

Dimensions for maintenance of nozzles and discs - Compact Performance

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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:

- full nozzles
- nozzles
- discs with removable lifting gear

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 237, 437, 438/439/481 and 459/462 valves and supersede any dimensions provided in previous versions or revisions.

6.1 Measures and facing profile

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

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6.2 Surface Quality

A surface quality to a mean roughness depth of Rz 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 plastic and soft 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 type 459 and 462, 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 lift restricted valves, the lift restriction must be checked and if necessary, the lift restriction bushing extended.

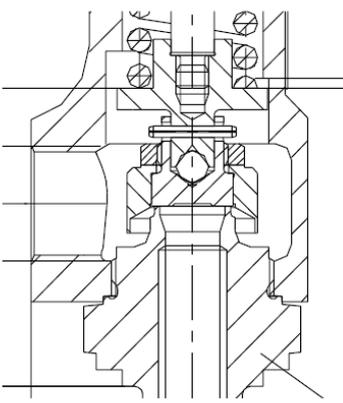
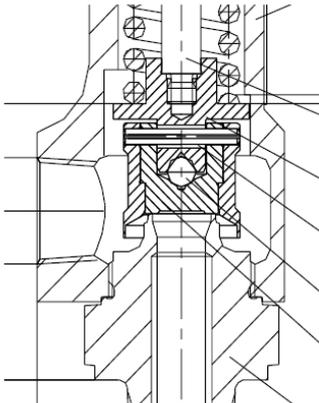
For type 437, 237 and 438/439/481 no final test is required.

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7 Refinishing of nozzle and disc type 237, 437 and 459, metal sealing

7.1 Information about old disc design

Since 2007 the types 437 do6 + 10 have been converted to a new metal-to-metal disc design. The “old” disc design is not available as spare part at LESER. Instead LESER will offer conversion kits to change over to the new design. For detailed information please ask LESER sales.

Feature-Benefits Type 437 do = 6 and do = 10 (Stainless steel disc): Old vs. New Disc Design	
 <p>Old:</p>	 <p>New:</p>
Feature	Benefit
Easy assembly	No torque wrench needed
Removable lifting aid	Simple repair of sealing surface
Zero-potential assembly of disc	Optimal functional tightness without refinish
Conversion kit available	Refitting of every customer valve possible

7.2 Work Instruction

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

Changes in dimension may only be such as not to reduce dimensions b and/or L below the lowest allowable tolerance. The dimensions A and C on the seat must be restored with inner and outer chamfering or rounding. No sharp edges to potentially cut the soft sealing seats. The flow diameter d0 shall not be reworked.

The recess dimensions "L₁" do not have to be reworked.

Remark: Small changes at the seat geometry may have big influence on the function of the safety valve. LESER recommends using a new inlet body and disc.

