

## Dimensions for maintenance of nozzles and discs - Critical Service

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### 1 Purpose

This LGS gives information about the dimensions and the surface quality which must be observed during the refinishing work, it also provides the work instructions.

### 2 Scope

This LGS applies to the LESER sites Hamburg and Hohenwestedt as well as for valve repair shops repairing and / or maintaining LESER valves. This LGS is valid for:

- nozzles
- discs with removable lifting gear

The scope of the product group Critical Service includes Type 447 and 546.

### 3 References

Not applicable

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## 4 Conditional Agreement

The further mentioned rules for the refinishing of nozzles and discs have been issued and explained in all conscience and describe the final design of the components.

LESER reserves the right to make necessary modifications at the components without determining these changes in this standard directly. So, if there are any doubts on user side when applying these guidelines, LESER must be contacted before performance of rework to clarify the actual situation.

When applying these guidelines, it must be considered generally that they describe the refinishing at components which influence the function and capacity of the safety valves. Even marginal deviations to this guideline can affect a malfunction or constricted capacity of the safety valve and therewith an inadmissible pressure increase can arise during application/operation. This could possibly have serious consequences for humans and environment. Therefore, it must be proceeded carefully when applying these rules.

LESER assumes no liability for safety devices which have been repaired or reworked in accordance with this LGS. The repair shop is solely responsible for the function and capacity of the re-introduced safety device.

The user of this LGS should be clear on the fact that the repair of a safety device against inadmissible overpressure is subjected to international laws. The violation of valid rules will be traced and avenged acc. to relevant legislations.

In case of any doubts during application of this LGS, LESER must be consulted before starting repair or rework of LESER safety devices.

## 5 Introduction

If the sealing surfaces of nozzles and discs have been damaged, the original sealing quality can be restored by refinishing of the sealing surfaces. The minimum and maximum dimensions given in the tables below must be ensured.

Other additional rework like Hardfacing (build-up welding) or similar activities at the surfaces are not allowed.

## 6 Execution

The refinishing by smooth turning and grinding with final lapping should be done on the nozzle and if necessary, also on the disc with the least possible material removal. Please refer to the limiting values in the following tables.

These critical dimensions apply to Type 447 and 546 valves and supersede any dimensions provided in previous versions or revisions.

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### 6.1 Measures and facing profile

Tables, together with the corresponding illustrations, contain the linear and angle dimensions which shall be observed. After processing of the nozzle surface, it is also important that the profile of the sealing area is restored moderately using inner and outer chamfers.

### 6.2 Surface Quality

A surface quality to a mean roughness depth of  $R_z$  0,25 (DIN EN ISO 4287) or AA 1 (ASME B46.1) must be achieved on both sealing surfaces through lapping.

In the case of PTFE sealing, different surface qualities may be as shown in the figures. These sealing surfaces may be achieved alternatively through smooth turning.

### 6.3 Test

In a final test on the mounted valve, it must be guaranteed that:

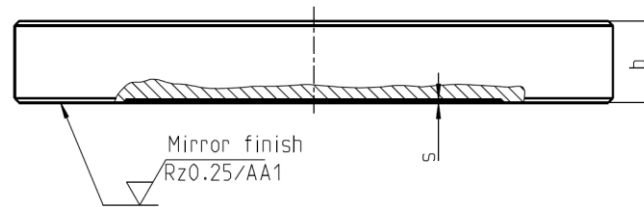
- The semi rings on the spindle must be off the guide when the valve is closed.
- The lower spring plate may not touch the guide when the spring is assembled.
- In case of lift restricted valves, the lift restriction must be checked and if necessary, the lift restriction bushing extended or lift restriction screw adjusted.

