
40	870	119	109	100	100
44	1025	122	111	100	103
48	1220	125	114	100	107
52	1455	130	118	100	113
56	1805	134	122	100	119
59	2200	139	128	113	125

300402P/300402V					
Mounting type A, C, D, AD, CD		Mounting type A, C, D, AD, CD		Mounting type A, C, D, AD, CD	Mounting type D
Deflection e [mm]	Impact mass [kg]	d ₁ [mm]	dG _o [mm]	dG _u [mm]	dG _u [mm]
18	1000	137	125	125	125
20	1060	138	126	125	125
24	1340	141	130	125	125
28	1655	143	132	125	125
32	2025	146	133	125	125
36	2415	149	136	125	125
40	2845	152	138	125	125
44	3270	155	141	125	133
48	3715	159	144	125	141
52	4220	167	154	137	152
54	4500	172	160	143	158



300402Q/300402W					
Mounting type A, C, D, AD, CD		Mounting type A, C, D, AD, CD		Mounting type A, C, D, AD, CD	Mounting type D
Deflection e [mm]	Impact mass [kg]	d ₁ [mm]	dG _o [mm]	dG _u [mm]	dG _u [mm]
17	500	135	125	125	125
20	570	137	126	125	125
24	700	139	130	125	125
28	855	141	132	125	125
32	1025	144	134	125	125
36	1235	146	135	125	125
40	1495	149	137	125	125
44	1830	151	139	125	125
48	2180	154	141	125	125
52	2595	159	146	125	137
57	3300	166	154	130	151

**3. Values for ACLA® buffer made of Autan HE**

300178A		
Mounting type A, C, D		
Deflection e [mm]	d₁ [mm]	dG₁ [mm]
10	135	129
20	140	129
30	143,5	129
40	147,5	129
50	152,5	129
60	160	129
70	171	155
80	186	178
85	195	190

300405A		
Mounting type A, C, D		
Deflection e [mm]	d₁ [mm]	dG₁ [mm]
12	85	81
24	88	81
36	92	81
48	95	81
60	99	81
72	105	87,5
84	112,5	104
96	125	120
104	135	130

300183A		
Mounting type A, C, D		
Deflection e [mm]	d₁ [mm]	dG₁ [mm]
10	149	142
20	155	142
30	160	142
40	165	142
50	170	142
60	175	155
70	187	172,5
80	207,5	197,5
90	237,5	230

300400L		
Mounting type A, C, D		
Deflection e [mm]	d₁ [mm]	dG₁ [mm]
8	84,4	80
16	89,0	80
24	91,5	80
32	95,0	80
40	99,4	80
48	105,0	80
56	112,5	97
64	126,5	112,5

300335A		
Mounting type A, C, D		
Deflection e [mm]	d₁ [mm]	dG₁ [mm]
16	105	101
32	110	101
48	115	101
64	117,5	101
80	121	101
96	125	101
112	137,5	120
128	157,5	145
144	190	177,5

300401L		
Mounting type A, C, D		
Deflection e [mm]	d₁ [mm]	dG₁ [mm]
8	105,2	100
16	108,5	100
24	112,0	100
32	115,7	100
40	120,2	100
48	125,4	100
56	133,3	119
64	149,2	134

300401M		
Mounting type A, C, D		
Deflection e [mm]	d₁ [mm]	dG₁ [mm]
8	104,6	100
16	107,5	100
24	111,5	100
32	113,4	100
40	117,2	100
48	121,6	100
56	128,0	115
64	140,2	129



300402L		
Mounting type A, C, D		
Deflection e [mm]	d₁ [mm]	dG₁ [mm]
8	132,2	125
16	135,5	125
24	140,0	125
32	144,4	125
40	149,7	125
48	156,2	138
56	167,4	153
60	175,5	158

300400F		
Mounting type A, C, D		
Deflection e [mm]	d₁ [mm]	dG₁ [mm]
8	84,4	80
16	89	80
24	91,5	80
32	95	80
40	99,4	80
48	105	80
56	112,5	97
64	126,5	113

300419L		
Mounting type A, C, D		
Deflection e [mm]	d₁ [mm]	dG₁ [mm]
8	147	140
16	151,2	140
24	155,2	140
32	160,1	140
40	165,5	140
48	172,0	149
56	188,2	164
57,5	186,0	171

300401F		
Mounting type A, C, D		
Deflection e [mm]	d₁ [mm]	dG₁ [mm]
8	105,2	100
16	108,5	100
24	112,0	100
32	115,7	100
40	120,2	100
48	125,4	100
56	133,3	119
64	149,2	134

300403L		
Mounting type A, C, D		
Deflection e [mm]	d₁ [mm]	dG₁ [mm]
8	173,0	165
16	177,5	165
24	181,8	165
32	186,5	165
40	191,2	165
48	196,9	165
56	200,5	190
58	207,5	190

300401G		
Mounting type A, C, D		
Deflection e [mm]	d₁ [mm]	dG₁ [mm]
8	104,6	100
16	107,5	100
24	111,5	100
32	113,4	100
40	117,2	100
48	121,6	100
56	128,0	115
64	140,2	129

300404L		
Mounting type A, C, D		
Deflection e [mm]	d₁ [mm]	dG₁ [mm]
8	230,6	220
16	235,4	220
24	240,3	220
32	245,5	220
40	250,8	220
48	257,0	225
50	258,5	233

300402F		
Mounting type A, C, D		
Deflection e [mm]	d₁ [mm]	dG₁ [mm]
8	132,2	125
16	135,5	125
24	140,0	125
32	144,4	125
40	149,7	125
48	156,2	138
56	167,4	153
60	175,5	158



300419F		
Mounting type A, C, D		
Deflection e [mm]	d₁ [mm]	dG₁ [mm]
8	147	140
16	151,2	140
24	155,2	140
32	160,1	140
40	165,5	140
48	172	149
56	183,2	164
57,5	186,0	171

300403F		
Mounting type A, C, D		
Deflection e [mm]	d₁ [mm]	dG₁ [mm]
8	173,0	165
16	177,5	165
24	181,8	165
32	186,5	165
40	191,2	165
48	196,9	165
56	200,5	190
58	207,5	190

300404F		
Mounting type A, C, D		
Deflection e [mm]	d₁ [mm]	dG₁ [mm]
8	230,6	220
16	235,4	220
24	240,3	220
32	245,5	220
40	250,8	220
48	257,0	225
50	258,5	233