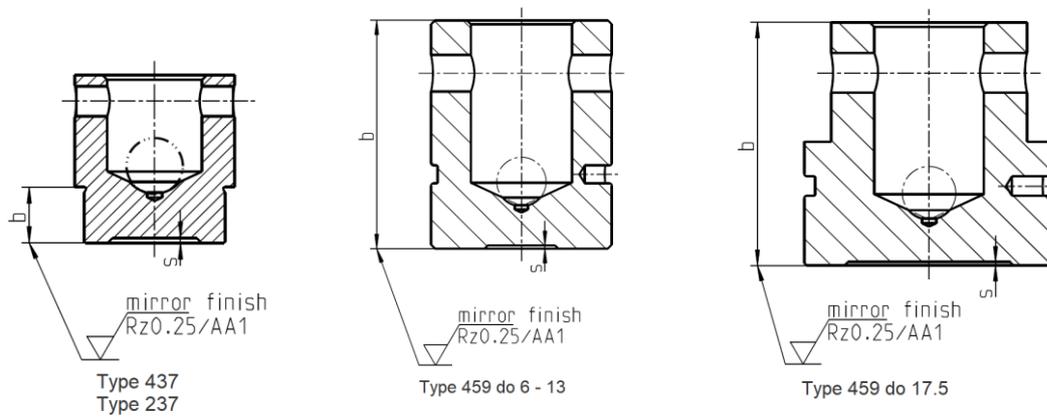
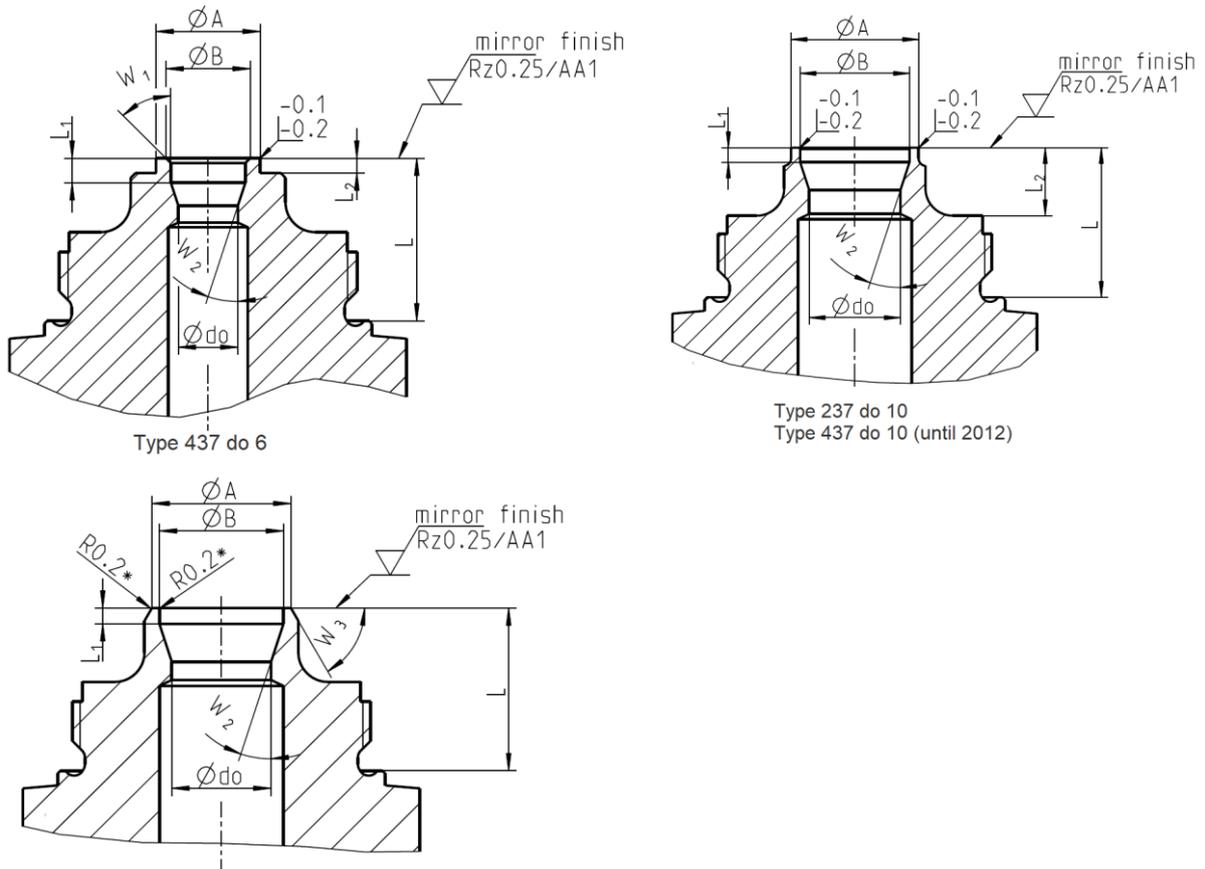


Figure 1. Discs all types, metal sealing.