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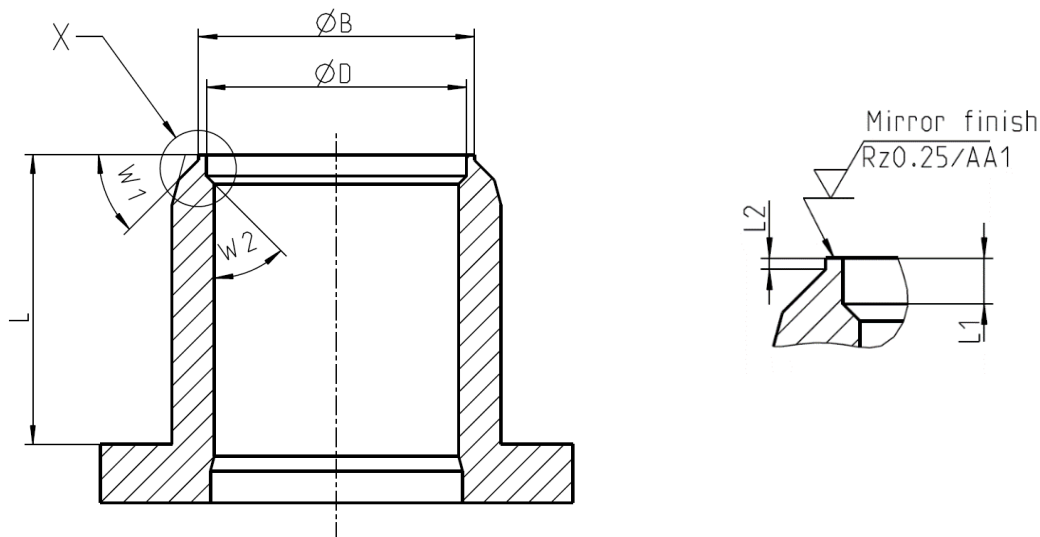
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**7 Refinishing of nozzle and disc, Critical Service, metal sealing**

Work is to be carried out according to Figure 1 and Figure 2 according to Table 1 to Table 2.



**Figure 1. Disc, metal sealing.**



**Figure 2. Nozzle, metal sealing.**

Changes in dimension may only be such as not to reduce dimensions b and/or L, L<sub>1</sub> and L<sub>2</sub> below its lower limit.

The dimension B on the sealing area of the nozzle shall be restored with outer chamfering within its limits.

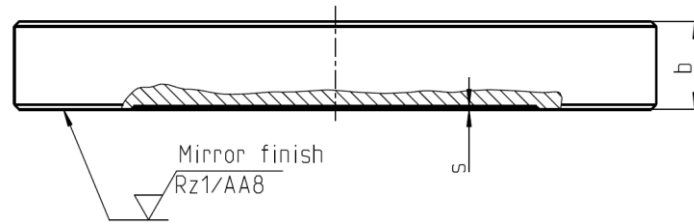
**8 Refinishing of disc, Critical Service, glass sealing**

The critical service safety valve can be equipped with a disc made from glass. This prevents wear and eliminates the need for reworking of the sealing surface. If the disc is severely damaged or the seat tightness is insufficient, the disc shall be replaced. For nozzles refer to Table 1 to Table 2.

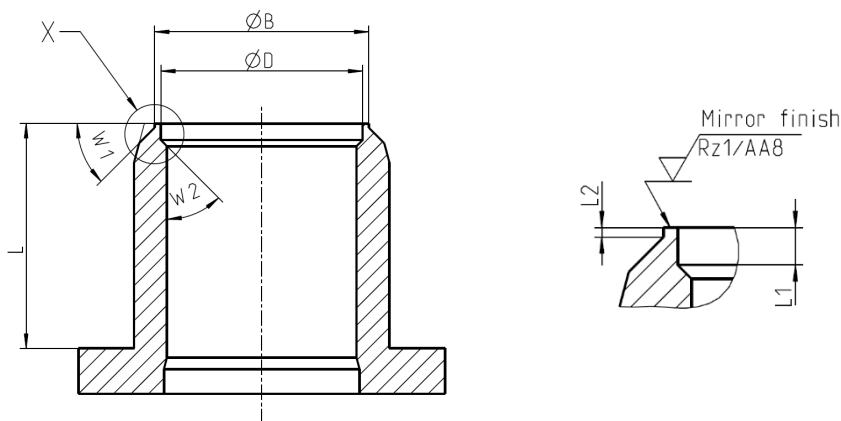
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**9 Refinishing of nozzle, Critical Service, PTFE sealing**

Work is to be carried out according to Figure 3 and Figure 4 and according to Table 1 to Table 2.



**Figure 3. Disc, PTFE sealing.**



**Figure 4. Nozzle, PTFE sealing.**

Changes in dimension may only be such as not to reduce dimensions b and/or L, L<sub>1</sub> and L<sub>2</sub> below its lower limit.

The dimension B on the sealing area of the nozzle shall be restored with outer chamfering within its limits.