*: turning dimension before finishing

Type 437 do 10

Figure 2. Nozzles type 437, 237.

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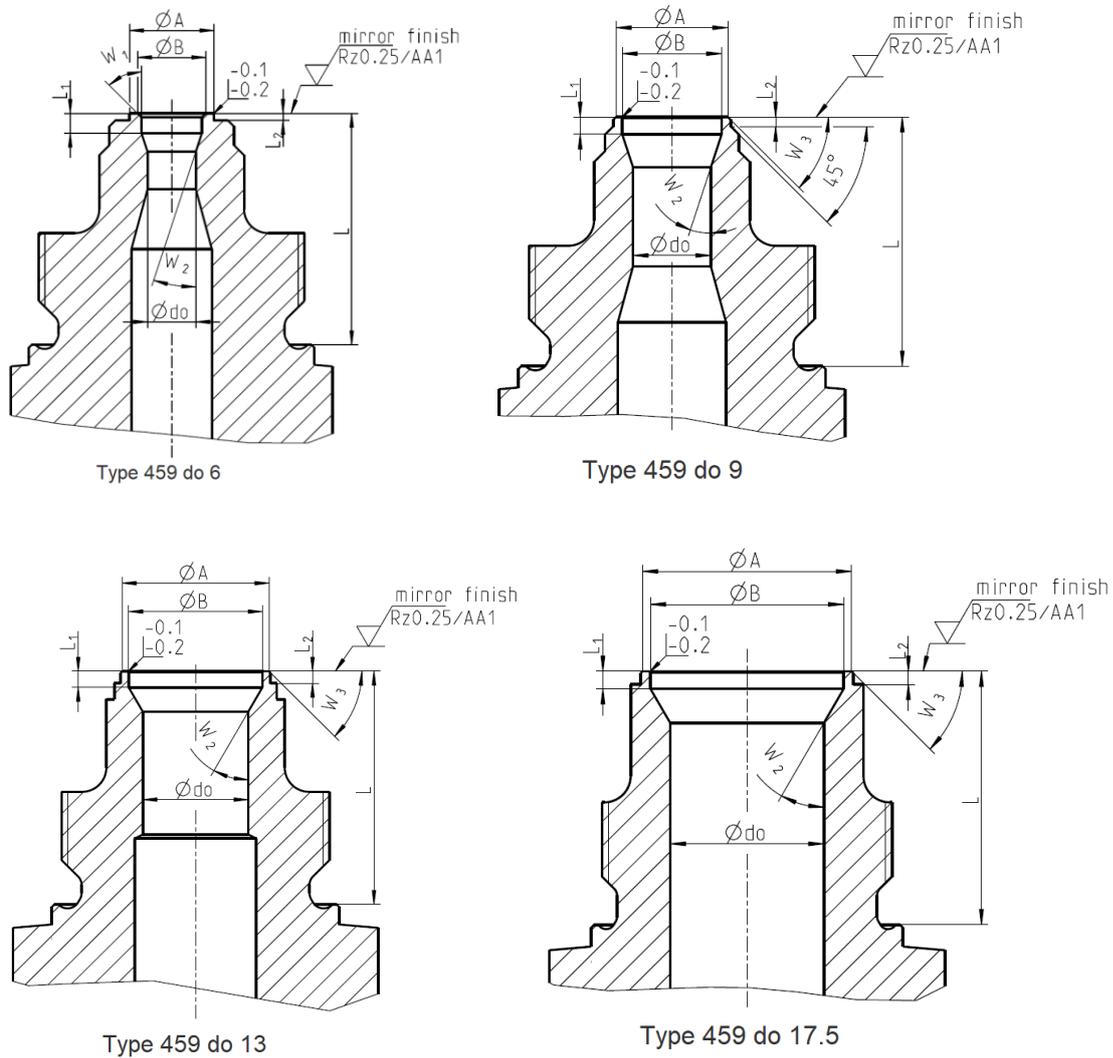


Figure 3. Nozzles type 459, 462.

8 Refinishing of sealing plate disc type 437 and 459, plastic sealing

It is not recommended to rework the sealing plate disc. If damaged, a replacement is recommended.

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

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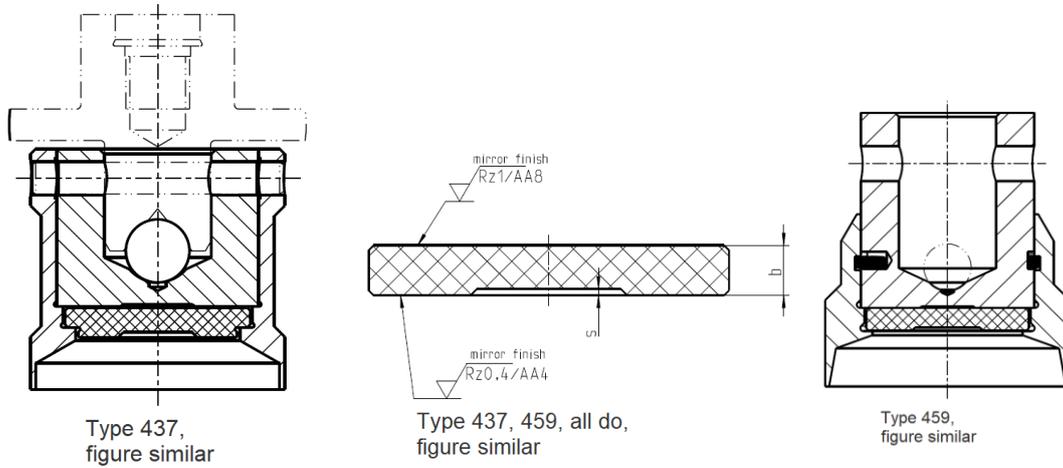


Figure 4. Discs type 437, 459, plastic sealing.

The sealing plates differ in detail depending on the variant, but the figure stands representative of all.

9 Refinishing of disc type 438, 439, 481 and 462, soft sealing

It is not permitted to rework the soft sealing disc. If damaged, a replacement is necessary.

Work is to be carried out according to Figure 3 and Figure 5 and Table 1 to Table 2.

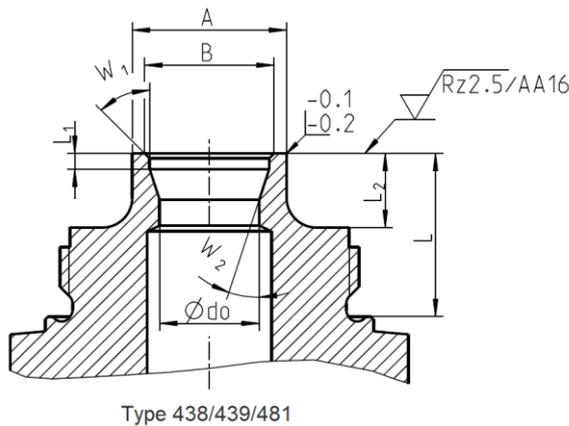


Figure 5. Nozzle type 438, 439, 481, soft sealing.