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**10 Tables**

**Table 1: nozzles and discs, critical service in mm**

Type	Orifice	Size in NPS	Size in DN	Nozzle								Disc	
				Diameter			Length			Angle		Thickness	
				B Ø in mm		D Ø in mm	L in mm	L <sub>1</sub> in mm	L <sub>2</sub> in mm	W <sub>1</sub> in °	W <sub>2</sub> in °	b in mm	s in mm
				upper limit	lower limit	upper limit	lower limit	lower limit	lower limit			lower limit	lower limit
447	23	-	25	28,2	28,0	26,0	37,2	4,7	0,7	50	-	8,9	0,5
447	46	-	50	52,1	51,9	49,1	53,7	3,2	0,7	45	45	8,9	0,2
447	60	-	80	65,7	65,3	63,65	61,2	3,2	-	5	45	8,9	0,2
447	92	-	100	101,2	100,8	97,15	87,7	3,2	-	50	45	11,9	0,2
5462	23	-	25	25,2	24,8	23,1	87,8	-	-	15	-	- *	- *
5462	46	-	50	48,2	47,8	46,1	128,7	-	-	15	-	- *	- *
5462	72	-	80	74,2	73,8	72,1	180,7	-	-	15	-	- *	- *
5466	23	-	25	29,1	28,9	27,1	87,8	4,7	0,1	45	30	8,9	0,4
5466	46	-	50	52,1	51,9	49,1	128,7	3,2	0,7	45	45	8,9	0,4

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Type	Orifice	Size in NPS	Size in DN	Nozzle								Disc	
				Diameter			Length			Angle		Thickness	
				B Ø in mm		D Ø in mm	L in mm	L <sub>1</sub> in mm	L <sub>2</sub> in mm	W <sub>1</sub> in °	W <sub>2</sub> in °	b in mm	s in mm
				upper limit	lower limit	upper limit	lower limit	lower limit	lower limit			lower limit	lower limit
5465	37	-	40	39,2	38,8	37,1	115,8	-	-	15	-	- *	- *
5465	60	-	65	62,2	61,8	60,1	153,3	-	-	15	-	- *	- *
5465	87	-	100	89,2	88,8	87,1	202,3	-	-	15	-	- *	- *

\* Type 5462, 5465 are exclusively equipped with disc made of glass.

**Table 2: nozzles and discs, critical series in inch.**

Type	Orifice	Size in NPS	Size in DN	Nozzle								Disc	
				Diameter			Length			Angle		Thickness	
				B Ø in inch		D Ø in inch	L in inch	L <sub>1</sub> in inch	L <sub>2</sub> in inch	W <sub>1</sub> in °	W <sub>2</sub> in °	b in inch	s in inch
				upper limit	lower limit	upper limit	lower limit	lower limit	lower limit			lower limit	lower limit
447	23	-	25	1.110	1.102	1.024	1.465	0.185	0.028	50	-	0.350	0.020
447	46	-	50	2.051	2.043	1.933	2.114	0.126	0.028	45	45	0.350	0.008
447	60	-	80	2.587	2.571	2.506	2.409	0.126	-	5	45	0.350	0.008
447	92	-	100	3.984	3.969	3.825	3.453	0.126	-	50	45	0.469	0.008
5462	23	-	25	0.992	0.976	0.909	3.457	-	-	15	-	- *	- *
5462	46	-	50	1.898	1.882	1.815	5.067	-	-	15	-	- *	- *
5462	72	-	80	2.921	2.906	2.839	7.114	-	-	15	-	- *	- *
5466	23	-	25	1.146	1.138	1.067	3.457	0.185	0.004	45	30	0.350	0.008
5466	46	-	50	2.051	2.043	1.933	5.067	0.126	0.028	45	45	0.350	0.008
5465	37	-	40	1.543	1.528	1.461	4.559	-	-	15	-	- *	- *

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Type	Orifice	Size in NPS	Size in DN	Nozzle								Disc	
				Diameter			Length			Angle		Thickness	
				B Ø in inch		D Ø in inch	L in inch	L <sub>1</sub> in inch	L <sub>2</sub> in inch	W <sub>1</sub> in °	W <sub>2</sub> in °	b in inch	s in inch
				upper limit	lower limit	upper limit	lower limit	lower limit	lower limit			lower limit	lower limit
5465	60	-	65	2.449	2.433	2.366	6.035	-	-	15	-	- *	- *
5465	87	-	100	3.512	3.496	3.429	7.965	-	-	15	-	- *	- *

\* Type 5462, 5465 are exclusively equipped with disc made of glass.