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10 Tables

Table 1: nozzles and discs type 437, 237 438, 439, 481 and 459, 462 in mm

Type	Size d ₀ in mm	Pressure range in Class in PN	Nozzle										Disc, metal sealing		Disc, plastic sealing	
			Diameter				Length			Angle			Thickness		Thickness	
			A Ø in mm		B Ø in mm		L in mm	L ₁ in mm	L ₂ in mm	W ₁ in °	W ₂ in °	W ₃ in °	b in mm	s in mm	b in mm	s in mm
			lower limit	upper limit	lower limit	upper limit	lower limit	lower limit	lower limit				lower limit	lower limit	lower limit	lower limit
437	6	all	10,45	-	8,5	8,6	16,3	2,4	1,4	45	18	-	5,8	0,3	2,85	0,3
437	10	all	14	14,05	-	12,55	16,3	1,5	-	-	18	60	5,8	0,3	2,85	0,3
237	10	all	13,45	-	-	12,05	16,3	1,5	1,9	-	18	-	5,8	0,2	-	-
459	6	all	10,3	-	8,5	8,6	28,8	2,4	0,8	45	18	-	27,8	0,2	-	-
459	9	all	12,9	13	-	11,55	28,8	1,9	1	-	18	45	27,8	0,2	2,8	0,2
459	13	all	18,1	18,2	-	16,55	28,8	1,9	1,4	-	30	45	27,8	0,2	2,8	0,2
459	17.5	all	23,8	23,9	-	22,05	28,8	1,9	1,4	-	30	45	27,2	0,2	2,8	0,2
438	10	all	15,4	-	-	12,05	16,3	1,5	-	45	18	-	-	-	-	-
481	10	all	15,4	-	-	12,05	16,3	1,5	-	45	18	-	-	-	-	-
439	10	all	15,4	-	-	12,05	16,3	1,5	-	45	18	-	-	-	-	-
462	9	all	12,9	13	-	11,55	28,8	1,9	1	-	18	45	-	-	-	-
462	13	all	18,1	18,2	-	16,55	28,8	1,9	1,4	-	30	45	-	-	-	-
462	17.5	all	23,8	23,9	-	22,05	28,8	1,9	1,4	-	30	45	-	-	-	-

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Table 2: nozzles and discs type 437, 237, 438, 439, 481 and 459, 462 in inch

Type	Size d ₀ in mm	Pressure range in Class in PN	Nozzle										Disc, metal sealing		Disc, plastic sealing	
			Diameter				Length			Angle			Thickness		Thickness	
			A Ø in inch		B Ø in inch		L in inch	L ₁ in inch	L ₂ in inch	W ₁ in °	W ₂ in °	W ₃ in °	b in inch	s in inch	b in inch	s in inch
			lower limit	upper limit	lower limit	upper limit	lower limit	lower limit	lower limit				lower limit	lower limit	lower limit	lower limit
437	6	all	0.411	-	0.335	0.339	0.642	0.094	0.055	45	18	-	0.228	0.012	0.112	0.012
437	10	all	0.551	0.553	-	0.494	0.642	0.059	-	-	18	60	0.228	0.012	0.112	0.012
237	10	all	0.530	-	-	0.474	0.642	0.059	0.075	-	18	-	0.228	0.008	-	-
459	6	all	0.406	-	0.335	0.339	1.134	0.094	0.031	45	18	-	1.094	0.008	-	-
459	9	all	0.508	0.512	-	0.455	1.134	0.075	0.039	-	18	45	1.094	0.008	0.110	0.008
459	13	all	0.713	0.717	-	0.652	1.134	0.075	0.055	-	30	45	1.094	0.008	0.110	0.008
459	17.5	all	0.937	0.941	-	0.868	1.134	0.075	0.055	-	30	45	1.071	0.008	0.110	0.008
438	10	all	0.606	-	-	0.474	0.642	0.059	-	45	18	-	-	-	-	-
481	10	all	0.606	-	-	0.474	0.642	0.059	-	45	18	-	-	-	-	-
439	10	all	0.606	-	-	0.474	0.642	0.059	-	45	18	-	-	-	-	-
462	9	all	0.508	0.512	-	0.455	1.134	0.075	0.039	-	18	45	-	-	-	-
462	13	all	0.713	0.717	-	0.652	1.134	0.075	0.055	-	30	45	-	-	-	-
462	17.5	all	0.937	0.941	-	0.868	1.134	0.075	0.055	-	30	45	-	-	-	-

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